RF & MICROWAVE POWER TRANSISTORS

DATABOOK

1st EDITION

DECEMBER 1989

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RF AND MICROWAVE TRANSISTORS

SGS-THOMSON Microelectronics represents more than 20 years of experience in the design and manufacture of high technology, high quality and high volume RF Power transistors to the military and professional communications marketplace. Our processes are recognized in the fields of cellular telephone, avionics instrumentation, television broadcast, radars and microwave transmission around the world.

Our factory in Montgomeryville, Pennsylvania is renowned for the ability to produce large volumes of complex RF Power transistors with outstanding reproducibility.

The breadth of our standard RF Power transistor product line is displayed for you on the following pages. Our products cover a range of frequencies from 2MHz to 4 GHz and at power levels that range from more than 1kW under pulsed conditions at 1GHz to more than 150W under class AB linear conditions at 860MHz for band IV/V television, both of which are unexcelled in the industry. But our expertise does not stop there. In areas such as Base Station devices for cellular telephones at frequencies up to 960MHz, a totally new product line is available with unsurpassed power from a single device exceeding 120W under Class AB conditions and many more custom products.

Every RF transistor that we design incorporates many features which assure a reliable product life cycle and ruggedness in your custom applications. This begins with our selection from a variety of geometric structures, each with excellent characteristics at specific operating frequencies or power levels, depending on the application that is intended. Our sophisticated processes are carefully controlled and monitored in an ultra-clean laboratory environment ensuring that every lot processed is reproduced to perform identically to any other. Gold metal on the top and bottom of each wafer is our guarantee of our superior die attach integrity, low thermal resistance and long product lifetime. In the assembly areas, automatic wire bonding equipment is used to control the placement, loop heights and coupling of the wires for maximum performance at your operating frequencies and conditions. Every control that we employ in our process puts our reputation on the line and makes us stand above our competition.

Each and every product undergoes extensive testing in both the final test and quality assurance areas. We systematically check and cross check the integrity of each device and the performance which our customers around the world expect. Both D.C. and RF tests are performed at your specifications and preferably in your test fixtures simulating your system. In addition we perform tests that evaluate the device thermal efficiency under high dissipation, the level of our emitter ballast resistance and the ability of our products to withstand high levels of V.S.W.R., a simulation of antenna mismatch conditions in your system.

Most of all, our company is dedicated to provide the highest level of service to the achievement of just-in time deliveries, zero defects and guaranteed performance that you expect. Our many sales offices worldwide can provide the assistance that you need to select the right product for your application, investigate the delivery of any product in this brochure or answer any other questions that you feel are of importance. Just give us a cell.

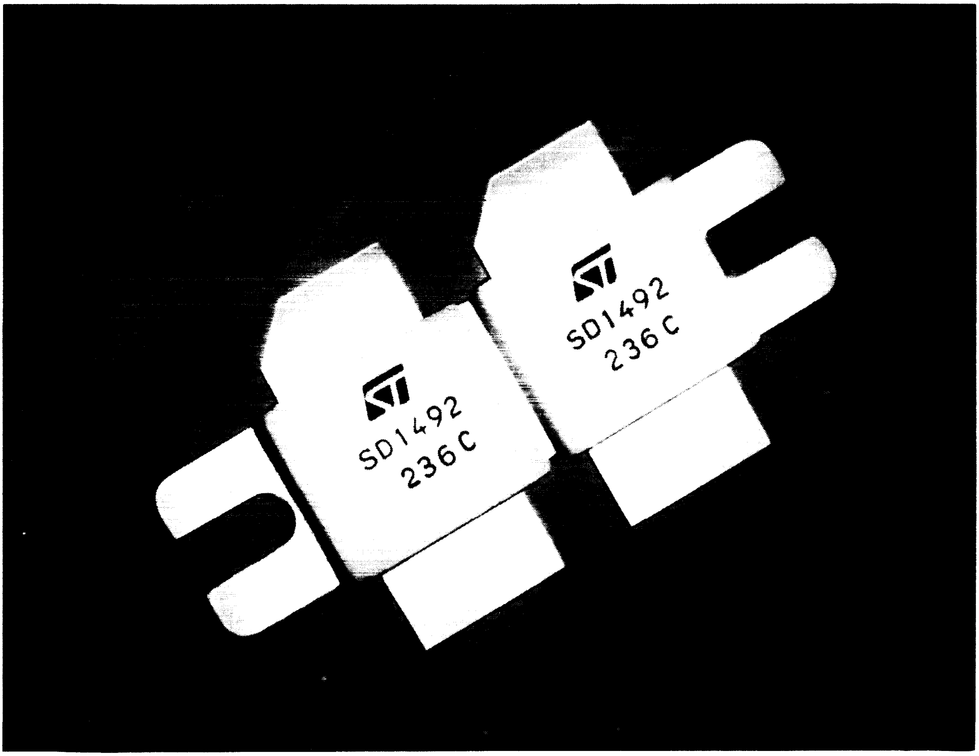
Quality assurance
SGS-THOMSON Microelectronics has made a total commitment to assure high reliability and high quality RF and Microwave Power Transistors.

Quality programs

SGS-THOMSON conforms to:

MIL-S-19500 Appendix D
MIL-I-45208 Inspection System Requirements
MIL-STD-45662 Calibration

A complete and fully equipped Product Assurance Testing Laboratory has been established in Montgomeryville with the capability to screen devices to any reliability level required (form Scanning Electron Microphotography through High Temperature Burn-in) using MIL, NASA or customer specifications. This facility is also equipped to support outside service contracts. The Quality Assurance Inspection activity assures that the highest quality workmanship will be maintained. Generic data on alla product families can be obtained thus enabling customers to eliminate costly qualification and dramatically improve delivery.



150 Watt Class AB RF Power Transistor for TV Band IV + V

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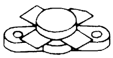
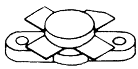
PRODUCT GUIDE

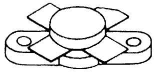
BIAS	Bias
CB	Common base
CC	Common collector
CE	Common emitter
C_{12e}	Reverse transfer capacitance, open circuited input, common emitter
C_{22b}	Output capacitance, open circuited input, common base
CMD	Cross modulation distortion
f_o	Test frequency
f_T	Transition frequency
G_P	Power gain
I_B	Continuous base current
I_C	Continuous collector current
IMD	Intermodulation distortion
NF	Noise figure
P_{in}	Input power
P_{out}	Output power
$P_{out\ (PEP)}$	Output peak envelope power
P_{tot}	Total power dissipation
R_{th} (j-c)	Thermal resistance (junction-case)
T_p	Pulse width
$V_{(BR)\ CEO}$	Collector-emitter breakdown voltage
V_{CB}	Collector-base continuous voltage
V_{CC}	Collector D.C. voltage supply
V_{out}	Output voltage
δ	Duty cycle
η_C	Collector efficiency



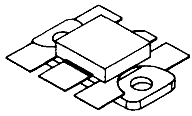
.380 4LFL
(M113)



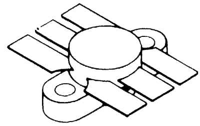
.500 4LFL
(M174)



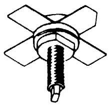
550 4LFL
(M177)



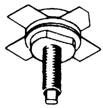
400 x .425 6LFL
(M169)



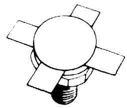
.500 6LFL
(M111)



380 4L STUD
(M135)



500 4L STUD
(M130)



550 4L STUD
(M164)

2 - 30 MHz LINEAR SSB APPLICATIONS

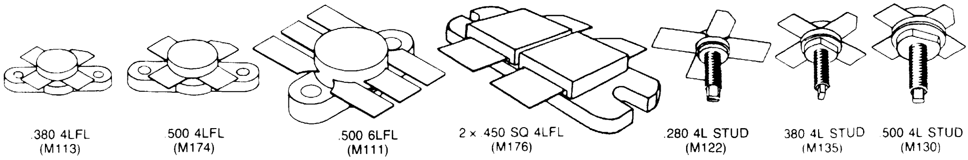
Type P/N	Type SD #	Package	Config.	V_{CC} (V)	$P_{out(PEP)}$ (W)	f_o (MHz)	P_{in} (W)	G_P min (dB)	IMD max (dB)
SD 1285		.380 4LFL	CE	12.5	**20**	30	0.63	15	−30
SD 1451		.500 4LFL	CE	12.5	**50**	30	1.6	15	−26
SD 1405		.500 4LFL	CE	12.5	**75**	30	3.8	13	−30
SD 1487		.500 4LFL	CE	12.5	**100**	30	6.3	12	−30
SD 1224-10		.380 4LFL	CE	28	**30**	30	0.475	18	−28
TH 208	SD 1724-1	.500 4LFL	CE	28	**65**	30	0.25	18	−30
SD 1407		.500 4LFL	CE	28	**100**	30	3.15	15	−30
TH 416	SD 1729	.500 4LFL	CE	28	**130**	30	8.2	12	−30
TH 560	SD 1730	.500 4LFL	CE	28	**220**	30	9.5	12	−30
TH 513	SD 1733	.380 4LSTUD	CE	50	**75**	30	3	14	−30
THA 15	SD 1726	.500 4LFL	CE	50	**150**	30	6	14	−30
THX 15	SD 1727	.550 4L STUD	CE	50	**150**	30	6	14	−30
SD 1411		.400 x .425 6LFL	CE	40	**200**	30	5	16	−30
TH 562	SD 1731	.500 4LFL	CE	50	**220**	30	12	13	−30
TH 430	SD 1728	.550 4LFL	CE	50	**250**	30	10	14.5	−30

SD # is the code used in our ordering and invoicing system.

27 ...88 MHz CLASS C, FM OPERATION

Type P/N	Type SD #	Package	Config.	V_{CC} (V)	P_{out} (W)	f_o (MHz)	P_{in} (W)	G_P min (dB)
SD 1290		.500 4L STUD	CE	12.5	**40**	50	4	10
SD 1451		.500 4LFL	CE	12.5	**55**	50	5.5	10
SD 1446		.380 4LFL	CE	12.5	**70**	50	7	10
SD 1405		.500 4LFL	CE	12.5	**100**	50	20	7
SD 1407-8		.500 6LFL	CE	28	**100**	80	11	9.5
TH 513	SD 1733	.380 4L STUD	CE	50	**75**	70	7	10
THA 15	SD 1726	.500 4LFL	CE	50	**150**	70	19	9
THX 15	SD 1727	.550 4L STUD	CE	50	**150**	70	19	9
TH 430	SD 1728	.550 4LFL	CE	50	**250**	70	25	10

SD # is the code used in our ordering and invoicing system.



55 - 108 MHz CLASS C FOR FM TRANSMITTERS

Type	Package	Config.	V_{CC} (V)	P_{out} (W)	f_o (MHz)	P_{in} (W)	G_P (dB)	η_C (%)
SD 1476*	.2 × .450 SQ 4LFL	CE	28	240	55-88	20	11	50
SD 1457	.500 4LFL	CE	28	75	108	7.5	10	75
SD 1460	.500 4LFL	CE	28	160	108	20	9	75
SD 1483	.2 × .450 SQ 4LFL	CE	28	300	108	25	10	60

* Class AB, I_{CQ} = 2 × 400 mA.

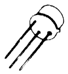
108 ... 152 MHz CLASS C FOR AIRCRAFT COMMUNICATIONS

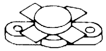
Type	Package	Config.	V_{CC} (V)	P_{out} min (W)	f_o (MHz)	P_{in} (W)	G_P min (dB)
SD 1430	.380 4L STUD	CE	6.5	10	136	2	7
SD 1220-1	.380 4L FL	CE	28	7	136	1	8.4
SD 1013	.380 4L STUD	CE	28	10	150	1	10
SD 1013-3	.380 4L FL	CE	28	10	150	1	10
SD 1222-6	.380 4L STUD	CE	28	15	136	2.3	11
SD 1222-5	.380 4L FL	CE	28	20	136	3	8.2
SD 1015	.380 4L STUD	CE	28	30	150	3	10
SD 1224-2	.380 4L FL	CE	28	40	175	7	7.6
SD 1219-5	.380 4L STUD	CE	28	50	136	5	10
SD 1219	.380 4L STUD	CE	28	60	150	12	7
SD 1019	.500 4L STUD	CE	28	80	136	10	9
SD 1438-2	.380 4L FL	CE	28	100	136	16	7
SD 1480*	.500 6L FL	CE	28	125	136-175	12	9.2

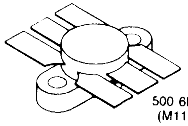
* Internally input matched.

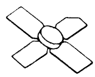
2 ... 400 MHz MOS FIELD EFFECT, N CHANNEL BROADBAND LARGE SIGNAL APPLICATIONS

Type	Package	Config.	V_{DD} (V)	I_{DQ} (mA)	P_{out} (W)	f_o (MHz)	P_{in} (W)	G_P (dB)
SD 1900	.380 4LFL	CS	28	50	5	150	0.25	13
SD 1900-1	.280 4L STUD	CS	28	50	5	150	0.25	13
SD 1902	.380 4LFL	CS	28	50	15	150	1.5	10
SD 1902-1	.280 4L STUD	CS	28	50	15	150	1.5	10
SD 1904	.380 4LFL	CS	28	50	30	150	3.75	13
SD 1904-1	.280 4L STUD	CS	28	50	30	150	3.75	13
SD 1905	.380 4LFL	CS	28	50	45	150	2.25	13
SD 1906-1	.500 4LFL	CS	28	300	60	150	3.0	13
SD 1907	.500 4LFL	CS	28	50	80	150	8.0	10
SD 1908-1	.500 4LFL	CS	28	500	120	150	12.0	10
SD 1912	.500 4LFL	CS	28	250	150	150	37.5	6
SD 1920	.500 4LFL	CS	50	250	150	150	18.75	8
SD 1912-2	.2 × .425 4LFL	CS	28	500	300	150	75	6
SD 1920-2	.2x.425 4LFL	CS	50	500	300	150	47.5	8


TO 39
(M134)


380 4LFL
(M113)


500 6LFL
(M111)


.280 4LSL
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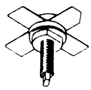
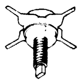
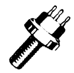
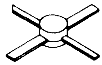

380 4L STUD
(M135)


380 NARROW 4L STUD
(M104)

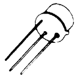

TO 60
(M137)


XO-72 SL
(M107)

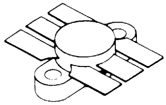
130 ... 230 MHz CLASS FOR FM MOBILE APPLICATIONS

Type		Package	Config.	V_{CC} (V)	P_{out} min (W)	f_o (MHz)	P_{in} (W)	G_P min (dB)	η_C max (%)
P/N	SD #								
SD 1134-5		.280 4LSL	CE	7.5	0.5	150	0.1	7	—
SD 1080-2		XO-72 SL	CE	7.5	0.75	175	0.1	8	—
SD 1135-3		.280 4LSL	CE	7.5	2.5	150	0.22	11	—
SD 1127		TO-39	CE	12.5	4	175	0.4	10	—
2N 6080	SD 1012	.380 4L STUD	CE	12.5	4	175	0.25	12	60
SD 1012-3		.380 4LFL	CE	12.5	6	175	0.75	9	—
SD 1133		.380 4L STUD	CE	12.5	10	175	1	10	—
SD 1143		.380 4LSTUD	CE	12.5	10	175	1	10	—
SD 1143-1		.380 4LFL	CE	12.5	10	175	1	10	—
2N 6081	SD 1014-2	.380 4L STUD	CE	12.5	15	175	3.5	6.3	60
SD 1014-6		.380 4LFL	CE	12.5	15	175	3.5	6.3	—
2N 6082	SD 1229-7	.380 4L STUD	CE	12.5	25	175	6	6.2	50
SD 1229-1		.380 4LFL	CE	12.5	25	175	7.9	5	—
SD 1272		.380 4L STUD	CE	12.5	25	175	3	9.2	—
SD 1272-2		.380 4LFL	CE	12.5	25	175	3	9.2	—
SD 1274		.380 4L STUD	CE	12.5	30	175	3	10	—
SD 1274-1		.380 4L FL	CE	12.5	30	175	3	10	—
2N 6083	SD 1229-8	.380 4L STUD	CE	12.5	30	175	8.1	5.7	50
2N 6084	SD 1018	.380 4L STUD	CE	12.5	40	175	14	4.5	50
SD 1018-6		.380 4LFL	CE	12.5	40	175	14	4.5	70
SD 1018-15		.380 4LFL	CE	12	40	175	12	4.5	70
SD 1278		.380 4L STUD	CE	12.5	40	175	10	6	—
SD 1275		.380 4L STUD	CE	12.5	40	175	5	9	—
SD 1275-1		.380 4LFL	CE	12.5	40	175	5	9	—
SD 1428*		.500 6LFL	CE	12.5	45	175	11.3	6.5	50
SD 1477*		.500 6LFL	CE	12.5	100	175	25	6	—
SD 1441*		.500 6LFL	CE	12.5	150	175	40	5	—
SD 1021		.380 4L STUD	CE	12.5	5.5	230	1.3	6.2	60
SD 1022		.380 4L STUD	CE	12.5	30	230	5.5	7.4	60
2N 5589	SD 1212-2	.380 NARROW 4L STUD	CE	13.6	3	175	0.2	8.2	50
2N 3926	SD 1062	TO-60	CE	13.6	7	175	1.7	5.4	70
2N 5590	SD 1214-12	.380 4L STUD	CE	13.6	10	175	2.3	5.2	50
2N 3927	SD 1072	TO-60	CE	13.6	12	175	4	4.8	80
2N 5591	SD 1216	.380 4L STUD	CE	13.6	25	175	8.3	4.4	50
SD 1273		.380 4L STUD	CE	13.6	40	160	5	9	55
2N 5641	SD 1220	.380 NARROW 4L STUD	CE	28	7	175	0.45	8.4	60
2N 3632	SD 1070	TO-60	CE	28	13.5	175	3.5	5.8	—
2N 5642	SD 1222-10	.380 4L STUD	CE	28	13.5	175	3.5	8.2	60
2N 5643	SD 1224	.380 4L STUD	CE	28	40	175	6.6	7.6	60

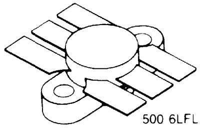
* Internally input matched **SD # is the code used in our ordering and invoicing system.**



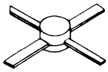
TO-39
(M134)



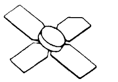
380 6LFL
(M136)



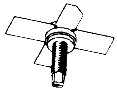
500 6LFL
(M117)



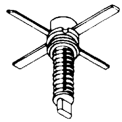
XO-72 SL
(M107)



280 4L SL (B)
(M123)



280 4L STUD (B)
(M122)

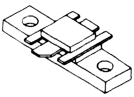


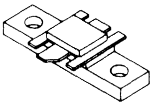
XO-72
(M108)

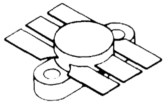
450 - 512 MHz CLASS FOR MOBILE APPLICATIONS

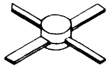
Type		Package	Config.	V_{CC} (V)	P_{out} min (W)	f_o (MHz)	P_{in} (W)	G_P min (dB)
P/N	SD #							
SD 1482		.280 4L STUD (B)	CE	7.5	3	470	0.475	8
SD 1080-6		XO-72 SL	CE	12.5	0.5	470	0.05	10
SD 1080-7		XO-72	CE	12.5	0.5	470	0.05	10
SD 1132-5		XO-72	CE	12.5	0.6	470	0.03	13
SD 1444		TO-39	CE	12.5	2	470	0.32	8
2N 5944	SD 1144	.280 4L STUD (B)	CE	12.5	2	470	0.25	9
SD 1134		.280 4L STUD (B)	CE	12.5	2	470	0.2	10
2N 5945	SD 1145	.280 4L STUD (B)	CE	12.5	4	470	0.65	8
SD 1150		.280 4L STUD (B)	CE	12.5	4	470	0.635	8
SD 1150-3		.280 4L SL (B)	CE	12.5	4	470	0.635	8
SD 1135		.280 4L STUD (B)	CE	12.5	5	470	0.6	8.5
SD 1433		.280 4L STUD (B)	CE	12.5	10	470	1.3	8
2N 5946	SD 1146	.280 4L STUD (B)	CE	12.5	10	470	2.5	6
SD 1136		.280 4L STUD (B)	CE	12.5	10	470	2.5	6
SD 1410-1		.380 6LFL	CE	12.5	10	512	2.5	6
SD 1429*		.500 6LFL	CE	12.5	12	470	2.4	7.8
SD 1429-3*		.500 6LFL	CE	12.5	15	470	2.7	7.5
SD 1422*		.500 6LFL	CE	12.5	25	470	6	6.2
SD 1488*		.500 6LFL	CE	12.5	38	470	9	5.8
SD 1434*		.500 6LFL	CE	12.5	45	470	14	5
SD 1499-1*		.500 6LFL	CE	12.5	65	470	22	4.7

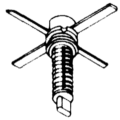
* Internally input matched **SD # is the code used in our ordering and invoicing system.**

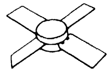

230 6LFL
(M118)

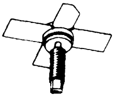

400 6LFL
(M169)

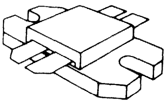

380 6LFL
(M136)

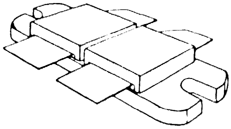

XO-72 SL
(M107)

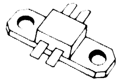

XO-72
(M108)


.280 4L SL (B)
(M123)


.280 4L STUD (B)
(M122)


438 4L BAL FLG
(M173)


2 × 450 SQ 4LFL
(M175)


250 × 320 4LFL
(M156)


250 SQ 2LFL HERM
(M105)

870 ... 960 MHz CLASS C FOR LAND MOBILE APPLICATIONS

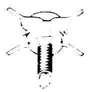
Type	Package	Config.	V_{CC} (V)	P_{out} min (W)	f_o (MHz)	P_{in} (W)	G_P min (dB)
SD 1402	XO-72 SL	CB	12.5	0.3	870	0.048	8
SD 1409	XO-72	CB	12.5	2	870	0.35	8
SD 1410*	.380 6LFL	CB	12.5	6	870	0.95	8
SD 1410-3*	.230 6LFL	CB	12.5	7	836	0.95	7.5
SD 1418*	.230 6LFL	CE	12.5	15	836	4.5	5.2
SD 1412*	.380 6LFL	CB	12.5	18	836	4.5	6
SD 1412-3*	.230 6LFL	CB	12.5	18	836	4.5	6
SD 1421*	.230 6LFL	CB	12.5	25	836	7	5.5
SD 1414*	.230 6LFL	CB	12.5	45	836	12.5	4.5
SD 1400	.230 6LFL	CB	24	9	875	1	9.5
SD 1400-2	.230 6LFL	CB	24	14	900	1.5	9.7
SD 1400-3	.230 6LFL	CB	24	14	960	1.4	9.5
SD 1495-3	.230 6LFL	CB	24	30	960	6	7
SD 1495	.230 6LFL	CB	24	35	870	6	7.6
SD 1496-3	.230 6LFL	CB	24	55	960	10	7.4
SD 1496	.230 6LFL	CB	24	60	900	12.5	7.5
SD 1426** ■	.400 6LFL	CB	24	60	900	12	7

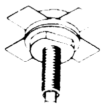
* Internally input matched ** Internally input/output matched ■ In development.

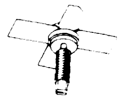
860 ... 960 MHz CLASS AB LINEAR FOR BASE STATION APPLICATIONS

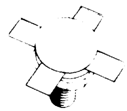
Type	Package	Config.	V_{CC} (V) ICC (mA)	P_{out} min (W)	f_o (MHz)	P_{in} (W)	G_P min (dB)
SD 1420	.280 4LS	CE	24/200	2.1	860-960	.25	9
SD 1420-1	.280 4LSL	CE	24/200	2.1	860-960	.25	9
SD 1423	.230 6LFL	CE	24/75	15	860-960	2.4	8
SD 1424	.250 × 320 4LFL	CE	24/150	30	860-960	5.3	7.5
SD 1425	.230 6LFL	CE	24/150	30	860-960	5.3	2.5
SD 1658	.438 × .450 4LFL	CE	24/200	40	860-900	10	6
SD 1660	.2 × .450 4LFL	CE	24/800	120	860-900	30	6
SD 1680	.2 × .450 4LFL	CE	24/800	100	915-960	25	6

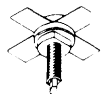

TO-60
(M137)

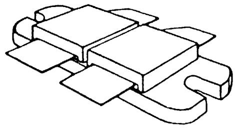

380 NARROW 4L STUD
(M104)

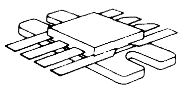

500 4L STUD
(M130)

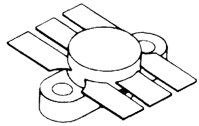

280 4L STUD
(M122)


550 4L STUD
(M164)


380 4L STUD
(M135)


2 x .450 SQ 4LFL
(M175)


.400 BAL FL
(M168)


500 6LFL
(M117)

WIDEBAND VHF - UHF CLASS C FOR ECM AND RADIO LINKS APPLICATIONS

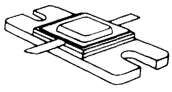
Type		Package	Config.	V_{CC} (V)	P_{out} min (W)	Freq. range (MHz)	P_{in} (W)	Gp min (dB)	c min (%)	C_{22b} max (pF)	R_{th} (j-c) (°C/W)
P/N	SD #										
2N 5090	SD 1037-4	TO-60	CE	28	1.2	400	0.2	7.8	45	3.5	35
2N 5635	SD 1240	.380 NARROW 4L STUD	CE	28	2.5	400	0.6	6.2	50	10	23.3
2N 3375	SD 1050	TO-60	CE	28	3	400	1	4.7	—	10	15
2N 4440	SD 1060	TO-60	CE	28	5	400	1.7	4.7	45	10	15.1
2N 5636	SD 1242	.380 NARROW 4L STUD	CE	28	7.5	400	2	5.7	50	20	11.7
SD 1475		.280 4L STUD	CE	28	10	400	0.9	10.5	50	15	6.4
2N 3733	SD 1075	TO-60	CE	28	10	400	4	4	—	20	7.6
2N 5016	SD 1090	TO-60	CE	28	15	400	4	5.7	50	25	5.8
2N 5637	SD 1244-7	.380 4L STUD	CE	28	20	400	6.9	4.6	60	30	5.8
SD 1462*		.500 6LFL	CE	28	70	225-400	8.8	9.0	—	70	0.8
SD 1468*		.500 6LFL	CE	28	70	225-400	10	8.4	60§	75	1.25
SD 1470*		.500 6LFL	CE	28	100	225-400	18	7	—	—	0.7
TCC 0105-100*	SD 1464	.400 BAL FL	CE	28	100	100-500	17.8	7.5	—	—	0.67
TCC 0204-125*	SD 1463	.400 BAL FL	CE	28	125	225-400	25	7	—	—	0.65

* Internally input matched. §Typical value. **SD # is the code used in our ordering and invoicing system.**

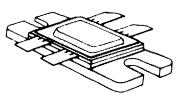
LINEAR TRANSISTORS FOR TV APPLICATIONS, BAND III

Type		Package	Config.	BIAS V_1/I_1 (V) (mA)	P_{out} min (W)	f_o (MHz)	P_{in} (W)	Gp min (dB)	IMD (3tones) (dB)	C_{22b} max (pF)	$R_{th(j-c)}$ (°C/W)
P/N	SD #										
SD 1455		.500 4L STUD	CE	28/2500	14	225	1.75	9	−55	80	1.5
SD 1458*		.500 6LFL	CE	28/2500	14	225	0.6	14	−53	80	1.5
SD 1459		.550 4L STUD	CE	28/3500	30	225	5.3	7.5	−53	150	1.2
TCC3100*	SD 1456-2	.400 BAL FL	CE	28/2 x 100	100	225	10	11		80	1.2
SD 1485**		2 x .450 SQ 4LFL	CE	32/2 x 250	200	230	16	11			.45

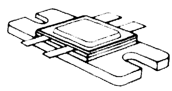
* Internally input matched. ** Class AB. **SD # is the code used in our ordering and invoicing system.**



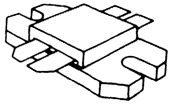
400 SQ 2LFL HERM
(M138)



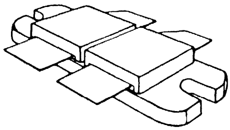
400 × 500 4LFLB HERM
(M102)



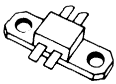
.400 × 425 4LFLB HERM
(M119)



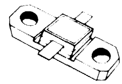
438 4L BAL FLG
(M173)



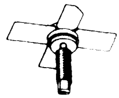
2 × 450 SQ 4LFL
(M175)



250 × 320 4LFL
(M156)



250 SQ 2LFL HERM
(M105)



.280 4L STUD (C)
(M122)

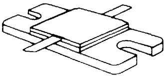
LINEAR TRANSISTORS FOR TV APPLICATIONS, BANDS IV AND V

Type P/N	Type SD #	Package	Config.	BIAS V_1/I_1 (V) (mA)	P_{out} min (W)	f_o (MHz)	P_{in} (W)	G_P min (dB)	IMD (3 t.) (dB)	C_{22b} max (pF)	$R_{th(j-c)}$ (°C/W)
TCC597*	SD 1449		CE	20/440	1	860	0.1	10	−58	7	9.0
TCC598*	SD 1448	.280 4L STUD (C)	CE	25/850	4	860	0.8	7	−58	20	5.5
TDS 595*	SD 1732	.250 x .320 4LFL	CE	25/2 x 900	14	860	1.2	8.5	−47	17.5§	2.5
SD 1490*	—	.438 4L BAL FLG	CE	28/2 x 1500	25	860	1.9	9.0	−45	30 §	1.3
SD 1489**		.438 4L BAL FLG	CE	28/2 x 150	50	860	10.5	6.5	—	40	1.0
SD 1492**		2 x .450 SQ 4LFL	CE	28/2 x 500	150	860	30	6.5	—	—	0.55

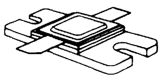
* Class A ** Class AB. §Typical value. **SD # is the code used in our ordering and invoicing system.**

200 ... 500 MHz UHF PULSE POWER TRANSISTORS

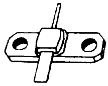
Type	Package	Config.	V_{CC} (V)	P_{out} (W)	P_{in} (W)	Frequency range (MHz)	G_P min (dB)	T_P/δ (μs/%)
SD 1511-8	.250 SQ 2LFL HERM	CE	28	10	1.2	425	9.2	CW
SD 1474	.400 SQ 2LFL HERM	CE	28	48	10	425	6.8	CW
SD 1563	.400 SQ 2LFL HERM	CB	40	300	30	400-500	9.5	250/10
SD 1564	.400 x .425 4LFLB HERM	CE	40	400	70	400-500	7.5	60/2
SD 1565	.400 x .500 4LFLB HERM	CB	40	500	50	200-500	9.7	250/10



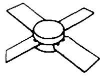
400 SQ 2LFL
(M103)



.400 SQ 2LFL HERM
(M138)



250 2LFL HERM
(M105)

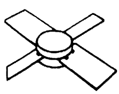


.280 4LSL
(M115)

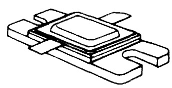
960 ... 1220 MHz CLASS C PULSE FOR DME/IFF/TACAN

Type	Package	Config.	V_{CC} (V)	P_{out} typ (W)	P_{in} (W)	Frequency range (MHz)	G_P typ (dB)	T_P/δ (μs/%)
SD 1520-3*	.280 4LSL	CE	28	1 1 min 0.75	0.09 0.100 0.100	1030-1090 1025-1150 960-1215	10.5 10.5 min 8.8	10/ 1 10/ 1 10/10
SD 1520-8*	.250 2LFL HERM	CE	28	0.10 0.10 min 0.75	0.025 0.025 0.025	1030-1090 1025-1150 960-1215	10.5 10 min 8.8	10/ 1 10/ 1 10/10
SD 1522-9	.250 2LFL HERM	CB	35	1.7 1.5 min 1.2	0.325 0.325 0.325	1030-1090 1025-1150 960-1215	9.3 8.75 min 8	10/ 1 10/ 1 10/10
SD 1522-3	.280 4LSL	CB	35	1.7 1.5 min 1.25	0.200 0.200 0.200	1030-1090 1025-1150 960-1215	9.3 min 8.75 min 8.0	10/ 1 10/ 1 10/10
SD 1524-1	.280 4LSL	CB	28	3 2.7 min 2.3	0.300 0.280 0.250	1030-1090 1025-1150 960-1215	10 9.8 min 9.6	10/ 1 10/ 1 10/10
SD 1526-1	.280 4LSL	CB	28	6 5 min 4	0.700 0.560 0.500	1030-1090 1025-1150 960-1215	9.3 9.5 min 9	10/ 1 10/ 1 10/10
SD 1527-8	.250 2LFL HERM	CB	50 28 28	5 min 4 4	0.350 0.500 0.640	1030-1090 1030-1090 960-1215	11.5 min 9 8	10/ 1 10/ 1 10/10
SD 1528-6 SD 1528-8	.280 4LSL .250 2LFL HERM	CB	50	20 15 min 12	1.5 1.5 1.5	1030-1090 1025-1150 960-1215	11.2 10 min 9	10/ 1 10/ 1 10/10
SD 1530-1 SD 1530-8	.280 4LSL .250 2LFL HERM	CB	50	40 35 min 25	5.00 4.95 3.50	1030-1090 1025-1150 960-1215	9 8.5 min 8.5	10/ 1 10/ 1 10/10
SD 1534-1 SD 1534-8	.280 4LSL .250 2LFL HERM	CB	50	80 75 min 50	12.7 13.3 10	1030-1090 1025-1150 960-1215	8 7.5 min 7	10/ 1 10/ 1 10/10
SD 1536-3 SD 1536-8	.280 4LSL .250 2LFL HERM	CB	50	100 90 min 80	13 13 13	1030-1090 1025-1150 960-1215	8.9 8.4 min 8.4	10/ 1 10/ 1 10/10
SD 1538-2 SD 1538-8	.400 SQ 2LFL .400 SQ 2W LFL HERM	CB	50	200 150 min 140	30 25 25	1030-1090 1025-1150 960-1215	7.6 7.8 min 7.0	10/ 1 10/ 1 10/10
SD 1540 SD 1540-8	.400 SQ 2LFL .400 SQ 2WL FL HERM	CB	50	350 300 min 290	70 70 70	1030-1090 1025-1150 960-1215	7 6.3 min 6.1	10/ 1 10/ 1 10/10

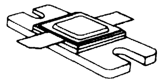
* Class A



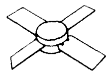
.375 4LSL
(M143)



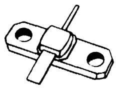
400 × 500 2LFL HERM
(M112)



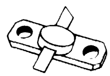
.400 SQ 2LFL HERM
(M138)



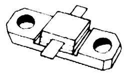
.280 4LSL
(M115)



250 2LFL HERM
(M105)



.280 2LFL
(M114)

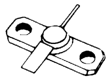


250 SQ 2LFL
(M160)

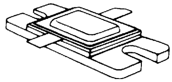
960 ... 1220 MHz CLASS C PULSE FOR DME/IFF/TACAN (Cont'd)

Type	Package	Config.	V_{CC} (V)	P_{out} typ (W)	P_{in} (W)	Frequency range (MHz)	G_P typ (dB)	T_P/δ (μs/%)
SD 1540-3	.375 4LSL	CB	50	325 min 240 200	70 70 70	1030-1090 1025-1150 960-1215	6.6 min 6 min 4.6	10/ 1 10/ 1 10/10
SD 1541	.400 SQ 2LFL	CB	50	450 min 400 min	90 90	1030-1090 1025-1150	7 min 6.5 min	10/ 1 10/ 1
SD 1541-1	.400 x .500 2LFL HERM	CB	50	400 min	90	1025-1150	6.5 min	10/ 1
SD 1541-9	.400 x .500 2LFL HERM	CB	50	450 min	90	1030-1090	7 min	10/ 1
SD 1542	.400 x .500 2LFL HERM	CB	50	600 550 min	150 150	1030-1090 1025-1150	6 5.6 min	10/ 1 10/ 1
SD 1542-4	.400 x .500 2LFL HERM	CB	50	600 min	150	1030-1090	6 min	10/ 1
SD 1546-1	.280 4LSL	CB	50	60 min	—	1030-1090	(oscillator)	10/ 1
SD 1512	.250 2LFL	CB	30	5 min	1	960-1220	7 min	400/20
SD 1513	.400 SQ 2WL FL HERM	CB	42	30 min	6.5	960-1220	6.6 min	400/20
SD 1514	.400 SQ 2WL FL HERM	CB	50	100 min	25	960-1220	6 min	400/20
SD 1550	.250 2LFL HERM	CB	35	15 min	1.5	960-1215	10 min	20/10
SD 1551	.400 SQ 2WL FL HERM	CB	50	80 min	12	960-1215	7.5 min	20/10
SD 1552	.400 x .500 2LFL HERM	CB	50	300 min	65	960-1215	6.6 min	20/10
SD 1554	.400 x .400 2LFL HERM	CB	50	80	15	1090	7.7 min	(1)
SD 1555	.400 x .400 2LFL HERM	CB	50	75	15	1030	7.0	(2)
SD 1556	.400 x .500 2LFL HERM	CB	50	350	60	1090	7.5	(1)
SD 1557	.400 x .500 2LFL HERM	CB	50	300	60	1030	7.0	(2)

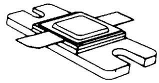
(1) Mode S transponder. (2) Mode S interrrogator.



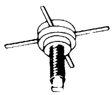
230 2LFL
(M151)



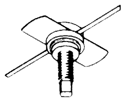
400 x 500 2LFL HERM
(M112)



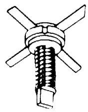
400 SQ 2WL FL HERM
(M138)



TO-117
(M101)



TO-129
(M140)



320 4L STUD HERM
(M126)

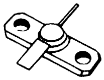
1.2 ... 1.4 GHz CLASS C PULSE FOR RADAR APPLICATIONS

Type	Package	Config.	V_{CC} (V)	P_{out} typ (W)	P_{in} (W)	Frequency range (MHz)	G_P typ (dB)	T_P/δ (μs/%)
SD 1500	.250 2LFL	CB	28	5	1.0	1200-1400	7.0	400/20
SD 1501	.400 SQ 2L FL HERM	CB	35	30	6.0	1200-1400	7.0	400/20
SD 1504	.400 SQ 2L FL HERM	CB	45	50	8.3	1200-1400	7.8	300/10
SD 1502	.400 SQ 2L FL HERM	CB	50	100	25	1200-1400	6.0	400/20
SD 1505	.400 x .500 2LFL HERM	CB	50	125	25	1200-1400	7.0	150/10
SD 1507	.400 x .500 2LFL HERM	CB	50	285	65	1200-1400	6.4	150/5

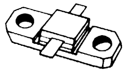
0.75 ... 4.2 GHz MICROWAVE TRANSISTORS FOR CLASS C OPERATION

Type		Package	Config.	V_{CC} (V)	P_{out} min (W)	f_o (GHz)	P_{in} (W)	G_P min (dB)	η_C min (%)	C_{22b} max (pF)	$R_{th\ (j-c)}$ (°C/W)
P/N	SD #										
2N 4429	SD 1176	TO-117	CE	28	1.0	1.0	0.3	5.0	35	3.5	35
2N 4430	SD 1170	TO-129	CE	28	2.5	1.0	0.75	5.0	35	5.0	17.5
2N 4431	SD 1171	TO-129	CE	28	5.0	1.0	1.57	5.0	35	10.0	9.7
SD 1544		.320 4L STUD HERM	CE	28	1.0	2.0	0.315	5.0	—	2.5	30.2
SD 1545		.320 4L STUD HERM	CE	28	2.5	2.0	0.8	5.0	—	5.0	10.9
TCC 2001	SD 1801	.230 2LFL	CB	28	1.0	2.0	0.2	7.0	35	3.2	25
TCC 2003	SD 1803	.230 2LFL	CB	28	3.0	2.0	0.5	7.8	35	4.0	15
TCC 2005	SD 1805	.230 2LFL	CB	28	5.0	2.0	1.0	7.0	30	8.0	8.5
TCC 2010	SD 1810	.230 2LFL	CB	28	10.0	2.0	1.25	9.0	35	16.0	5.5
TCC 2301	SD 1813	.230 2LFL	CB	22	1.0	2.3	0.1	10.0	40	3.0	25
TCC 2302	SD 1812	.230 2LFL	CB	20	2.0	2.3	0.25	9.0	40	4.0	20
TCC 2304	SD 1814	.230 2LFL	CB	20	4.0	2.3	0.5	9.0	40	8.0	8.5
TCC 2307	SD 1817	.230 2LFL	CB	22	7.0	2.3	1.1	8.0	35	16.0	4.5
TCC 3000	SD 1830	.230 2LFL	CB	28	0.5	3.0	0.1	7.0	30	3.0	45
TCC 3001	SD 1831	.230 2LFL	CB	28	1.0	3.0	0.2	7.0	35	3.0	35
TCC 3003	SD 1833	.230 2LFL	CB	28	3.0	3.0	0.75	6.0	30	4.0	15
TCC 3005	SD 1835	.230 2LFLF	CB	28	5.0	3.0	1.58	5.0	30	8.0	8.5

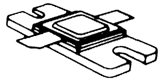
SD # is the code used in our ordering and invoicing system.



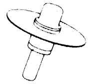
230 2LFL
(M151)



250 SQ 2LFL
(M161)



.400 SQ 2LFL HERM
(M138)



500 COAX
(M144)

2 ... 4 GHz MICROWAVE TRANSISTORS FOR CLASS A OPERATION

Type		Package	Config.	BIAS V_1/I_1 (V) (mA)	P_{out} (W)	f_o (GHz)	P_{in} (mW)	G_P min (dB)	$R_{th(j-c)}$ (°C/W)
P/N	SD #								
TCC 2100	SD 1851-4	.230 2LFL	CE	20/70	0.316	1	28	10.5	35
TCC 20 L08	SD 1851	.230 2LFL	CE	20/120	0.8	2	125	8	30
TCC 20 L 15	SD 1853	.230 2LFL	CE	20/220	1.5	2	300	7	17
TCC 20 L 25	SD 1855	.230 2LFL	CE	20/440	2.5	2	625	6	8.5
SD 1850		.230 2LFL*	CE	15/80	0.2	2.3	16	11	45

SD # is the code used in our ordering and invoicing system.

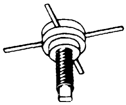
0.7 ... 2.5 GHz MICROWAVE TRANSISTORS FOR OSCILLATORS

Type	Package	Config.	V_{CC} (V)	P_{out} (W)	Frequency range (GHz)	η_C (%)	I_C (mA)	$R_{th(j-c)}$ (°C/W)
SD 1845	.230 2LFL	CC	20	0.5	2.3	25	90	45
SD 1847	.230 2LFL	CC	24	1.5	2.3	30	250	17
SD 1837	.230 2LFL	CC	20	2	2.3	25	400	—
SD 1838	.230 2LFL	CC	20	3	2.3	30	500	—
SD 1840	.500 COAX	CE	20	1	2	28	—	25
SD 1842	.500 COAX	CE	21	1.2	2.3	—	—	—

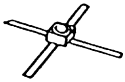
1.60 ... 1.70 GHz POWER TRANSISTORS FOR MARISAT

Type	Package	Config.	V_{CC} (V)	P_{out} (W)	Frequen. range (GHz)	P_{in} (W)	G_P min (dB)	η_C min (%)	Θ_{j-c} (°C/W)
SD 1891*	.230 2LFLH	CB	28	3	1.60-1.70**	.25	10.8	40	20
SD 1893*	.230 2LFLH	CB	28	10	1.60-1.70**	.80	11.0	40	5.5
SD 1895	.250 SQ 2LNH	CB	28	15	1.60-1.70**	1.8	9.2	45	4.7
SD 1888	.250 SQ 2LNH	CB	28	20	1.60-1.70**	2.5	9.0	45	4.0
SD 1868*	.400 SQ 2LFLH	CB	28	30	1.60-1.70**	4.0	8.7	40	3.0

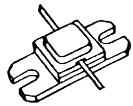
* Non hermetic versions of above standard products are under development ** Test frequency – 1.65 GHz



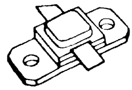
TO 117
(M101)



.100SQ4LN
(M150)



.400 2LFLNL
(M155)



400 2LFL
(M142)

1.4 ... 2.7 GHz MATCHED MICROWAVE TRANSISTORS FOR TELECOMUNNICATIONS

Type		Package	Config.	V_{CC} (V)	P_{out} (W)	Freq. range (GHz)	P_{in} (W)	G_P min (dB)	η_C min (%)	$R_{th\ (j-c)}$ (°C/W)
P/N	SD #									
TCC 1417-12	SD 1869	.400 2L FL	CB	24	12	1.4 ... 1.7	2.0	7.8	40	5.5
TCC 1417-25	SD 1866	.400 2L FL	CB	24	25	1.4 ... 1.7	4.5	7.5	40	3.0
TCC 1720-3	SD 1876	.400 2L FLNL	CB	24	3	.17 ... 2.0	0.4	8.8	40	—
TCC 1720-6	SD 1885	.400 2L FLNL	CB	24	6	1.7 ... 2.0	1.0	7.8	45	9.5
TCC 1720-10	SD 1860	.400 2L FL	CB	24	10	1.7 ... 2.0	2.0	7.0	45	8.0
TCC 1720-13	SD 1883	.400 2L FL	CB	24	13	1.7 ... 2.0	2.2	7.7	45	4.5
TCC 1720-20	SD 1873	.400 2L FL	CB	24	20	1.7 ... 2.0	3.5	7.5	40	3.5
TCC 1720-25	SD 1874	.400 2L FL	CB	24	25	1.7 ... 2.0	4.5	7.4	40	3.0
TCC 1922-18	SD 1872	.400 2L FL	CB	24	18	1.9 ... 2.2	4.5	6.0	40	3.0
TCC 2023-6	SD 1886	.400 2L FLNL	CB	24	6	2.0 ... 2.3	1.0	7.8	40	6.5
TCC 2023-16	SD 1887	.400 2L FL	CB	24	16	2.0 ... 2.3	4.0	6.0	40	3.0
TCC 2223-3	SD 1879	.400 2L FLNL	CB	24	3	2.2 ... 2.3	0.4	8.4	40	—
TCC 2223-10	SD 1862	.400 2L FL	CB	24	10	2.2 ... 2.3	2.0	7.0	40	4.5
TCC 2223-18	SD 1870	.400 2L FL	CB	24	18	2.2 ... 2.3	4.0	6.5	40	3.0
TCC 2327-15	SD 1875	.400 2L FL	CB	24	15	2.3 ... 2.7	6.0	4.0	30	3.0

SD # is the code used in our ordering and invoicing system.

40 ... 900 MHz CLASS A LINEAR CATV/MATV APPLICATIONS

Type	Package	BV_{CEO} (V)	f_t (MHz) @	I_C (mA)	N_F (dB) @	IC/f (mA)(MHz)
SD 1005	TO-117	30	1700 typ	60	2.7	10/200
SD 1317	TO-117	20	3800 typ	60	2.1	40/200
SD 1331	.100SQ4LH	12	5500 typ	30	2.0	5/1000
SD 1332	.100SQ4LH	15	5500 typ	15	2.0	5/1000
SD 1333	.100SQ4LH	15	5000 typ	50	2.0	10/1000

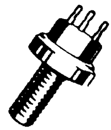
DATASHEETS

SGS-THOMSON
MICROELECTRONICS

2N3375
2N3632/2N3733

RF & MICROWAVE TRANSISTORS
VHF-UHF CLASS C WIDE BAND

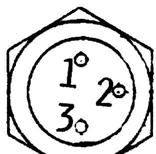
- FREQUENCY 130 TO 400MHz
- VOLTAGE 28V
- POWER OUT 2.5 TO 13.5W
- HIGH POWER GAIN
- HIGH EFFICIENCY
- CLASS C TRANSISTORS
- COMMON EMITTER



TO 60 (M137)

ORDER CODE	BRANDING
SD1050	2N3375
SD1070	2N3632
SD1075	2N3733

PIN CONNECTION



S882N3375-01

1 emitter
2 base
3 collector

DESCRIPTION

This line of silicon epitaxial NPN planar high frequency transistors employs a multi emitter electrode design. This feature together with a heavily diffused base matrix located between the individual emitters results in high RF current handling capability, high power gain, low base resistance and low output capacitance. These transistors are intended for Class A, B, or C amplifier, oscillator or frequency multiplier circuits and are specifically designed for operation in the VHF-UHF region.

Device	Package
2N3375	TO 60
2N3632	TO 60
2N3733	TO 60

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	2N3375	2N3632	2N3733	Unit
V_{CBO}	Collector to Base Voltage	65	65	65	V
V_{CEO}	Collector to Emitter Voltage	40	40	40	V
V_{EBO}	Emitter to Base Voltage	4.0	4.0	4.0	V
$I_{C\,(max)}$	Continuous Collector Current	1.5	3.0	3.0	A
P_D	Total Dissipation at 25°C Stud	11.6	23.0	23.0	V
T_j	Junction Temperature	200	200	200	°C
T_{stg}	Storage Temperature	– 65 to 150	– 65 to 150	– 65 to 150	°C

		2N3375	2N3632	2N3733	
$R_{th\,(j\text{-}c)}$	Junction-case Thermal Resistance	15.0	7.6	7.6	°C

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

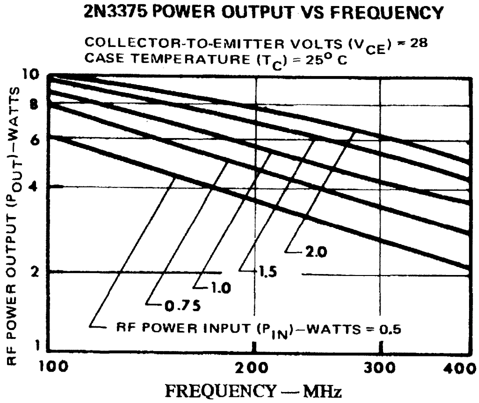
STATIC

Symbol	Test Conditions		2N3375			2N3632			2N3733			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
BV_{CBO}	I_C = 0.5mA	V_{BE} = 0	65			65			65			V
BV_{CEO}	I_C = 200mA	I_B = 0	40			40			40			V
BV_{EBO}	I_E = 0.25mA	I_C = 0	4	(I_E = 0.1mA)		4			4			V
I_{CEO}	V_{CB} = 30V	I_E = 0			0.1			0.25			0.25	mA
H_{FE}	V_{CE} = 5V	I_C = 250mA	10			5	(I_C = 1A)		10			

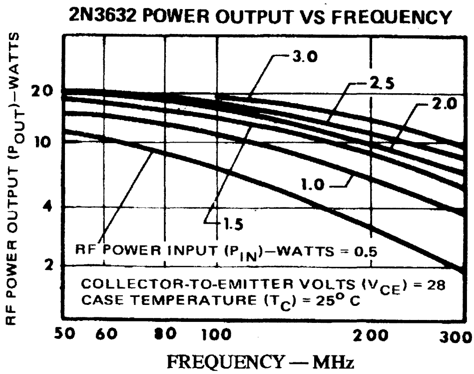
DYNAMIC

Symbol	Test Conditions		2N3375			2N3632			2N3733			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
P_O	F = 175MHz Class C	V_{CE} = 28V				13.5						W
P_O	F = 400MHz	V_{CC} = 28V	3						10			W
G_P	F = 175MHz	V_{CC} = 28V				5.8						dB
G_P	F = 400MHz	V_{CC} = 28V	4.8						4.0			dB
η_C	F = 175MHz	V_{CC} = 28V				70						%
η_C	F = 400MHz	V_{CC} = 28V	40						45			%
C_{OB}	F = 1MHz	V_{CB} = 30V			10			20			20	pF

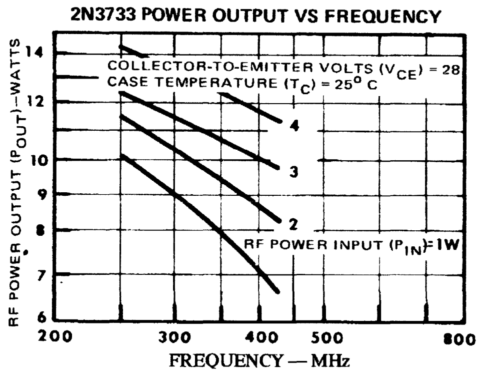
APPLICATION INFORMATION (typical curves)



S882N3375-02



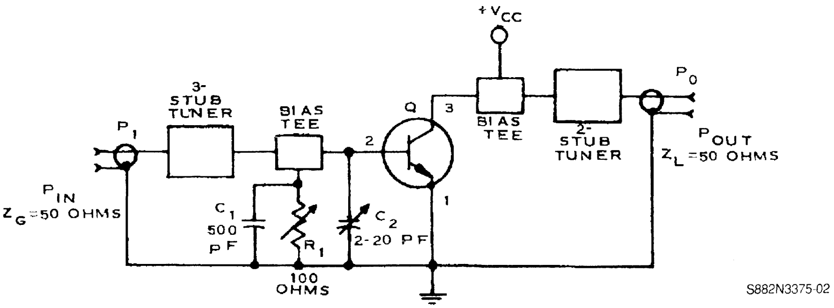
S882N3632-04



S882N3733-05

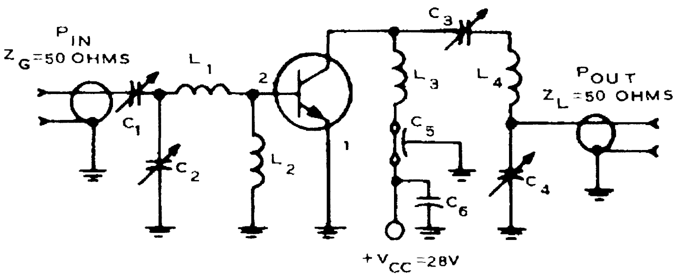
TEST CIRCUITS

2N3375 (400 MHz OPERATION)



S882N3375-02

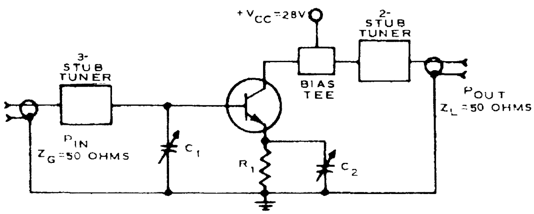
2N3632 (175MHz OPERATION)



S882N3632-02

2N3632
C1, C2, C3, C4 : 7 - 100pF
C5 : 100pF
C6 : 0.01F, disc ceramic
L1 : 1.5 turns No. 16 wire, 3/16" ID, 5/16" long
L2 : Ferrite choke, Z = 450
L3 : 1 turn No. 16 wire, 1/4" ID, 3/8" long
L4 : 2 turns No. 16 wire, 1/4" ID, 1/4" long

2N3733(400MHz OPERATION)

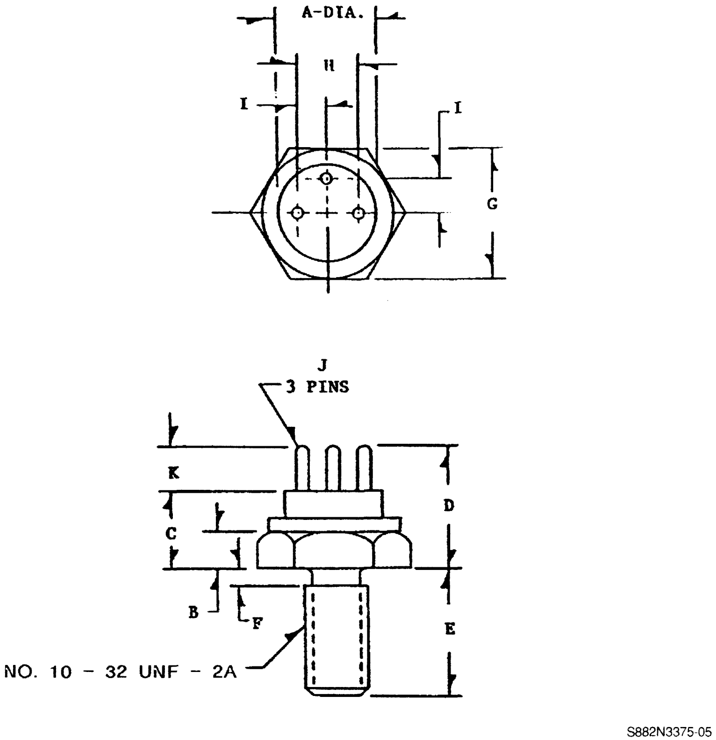


C_1, C_2: 7.8-17 pf R_1: 0.56 ohm

S882N3733-02

PACKAGE MECHANICAL DATA

TO 60



	Minimum Inches	Maximum Inches
A	.320	.340
B	.110	.135
C	.245	.300
D	.400	.450
E	.420	.455
E	.140	.160

	Minimum Inches	Maximum Inches
F		.078
G	.420	.440
H	.190	.210
I	.095	.105
J	.030	.046
K	.140	.160

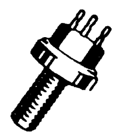
SGS-THOMSON MICROELECTRONICS

2N3926/2N3927

RF & MICROWAVE TRANSISTORS 130...230MHz FM MOBILE APPLICATIONS

- FREQUENCY
- VOLTAGE
- POWER OUT
- POWER GAIN
- EFFICIENCY
- CLASS C TRANSISTORS
- COMMON EMITTER

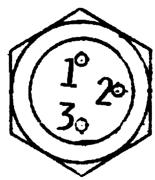
2N3926	2N3927
175MHz	175MHz
5.4dB	4.8dB
70%	80%



TO 60 (M137)

ORDER CODE	BRANDING
SD1062	2N3926
SD1072	2N3927

PIN CONNECTION



S882N3926-01

1 emitter
2 base
3 collector

DESCRIPTION

These types are silicon epitaxial NPN-planar transitors which employ a multi-emitter electrode design. This feature together with a heavily diffused base matrix located between the individual emitters result in high RF current handling capability, high power gain , low base and low ouptut capacitance. This family is intended for Class A, B or C amplifier, oscillator or frequency multiplier circuits.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	2N3926	2N3927	Unit
V_{CBO}	Collector to Base Voltage	36.0	36.0	V
V_{CEO}	Collector to Emitter Voltage	18.0	18.0	V
V_{EBO}	Emitter to Base Voltage	4.0	4.0	V
$I_{C\ (max)}$	Continuous Collector Current	1.5	3.0	A
P_D	Total Dissipation at 25°C Stud	11.6	23.2	W
T_j	Junction Temperature	200	200	°C
T_{stg}	Storage Temperature	– 65 to 150	– 65 to 150	°C

		2N3926	2N3927	
$R_{th(j-c)}$	Junction-case Thermal Resistance	15.1	7.54	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		2N3926 Min.	2N3926 Typ.	2N3926 Max.	2N3927 Min.	2N3927 Typ.	2N3927 Max.	Unit
BV_{CBO}	I_C = 250μA	V_{BE} = 0	36			36	(I_C = 500μA)		V
BV_{CEO}	I_C = 200mA	I_B = 0	18			18			V
BV_{EBO}	I_E = 1mA	I_C = 0	4			4	(I_E = 2mA)		V
I_{CBO}	V_{CB} = 15V	I_E = 0			5			10	mA
h_{FE}	V_{CE} = 5V	I_C = 100mA	5			5			

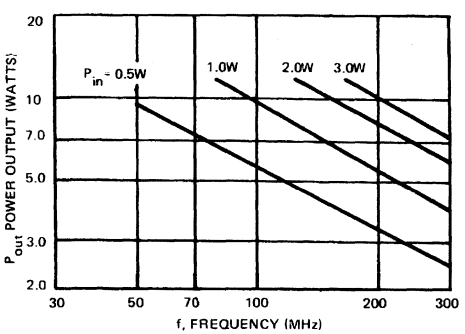
DYNAMIC

Symbol	Test Conditions		2N3926 Min.	2N3926 Typ.	2N3926 Max.	2N3927 Min.	2N3927 Typ.	2N3927 Max.	Unit
P_O	f = 175MHz Class C	V_{CE} = 13.6V	7.0			12.0			W
G_p	f = 175MHz Class C	V_{CE} = 13.6V	5.4			4.8			dB
η_C	f = 175MHz Class C	V_{CB} = 13.6V	70			80			%
C_{OB}	V_{CB} = 13.6V f = 1MHz	I_C = 0			20			45	pF

APPLICATION INFORMATION (typical curves)

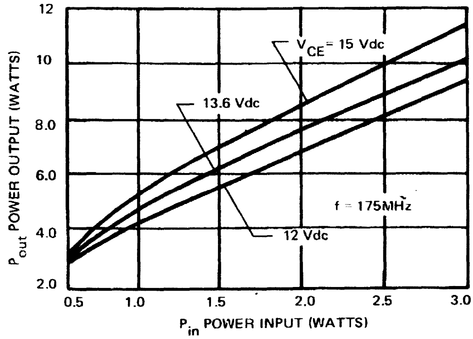
2N3926

POWER OUTPUT VS FREQUENCY



S882N3926-02

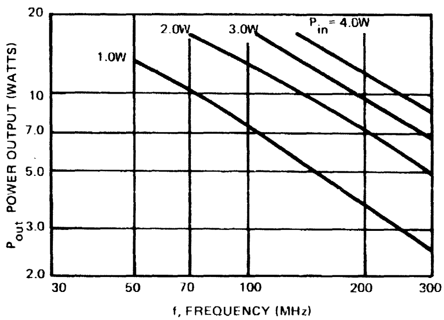
POWER OUTPUT VS POWER INPUT



S882N3926-03

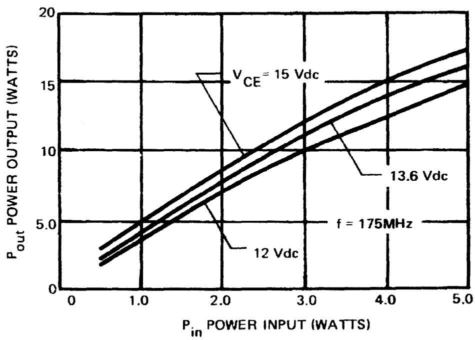
2N3927

POWER OUTPUT VS FREQUENCY



S882N3927-04

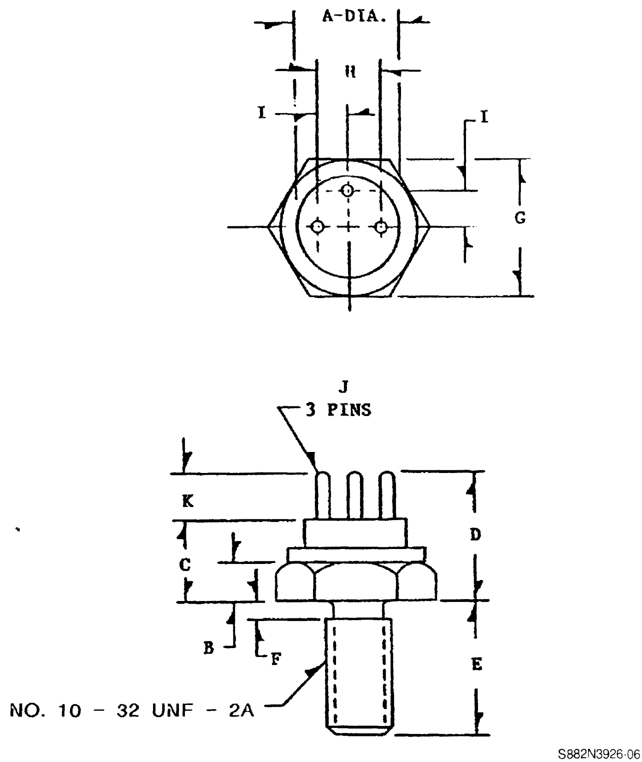
POWER OUTPUT VS POWER INPUT



S882N3927-05

PACKAGE MECHANICAL DATA

TO 60



	Minimum Inches	Maximum Inches
A	.320	.340
B	.110	.135
C	.245	.300
D	.400	.450
E	.420	.455
E	.140	.160

	Minimum Inches	Maximum Inches
F		.078
G	.420	.440
H	.190	.210
I	.095	.105
J	.030	.046
K	.140	.160

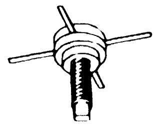
SGS-THOMSON
MICROELECTRONICS

2N4429 → 4431

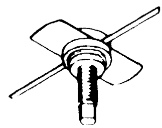
RF & MICROWAVE POWER TRANSISTORS

MICROWAVE POWER TRANSISTORS FOR CLASS C APPLICATIONS

FEATURES	HIGH POWER GAIN	PACKAGE
2N4431	5W @ 1GHz	MT66
2N4430	2.5W @ 1GHz	MT66
2N4429	1W @ 1GHz	TO-117A



TO-117A (M148)



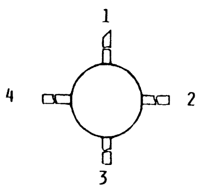
MT66 (M127)

BRANDING	ORDER CODES
2N4431	SD1171
2N4430	SD1170
2N4429	SD1176

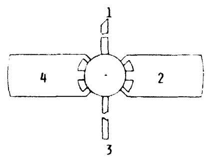
DESCRIPTION

This family of single chip silicon transistors was designed for reliable operation in the 1GHz region. Precise epitaxial growth, diffusion, photoengraving and injection molding techniques are employed to fabricate each device. The family is intended for Class A, B, or C amplifier, oscillator, and multiplier operations in the UHF region.

PIN CONNECTION



S882N4429-01



S882N4429-02

PIN	1	2	3	4
2N4431	C	B	E	B
2N4430	C	B	E	B
2N4429	C	B	E	B

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Symbol	Parameter	2N4431	2N4430	2N4429	Unit
V_{CBO}	Collector to Base Voltage	55.0	55.0	55.0	V
V_{CEO}	Collector to Emitter Voltage	40.0	40.0	35.0	V
V_{EBO}	Emitter to Base Voltage	3.5	3.5	3.5	V
I_C(max)	Continuous Collector Current	2.0	1.0	425	mA
P_D	Total Dissipation at 25°C Stud	18.0	10.0	5.0	W
$\varnothing_{JC}$	Thermal Resistance (junction to stud)	9.7	17.5	35.0	°C/W
T_J	Junction Temperature	200	200	200	°C
T_{stg}	Storage Temperature	– 65 to 150	– 65 to 150	– 65 to 150	°C

ELECTRICAL CHARACTERISTICS

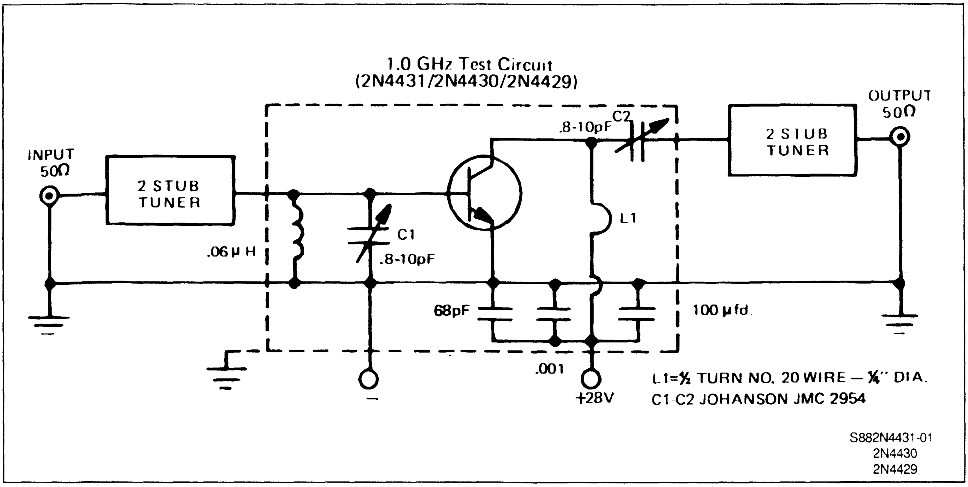
STATIC

Symbol	Parameter	Test Conditions	2N4431		2N4430		2N4429		Unit
			Min.	Max.	Min.	Max.	Min.	Max.	
I_{CEX}	Collector Cutoff Current	V_{CE} = 55V V_{BE} = 1.5V		4.0		2.0		1.0	mA
BV_{CEO}	Collector to Emitter Breakdown Voltage	I_C = 50mA, I_B = 0	40.0		40.0				V
		I_C = 20mA, I_B = 0					35.0		V
BV_{CER}	Collector to Emitter Breakdown Voltage	R = 10Ω, I_C = 50mA	55.0		55.0				V
		R = 10Ω, I_C = 20mA					55.0		V
BV_{EBO}	Emitter to Base Breakdown Voltage	I_E = 0.50mA	3.5						V
		I_E = 0.20mA			3.5				V
		I_E = 0.10mA					3.5		V
h_{FE}	DC Current Gain	V_{CE} = 5V, I_C = 100mA	20	200	20	200			
		V_{CE} = 5V, I_C = 50mA					20	200	

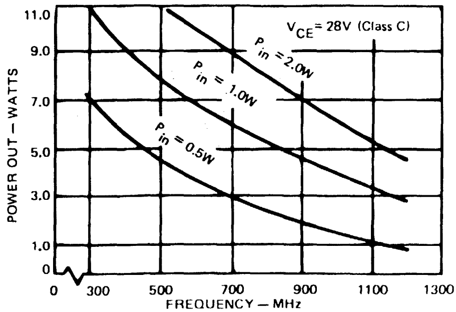
DYNAMIC

Symbol	Parameter	Test Conditions	2N4431		2N4430		2N4429		Unit
			Min.	Max.	Min.	Max.	Min.	Max.	
f_T	Gain Bandwidth @ 200mHz	V_{CE} = 20V, I_C = 100mA	600		600				MHz
		V_{CE} = 20V, I_C = 50mA					700		MHz
C_{ob}	Output Capacitance	V_{CE} = 28V, f_o = 1.0MHz		10		5.0		3.5	pF
h_{FE}	DC Current Gain	V_{CE} = 5.0V, I_C = 2.0A	5						
		V_{CE} = 5.0V, I_C = 1.0A			5				
		V_{CE} = 5.0V, I_C = 400mA					5		
P_{out}	Power Output V_{CE} = 28V n = Collector Efficiency > 35	f_o = 1000MHz, P_{in} = 1.57W	5.0						W
		f_o = 1000MHz, P_{in} = 750mW			2.5				W
		f_o = 1000MHz, P_{in} = 300mW					1.0		W
		f_o = 500MHz, P_{in} = 75mW							mW

TEST CIRCUIT

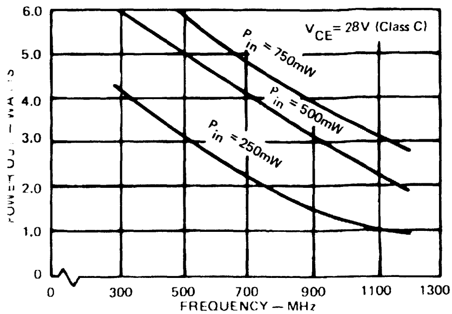


POWER OUT vs. FREQUENCY (2N4431)



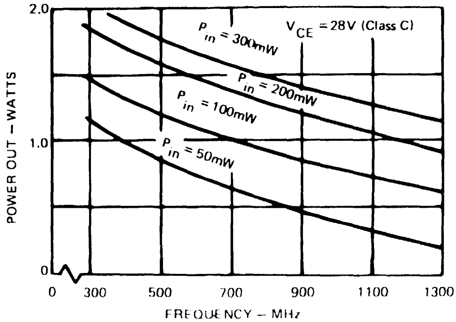
S882N4431 02

POWER OUT vs. FREQUENCY (2N4430)



S882N4430-02

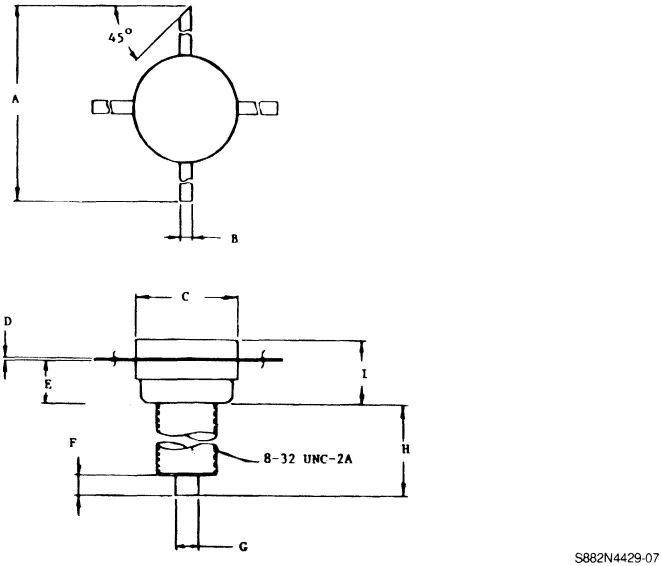
POWER OUT vs. FREQUENCY (2N4429)



S882N4429-03

PACKAGE MECHANICAL DATA

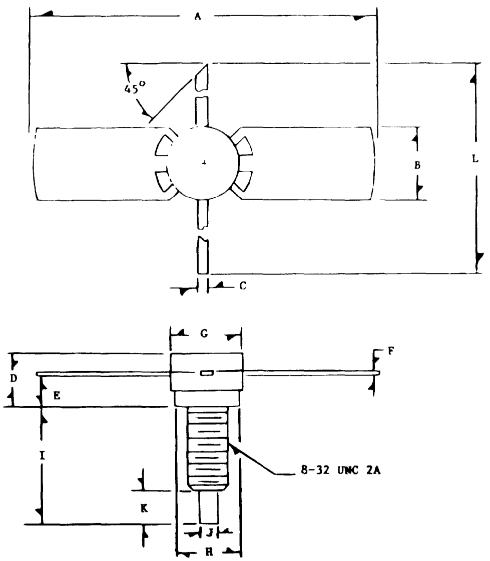
TO-117A



	Minimum Inch/mm	Maximum Inch/mm
A	.910/23.11	
B	.024/0.61	.034/0.86
C	.270/6.86	.290/7.37
D	.003/0.08	.007/0.18
E	.110/2.79	.130/3.30
F	.115/2.92	.145/3.68
G	.055/1.40	.065/1.65
H	.435/11.05	.465/11.81
I	.175/4.45	.210/5.33

PACKAGE MECHANICAL DATA

MT66



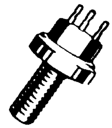
	Minimum Inches	Maximum Inches
A	.865	.900
B	.285	.295
C	.025	.035
D	.180	.200
E	.110	.130
F	.008	.012

	Minimum Inches	Maximum Inches
G	.270	.290
H	.240	.260
I	.435	.465
J	.055	.065
K	.115	.135
L	1.350	

2N4440

RF & MICROWAVE TRANSISTORS
WIDEBAND VHF-UHF CLASS C

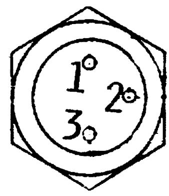
- CLASS C TRANSISTOR
- FREQUENCY 400MHz
- VOLTAGE 28V
- POWER OUT 5.0W
- POWER GAIN 4.7dB
- EFFICIENCY 45%



TO 60 (M137)

ORDER CODE	BRANDING
SD1060	2N4440

PIN CONNECTION



S882N4440-01

1 emitter
2 base
3 collector

DESCRIPTION

This type of silicon epitaxial NPN planar high frequency transistor employs a multi emitter electrode design. This feature together with a heavily diffused base matrix located between the individual emitters results in high RF current handling capability, high power gain, low base resistance and low output capacitance. These transistors are intended for Class A, B, or C amplifier, oscillator or frequency multiplier circuits and are specifically designed for operation in the VHF-UHF region.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	40.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	1.5	A
T_{stg}	Storage Temperature	– 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	15.1	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 C)

STATIC

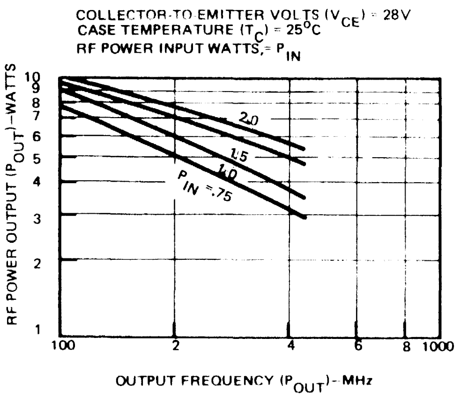
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 100μA	I_E = 0	65			V
BV_{CEO}	I_C = 200mA	I_B = 0	40.0			V
BV_{EBO}	I_E = 1mA	I_C = 0	4.0			V

DYNAMIC

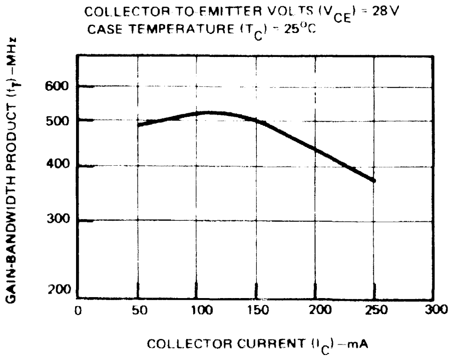
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 400MHz	V_{CE} = 28V		5.0			W
G_P	f = 400MHz	V_{CE} = 28V		4.7			dB
η_C	f = 400MHz	V_{CE} = 28V		45.0			%
C_{OB}	f = 1.0MHz	V_{CB} = 30V	I_E = 0			10.0	pF

APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS FREQUENCY

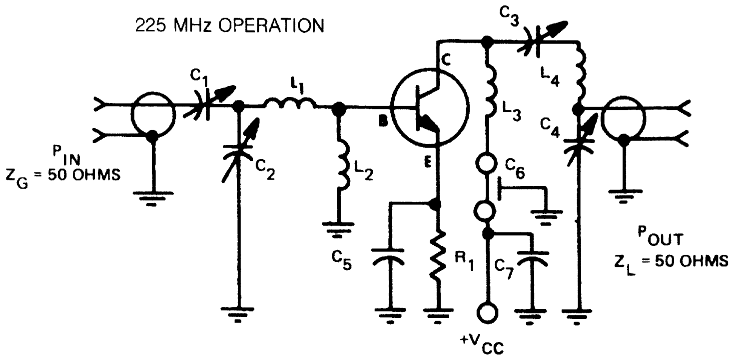


S882N4440-02



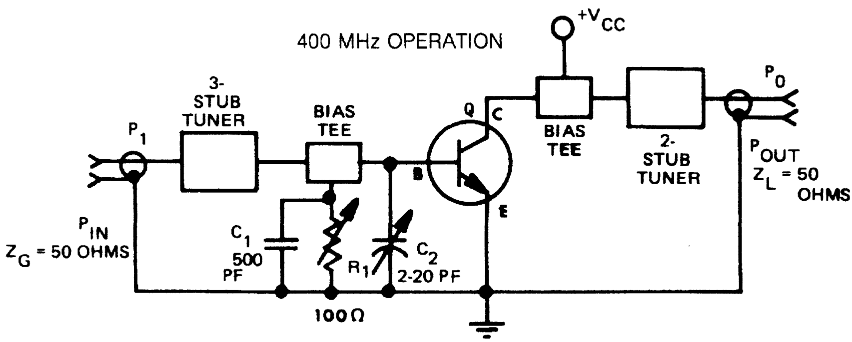
S882N4440-03

TEST CIRCUIT



S882N4440-04

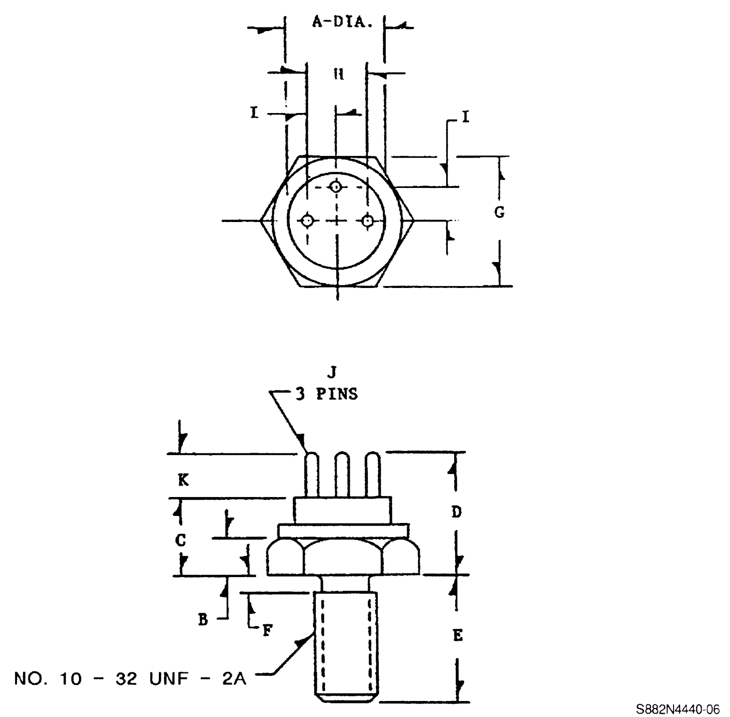
C_1 :	2-25pF	L_2 :	Ferrite choke, Z = 450 (± 20%)
C_2, C_3, C_4 :	4-40pF	L_3 :	0.47μH choke
C_5 :	50pF, disc ceramic	L_4 :	2 turns No. 16 wire, 3/8" ID, 7/16" long
C_6 :	1500pF	Q :	2N4440
C_7 :	0.005μF, disc ceramic	R_1 :	1.35, non-inductive
L_1 :	1 turn No. 16 wire, 1/4" ID, 1/8" long		



S882N4440-05

PACKAGE MECHANICAL DATA

TO 60



	Minimum Inches	Maximum Inches
A	.320	.340
B	.110	.135
C	.245	.300
D	.400	.450
E	.420	.455
E	.140	.160

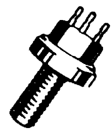
	Minimum Inches	Maximum Inches
F		.078
G	.420	.440
H	.190	.210
I	.095	.105
J	.030	.046
K	.140	.160

SGS-THOMSON
MICROELECTRONICS

2N5016

RF & MICROWAVE TRANSISTORS
WIDEBAND VHF-UHF CLASS C

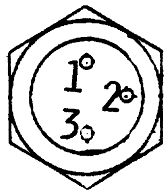
- CLASS C TRANSISTOR
- FREQUENCY 400MHz
- VOLTAGE 28V
- POWER OUT 15.0W
- POWER GAIN 4.8dB
- EFFICIENCY 50%
- GROUNDED EMITTER



TO 60 (M137)

ORDER CODE	BRANDING
SD1090	2N5016

PIN CONNECTION



S882N5016–01

1 emitter
2 base
3 collector

DESCRIPTION

The 2N5016 is a silicon epitaxial NPN planar transistor which employs a multi-emitter electrode design. This feature together with a heavily diffused base matrix located between the individual emitters result in high RF current handling capability, high power gain, low base resistance and low output capacitance. The 2N5016 is entended for Class A, B or C amplifier, oscillator or frequency multiplier circuits operating at 200 to 700MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CER}	Collector - Emitter Voltage	40	V
V_{CES}	Collector - Emitter Voltage	65	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	4.5	A
P_{tot}	Total Power Dissipation	30.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	5.8	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

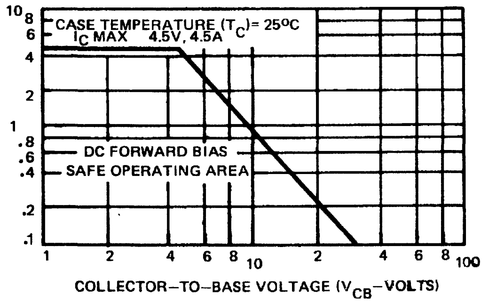
Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CER}	I_C = 200mA	R_{BE} = 30Ω	40			V
BV_{CBO}	I_C = 200mA	I_E = 0	65			V
BV_{EBO}	I_E = 5mA	I_C = 0	4			V
I_{CEO}	V_{CE} = 30V	I_E = 0	10			mA
$V_{CE(sat)}$	IC = 2.0A	IB = 400mA			1	V

DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	F = 400MHz F = 225MHz	V_{CE} = 28V V_{CE} = 28V		15 23			W
G_P	F = 400MHz F = 225MHz	V_{CE} = 28V V_{CE} = 28V		4.8 6.6			dB
η_c	F = 400MHZ F = 225MHZ	V_{CC} = 28V V_{CC} = 28V		50 60			%
C_{OB}	F = 1MHz	V_{CB} = 30V	I_E = 0			25	pF
F_T	V_{CE} = 15V	I_C = 500mA			600		MHz

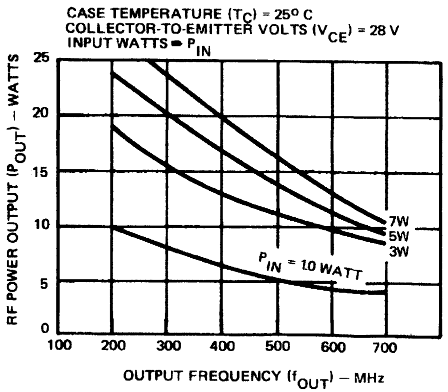
APPLICATION INFORMATION (typical curves)

SAFE OPERATION WITH DC FORWARD BIAS



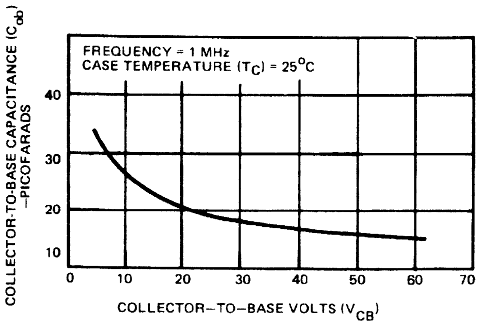
S882N5016-02

TYPICAL POWER OUTPUT VS FREQUENCY



S882N5016-03

TYPICAL VARIATION OF COLLECTOR–TO–BASE CAPACITANCE



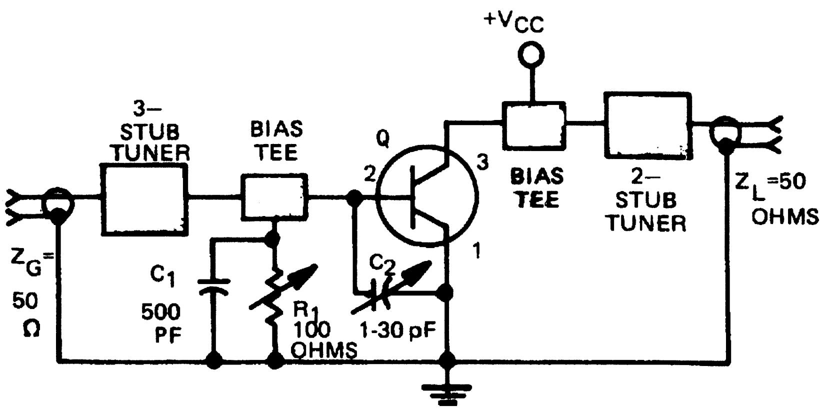
S882N5016-04

IMPEDANCE DATA (typical)

Z_{IN} = 2.5 + j5Ω
F = 400MHz
V_{CE} = 28V

TEST CIRCUIT

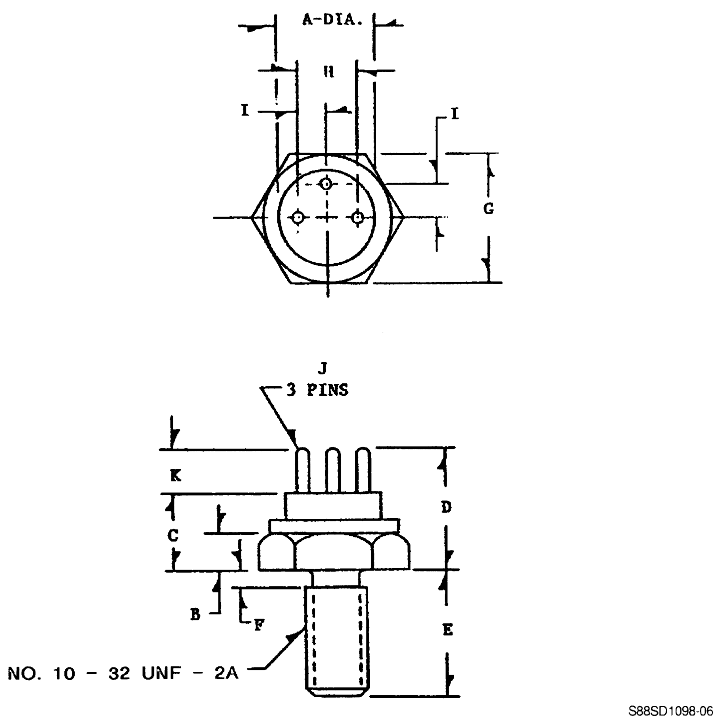
RF AMPLIFIER CIRCUIT FOR POWER OUTPUT TEST
(400MHz operation)



S882N5016-05

PACKAGE MECHANICAL DATA

TO 60



	Minimum	Maximum
A	.320	.340
B	.110	.135
C	.245	.300
D	.400	.450
E	.420	.455
E	.140	.160

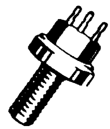
	Minimum	Maximum
F		.078
G	.420	.440
H	.190	.210
I	.095	.105
J	.030	.046
K	.140	.160

SGS-THOMSON
MICROELECTRONICS

2N5090

RF & MICROWAVE TRANSISTORS
WIDEBAND VHF - UHF CLASS C

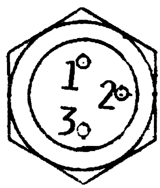
- CLASS C TRANSISTOR
- FREQUENCY 400MHz
- VOLTAGE 28V
- POWER OUT 1.2W
- POWER GAIN 7.8dB
- EFFICIENCY 45%



TO 60 (M137)
hermetic sealed

ORDER CODE	BRANDING
SD1037-04	2N5090

PIN CONNECTION



S882N5090-01

1 emitter
2 base
3 collector

DESCRIPTION

The 2N5090 is a silicon epitaxial NPN planar transistor that employs a multi-emitter electrode design. This feature together with a heavily diffused base matrix located between the individual emitters result in high RF current handling capability, high power gain, low base resistance and low output capacitance. They are intended for Class A, B or C amplifier, oscillator or frequency multiplier circuits.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	55	V
V_{CEO}	Collector - Emitter Voltage	30	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current	0.4	A
P_{tot}	Total Power Dissipation	5.0	W
T_{stg}	Storage Temperature	– 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	35	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

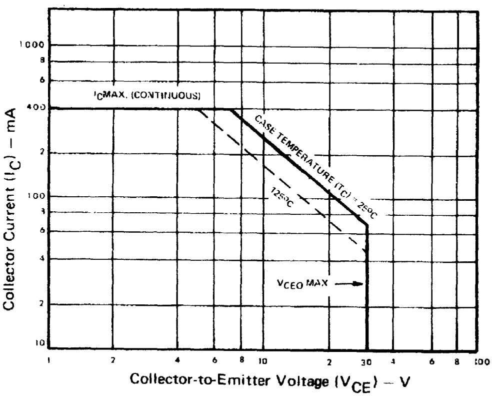
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 100μA	I_E = 0	55.0			V
BV_{CEO}	I_E = 5.0mA	I_B = 0	30.0			V
BV_{EBO}	I_E = 100μA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 28V	I_E = 0			20.0	mA

DYNAMIC

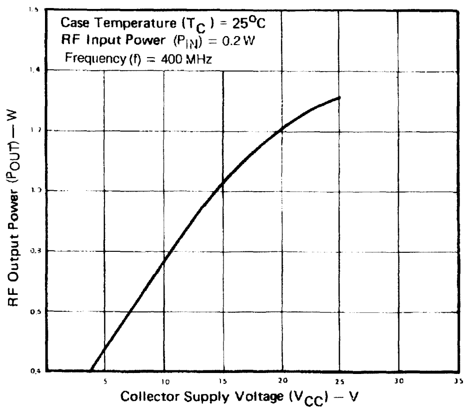
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 400MHz	V_{CE} = 28V		1.2			W
G_P	P_o = 1.2W	I_C = 96mA		7.8			dB
η_C	P_o = 1.2W	V_{CE} = 28V		45.0			%
C_{OB}	f = 1.0MHz	V_{CB} = 30V	I_E = 0			3.5	pF

APPLICATION INFORMATION (typical curves)



SAFE AREA FOR DC OPERATION.

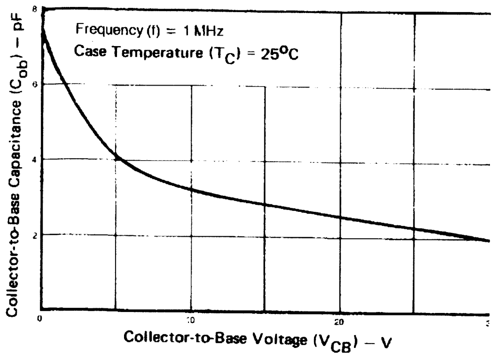
S882N5090-02



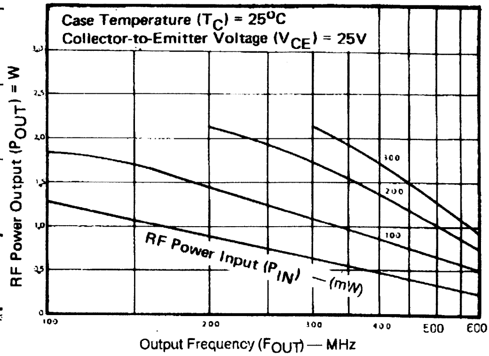
TYPICAL OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE.

S882N5090-03

APPLICATION INFORMATION (typical curves) (continued)

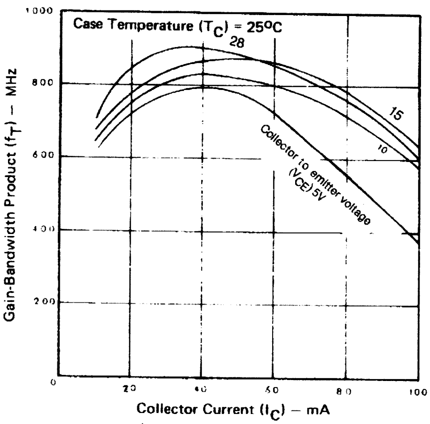


S882N5090-04



POWER OUTPUT vs FREQUENCY

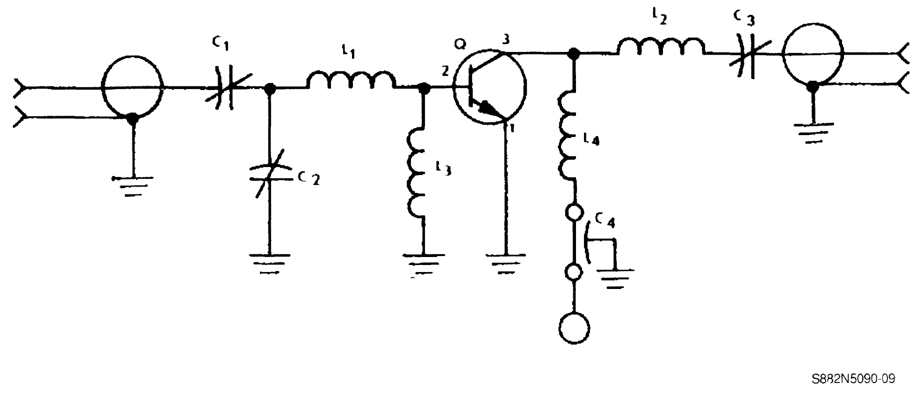
S882N5090-05



TYPICAL GAIN-BANDWIDTH PRODUCT VS. COLLECTOR CURRENT.

S882N5090-06

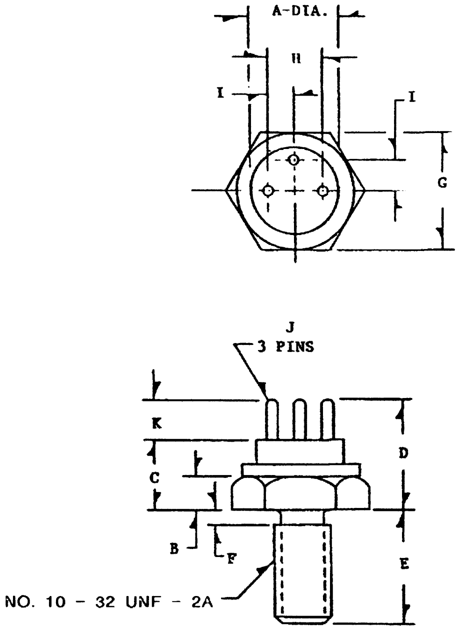
400MHz TEST CIRCUIT



C_1	0.9-7pF (ARCO 400 or equivalent)	L_2	3 turns No. 16 wire, 1/4" ID, 3/8" long
C_2, C_3	1.5-20pF (ARCO 402 or equivalent)	L_3	RF choke, 0.1H
C_4	1,000pF feed through	L_4	2 turns No. 18 wire, 1/8" ID, 2/16" long
L_1	2 turns No. 18 wire, 1/4" ID, 1/8" long	Q	2N5090

PACKAGE MECHANICAL DATA

TO 60



	Minimum Inches	Maximum Inches
A	.320	.340
B	.110	.135
C	.245	.300
D	.400	.450
E	.420	.455
E	.140	.160

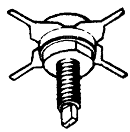
	Minimum Inches	Maximum Inches
F		.078
G	.420	.440
H	.190	.210
I	.095	.105
J	.030	.046
K	.140	.160

SGS-THOMSON MICROELECTRONICS

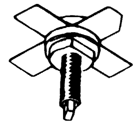
2N5589
2N5590/2N5591

RF & MICROWAVE TRANSISTORS 130...230MHz FM MOBILE APPLICATIONS

- FREQUENCY 175MHz
- VOLTAGE 13.6V
- POWER OUT 8 TO 25W
- HIGH POWER GAIN
- HIGH EFFICIENCY
- CLASS C TRANSISTORS
- COMMON EMITTER



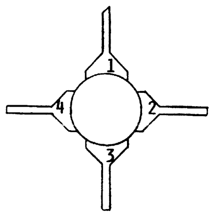
.380 NARROW 4LSTUD (M104)
epoxy sealed



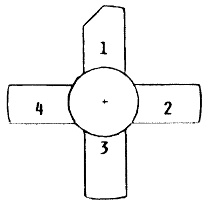
.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	BRANDING
SD1212-02	2N5589
SD1214-12	2N5590
SD1216	2N5591

PIN CONNECTION



S882N5589-01



S882N5590-2N5591-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The devices are epitaxial silicon NPN-planar transistors designed primarily for VHF mobile and marine transmitters.

These devices utilize ballacted emitter resistors and improved metallization systems to achieve extreme ruggedness under severe operating conditions.

device	package
2N5589	.380 NARROW 4LSTUD
2N5590	.380 4LSTUD
2N5591	.380 4LSTUD

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	2N5589	2N5590	2N5591	Unit
V_{CBO}	Collector to Base Voltage	36.0	36.0	36.0	V
V_{CEO}	Collector to Emitter Voltage	18.0	18.0	18.0	V
V_{EBO}	Emitter to Base Voltage	4.0	4.0	4.0	V
$I_{C\ (max)}$	Continuous Collector Current	0.6	2.0	4.0	A
P_D	Total Dissipation at 25°C Stud	15.0	30.0	70.0	W
T_j	Junction Temperature	200	200	200	°C
T_{stg}	Storage Temperature	– 65 to 150	– 65 to 150	– 65 to 150	°C

		2N5589	2N5590	2N5591	
$R_{th\,(j-c)}$	Junction-case Thermal Resistance	11.7	5.8	2.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

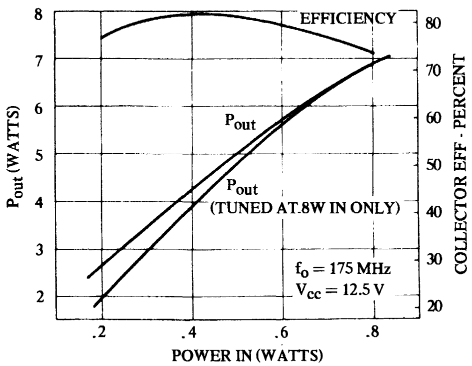
Symbol	Test Conditions		2N5589			2N5590			2N5591			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
BV_{CES}	I_C = 200mA	V_{BE} = 0	36			36			36			V
BV_{CEO}	I_C = 200mA	I_B = 0	18			18			18			V
BV_{EBO}	I_E = 2.5mA	I_C = 0	4	(I_E = 1mA)		4			4	(I_E = 5mA)		V
I_{CBO}	V_{CB} = 15V	I_E = 0			1			1			1	mA
h_{FE}	V_{CE} = 5V	I_C = 0.25A	5	(I_C = 0.1A)		5			5	(I_C = 0.5A)		

DYNAMIC

Symbol	Test Conditions		2N5589			2N5590			2N5591			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
P_O	F = 175MHz Class C	V_{CE} = 13.6V	3.0			10			25			W
G_p	F = 175MHz Class C	V_{CE} = 13.6V	8.2			5.2			4.4			dB
η_C	F = 175MHz Class C	V_{CB} = 13.6V	50			50			50			%
C_{OB}	V_{CB} = 15V F = 1MHz	I_C = 0			30			70			120	pF

APPLICATION INFORMATION (typical curves)

2N5589



Power Output vs. Power Input

S882N5589-02

IMPEDANCE DATA (typical)

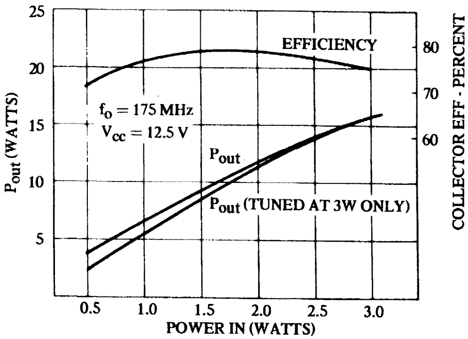
2N5589

f = 175MHz, V_{CC} = 12.5V			
P_{IN} WATTS	P_{OUT} WATTS	Input OHMS	OUTPUT OHMS
0.2	2.6	2.9 + J0.5	15.0 + J16.8
0.4	4.2	3.5 + J0.2	14.2 + J10.4
0.6	5.7	3.7 + J0.1	13.0 + J7.3
0.8	7.1	4.0 + J0.3	12.3 + J5.8

Network Impedance at Transistor Terminals

APPLICATION INFORMATION (typical curves) (continued)

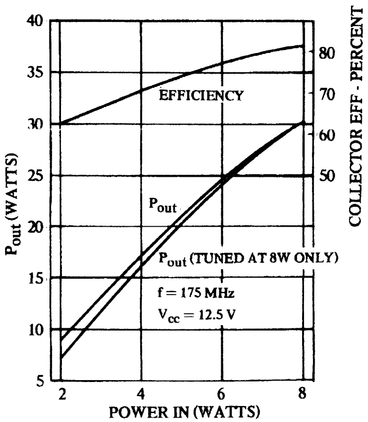
2N5590



Power Output vs. Power Input

S882N5590-02

2N5591



Power Output vs. Power Input

S882N5591-02

IMPEDANCE DATA (typical) (continued)

2N5590

f = 175MHz, V_{CC} = 12.5V			
P_{IN} WATTS	P_{OUT} WATTS	Input OHMS	OUTPUT OHMS
0.5	3.8	1.4 + J2.0	9.0 + J8.9
1.0	6.6	1.5 + J2.4	10.0 + J5.1
2.0	11.8	1.6 + J2.5	8.6 + J1.3
3.0	15.8	1.8 + J2.6	6.9 + J0

Network Impedance at Transistor Terminals

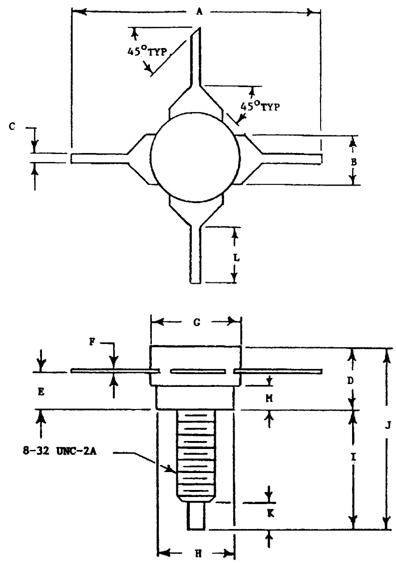
2N5591

f = 175MHz, V_{CC} = 12.5V			
P_{IN} WATTS	P_{OUT} WATTS	Input OHMS	OUTPUT OHMS
2.0	10.0	.99 + J1.2	4.5 + J4.3
4.0	17.0	1.1 + J1.3	4.3 + J2.7
6.0	24.6	1.3 + J1.5	4.0 + J2.01
8.0	30.2	1.3 + J1.5	3.9 + J1.7

Network Impedance at Transistor Terminals

PACKAGE MECHANICAL DATA

.380 NARROW 4LSTUD

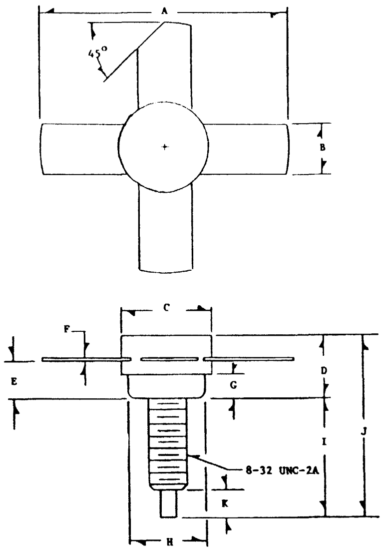


	Minimum Inches	Maximum Inches
A	1.000	
B	.220	.230
C	.025	.035
D		.275
E	.155	.175
F	.004	.007
G	.370	.380

	Minimum Inches	Maximum Inches
H	.320	.330
I	.450	.490
J		.750
K	.100	.130
L	.220	
M	.090	.100

PACKAGE MECHANICAL DATA (continued)

.380 4LSTUD



S882N5590-2N5591-03

	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

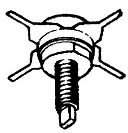
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON
MICROELECTRONICS

2N5635
2N5636/2N5637

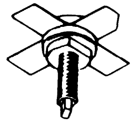
RF & MICROWAVE TRANSISTORS
WIDEBAND VHF - UHF CLASS C

- CLASS C TRANSISTOR FAMILY
- FREQUENCY 400MHz
- VOLTAGE 28V
- POWER OUT 2.5 TO 20W
- HIGH POWER GAIN
- HIGH EFFICIENCY



.380 NARROW 4LSTUD (M104)

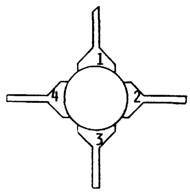
ORDER CODE
SD1240
SD1242
SD1244-07



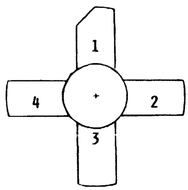
.380 4LSTUD (M135)

BRANDING
2N5635
2N5636
2N5637

PIN CONNECTION



S882N5635-01



S882N5635-02

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The 2N5635, 2N5636, 2N5637 are epitaxial silicon NPN-planar transistors designed primarily for UHF communications transmitters. These devices utilize ballasted emitter resistors and improved metallization systems to achieve extreme ruggedness under severe operating conditions.

Part Number	Package
2N5635	.380N 4LSTUD
2N5636	.380N 4LSTUD
2N5637	.380 4LSTUD

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	2N5635	2N5636	2N5637	Unit
V_{CBO}	Collector - Base Voltage	60.0	60.0	60.0	V
V_{CEO}	Collector - Emitter Voltage	35.0	35.0	35.0	V
V_{CES}	Collector - Emitter Voltage	60	60	60	V
V_{EBO}	Emitter - Base Voltage	4.0	4.0	4.0	V
I_C	Collector Current	1.0	1.5	3.0	A
P_{tot}	Total Power Dissipation	7.5	15.0	30.0	W
T_{stg}	Storage Temperature	– 65 to + 150	– 65 to + 150	– 65 to + 150	°C
T_j	Junction Temperature	200	200	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	23.3	11.7	5.8	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

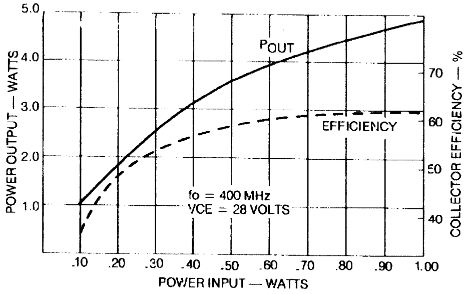
Symbol	Test Conditions		2N5635			2N5636			2N5637			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
BV_{CES}	I_C = 100mA	V_{BE} = 0	60.0									V
	I_C = 200mA	V_{BE} = 0				60.0			60.0			
BV_{CEO}	I_C = 100mA	I_B = 0	35.0									V
	I_C = 200mA	I_B = 0				35.0			35.0			
BV_{EBO}	I_E = 1.0mA	I_C = 0	4.0									V
	I_E = 5.0mA	I_C = 0				4.0						
	I_E = 10.0mA	I_C = 0							4.0			
I_{CBO}	V_{CB} = 30V	I_E = 0			0.10			0.10			1	mA
h_{FE}	V_{CE} = 5V	I_C = 100mA	5.0									
	V_{CE} = 5V	I_C = 200mA				5.0						
	V_{CE} = 5V	I_C = 500mA							5.0			

DYNAMIC

Symbol	Test Conditions		2N5635			2N5636			2N5637			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
P_{out}	f_o = 400MHz,	V_{CE} = 28V	2.5	3.5		7.5	10.0		20	23		W
G_p	P_o = 2.5W,	I_C = 179mA	6.2	8.5								dB
	P_o = 7.5W,	I_C = 534mA				5.7	7.9					
	P_o = 20W,	I_C = 1.19A							4.6	6.1		
η_C	P_o = 2.5W,	I_C = 179mA	50									%
	P_o = 7.5W,	I_C = 534mA				50						
	P_o = 20W,	I_C = 1.19A							60			
C_{OB}	V_{CE} = 30V, f_o = 1.0MHz	I_C = 0			10.0			20.0			30.0	pF
C_{ib}	V_{EB} = 0.5V, f_o = 1.0MHz	I_C = 0		18			44			96		pF

APPLICATION INFORMATION (typical curves)

2N5635



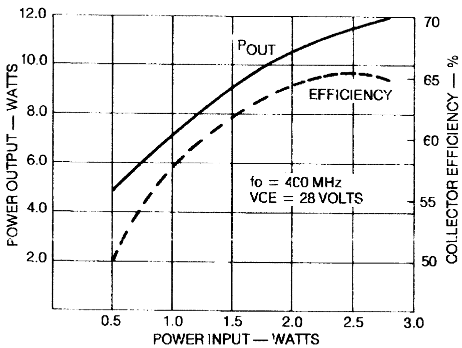
POWER OUTPUT VS POWER INPUT

S882N5635-01

f_o = 400MHz		V_{CE} = 28.0Volts	
P_{IN} Watts	P_{OUT} Watts	Input Ohms	Output Ohms
.20W	2.0W	3.8 + j1.9	30.2 – j50.0
.40W	3.2W	4.4 + j2.9	34.5 – j48.2
.60W	4.1W	4.6 + j3.5	39.5 – j43.8
.80W	4.6W	4.8 + j4.0	42.3 – j40.8

Large Signal Input and Output Impedance

2N5636



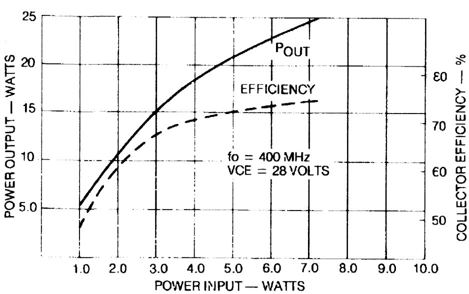
POWER OUTPUT VS POWER INPUT

S882N5636-01

f_o = 400MHz		V_{CE} = 28.0Volts	
P_{IN} Watts	P_{OUT} Watts	Input Ohms	Output Ohms
1.0	7.5	2.3 + j3.4	16.8 – j19.5
1.5	9.2	2.4 + j3.5	17.6 – j19.4
2.0	10.5	2.5 + j3.8	18.3 – j19.2
2.5	11.5	2.7 + j4.0	18.4 – j19.2

Large Signal Input and Output Impedance

2N5637



POWER OUTPUT VS POWER INPUT

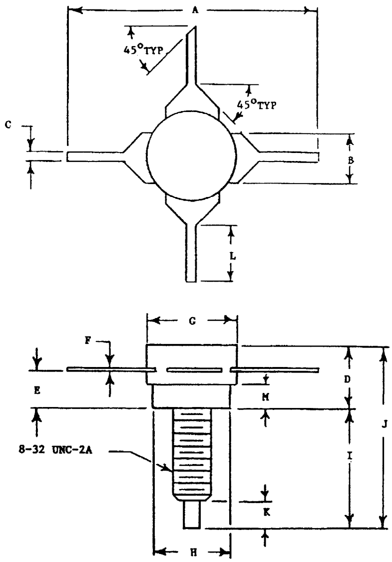
S882N5637-01

f_o = 400MHz		V_{CE} = 28.0Volts	
P_{IN} Watts	P_{OUT} Watts	Input Ohms	Output Ohms
4.0	18.0	1.7 + j3.7	12.4 – j10.1
5.0	20.9	1.7 + j3.8	12.6 – j10.0
6.0	23.1	1.7 + j3.9	12.7 – j10.0
7.0	24.8	1.7 + j4.0	12.8 – j 9.8

Large Signal Input and Output Impedance

PACKAGE MECHANICAL DATA

.380 NARROW 4LSTUD

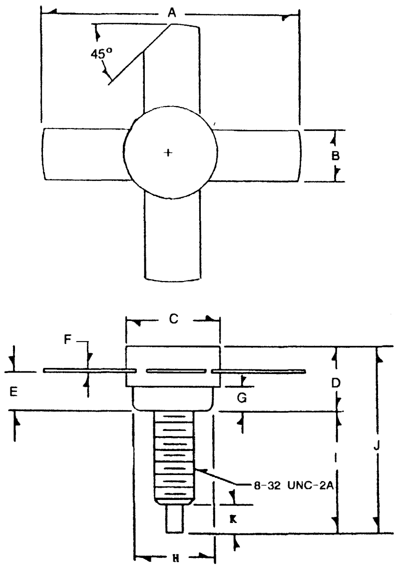


	Minimum Inches	Maximum Inches
A	1.000	
B	.220	.230
C	.025	.035
D		.275
E	.155	.175
F	.004	.007
G	.370	.380

	Minimum Inches	Maximum Inches
H	.320	.330
I	.450	.490
J		.750
K	.100	.130
L	.220	
M	.090	.100

PACKAGE MECHANICAL DATA

.380 4LSTUD



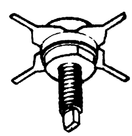
	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

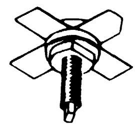
2N5641
2N5642/2N5643

RF & MICROWAVE TRANSISTORS
130...230MHz FM MOBILE APPLICATIONS

- FREQUENCY 175MHz
- VOLTAGE 28V
- HIGH POWER OUT 7 TO 40W
- HIGH POWER GAIN
- EFFICIENCY
- CLASS C TRANSISTORS
- COMMON EMITTER



.380 Narrow 4LSTUD
(M104)
epoxy sealed



.380 4LSTUD
(M135)
epoxy sealed

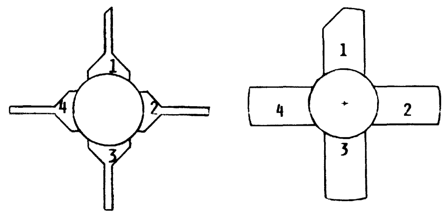
ORDER CODE	BRANDING
SD1220	2N5641
SD1222-10	2N5642
SD1224	2N5643

DESCRIPTION

These devices are epitaxial silicon NPN-planar transistors designed primarily for 12.5V AM class C RF amplifiers functional in the aviation band 118-136MHz and for 28V FM class C RF amplifiers utilized in ground station transmitters. These devices utilize ballasted emitter resistors and improved metallization systems to achieve optimum load mismatch capability.

Device	Package
2N5641	.380 Narrow 4LSTUD
2N5642	.380 4LSTUD
2N5643	.380 4LSTUD

PIN CONNECTION



S882N5641-01

1 collector
2 emitter
3 base
4 emitter

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	2N5641	2N5642	2N5643	Unit
V_{CBO}	Collector to Base Voltage	65	65	65	V
V_{CEO}	Collector to Emitter Voltage	35	35	35	V
V_{EBO}	Emitter to Base Voltage	4.0	4.0	4.0	V
$I_{C\,(max)}$	Continuous Collector Current	1.0	3.0	5.0	A
P_D	Total Dissipation at 25°C Stud	15	30	60	W
T_j	Junction Temperature	200	200	200	°C
T_{stg}	Storage Temperature	– 65 to 150	– 65 to 150	– 65 to 150	°C

		2N5641	2N5642	2N5643	
$R_{th(j-c)}$	Junction-case Thermal Resistance	11.7	5.8	2.9	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

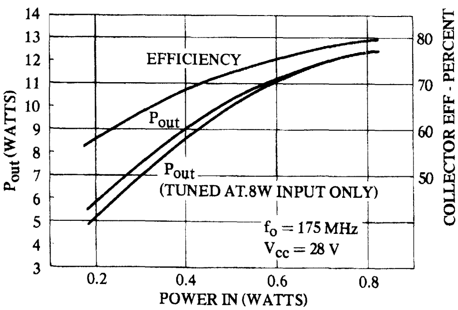
Symbol	Test Conditions		2N5641			2N5642			2N5643			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
BV_{CES}	I_C = 200mA	V_{BE} = 0	65			65			65			V
BV_{CEO}	I_C = 200mA	I_B = 0	35			35			35			V
BV_{EBO}	I_E = 10mA	I_C = 0	4	(I_E = 5mA)		4			4			V
I_{CBO}	V_{CB} = 30V	I_E = 0			1			1			1	mA
h_{FE}	V_{CE} = 5V	I_C = 200mA	5	(I_C = 100mA)		5			5	(I_C = 500mA)		

DYNAMIC

Symbol	Test Conditions		2N5641			2N5642			2N5643			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
P_O	F = 175MHz Class C	V_{CE} = 28V	7			20			40			W
G_p	F = 175MHz Class C	V_{CE} = 28V	8.4			8.2			7.6			dB
η_C	F = 175MHz Class C	V_{CB} = 28V	60			60			60			%
C_{OB}	V_{CB} = 30V F = 1MHz	I_C = 0			15			35			65	pF

APPLICATION INFORMATION (typical curves)

2N5641



Power Output vs Power Input

S882N5641-02

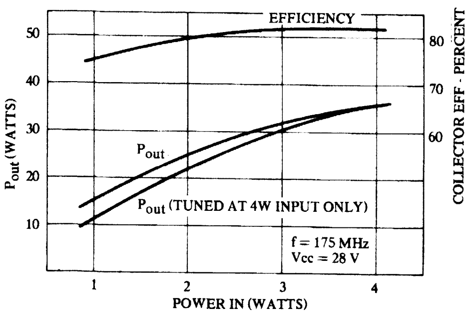
IMPEDANCE DATA (typical)

NETWORK IMPEDANCE AT TRANSISTOR TERMINALS

f = 175MHz,		V_{CC} = 28V	
P_{IN} Watts	P_{OUT} Watts	Input Ohms	Output Ohms
0.2	5.8	2.15 – j1.95	23.23 – j29.68
0.4	9.08	2.42 – j1.57	22.08 – j29.50
0.6	11.19	2.52 – j1.15	21.80 – j29.15
0.8	12.67	2.57 – j5.25	18.55 – j30.38

APPLICATION INFORMATION (typical curves) (continued)

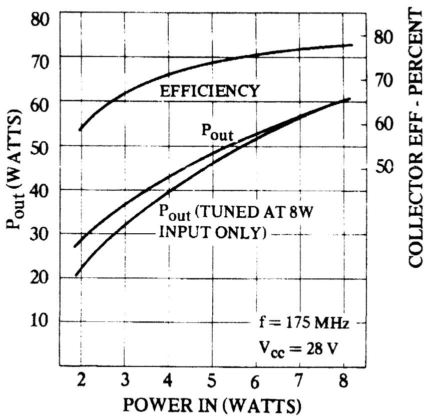
2N5642



Power Output vs Power Input

S882N5642-01

2N5643



Power Output vs Power Input

S882N5643-01

IMPEDANCE DATA (typical) (continued)

NETWORK IMPEDANCE AT TRANSISTOR TERMINALS

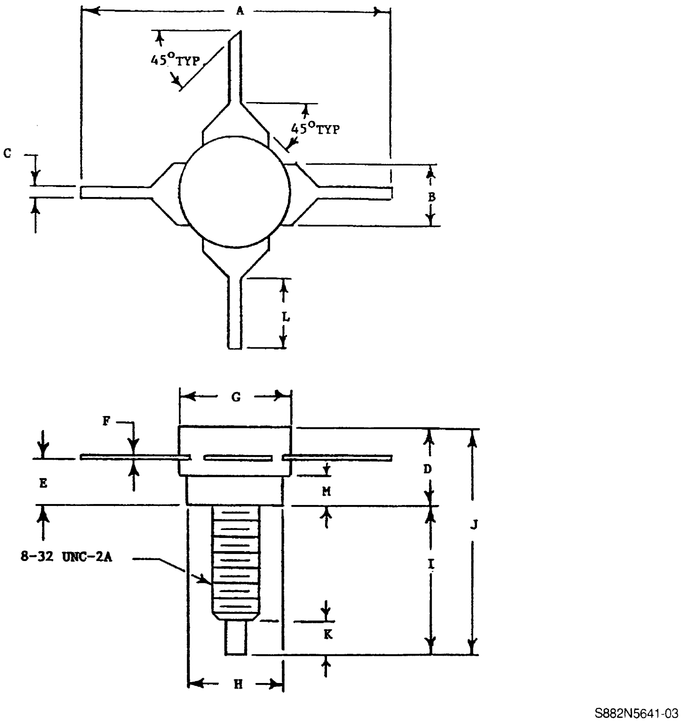
f = 175MHz,		V_{CC} = 28V	
P_{IN} Watts	P_{OUT} Watts	Input Ohms	Output Ohms
1.0	15.3	1.0 + j1.15	10.22 – j14.90
2.0	24.9	1.07 + j1.30	9.42 – j12.37
3.0	31.7	1.12 + j1.15	9.00 – j 9.60
4.0	35.9	1.20 + j1.25	9.92 – j 8.00

NETWORK IMPEDANCE AT TRANSISTOR TERMINALS

f = 175MHz,		V_{CC} = 28V	
P_{IN} Watts	P_{OUT} Watts	Input Ohms	Output Ohms
2.0	28.5	.85 + j1.20	3.25 – j7.05
4.0	43.0	1.02 + j1.32	4.45 – j5.40
6.0	53.0	1.01 + j1.42	5.25 – j4.42
8.0	60.5	1.05 + j1.35	5.45 – j4.12

PACKAGE MECHANICAL DATA

.380 NARROW 4LSTUD

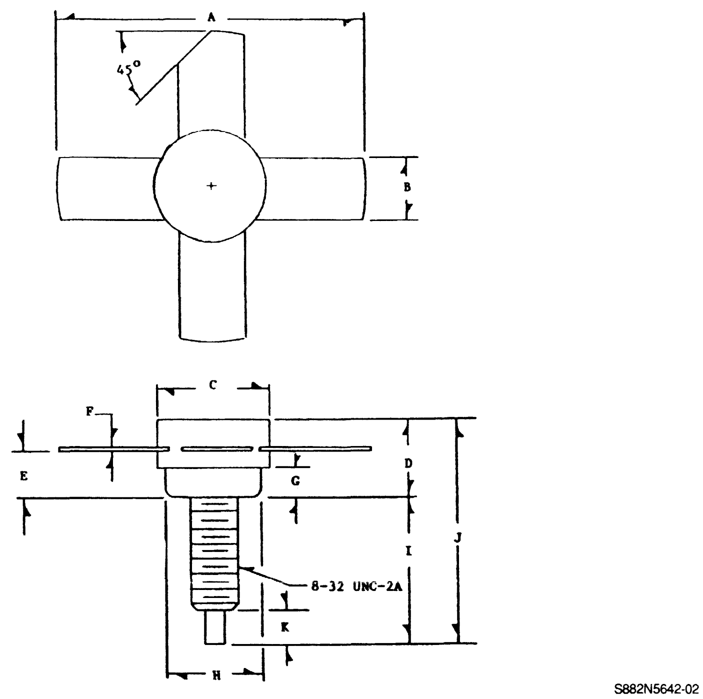


	Minimum Inches	Maximum Inches
A	1.000	
B	.220	.230
C	.025	.035
D		.275
E	.155	.175
F	.004	.007
G	.370	.380

	Minimum Inches	Maximum Inches
H	.320	.330
I	.450	.490
J		.750
K	.100	.130
L	.220	
M	.090	.100

PACKAGE MECHANICAL DATA (continued)

.380 4LSTUD



	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

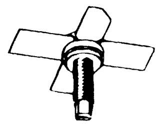
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON
MICROELECTRONICS

2N5944

RF & MICROWAVE TRANSISTORS
450-512MHz CLASS C MOBILE APPLICATIONS

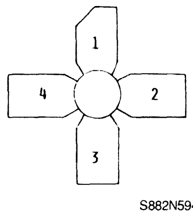
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 2W
- POWER GAIN 9dB
- COLLECTOR EFFICIENCY 60%
- COMMON EMITTER



.280 4LSTUD (M122)
epoxy sealed

ORDER CODE SD1144
BRANDING 2N5944

PIN CONNECTION



1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The 2N5944 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device utilizes improved metallization to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	.4	A
P_{tot}	Total Power Dissipation	5.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	35	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

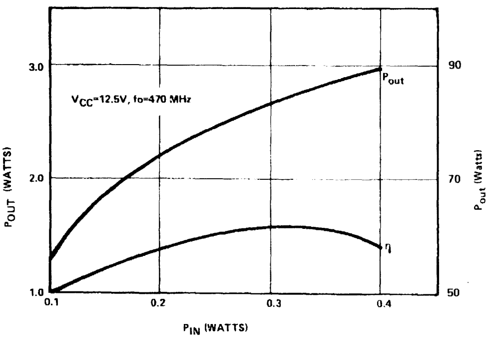
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	36			V
BV_{CEO}	I_C = 50mA	I_B = 0	16			V
BV_{EBO}	I_E = 1mA	I_C = 0	4			V
I_{CBO}	V_{CB} = 15V	I_E = 0			1	mA
h_{FE}	V_{CE} = 5V	I_C = 0.1A	20			

DYNAMIC

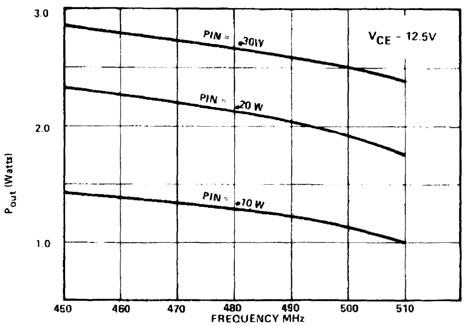
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		2			W
G_P	f = 470MHz	V_{CE} = 12.5V		9			dB
C_{OB}	f = ?MHz	V_{CB} = 12.5V	I_E = 0			15	pF

APPLICATION INFORMATION (typical curves)



POWER OUTPUT VS POWER INPUT

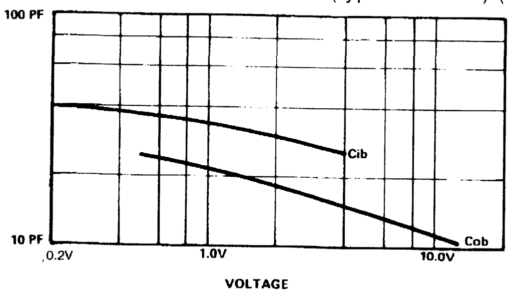
S88SD1144-02



POWER OUTPUT VS FREQUENCY

S88SD1144-03

APPLICATION INFORMATION (typical curves) (continued)



CAPACITANCE VS VOLTAGE

S88SD1144-04

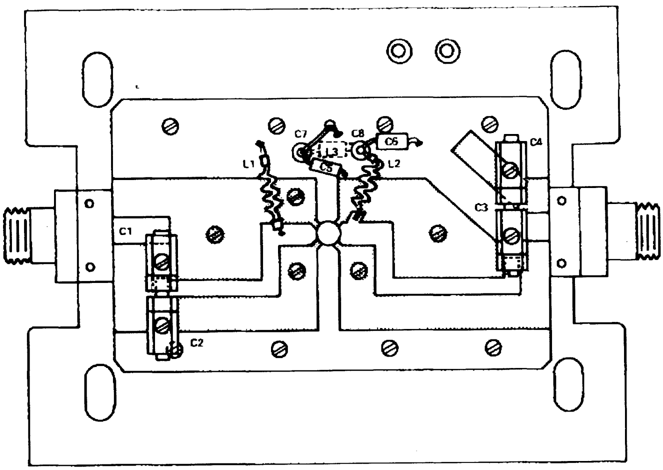
IMPEDANCE DATA

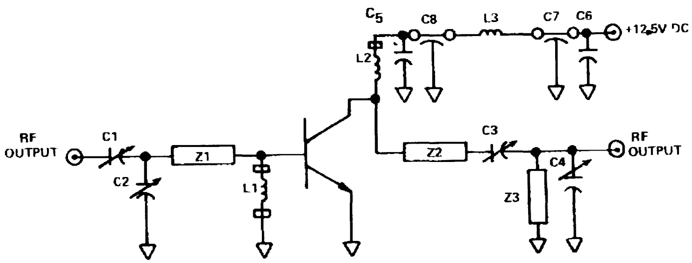
$Z_{IN} = 2.24 + j.6.5\Omega$

$Z_{OUT} = 13.0 - j.8.65\Omega$

F = 470MHz
$V_{CC} = 12.5V$
$P_O = 2W$

470MHz TEST CIRCUIT LAYOUT





S88SD1144-05

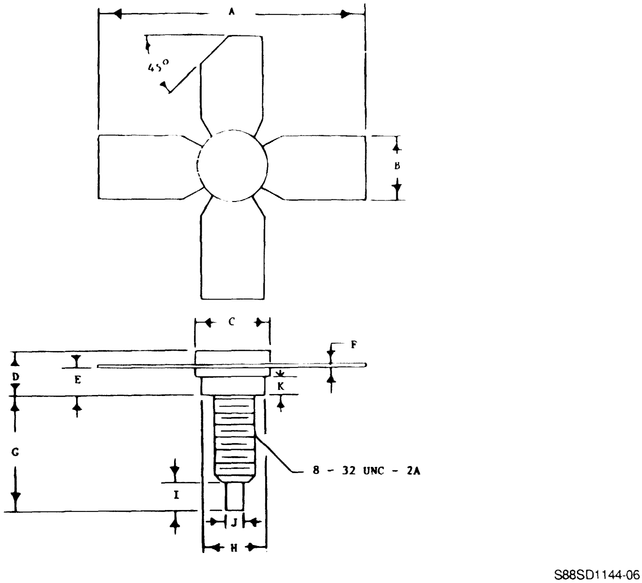
COMPONENT LIST

C_1, C_2, C_3, C_4	1.0 - 25pf, ARCO #421
C_5	Electrolytic, 1.0µf, 35V
C_6	Electrolytic, 4.7µf, 35V
C_7, C_8	Feedthru, 1000pf
L_1, L_2	7 Turns #22 Enameled 0.175" ID with Ferroxcube Ferrite Beads #56-590-65/3B
L_3	2 Turns in Ferrocube VK200/10-3B (RFC)

BOARD MATERIAL - GLASS TEFLON, 1/16" DUROID

PACKAGE MECHANICAL DATA

.280 4LSTUD



	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

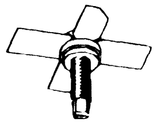
	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SGS-THOMSON MICROELECTRONICS

2N5945

RF & MICROWAVE TRANSISTORS 450-512MHz CLASS C MOBILE APPLICATIONS

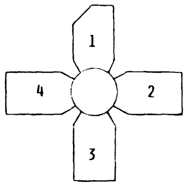
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 4.0W
- POWER GAIN 8.0dB
- EFFICIENCY 55%
- COMMON EMITTER



.280 4LSTUD (M122)
epoxy sealed

ORDER CODE	BRANDING
SD1145	2N5945

PIN CONNECTION



S882N5945-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The 2N5945 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device utilizes improved metallization to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	2.0	A
P_{tot}	Total Power Dissipation	37.5	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	11.6	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

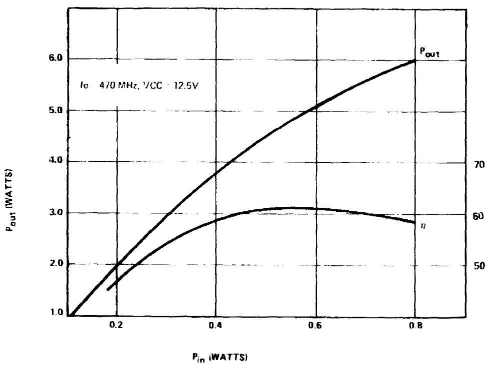
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100mA	V_{BE} = 0	36			V
BV_{CEO}	I_C = 100mA	I_B = 0	16			V
BV_{EBO}	I_E = 2mA	I_C = 0	4			V
I_{CBO}	V_{CB} = 15V	I_E = 0			1	mA
h_{FE}	V_{CE} = 5V	I_C = .2A	20			

DYNAMIC

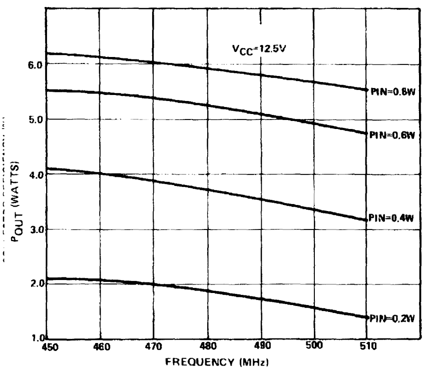
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		4			W
G_P	f = 470MHz	V_{CE} = 12.5V		8			dB
C_{OB}	f = ?MHz	V_{CB} = 12.5V	I_E = 0			25	pF

APPLICATION INFORMATION (typical curves)



POWER OUTPUT VS POWER INPUT

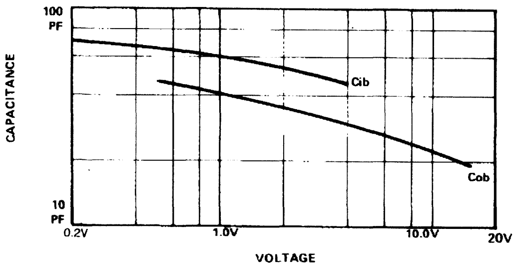
S882N5945-02



POWER OUTPUT VS FREQUENCY

S882N5945-03

APPLICATION INFORMATION (typical curves) (continued)



CAPACITANCE VS VOLTAGE

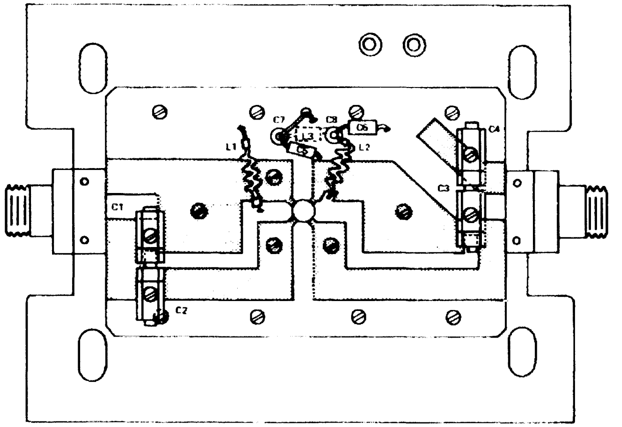
S882N5945-04

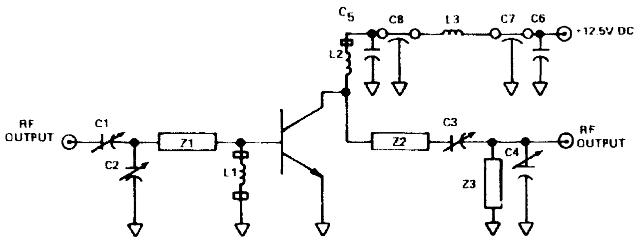
IMPEDANCE DATA (typical)

$Z_{IN} = 2.0 + j\,0.96\Omega$
$Z_{OUT} = 6.0 - j\,3.4\Omega$

F = 470MHz
V_{CC} = 12.5V
P_O = 4.0W

470MHz TEST CIRCUIT LAYOUT





S882N5645 C5

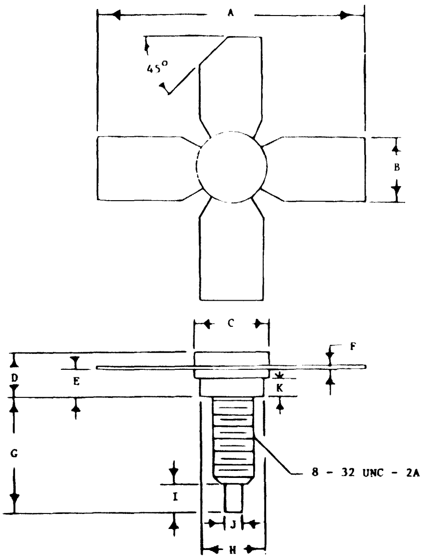
COMPONENT LIST

C_1, C_2, C_3, C_4	1.0 - 25pf, ARCO #421
C_5	Electrolytic, 1.0µf, 35V
C_6	Electrolytic, 4.7µf, 35V
C_7, C_8	Feedthru, 1000pf
L_1, L_2	7 Turns #22 Enameled 0.175" ID with Ferroxcube Ferrite Beads #56-590-65/3B
L_3	2 Turns in Ferrocube VK 200/10-3B (RFC)

BOARD MATERIAL - GLASS TEFLON, 1/16" DUROID

PACKAGE MECHANICAL DATA

.280 4LSTUD



	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

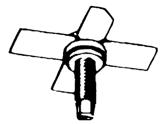
	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SGS-THOMSON MICROELECTRONICS

2N5946

RF & MICROWAVE TRANSISTORS 450–512MHz CLASS C MOBILE APPLICATIONS

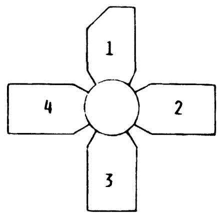
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 10.0W
- POWER GAIN 6.0dB
- EFFICIENCY 60%
- COMMON EMITTER



.280 4L STUD (M122)
epoxy sealed

ORDER CODE	BRANDING
SD1146	2N5946

PIN CONNECTION



S882N5946–01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The 2N5946 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device utilizes improved metallization to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	2.0	A
P_{tot}	Total Power Dissipation	37.5	W
T_{stg}	Storage Temperature	− 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	4.7	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

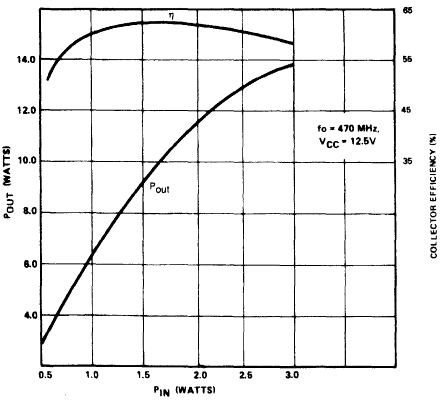
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 200mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 200mA	I_B = 0	16			V
BV_{EBO}	I_E = 4mA	I_C = 0	4			V
I_{CBO}	V_{CB} = 15V	I_E = 0			2	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	20			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		10			W
G_P	f = 470MHz	V_{CE} = 12.5V		6			dB
C_{OB}		V_{CB} = 12.5V	I_C = 0			45	pF

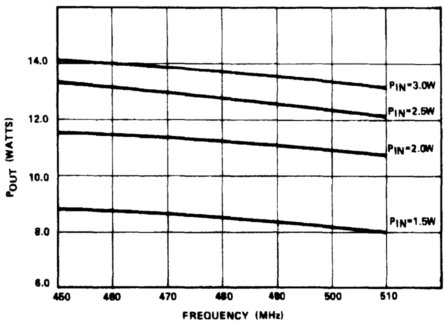
APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS POWER INPUT



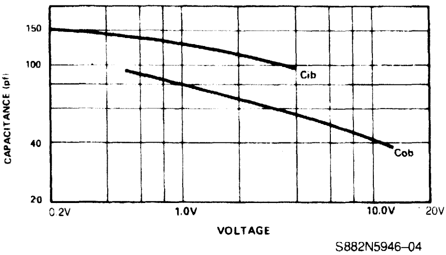
S882N5946–02

POWER OUTPUT VS FREQUENCY



S882N5946–03

CAPACITANCE VS VOLTAGE



IMPEDANCE INFORMATION

$Z_{IN} = 1.6 + j2.2\Omega$

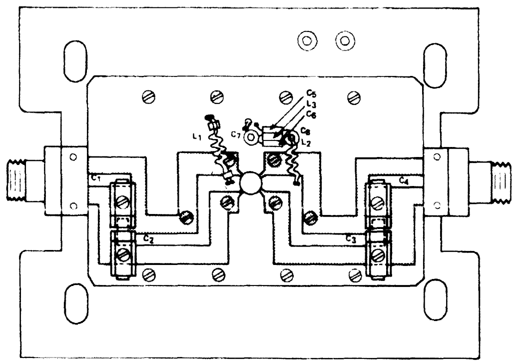
$Z_{OUT} = 6.0 - j0.34\Omega$

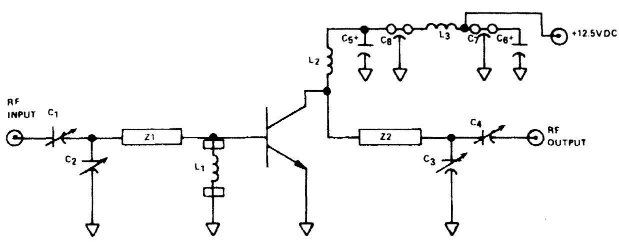
F = 470MHz 12V

$V_{CE} = 12.5V$

$P_O = 10.0W$

470MHz TEST CIRCUIT LAYOUT





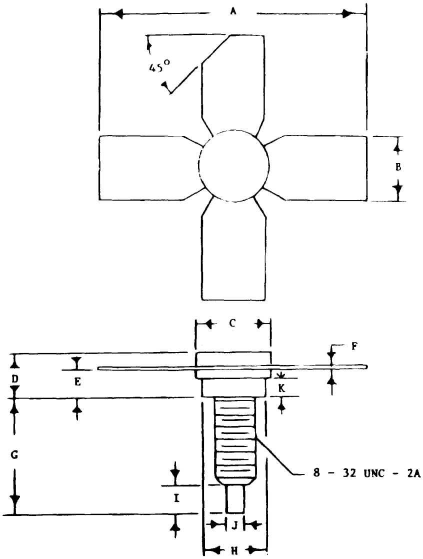
COMPONENT LIST

C1 - 1.0-20pf, ARCO #420
C2, C3, C4 - 1.0-25pf, ARCO #421
C5, C6 - Electrolytic, 1.0µf, 35V
C7, C8 - Feedthru, 1000pf
L1 - 7 Turns #22 Enameled
0.175" ID with Ferroxcube

Ferrite Beads #56-590-65/3B
L2 - 5 Turns #22 Enameled
0.175" ID
L3 - 2 Turns in Ferrocube
VK 200/19-4B (RFC)
BOARD MATERIAL - GLASS TEFLON 1/16" Duroid

PACKAGE MECHANICAL DATA

.280 4LSTUD



	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

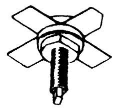
	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SGS-THOMSON MICROELECTRONICS

2N6080 → 2N6084

RF & MICROWAVE TRANSISTORS 130... 230MHz FM MOBILE APPLICATIONS

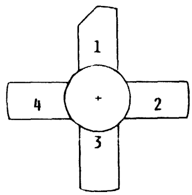
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 4 → 40W
- HIGH POWER GAIN
- HIGH EFFICIENCY
- FM CLASS C TRANSISTORS
- COMMON EMITTER



.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	BRANDING
SD1012	2N6080
SD1014-02	2N6081
SD1229-07	2N6082
SD1229-08	2N6083
SD1018	2N6084

PIN CONNECTION



S882N6080-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

This line of epitaxial silicon NPN-planar transistor is designed primarily for VHF mobile and marine transmitters. The device utilizes emitter ballasting resistors and improved metallization systems to achieve extreme ruggedness under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Symbol	Parameter	Value					Unit
		2N6080	2N6081	2N6082	2N6083	2N6084	
V_{CBO}	Collector to Base Voltage	36.0	36.0	36.0	36.0	36.0	V
V_{CEO}	Collector to Emitter Voltage	18.0	18.0	18.0	18.0	18.0	V
V_{EBO}	Emitter to Base Voltage	4.0	4.0	4.0	4.0	4.0	V
I_C(max)	Continuous Collector Current	1.0	2.5	4.0	4.0	6.0	A
P_D	Total Dissipation at 25°C Stud	12.0	31.0	65.0	65.0	80.0	W
T_j	Junction Temperature	+ 200	+ 200	+ 200	+ 200	+ 200	°C
T_{stg}	Storage Temperature	– 65 to + 150	– 65 to + 150	– 65 to + 150	– 65 to + 150	– 65 to + 150	°C

THERMAL DATA

		2N6080	2N6081	2N6082	2N6083	2N6084	
$R_{th\ (j-c)}$	Junction-case Thermal Resis.	15	5.6	2.8	2.8	2.2	°C/W

ELECTRICAL CHARACTERISITICS (T_{case} = 25°C)

STATIC

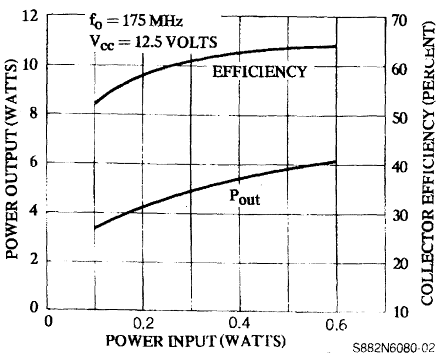
Symbol	Test Conditions	2N6080			2N6081			2N6082			2N6083			2N6084			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
B_{VCES}	I_C = 20mA V_{BE} = 0	36			36			36			36			36			V
B_{VCEO}	I_C = 100mA I_B = 0	18			18			18			18			18			V
B_{VEBO}	I_E = 10mA I_C = 0	4			4			4			4			4			V
I_{CBO}	V_{CB} = 15V I_E = 0			0.25			0.5			1			1			2.5	mA
h_{FE}	V_{CE} = 5V I_E = 0.25A	5			5			5			5			5			

DYNAMIC

Symbol	Test Conditions	2N6080			2N6081			2N6082			2N6083			2N6084			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
P_O	F = 175MHz V_{CE} = 12.5V Class C	4			15			25			30			40			W
G_P	F = 175MHz V_{CE} = 12.5V Class C	12			6.3			6.2			5.7			4.5			dB
η_C	F = 175MHz V_{CE} = 12.5V Class C	50			60			50			50			50			%
F_T	V_{CE} = 13.6V I_C = 100mA F = 100MHz	200			200			200			200			200			MHz
C_{OB}	V_{CE} = 15V I_C = 0 F = 1MHz			20			85			130			130			200	pF

APPLICATION INFORMATION (typical curves)

2N6080



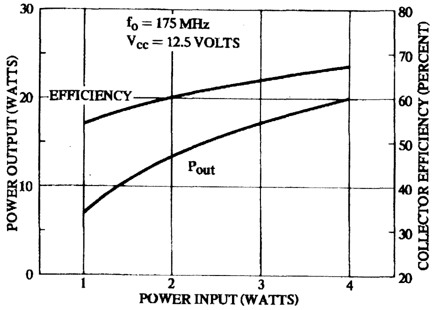
POWER OUT AND EFFICIENCY vs POWER IN

IMPEDANCE DATA (typical)

NETWORK IMPEDANCE AT TRANSISTOR TERMINALS

f_o = 175MHz, V_{CC} = 12.5V			
P_{IN} WATTS	P_{OUT} WATTS	INPUT OHMS	OUTPUT OHMS
0.1	3.3	1.5 + j1.7	5.8 + j1.4
0.3	4.9	2.2 + j1.3	7.6 + j9.8
0.5	5.8	2.9 + j0.4	8.4 + j6.9

2N6081



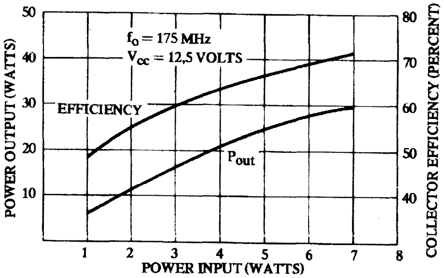
S882N6081-01

POWER OUT AND EFFICIENCY vs POWER IN

NETWORK IMPEDANCE AT TRANSISTOR TERMINALS

f_o = 175MHz, V_{CC} = 12.5V			
P_{IN} WATTS	P_{OUT} WATTS	INPUT OHMS	OUTPUT OHMS
1	9.3	0.8 – j1.0	4.0 + j3.0
3	19.6	1.0 – j1.4	3.3 + j1.2
5	27.6	1.0 – j1.0	2.9 + j0.6

2N6082



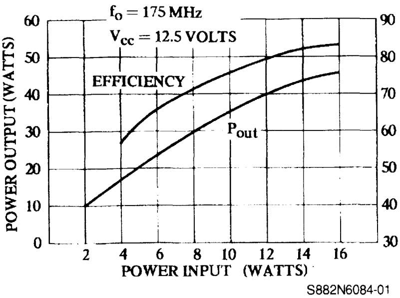
S882N6082-01

POWER OUT AND EFFICIENCY vs POWER IN

NETWORK IMPEDANCE AT TRANSISTOR TERMINALS

f_o = 175MHz, V_{CC} = 12.5V			
P_{IN} WATTS	P_{OUT} WATTS	INPUT OHMS	OUTPUT OHMS
2.5	17.4	0.8 – j1.0	2.4 + j1.5
5.0	27.5	0.9 – j0.9	2.1 + j0.4
7.5	35.8	0.9 – j1.1	2.2 + j0.1

2N6084



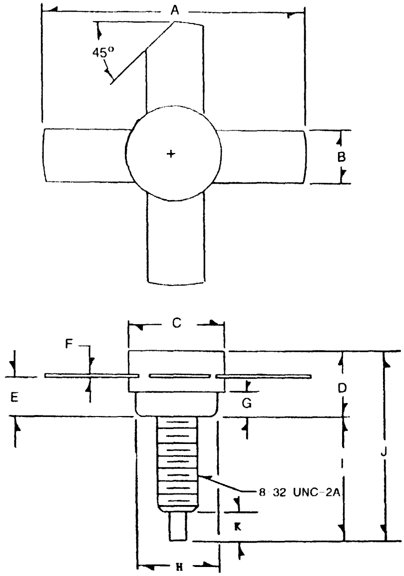
POWER OUT AND EFFICIENCY vs POWER IN

NETWORK IMPEDANCE AT TRANSISTOR TERMINALS

f_o = 175MHz, V_{CC} = 12.5V			
P_{IN} WATTS	P_{OUT} WATTS	INPUT OHMS	OUTPUT OHMS
4	21.7	0.8 – j1.1	2.2 – j0.3
8	37.1	0.8 – j1.3	1.7 – j0.5
12	46.5	0.8 – j1.6	1.6 – j0.3

PACKAGE MECHANICAL DATA

.380 4LSTUD

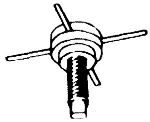


	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

RF & MICROWAVE TRANSISTORS
UHF SMALL SIGNAL

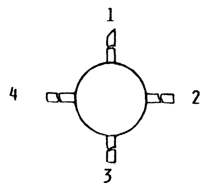
- HIGH GAIN BANDWIDTH PRODUCT
- LOW INTERMODULATION, LOW CROSS-MODULATION DISTORTION
- LOW NOISE FIGURE
- HIGH POWER GAIN



TO-117A (M148)
epoxy sealed

ORDER CODE	**BRANDING**
SD1005	SD1005

PIN CONNECTION



S88SD1005-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1005 is a silicon NPN transistor designed to be utilized in broadband linear amplifier circuitry such as CATV trunk, bridger and line extender amplifiers.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	50	V
V_{CEO}	Collector - Emitter Voltage	30	V
V_{EBO}	Emitter - Base Voltage	5.0	V
I_C	Collector Current (max.)	0.4	A
P_{TOT}	Total Device Dissipation at + 25°C	5.0	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	35	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

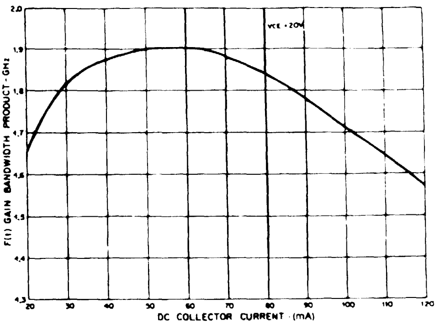
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 5mA	I_B = 0	30			V
BV_{CBO}	I_C = 0.1mA	I_E = 0	50			V
BV_{EBO}	I_E = 0.1mA	I_C = 0	5.0			V
I_{CEO}	V_{CB} = 28V	I_B = 0			0.1	mA
h_{FE}	V_{CE} = 20V	I_C = 70mA	30		300	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
NF nb	f = 200MHz	V_{CE} = 10V	I_C = 10mA		2.7		W
NF bb	f = 216MHz	V_{CE} = 22V	I_C = 70mA		7.5	9.0	dB
G_{VE}	f = 260MHz	V_{CE} = 22V	I_C = 70mA	10	11		dB
X-MOD*	Po = 50dbmv	V_{CE} = 22V	I_C = 70mA		– 53	– 50	dB
2 nd 0 **	Po = 50dbmv	V_{CE} = 22V	I_C = 70mA		– 55	– 50	dB
Cob	F = 1MHz	V_{CB} = 30V	I_E = 0		2.6	4.0	pF
Cib	F = 1MHz	V_{EB} = 0.5V	I_C = 0		8.0	10	pF

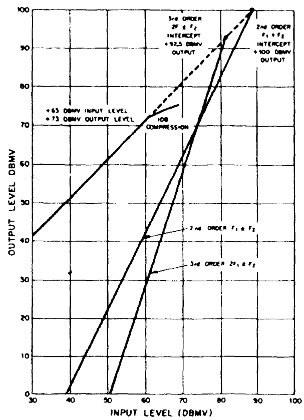
* 12 Channel Flat — NCTA Channel 1 through 12 100% Mod (sq. wave) 12CW.
** Channel 2 and Channel 6 Intermod Product on Channel 13.

GAIN BANDWIDTH PRODUCT F(t)
vs. Ic VcE = 20V



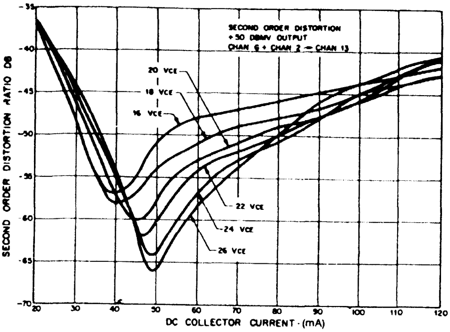
S88SD1005-02

SD1005 IN BROADBAND CKT.
DC BIAS 22 VcE-Ic 70mA



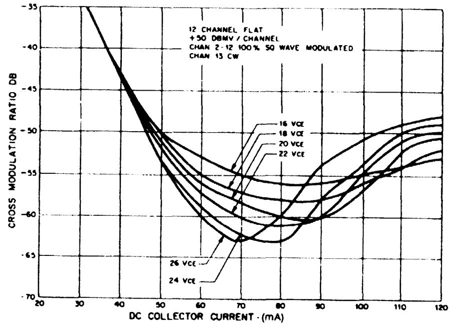
S88SD1005-03

SECOND ORDER DISTORTION + 50DBMV OUTPUT CHAN. G + 2 → CHAN.13



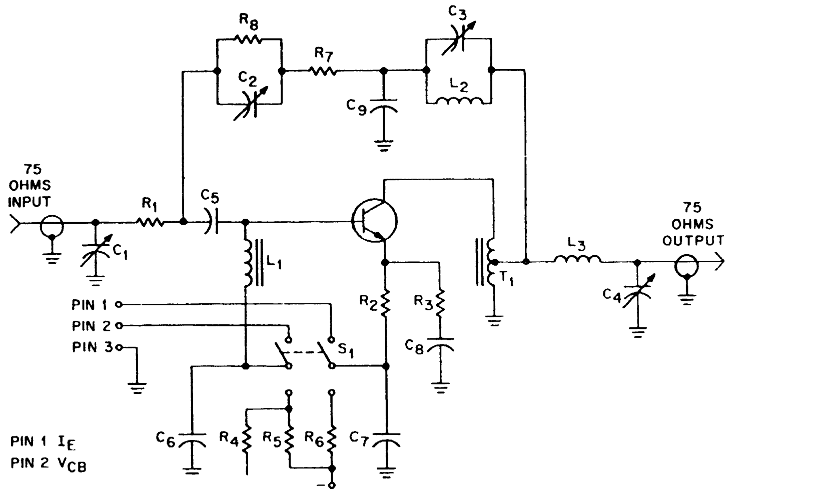
S88SD1005-04

CROSS MODULATION vs. Ic CHANNEL FLAT + 50DBMV/CHNNEL



S88SD1005-05

TEST CIRCUIT



R_1, R_2 = 20Ω. 1/4W. 5%
R_3 = 60Ω. 1/4W. 5%
R_4 = 1Ω. 1W. 5%
R_5 = 250Ω. 1/2W. 5%
R_6 = 47Ω. 1/2W. 5%
R_7 = 240Ω. 1/4W. 5%
R_8 = 100Ω. 1/4W. 5%

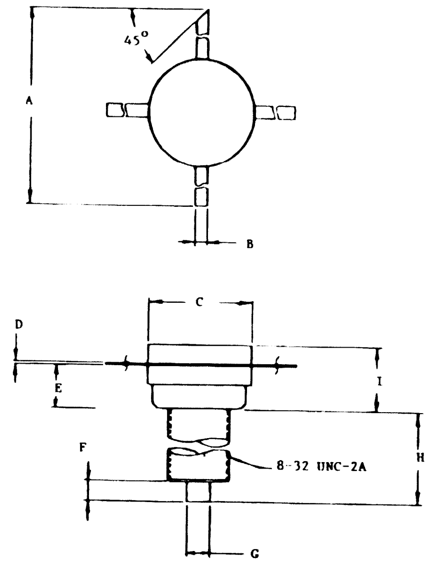
C_1, C_2, C_3, C_4 = 2.20PF
C_5, C_6, C_7, C_8 = 02μF.30V
C_9 = 2PF

L_1 = 77 # 30 Ferrite Core 3/8" Lenght Q_1 Material
L_2 = 1T = 22 1/4" AIR
L_3 = 4T # 22 1/4" AIR

T_1 = Broadband Ferrite Core Transformer
4 4 2 = 30 TAP 2T from Collector Q_1 Material
S1 = DPDT Toggle Switch 125V .3A

PACKAGE MECHANICAL DATA

TO-117A



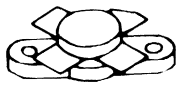
	Minimum Inch/mm	Maximum Inch/mm
A	.910/23.11	
B	.024/0.61	.034/0.86
C	.270/6.86	.290/7.37
D	.003/0.08	.007/0.18
E	.110/2.79	.130/3.30
F	.115/2.92	.145/3.68
G	.055/1.40	.065/1.65
H	.435/11.05	.465/11.81
I	.175/4.45	.210/5.33

SGS-THOMSON MICROELECTRONICS

SD1012-3

RF & MICROWAVE TRANSISTORS 130 ... 230MHz FM MOBILE APPLICATIONS

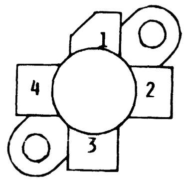
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 6W
- POWER GAIN 9dB
- EFFICIENCY 50%
- COMMON EMITTER



.380 4LFL (M113)
epoxy sealed

ORDER CODE	**BRANDING**
SD1012-03	SD1012-3

PIN CONNECTION



S88SD1012-3-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1012-3 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. This device utilizes a nichrome aluminium metallization system to achieve very high VSWR under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4,0	V
I_C	Collector Current	1.8	A
P_{tot}	Total Power Dissipation	20.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	8.75	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

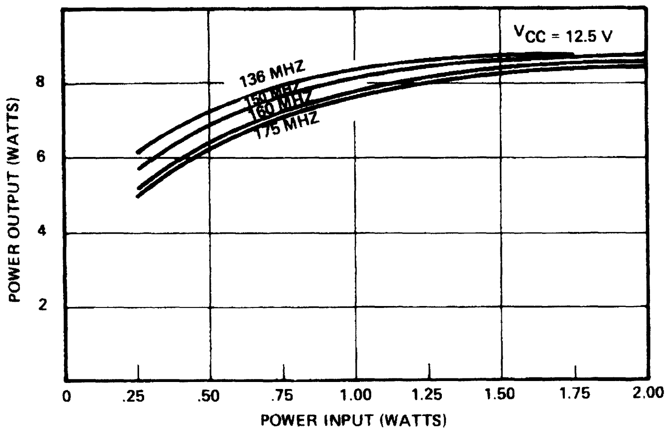
Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CES}	I_C = 5mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 10mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 1mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = .25A	5.0			

DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	f = 175MHz	V_{CE} = 12.5V		6.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		9.0			dB
η_C	f = 175MHz	V_{CC} = 12.5V		50			%
C_{OB}	f = 1MHz	V_{CB} = 15.0V	I_E = 0			20.0	pF

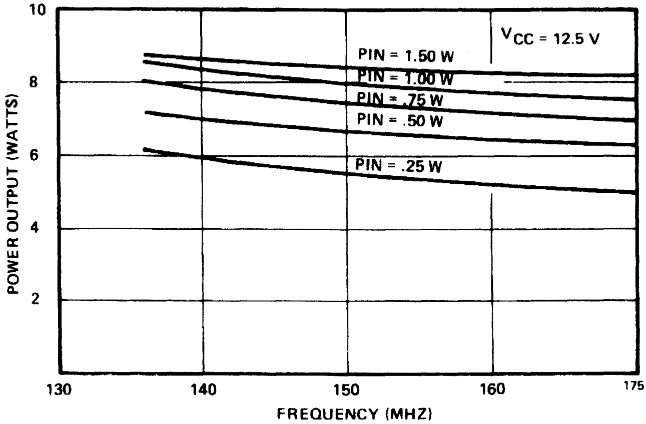
APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS. POWER INPUT.



S88SD1012-3-02

POWER OUTPUT VS. FREQUENCY.

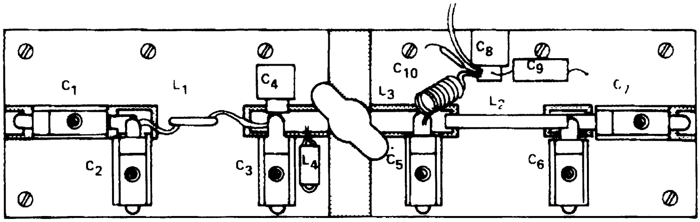


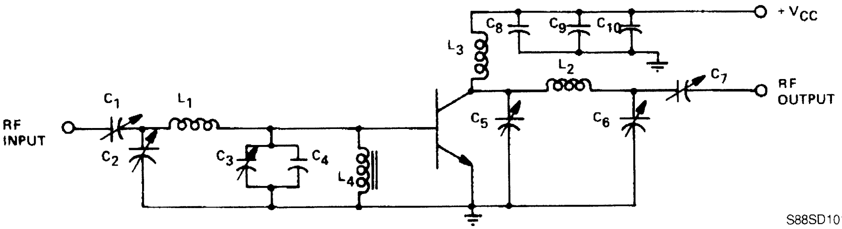
S88SD1012-3-03

IMPEDANCE VS. FREQUENCY

V_{cc}	P_{IN} (W)	P_{OUT} (W)	f_o (MHz)	Z_{SOURCE}	Z_{LOAD}
12.5V	1.0	8.10	150.	4.90 + J 3.46Ω	11.4 + J 4.56Ω
12.5V	1.0	7.70	175.	4.32 + J 3.04Ω	13.0 + J 7.81Ω

TEST CIRCUIT





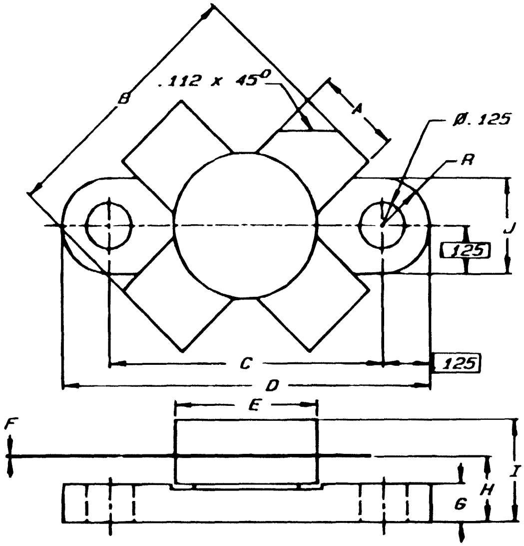
S88SD1012-3-04

PART LIST

C1, C2, C6	– 4 – 40pf, ARCO 422
C3, C5	– 7 – 100pf, ARCO 423
C7	– 24 – 200pf, ARCO 425
C4	– 25 pf UNELCO
C8	– 1000pf UNELCO
C9	– 10µf electrolytic 35 VDC
C10	– .01µf disc
L1	– 1 turn, No. 18 awg., 5/16" ID
L2	– Cu .003", 1 3/4" L, 3/16 W W 5/16"
L3	– 10 turns No. 22 enameled tigh wind on 300W 1/2 watt carbon resistor
L4	– RFC, 21/2 turns on VK2K/07-3B ferroxcube

PACKAGE MECHANICAL DATA

.380 4LFL



S88SD1012-3-05

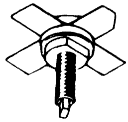
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON MICROELECTRONICS

SD1013

RF & MICROWAVE TRANSISTORS 108-152MHz APPLICATIONS

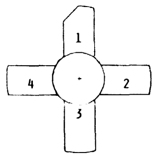
- FM CLASS C TRANSISTOR
- FREQUENCY 150MHz
- VOLTAGE 28V
- POWER OUT 10W
- POWER GAIN 10dB
- EFFICIENCY 55%TYP
- COMMON EMITTER



.380 4L STUD (M135)
epoxy sealed

ORDER CODE	BRANDING
SD1013	SD1013

PIN CONNECTION



S88SD1013-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1013 is a 28V epitaxial silicon NPN planar transistor designed for 108-152 MHz FM applications.
This device utilizes diffused emitter resistors to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	35.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	1.0	A
P_{tot}	Total Power Dissipation	13.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	13.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions			Value		Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 20mA	I_E = 0	65.0			V
BV_{CES}	I_C = 200mA	V_{BE} = 0	65.0			V
BV_{CEO}	I_C = 200mA	I_B = 0	35.0			V
BV_{EBO}	I_E = 10.0mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 30.0V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 200mA	5.0			

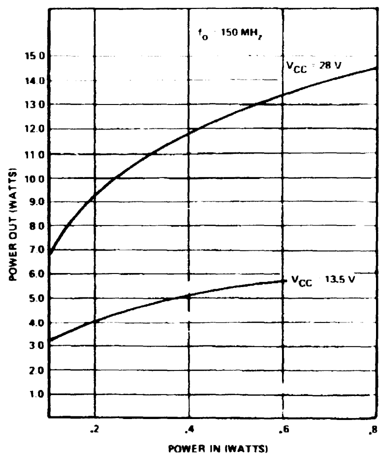
DYNAMIC

Symbol	Test Conditions				Value		Unit
				Min.	Typ.	Max.	
P_O	f = 150MHz	V_{CC} = 28.0V		10.0			W
G_P	f = 150MHz	V_{CC} = 28.0V		10.0			dB
C_{ob}	f = 1MHz	V_{CB} = 30.0V	I_E = 0			15	pF

When used at 13.5Volts performances are :
P_{OUT} = 3.5Watt typical.
G_P = 10.5dB typical.

APPLICATION INFORMATION (typical curves)

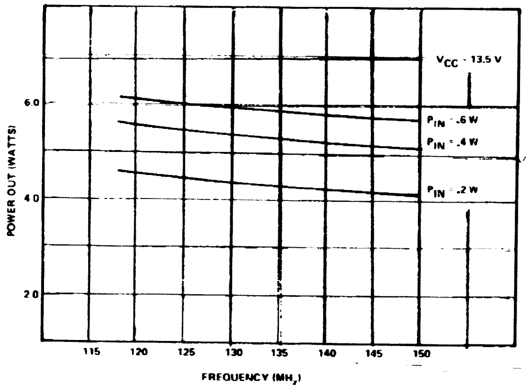
POWER OUT VS POWER IN



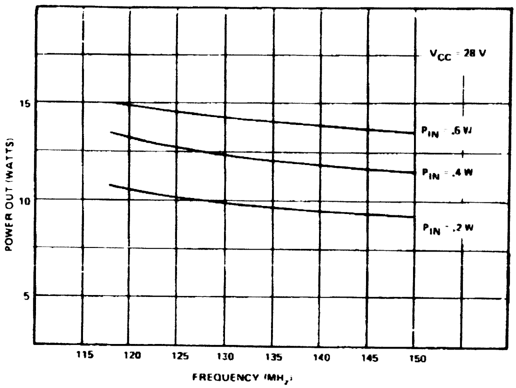
S88-SD1013-02

APPLICATION INFORMATION (typical curves)

POWER OUT VS FREQUENCY (13.5V, 28V)



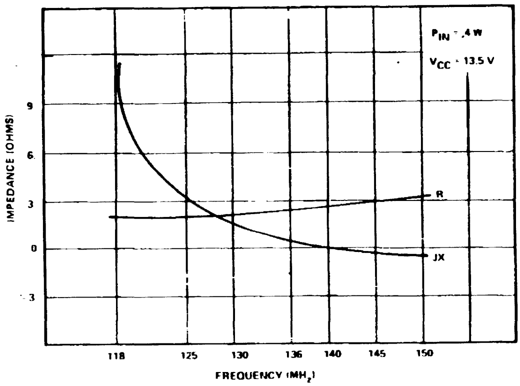
S88-SD1013-03



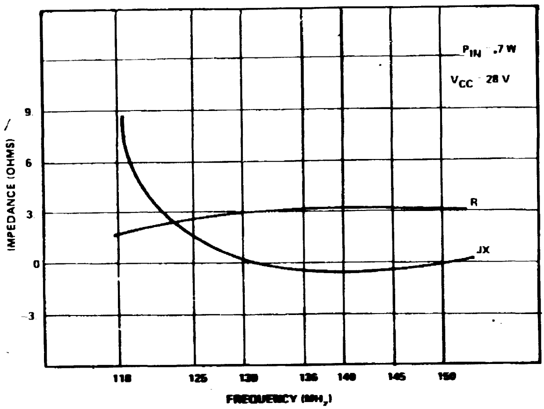
S88-SD1013-04

IMPEDANCES DATAS (typical)

SERIES SOURCE IMPEDANCE VS FREQUENCY (13.5V, 28V)



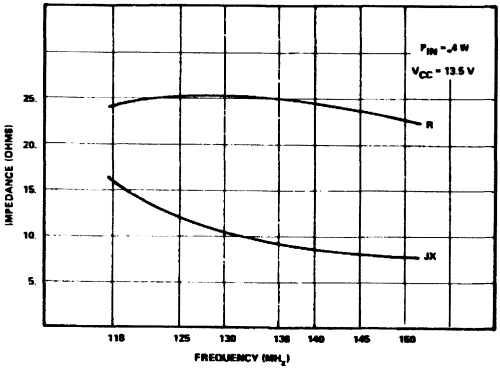
S88-SD1013-05



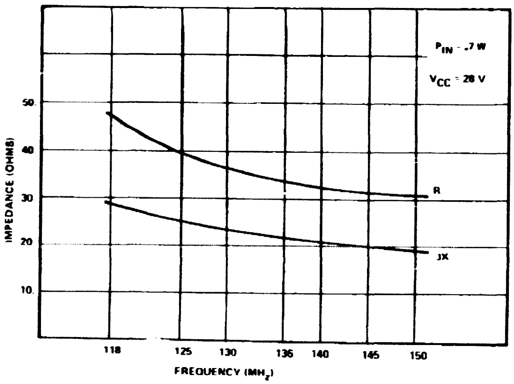
S88-SD1013-06

IMPEDANCES DATAS (typical)(continued)

SERIES COLLECTOR LOAD IMPEDANCE VS FREQUENCY (13.5V, 28V)

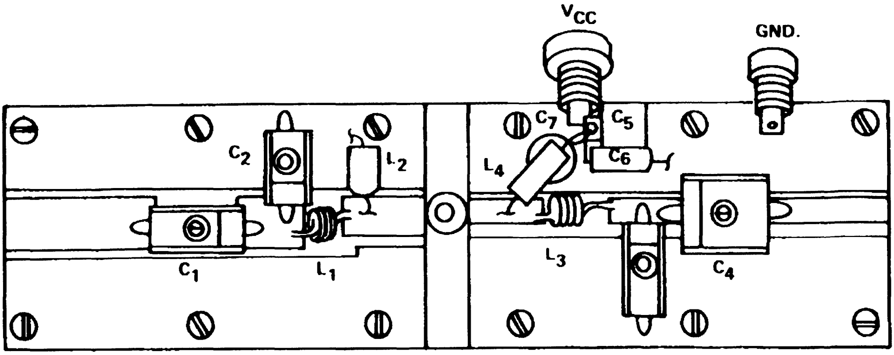


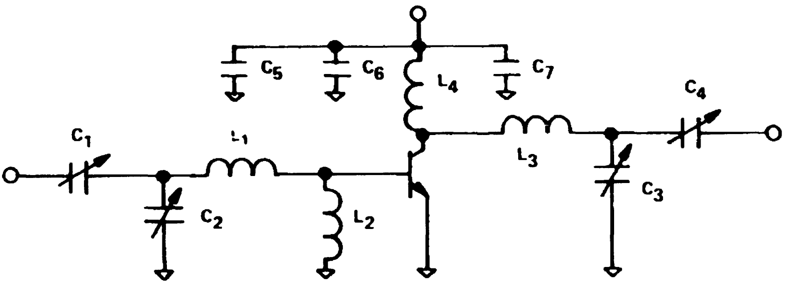
S88-SD1013-07



S88-SD1013-08

TEST FIXTURE



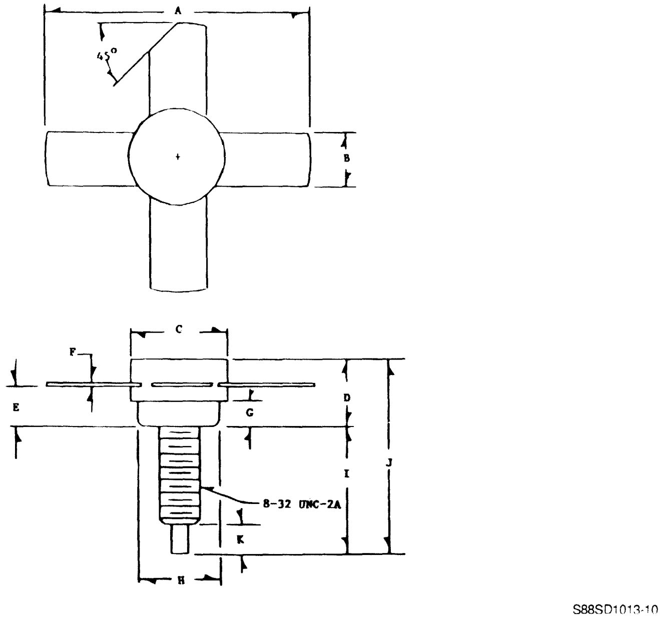


S88-SD1013-09

C_1, C_2	ARCO 422	C_7	.01pf CERAMIC DISC
C_3	ARCO 421	L_1	3T #22, 1/8 ID
C_4	ARCO 464	L_2	RFC FERROXCUBE
C_5	1000pf UNELCO	L_3	3T #18, 1/4 ID
C_6	10µf, ELECTROLYTIC 35V	L_4	.47µh MOLDED CHOKE.

PACKAGE MECHANICAL DATA

. 380 4L STUD



	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

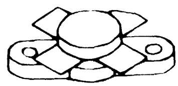
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON
MICROELECTRONICS

SD1013-3

RF & MICROWAVE TRANSISTORS
108-152MHz APPLICATIONS

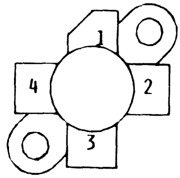
- FM CLASS C TRANSISTOR
- FREQUENCY 150MHz
- VOLTAGE 28V
- POWER OUT 10W
- POWER GAIN 10dB
- EFFICIENCY 55%TYP
- COMMON EMITTER



.380 4LFL (M113)
epoxy sealed

ORDER CODE	BRANDING
SD1013-03	SD1013-3

PIN CONNECTION



S88SD1013-3-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1013-3 is a 28V epitaxial silicon NPN planar transistor designed for 108-152 MHz FM applications.
This device utilizes diffused emitter resistors to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CEO}	Collector - Emitter Voltage	35	V
V_{CES}	Collector - Emitter Voltage	65	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	1	A
P_{tot}	Total Power Dissipation	13	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	13.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 200mA	I_E = 0	65			V
BV_{CES}	I_C = 200mA	V_{BE} = 0	65			V
BV_{CEO}	I_C = 200mA	I_B = 0	35			V
BV_{EBO}	I_E = 10.0mA	I_C = 0	4			V
I_{CBO}	V_{CB} = 30.0V	I_E = 0			1	mA
h_{FE}	V_{CE} = 5.0V	I_C = 200mA	5		200	

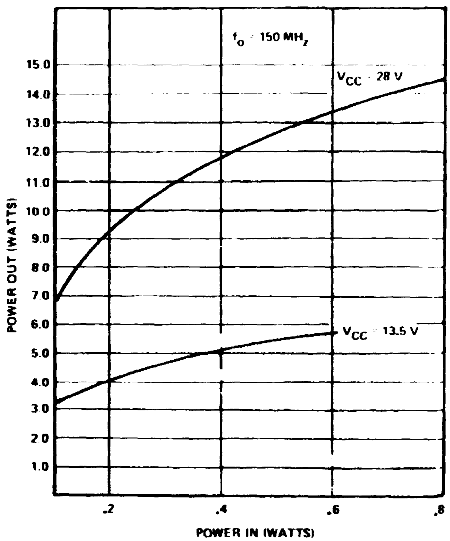
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 150MHz	V_{CC} = 28V		10			W
G_P	f = 150MHz	V_{CC} = 28V		10			dB
C_{ob}	f = 1MHz	V_{CB} = 30V	I_E = 0			15	pF

When used V_{CC} = 13.5V performances are :
P_{OUT} = 3.5Watt typical.
G_P = 10.5dB typical.

APPLICATION INFORMATION (typical curves)

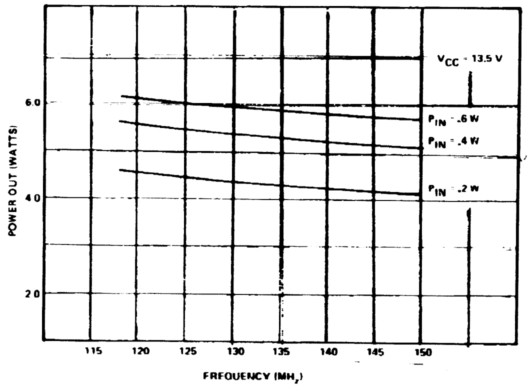
POWER OUT VS POWER IN



S88-SD1013-3-02

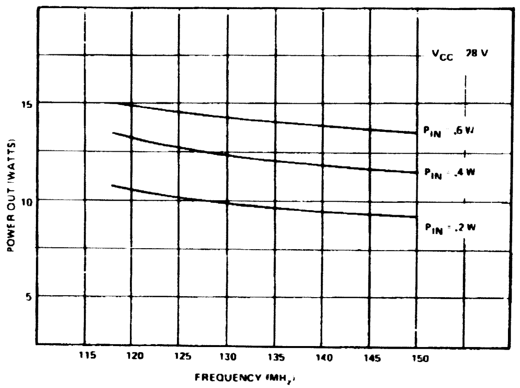
APPLICATION INFORMATION (typical curves)

POWER OUT VS FREQUENCY (13.5V, 28V)



V_{CC} = 13.5 V

S88-SD1013-3-03

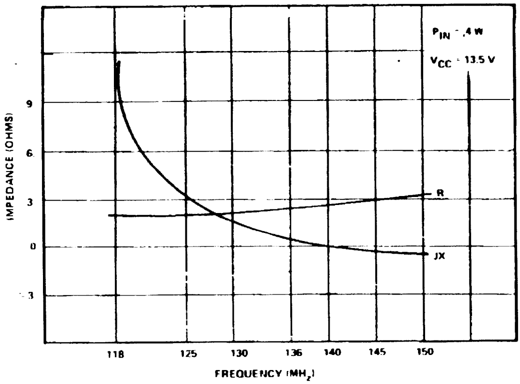


V_{CC} = 28 V

S88-SD1013-3-04

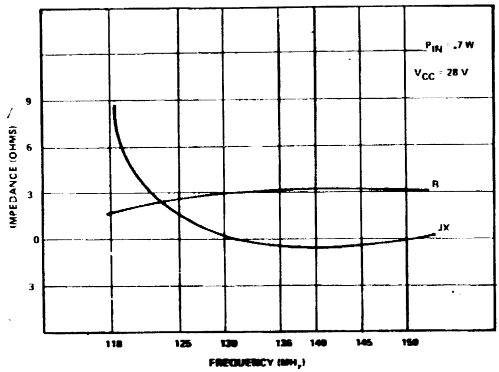
IMPEDANCES DATAS (typical)

SERIES SOURCE IMPEDANCE VS FREQUENCY (13.5V, 28V)



V_{CC} = 13.5 V

S88-SD1013-3-05

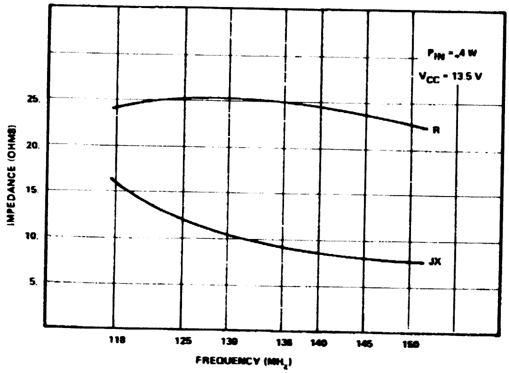


V_{CC} = 28 V

S88-SD1013-3-06

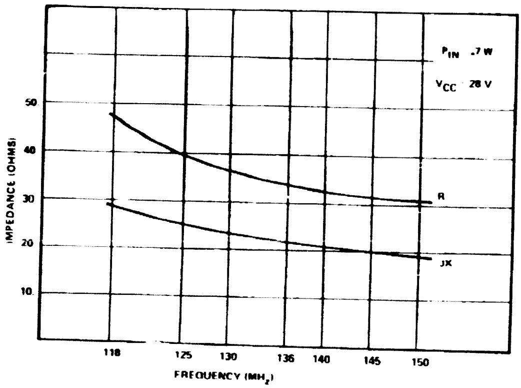
IMPEDANCES DATAS (typical)(continued)

SERIES COLLECTOR LOAD IMPEDANCE VS FREQUENCY (13.5V, 28V)



Vcc = 13.5 V

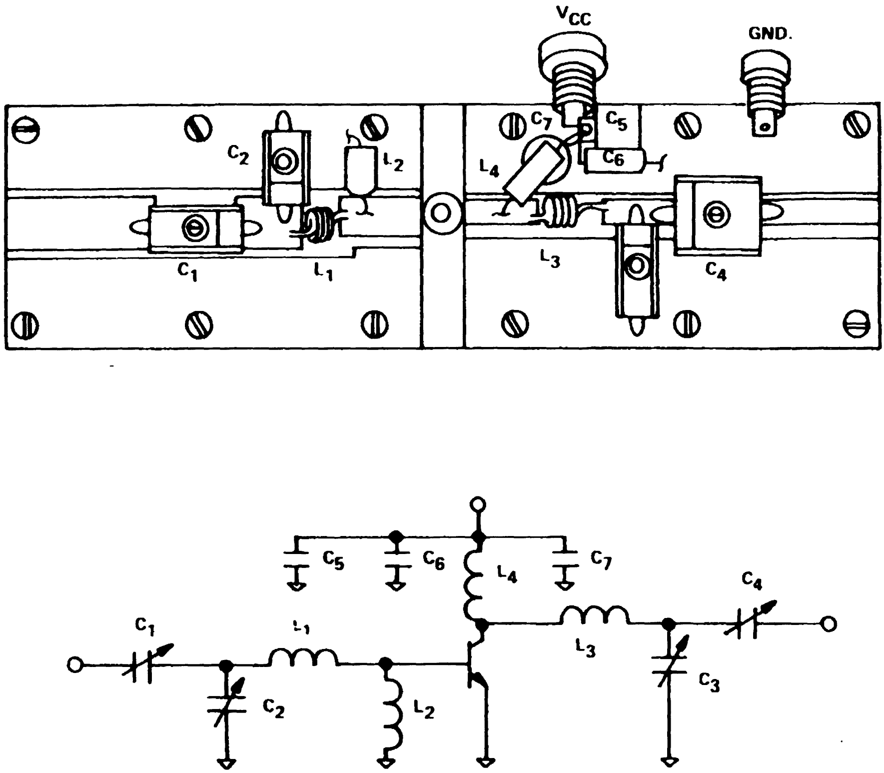
S88-SD1013-3-07



Vcc = 28 V

S88-SD1013-3-08

TEST FIXTURE

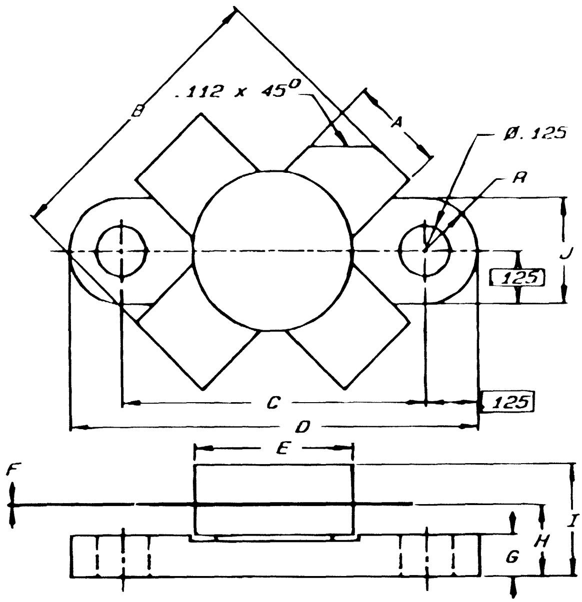


S88-SD1013-3-09

C_1, C_2	ARCO 422	C_7	.01pf CERAMIC DISC
C_3	ARCO 421	L_1	3T #22, 1/8 ID
C_4	ARCO 464	L_2	RFC FERROXCUBE
C_5	1000pf UNELCO	L_3	3T #18, 1/4 ID
C_6	10µf ELECTROLYTIC 35V	L_4	.47µh MOLDED CHOKE.

PACKAGE MECHANICAL DATA

.380 4LFL



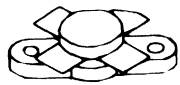
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON
MICROELECTRONICS

SD1014-6

RF & MICROWAVE TRANSISTORS
130 ... 230MHz FM MOBILE APPLICATIONS

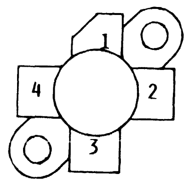
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 15W
- POWER GAIN 6.3dB
- EFFICIENCY 60 %
- COMMON EMITTER



.380 4LFL (M113)
epoxy sealed

ORDER CODE	**BRANDING**
SD1014-06	SD1014-6

PIN CONNECTION



S88SD1014-6-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

This epitaxial silicon NPN planar transistor is designed primarily for VHF mobile and marine transmitters. The device utilizes emitter ballasting resistors and improved metallization systems to achieve extreme ruggedness under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	2.5	A
P_{tot}	Total Power Dissipation	31.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	5.6	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

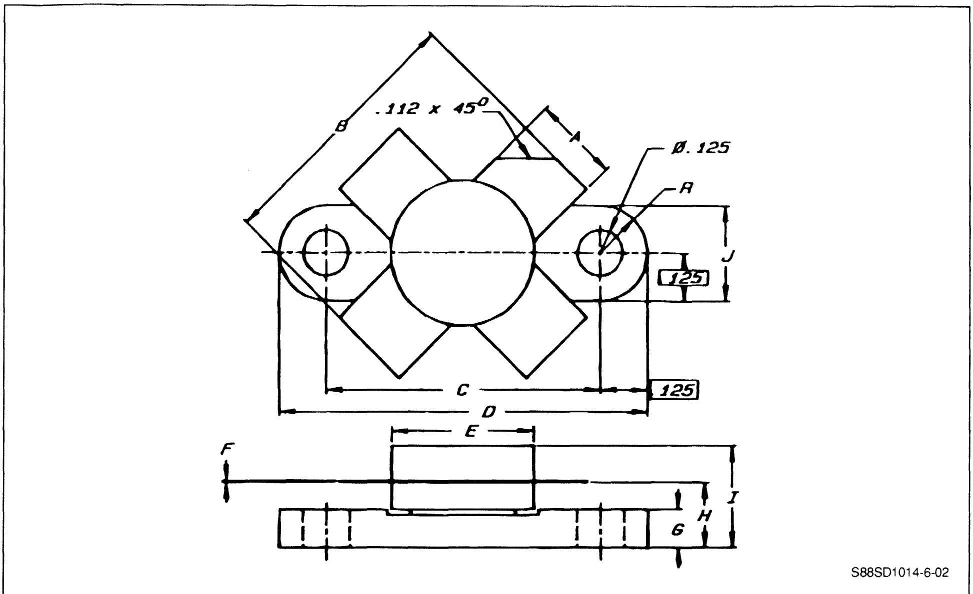
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 10mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 20mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 2mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			0.5	mA
h_{FE}	V_{CE} = 5.0V	I_C = 500mA	5.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		15.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		6.3			dB
η_C	f = 175MHz	V_{CC} = 12.5V		60			%
C_{OB}	f = 1MHz	V_{CB} = 15.0V	I_E = 0			85	pF

PACKAGE MECHANICAL DATA

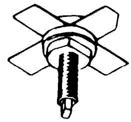
.380 4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

RF & MICROWAVE TRANSISTORS 108–152MHz APPLICATIONS

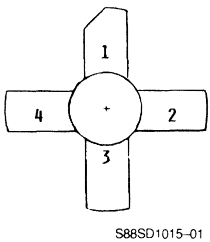
- FM CLASS C TRANSISTOR
- FREQUENCY 150MHz
- VOLTAGE 28V
- POWER OUT 30W
- POWER GAIN 10dB
- GOLD METALLIZATION
- COMMON EMITTER



.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	**BRANDING**
SD1015	SD1015

PIN CONNECTION



1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1015 is a 28V gold metallized epitaxial silicon NPN planar transistor designed for 108-152MHz FM applications.

This device utilizes diffused emitter resistors to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	1.0	A
P_{tot}	Total Power Dissipation	10.0	W
T_{stg}	Storage Temperature	− 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	4.4	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

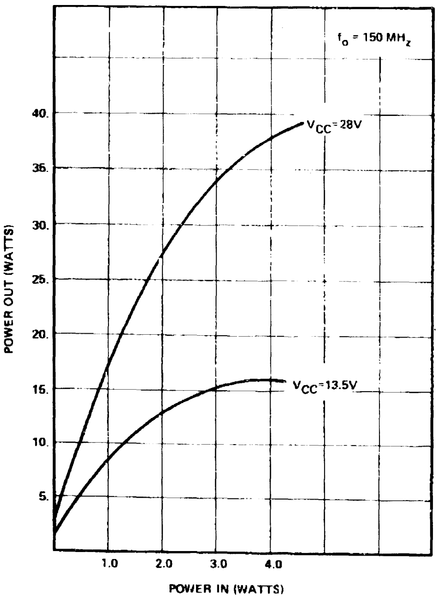
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CES}	I_C = 200mA	V_{BE} = 0		65.0			V
BV_{CEO}	I_E = 200mA	I_B = 0		35.0			V
BV_{EBO}	I_E = 10.0mA	I_C = 0		4.0			V
I_{CBO}	V_{CB} = 30.0V	I_E = 0				2.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 200mA		35.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 150MHz	V_{CC} = 13.5V		12.5			W
G_P	f = 150MHz	V_{CC} = 13.5V		7.0			dB
P_O	f = 150MHz	V_{CC} = 28V		30			W
G_P	f = 150MHz	V_{CC} = 28V		10			dB
C_{OB}	f = 1MHz	V_{CB} = 30.0V	I_E = 0			250	pF
C_{ib}	f = 1MHz	V_{EB} = 0.5V	I_C = 0		300		pF

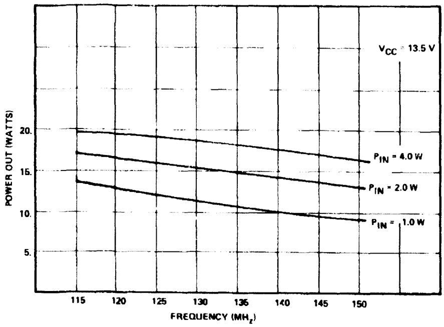
APPLICATION INFORMATION (typical curves)

POWER OUT VS POWER IN



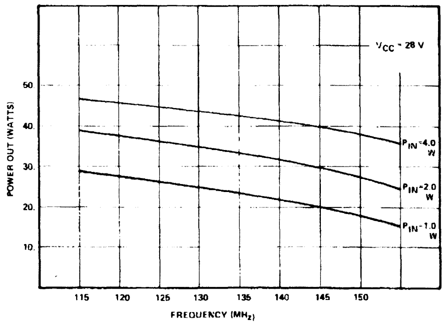
S88SD1015–02

POWER OUT VS FREQUENCY (13.5V)



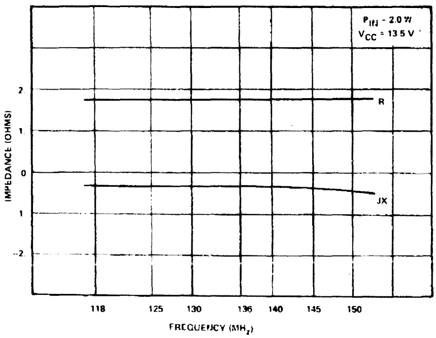
S88SD1015–03

POWER OUT VS FREQUENCY (28V)

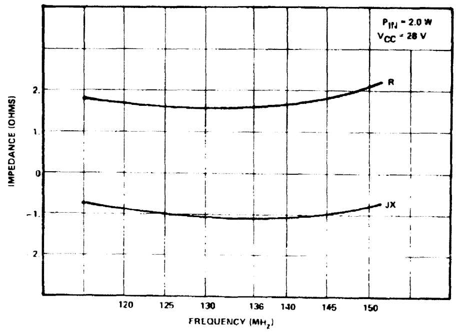


S88SD1015–04

SERIES SOURCE IMPEDANCE VS FREQUENCY (13.5V, 28V)

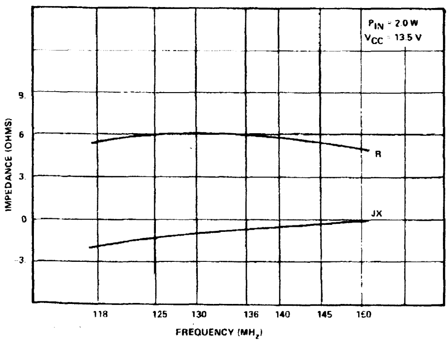


S88SD1015–05

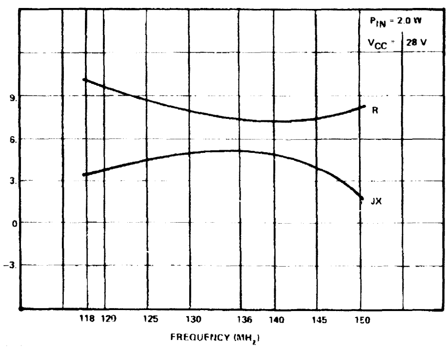


S88SD1015–06

SERIES COLLECTOR LOAD IMPEDANCE VS FREQUENCY (13.5V, 28V)

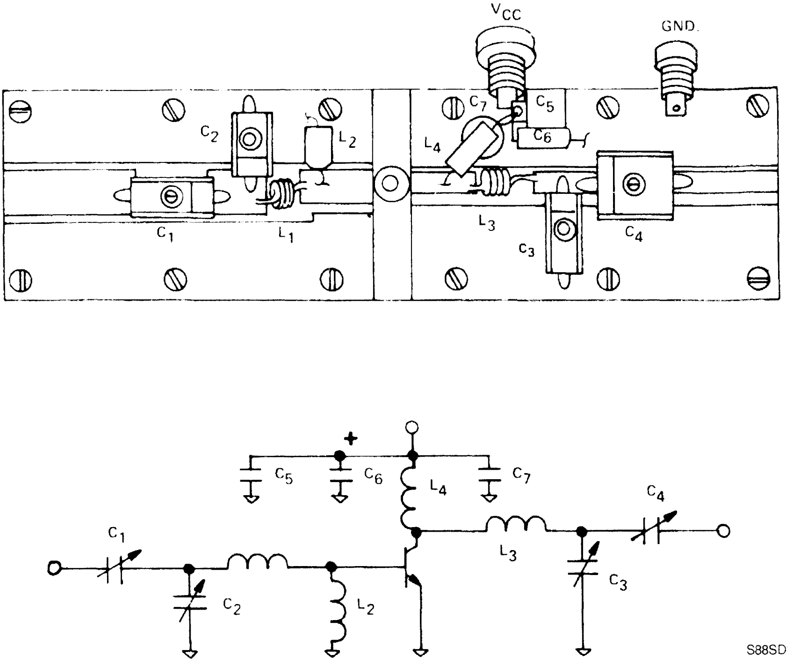


S88SD1015–07



S88SD1015–08

TEST FIXTURE



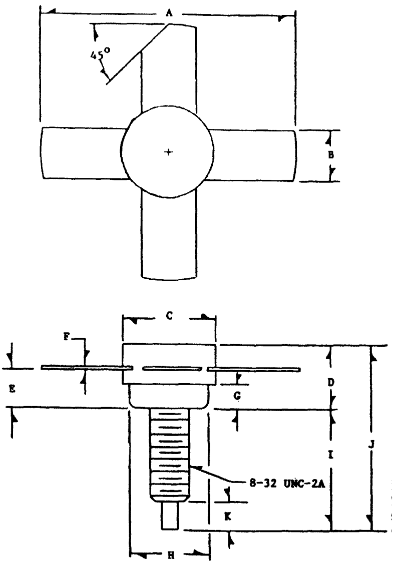
S88SD1015-09

COMPONENT LIST

C_1, C_2	ARCO 422
C_3	ARCO 422
C_4	ARCO 463
C_5	1000pF UNELCO
C_6	10μF ELECTROLYTIC 35V
C_7.	.01pf CEREMIC DISC.
L_1	3T #22, 1/8 ID
L_2	RFC FERROXCUBE
L_3	2T #18. 1/4 ID
L_4 .	.47μH MOLDED CHOKE

PACKAGE MECHANICAL DATA

. 380 4LSTUD



S88SD1015-10

	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

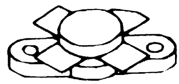
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON
MICROELECTRONICS

SD1018-6

RF & MICROWAVE TRANSISTORS
130...230MHz FM MOBILE APPLICATIONS

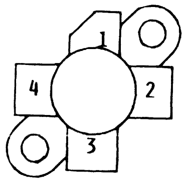
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 40W
- POWER GAIN 4.5dB
- EFFICIENCY 70%
- COMMON EMITTER



.380 4LFL (M113)
epoxy sealed

ORDER CODE	**BRANDING**
SD1018-06	SD1018-6

PIN CONNECTION



S88SD1018-6-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1018-6 is an epitaxial silicon NPN planar transistor designed primarily for VHF mobile and marine transmitters. This device utilizes ballasted emitter resistors and improved metallization systems to achieve extreme ruggedness under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	6.0	A
P_{tot}	Total Power Dissipation	80.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	2.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

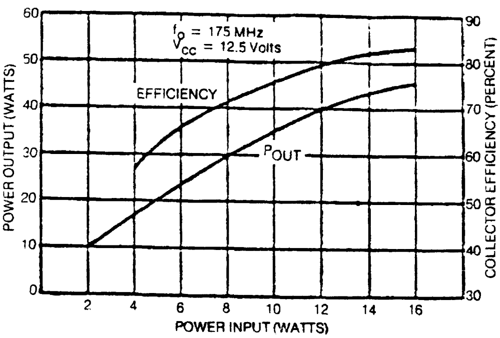
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 20mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 100mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			2.5	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1A	5.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		40.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		4.5			dB
η_C	f = 175MHz	V_{CE} = 12.5V		70.0			%
C_{OB}	f = 1MHz	V_{CB} = 15V	I_E = 0			200.0	pF

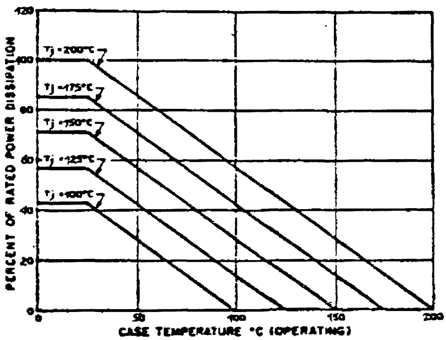
APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS. POWER INPUT



S88SD1018-6-02

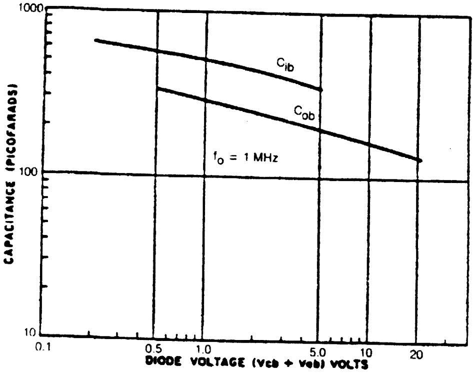
POWER DERATING CHART



S88S1018-6-03

APPLICATION INFORMATION (typical curves) (continued)

CAPACITANCE VS. VOLTAGE



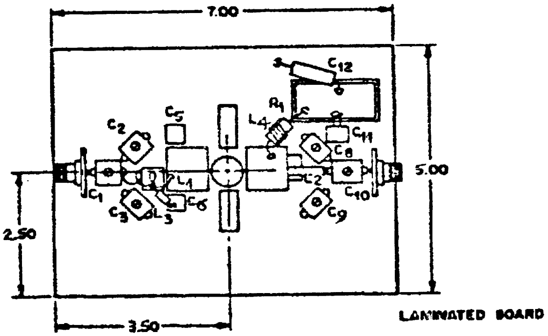
S88SD1018-6-06

IMPEDANCE DATA (typical)

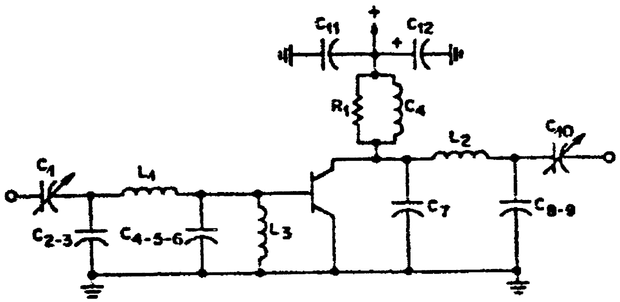
NETWORK IMPEDANCE AT TRANSISTOR TERMINALS

f_o = 175MHz,		V_{CC} = 12.5V	
P_{IN} WATTS	P_{OUT} WATTS	INPUT OHMS	OUTPUT OHMS
4	21.7	0.8 - j1.1	2.2 - j0.3
8	37.1	0.8 - j1.3	1.7 - j0.5
12	46.5	0.8 - j1.6	1.6 - j0.3

TEST CIRCUIT (175MHz)

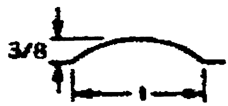


1. *MATERIAL : Epoxy Glass Board with Copper Lands for Base and Collector Contacts
2. CLAMP : DE-STA-CO No. 205S



C1	ARCO 462	L1	11/2 turns, No. 14 awg, 1/4"IDx1/2"long
C2,C3,C4	ARCO 403	L2*	1/8 wide brass strap x 11/2" long
C4, C5, C6	UNELCO 100pF	L3	FERRITE BEAD 48
C7	UNELCO 200pF	L4	4 turns, No. 16 awg, 3/i long wound on R1
C8, C9, C10	ARCO 404	R1	510Ω
C11	UNELCO 500pF		
C12	33μF 15V		

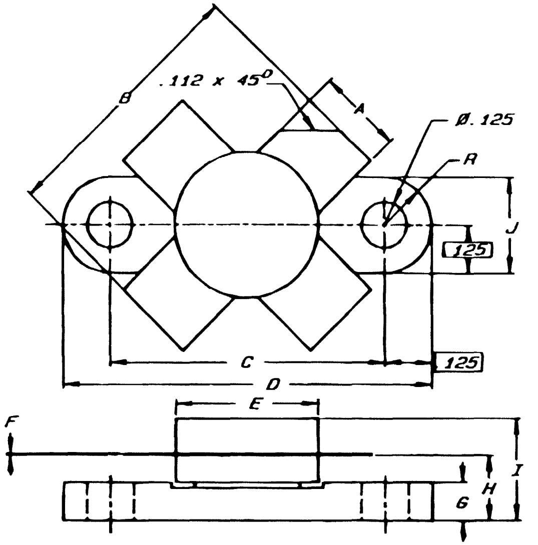
* L2



S88S1048-6-09

PACKAGE MECHANICAL DATA

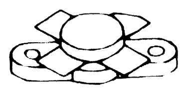
.380 4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

RF & MICROWAVE TRANSISTORS 130...230MHz FM MOBILE APPLICATIONS

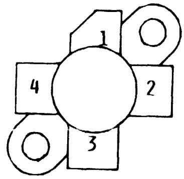
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 40W
- POWER GAIN 4.5dB
- EFFICIENCY 70%
- COMMON EMITTER



.380 4LFL(M113)
epoxy sealed

ORDER CODE	BRANDING
SD1018-15	SD1018-15

PIN CONNECTION



S88SD1018-15-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The 1018-15 is an epitaxial silicon NPN planar transistor designed primarily for HF and VHF mobile and marine transmitters. This device utilizes ballasted emitter resistors and improved metallization systems to achieve extreme ruggedness under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36	V
V_{CEO}	Collector - Emitter Voltage	18	V
V_{CES}	Collector - Emitter Voltage	36	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	6	A
P_{tot}	Total Power Dissipation	80	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	2.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

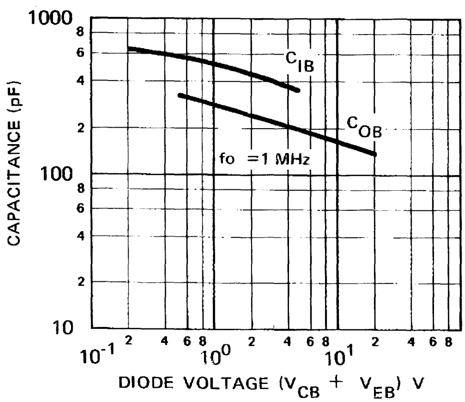
Symbol	Test Conditions			Value		Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 20mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 100mA	I_E = 0	18.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			2.5	mA
h_{FE}	V_{CE} = 5.0V	I_C = 4A			80	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		40.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		4.5			dB
η_C	f = 175MHz	V_{CE} = 12.5V		70.0			%
C_{OB}	f = 1MHz	V_{CB} = 15V	I_E = 0			200.0	pF
C_{ib}	f = 1MHz	V_{EB} = 0.5V	I_C = 0		640.0		pF
G_P'	SSB Cl. AB operation				20.0		dB
η_C	P_O = 30W PEP				35.0		%
IMD (3 tones)	F = 30MHz V_{CC} = 12.5V				– 33.0	– 30.0	dB
IMD (5 tones)	I_{CQ} = 50mA				– 36.0	– 30.0	dB

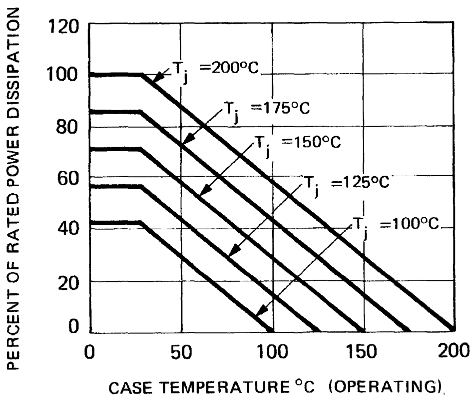
APPLICATION INFORMATION (typical curves)

CAPACITANCE VERSUS VOLTAGE



S88SD1018-15-02

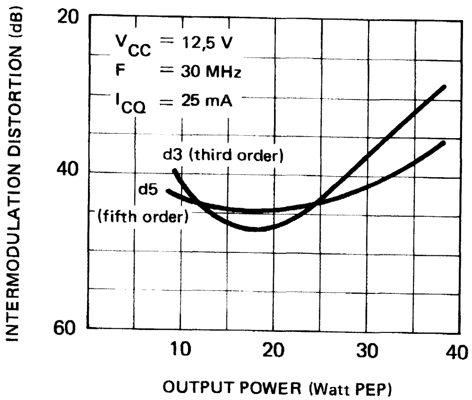
POWER DERATING CHART



S88S1018-15-03

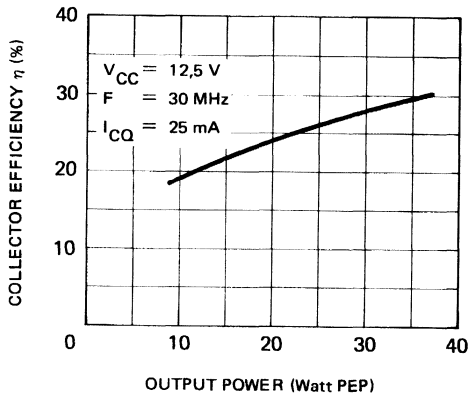
APPLICATION INFORMATION (typical curves) (continued)

INTERMODULATION DISTORTION VERSUS OUTPUT POWER (class AB)



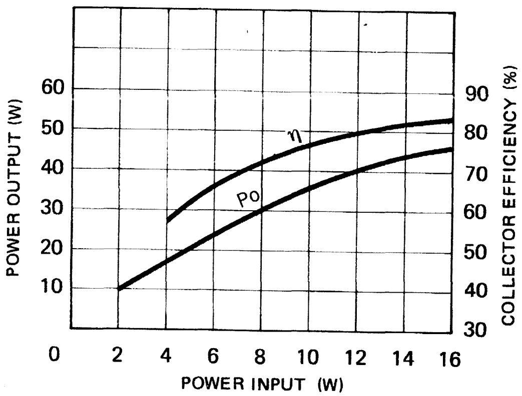
S88SD1018-15-04

COLLECTOR EFFICIENCY VERSUS OUTPUT POWER (class AB)



S88S1018-15-05

POWER OUTPUT AND COLLECTOR EFFICIENCY VERSUS INPUT POWER



S88SD1018-15-06

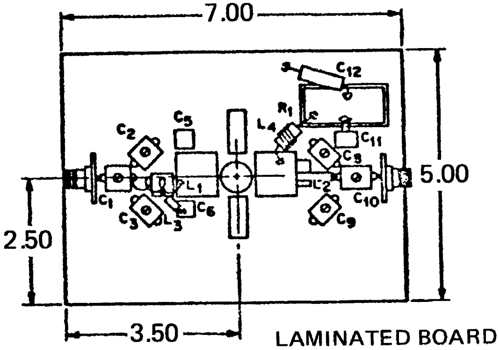
175MHz cw Class B operation

IMPEDANCE DATA (typical)

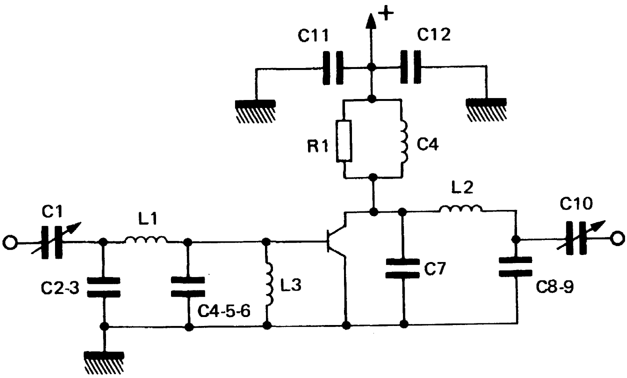
NETWORK IMPEDANCE AT TRANSISTOR TERMINALS

f_o = 175MHz,		V_{CC} = 12.5V	
P_I (W)	P_O (W)	INPUT (Ω)	OUTPUT (Ω)
4	21.7	0.8 - j1.1	2.2 - j0.3
8	37.1	0.8 - j1.3	1.7 - j0.5
12	46.5	0.8 - j1.6	1.6 - j0.3

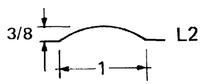
TEST CIRCUIT 175MHz



1. *MATERIAL : Expoxy glass board with copper lands for base and collector contacts
2. CLAMP : DE-STA-CO n°205 S

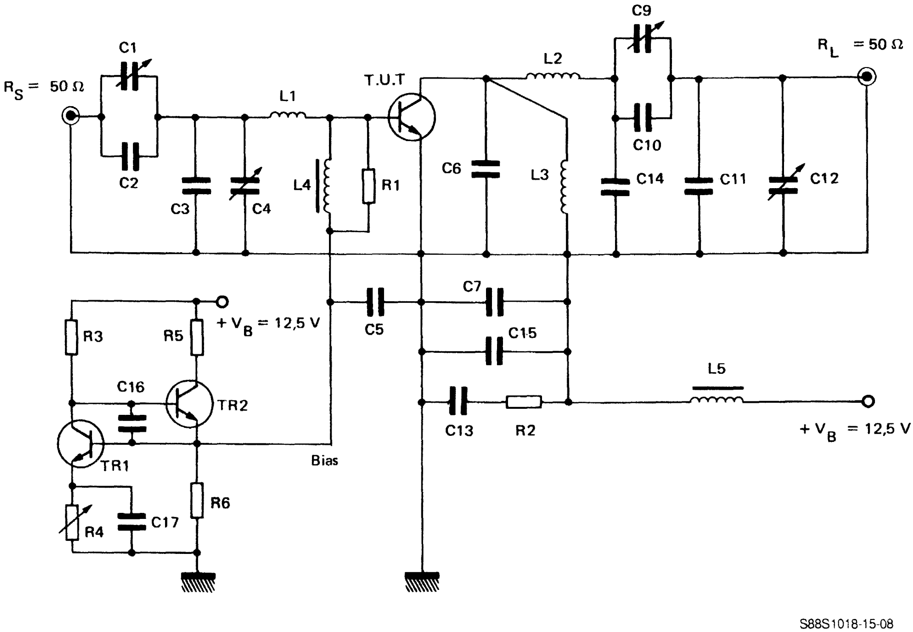


C1	ARCO 462
C2, C3	ARCO 403
C4, C5, C6	UNELCO 100pF
C7	UNELCO 200pF
C8, C9, C10	ARCO 404
C11	UNELCO 500pF
C12	33μF 15V
L1	11/2 turns, n°14 awg, 1/4" ID x 1/2" long
L2	1/8 wide brass strap x 11/2" long
L3	FERRITE BEAD 4B
L4	4 turns, n°16 awg. 3/i long wound on R1
R1	510Ω



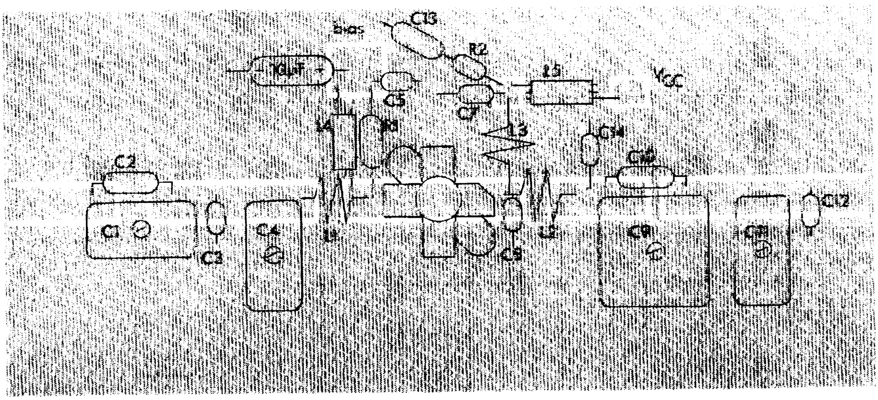
S88SD1018-15-07

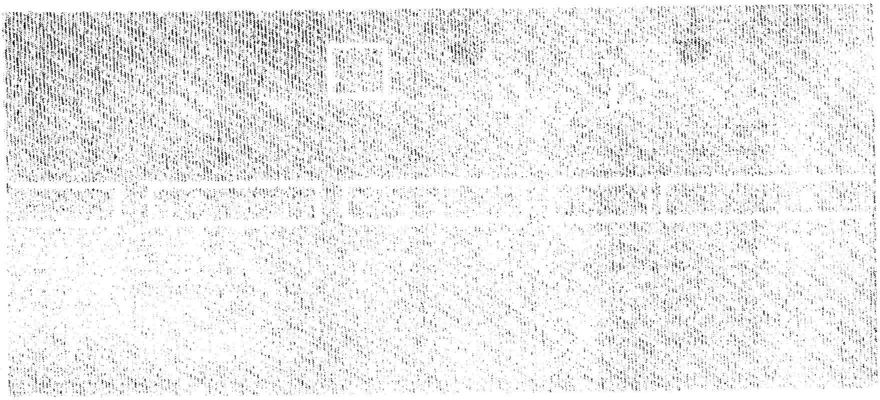
TEST CIRCUIT 30MHz SSB Class AB



C1 = C4	100pF Film dielectric trimmer	L1	3 turns Cu wire 1mm. int. dia. 9mm.
C2	39pF Ceramic capacitor	L2	3 turns Cu wire 1.6mm. int. dia. 10mm
C3	200pF Polystyrene capacitor	L3	3 turns Cu wire 1.6mm. int. dia. 8mm.
C5 = C7	4.7pF Polystyrene capacitor	L4, L5	R_F Choke, 420 ferrite core, ref : GV6 T6
C6	2x270pF Polystyrene capacitor		
C9	690pF Film dielectric trimmer	R1	2.7Ω - 1/2W
C10	100pF Ceramic capacitor	R2	4.7Ω - 1/2W
C11	300pF Film dielectric capacitor	R3	1.5kΩ - 1/2W
C12	47pF Ceramic capacitor	R4	5Ω - 3W (potentiometer)
C13	2.2μF Polyester capacitor	R5	50Ω - 5W
C14	2x82pF Ceramic capacitor	R6	150Ω - 1/2W
C16 = C15 = C17	100nF Polyester capacitor	TR1 = TR2 BD137	

TEST CIRCUIT 30MHz SSB Class AB
COMPONENTS LAYOUT AND PRINTED



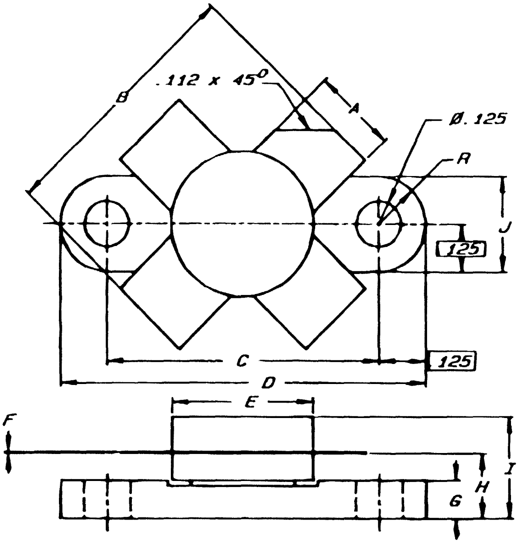


S88S1018-15-09

N.B. : The copper printed circuit and the components are situated on one side of the exposy filter glass board. The other side is fully metallized.

PACKAGE MECHANICAL DATA

.380 4LFL



S88SD1018-15-10

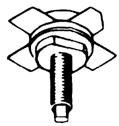
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON MICROELECTRONICS

SD1019

RF & MICROWAVE TRANSISTORS 108...152MHz APPLICATIONS

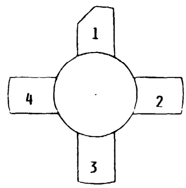
- CLASS C TRANSISTOR
- FREQUENCY 136MHz
- VOLTAGE 28V
- POWER OUT 80W
- POWER GAIN 9.0dB
- COMMON EMITTER



.5004LSTUD(M130)
epoxy sealed

ORDER CODE	BRANDING
SD1019	SD1019

PIN CONNECTION



S88SD1019-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1019 is a 28 volt epitaxial silicon NPN planar transistor designed primarily for VHF communications. This device utilizes nichrome aluminium metallization to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	35.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	9.0	A
P_{tot}	Total Power Dissipation	117.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.7	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

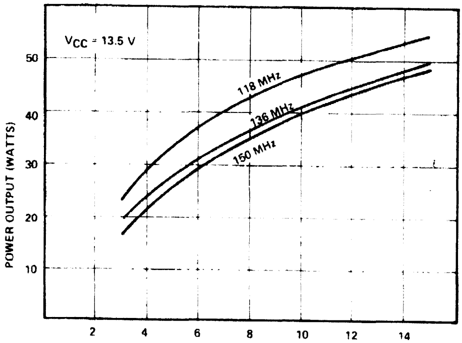
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 20mA	I_E = 0	65.0			V
BV_{CEO}	I_C = 200mA	I_B = 0	35.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 30.0V	I_E = 0		1.5		mA
h_{FE}	V_{CE} = 5.0V	I_C = 500mA	5.0			

DYNAMIC

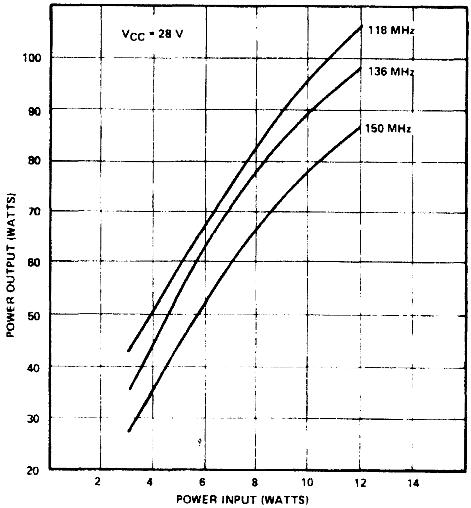
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 136MHz	V_{CE} = 28.0V		80.0			W
G_P	f = 136MHz	V_{CE} = 28.0V		9.0			dB
C_{OB}	f = 1MHz	V_{CB} = 30.0V	I_E = 0			150	pF

APPLICATION INFORMATION (typical curves)



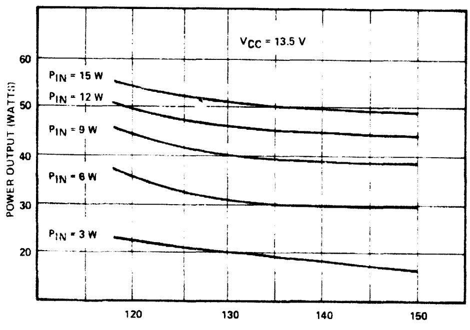
POWER OUTPUT VS. POWER INPUT

S88SD1019-02



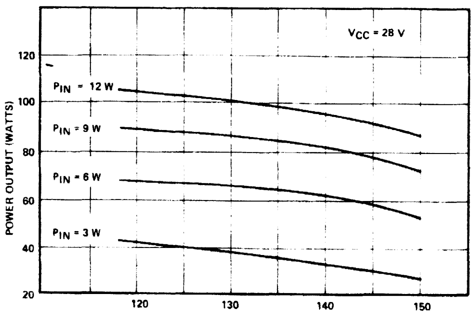
POWER OUTPUT VS. POWER INPUT

S88SD1019-03



POWER OUTPUT VS. FREQUENCY

S88SD1019-04



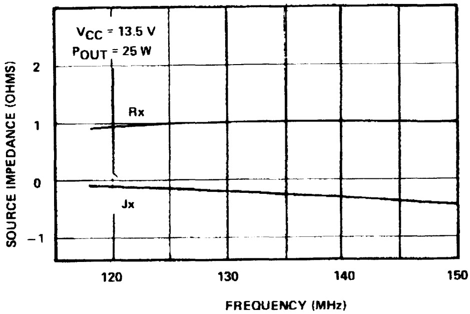
POWER OUTPUT VS. FREQUENCY

S88SD1019-05

IMPEDANCE DATA (typical value)

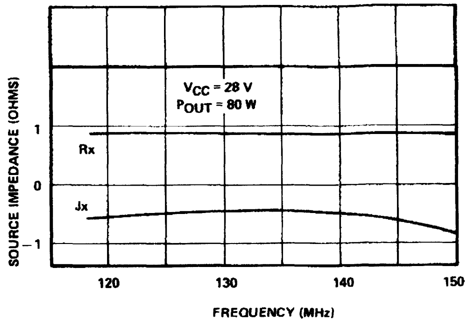
Z_S = .85 - j 0.5W
Z_{CL} = 4.5 + j 1.9W
F = 136MHz

V_{CE} = 28V
P_O = 80W



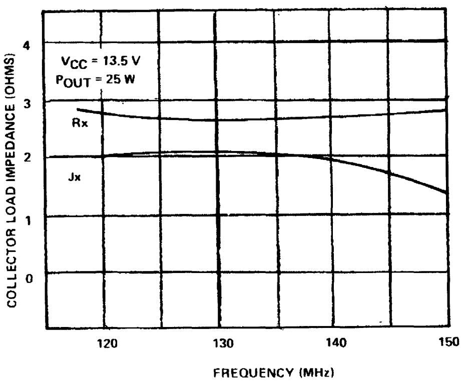
SERIES SOURCE IMPEDANCE VS. FREQUENCY

S88SD1019-06



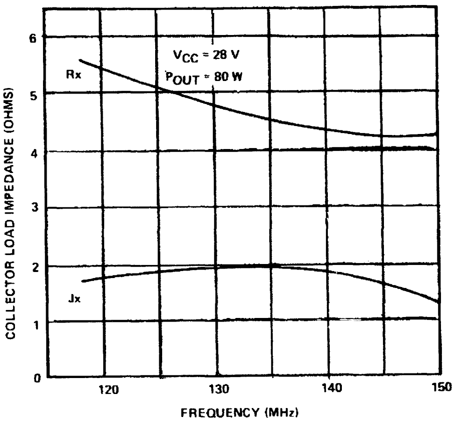
SERIES SOURCE IMPEDANCE VS. FREQUENCY

S88SD1019-07



SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY

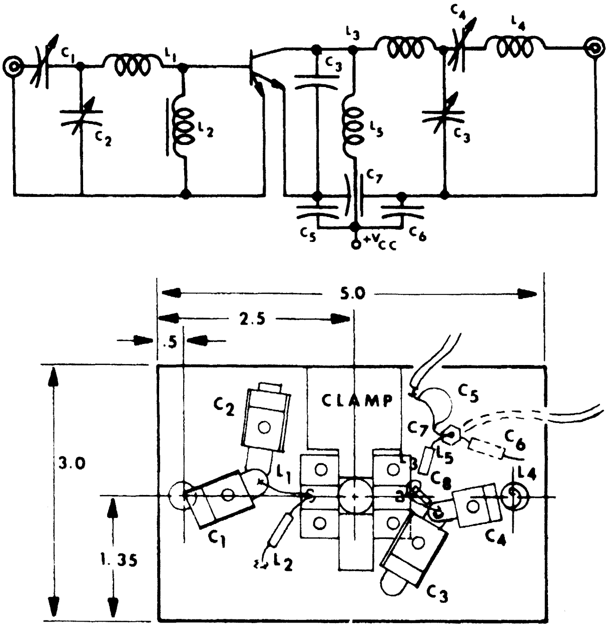
S88SD1019-09



SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY

S88SD1019-10

TEST CIRCUIT



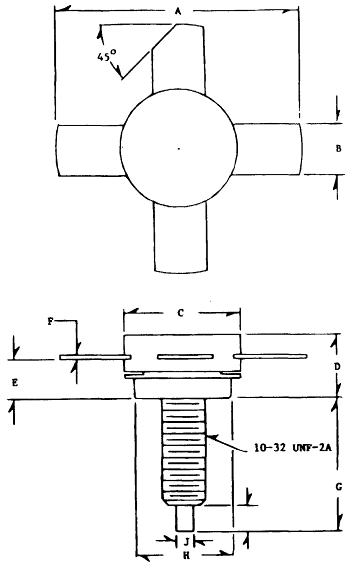
S88SD1019-10

C1 ARCO 462
C2. C3. C4 ARCO 463
C5 .02mF ERIE
C6 15mF SEMCOR
C7 AB 220pF FEEDTHRU

C8 150pF UNELCO
L1 NO. 14AWG. WIRE. .3 LONG
L2 12mH CHOKE
L3 1 TURN, NO 20 AWG, WIRE, 3" I.D., 25 LONG
L4 1 TURN, NO 16 AWG, WIRE, .23"I.D. .1 LONG
L5 .22mH DECI-DUCTOR

PACKAGE MECHANICAL DATA

.500 4LSTUD



S88SD1019-11

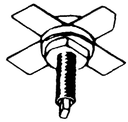
	Minimum Inches	Maximum Inches
A		1.030
B	.220	.230
C	.490	.510
D	.250	.290
E	.160	.180
F	.004	.006
G	.550	.600
H	.415	.425
I	.100	.130
J	.065	.075

SGS-THOMSON MICROELECTRONICS

SD1021

RF & MICROWAVE TRANSISTORS 130...230MHz FM MOBILE APPLICATIONS

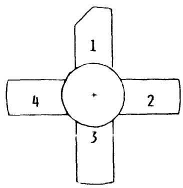
- FM CLASS C TRANSISTOR
- FREQUENCY 230MHz
- VOLTAGE 12.5V
- POWER OUT 5.5W
- POWER GAIN 6.2dB
- EFFICIENCY 60%
- COMMON EMITTER



.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	BRANDING
SD1021	SD1021

PIN CONNECTION



S88SD1021-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1021 is a 12.5V NPN epitaxial, common emitter planar transistor designed for VHF communications applications. The device is rugged and exhibits high gain at optimum efficiency.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	1.0	A
P_{tot}	Total Power Dissipation	9.7	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	18.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

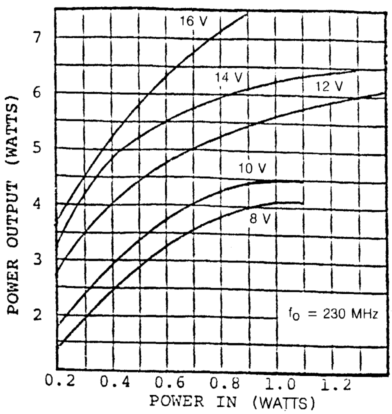
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5V	I_C = 250A	5.0		200	

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O	f = 230MHz	V_{CE} = 12.5V	5.5	6.0		W
G_P	f = 230MHz	V_{CE} = 12.5V	6.2	6.6		dB
η_C	f = 230MHz	V_{CE} = 12.5V	60.0	70.0		%
C_{OB}	f = 1.0MHz	V_{CB} = 12.5V		8.0	12.0	pF

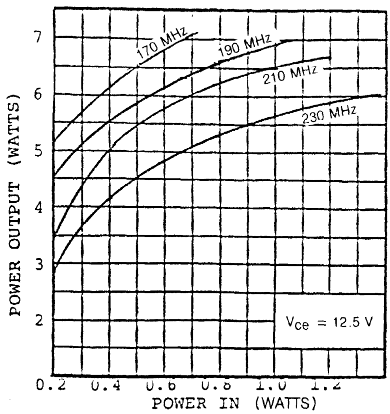
APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS POWER INPUT



S88SD1021-02

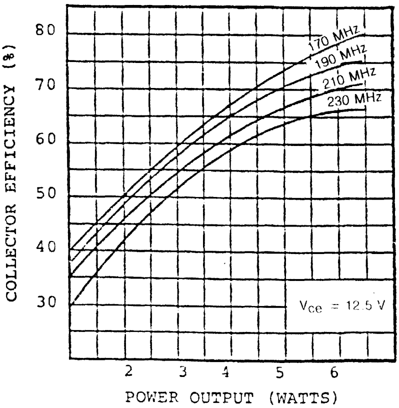
POWER OUTPUT VS POWER INPUT



S88S1021-03

APPLICATION INFORMATION (typical curves) (continued)

EFFICIENCY VS POWER OUTPUT



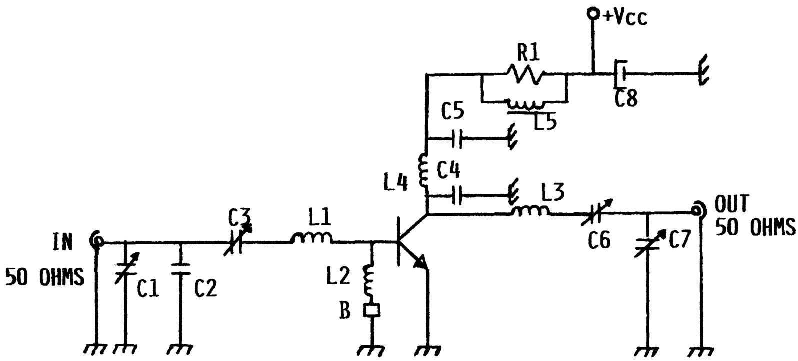
S88SD1021-04

IMPEDANCE DATA

V_{CE} = -12.5V
P_{out} = 5.5W

	170	200	230
Z_{IN}	3 – j 1.0	3 + j 0	3 + j 1.0
Z_{OUT}	10 – j 7.0	13 – j 8.0	17 – j 9.5

TEST CIRCUIT (170-230MHz)



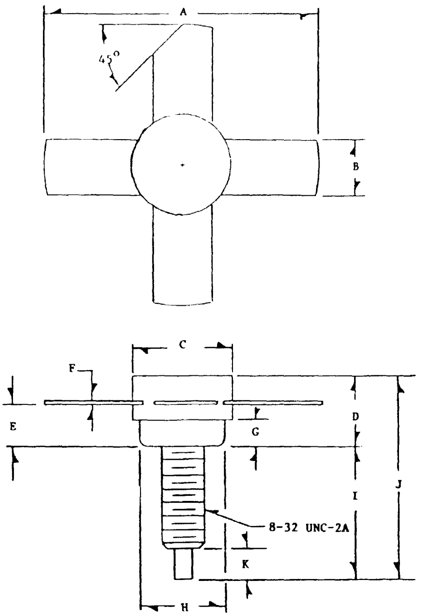
S88SD1021-05

C1 = 12. 65pF SPRAGUE TYPE GMC 20400 trimmer capacitor
C2 = 18pF ATC 100B 180J mica capacitor
C3 = 26 - 115pF SPRAGUE TYPE GMC 20600 trimmer capacitor
C4 = 1000pF LCC mica capacitor
C5 = 0,1μF LCC mica capacitor
C6 = 16 - 90pF SPRAGUE TYPE GMC 20500 trimmer capacitor
C7 = 1.30pF AIRTRONIC TYPE 5601 trimmer capacitor
C8 = 100μF, 40V electrolic capacitor

L1 = 2 turns Imm enameled-wire ID = 4mm
L2 = 4 turns 0.8mm enameled-wire ID = 4mm B. Ferroxcube bead 200/020 51292
L3 = 3 turns Imm enameled-wire ID = 8mm
L4 = 4 turns Imm enameled-wire ID = 6mm
L5 = Vk 200 - 20 - 48 Ferroxcube
R1 = 10Ω, 1/2W carbon composition resistor

PACKAGE MECHANICAL DATA

.380 4LSTUD



	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

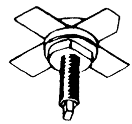
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON
MICROELECTRONICS

SD1022

RF & MICROWAVE TRANSISTORS
130...230MHz FM MOBILE APPLICATIONS

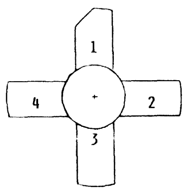
- FM CLASS C TRANSISTOR
- FREQUENCY 230MHz
- VOLTAGE 12.5V
- POWER OUT 30W
- POWER GAIN 7.4dB
- EFFICIENCY 60%
- COMMON EMITTER
- GOLD METALLIZATION



.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	BRANDING
SD1022	SD1022

PIN CONNECTION



S88SD1022-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1022 is a 12.5V, NPN epitaxial, common emitter planar transistor designed for VHF communications. This device utilizes diffused emitter resistors for ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	8.0	A
P_{tot}	Total Power Dissipation	33.6	W
T_{stg}	Storage Temperature	− 65 to + 150	°C
T_J	Junction Temperature	+ 200.0	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	5.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

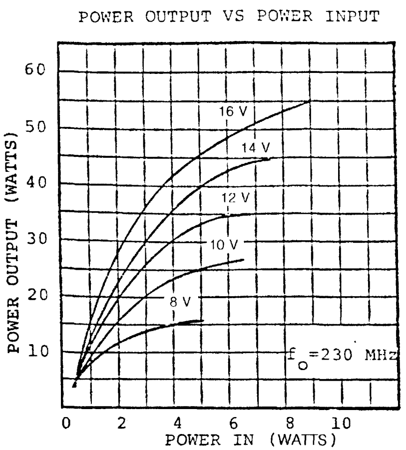
STATIC

Symbol	Test Conditions			Value		Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 15mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 5.0mA	I_C = 0	4.0			V
h_{FE}	V_{CE} = 5.0V	I_C = 1.0A	20.0			

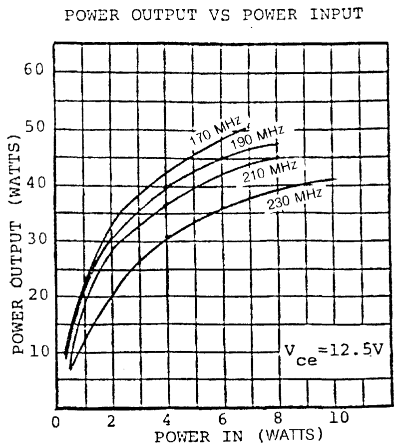
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 230MHz	V_{CE} = 12.5V		30.0	34.0		W
G_P	f = 230MHz	V_{CE} = 12.5V		7.4	7.9		dB
η_C	f = 230MHz	V_{CE} = 12.5V		60.0	70.0		%
C_{OB}	f = 1.0MHz	V_{CB} = 12.5V	I_E = 0		85.0	100.0	pF

APPLICATION INFORMATION (typical curves)

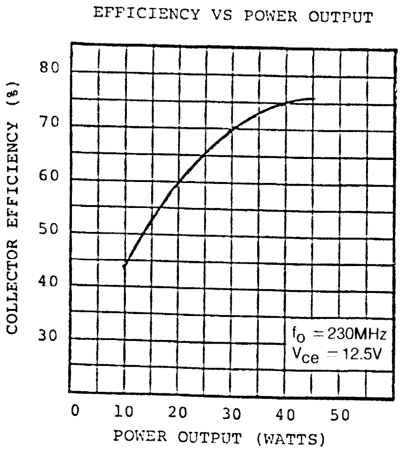


S88SD1022-02



S88SD1022-03

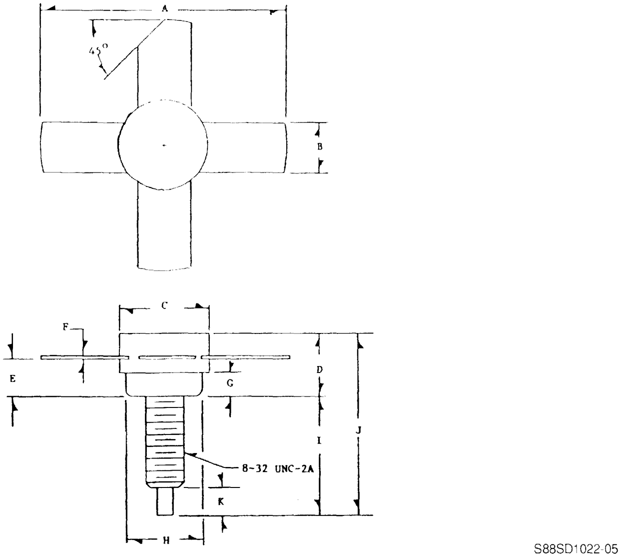
APPLICATION INFORMATION (typical curves) (continued)



S88SD1022-04

PACKAGE MECHANICAL DATA

.380 4L STUD



	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

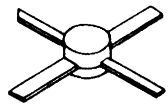
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON MICROELECTRONICS

SD1080-2

RF & MICROWAVE TRANSISTORS
130 ... 230MHz FM MOBILE APPLICATIONS

- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 7.5V
- POWER OUT .75W
- POWER GAIN 8.0dB
- COMMON EMITTER

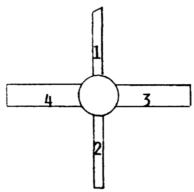


X0 72 SL (M107)
epoxy sealed

ORDER CODE SD1080-02

BRANDING 80-2

PIN CONNECTION



S88SD1080-2-01

1 collector
2 base
3 emitter
4 emitter

DESCRIPTION

The SD1080-2 is an NPN silicon epitaxial planar transistor designed for use in hand-held radios in the VHF frequency range. This device is processed and optimized for 7.5V operation and provides stable, high gain performance with very high VSWR at 7.5V.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	0.75	A
P_{tot}	Total Power Dissipation	5.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	35	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

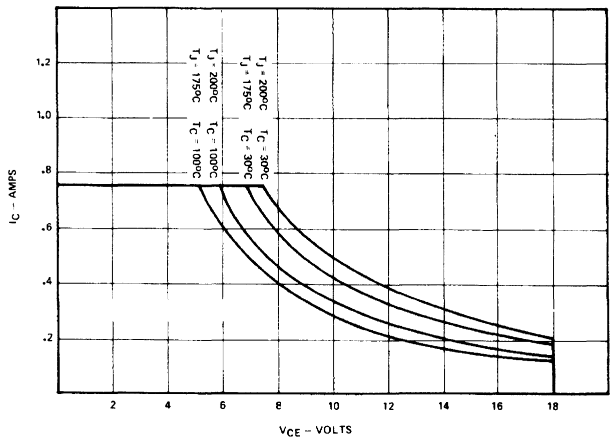
Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CES}	I_C = 20mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 5mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 1mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 7.5V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 50mA	10.0		200.0	

DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	f = 175MHz	V_{CE} = 7.5V		.75			W
G_P	f = 175MHz	V_{CE} = 7.5V		8.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.0V	I_E = 0			4.5	pF
C_{ib}	f = 1MHz	V_{EB} = 0.5V	I_C = 0		10.5		pF

APPLICATION INFORMATION (typical curves)

SAFE OPERATING AREA.

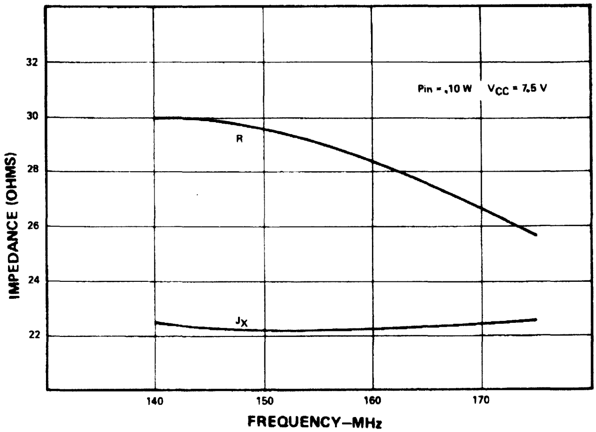


S88SD1080-2-02

IMPDANCE DATA (typical)

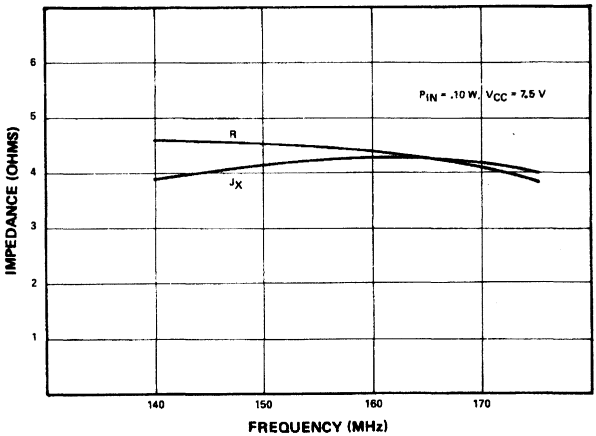
$Z_S = 3.8 + j\ 4.0\Omega$
$Z_{CL} = 25.7 + j\ 22.5\Omega$
$F = 175MHz$ $V_{CE} = 7.5V$ $P_{in} = 0.1W$

COLLECTOR LOAD IMPEDANCE VS. FREQUENCY.



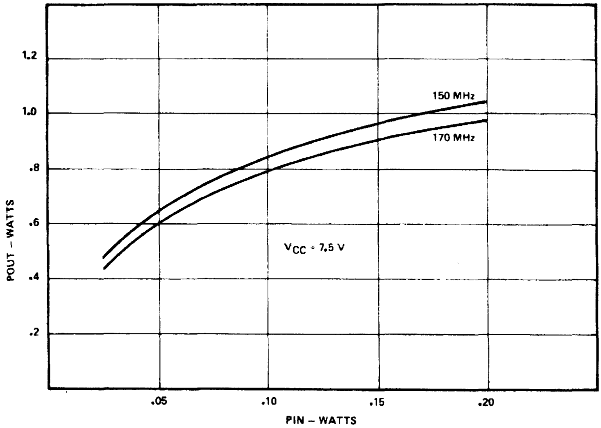
S88SD1080-2-03

SOURCE IMPEDANCE VS. FREQUENCY.



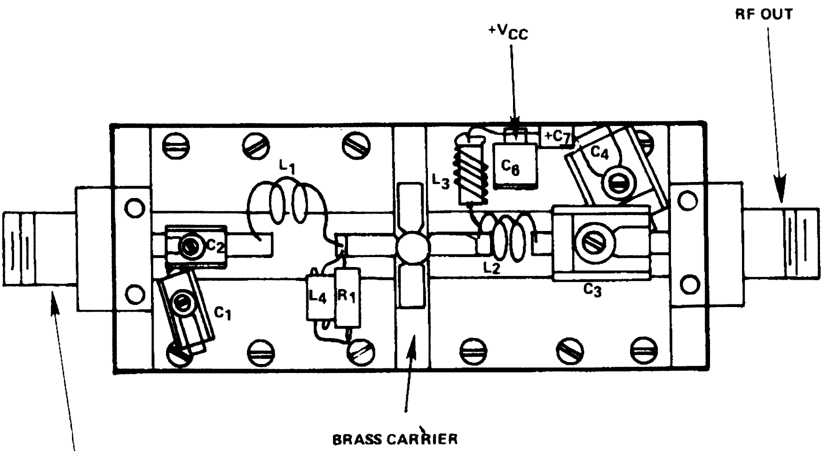
S88SD1080-2-04

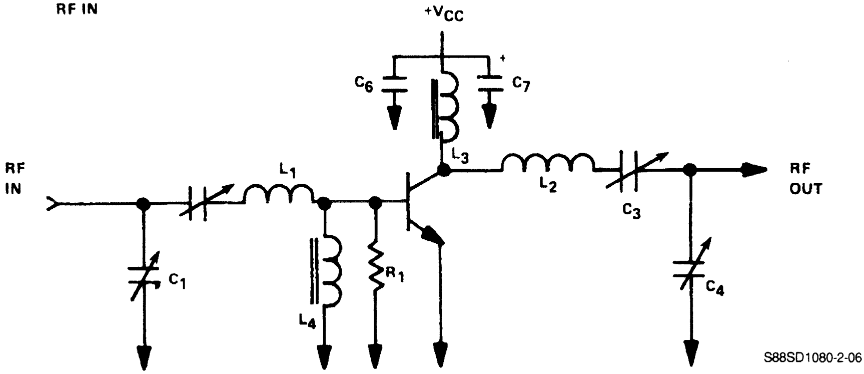
Power Output vs. Power Input.



S88SD1080-2-05

TEST FIXTURE



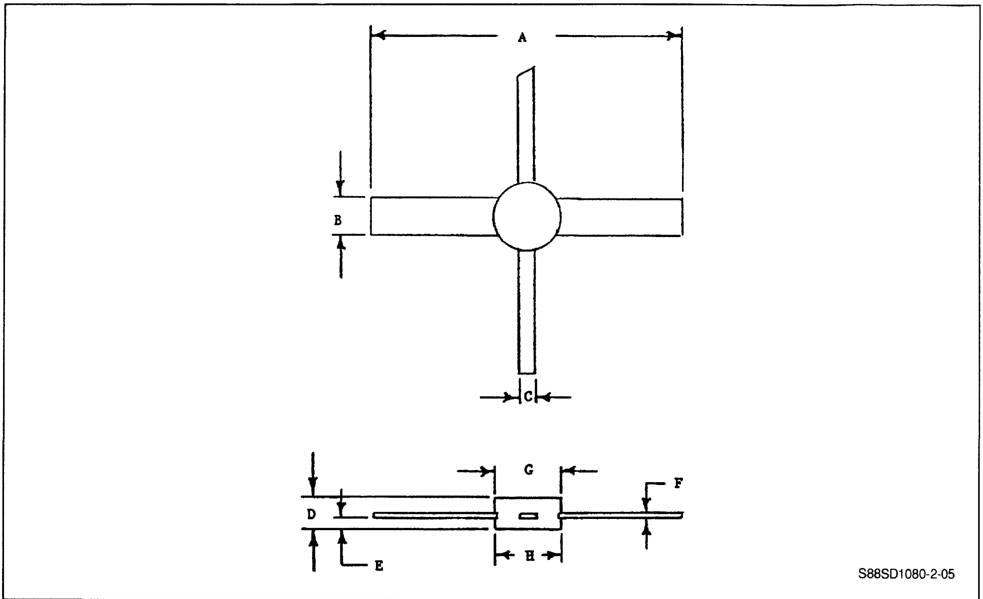


COMPONENT LIST

C1		ARCO #425
C2		ARCO #403
C3, C4		ARCO #463
C6	1000PF	UNELCO
C7	10µF	ELECTROLYTIC
L1	3 TURNS #18 TINNED	5/16" I.D.
L2	" "	" "
L3	10 TURNS #20 ENAMELED ON 300Ω 1W RESISTOR	
L4	RFC	VK200
R1	18Ω 1W CARBON	

PACKAGE MECHANICAL DATA

X0 72 SL



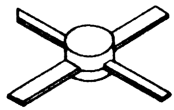
	Minimum Inches	Maximum Inches
A	.890	
B	.120	.130
C	.027	.033
D		.135
E	.40	.050
F	.003	.007
G	.201	.207
H	.201	.207

SGS-THOMSON
MICROELECTRONICS

SD1080-6

RF & MICROWAVE TRANSISTORS
450-512MHz CLASS C MOBILE APPLICATIONS

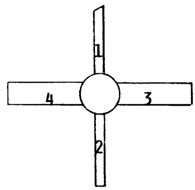
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT .5W
- POWER GAIN 10dB
- COMMON EMITTER



X0 72SL (M107)
epoxy sealed

ORDER CODE	**BRANDING**
SD1080-06	SD1080-6

PIN CONNECTION



S88SD1080-6-01

1 collector	3 emitter
2 base	4 emitter

DESCRIPTION

The SD1080-6 is a 12.5 volt epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device utilizes improved metallization systems to achieve extreme ruggedness under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	.150	A
P_{tot}	Total Power Dissipation	1.3	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	35.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

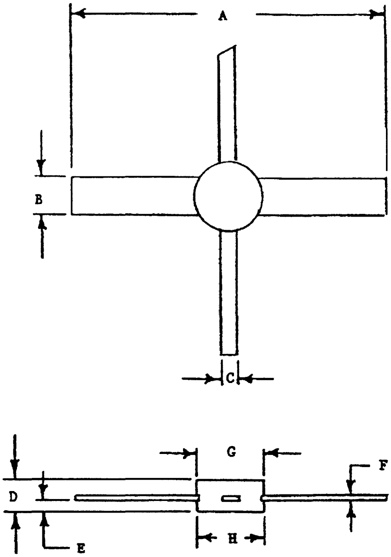
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 1mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 5mA	I_B = 0	18.0			V
BV_{EBO}	I_E = .1mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 12.0V	I_E = 0			1	mA
h_{FE}	V_{CE} = 5.0V	I_C = 50mA	10.0		200.0	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		.5			W
G_P	f = 470MHz	V_{CE} = 12.5V		10.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.0V	I_E = 0			4.5	pF

PACKAGE MECHANICAL DATA

X0 72SL



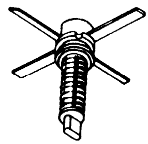
	Minimum Inches	Maximum Inches
A	.890	
B	.120	.130
C	.027	.033
D		.135
E	.40	.050
F	.003	.007
G	.201	.207
H	.201	.207

SGS-THOMSON
MICROELECTRONICS

SD1080-7

RF & MICROWAVE TRANSISTORS
450-512MHz CLASS C MOBILE APPLICATIONS

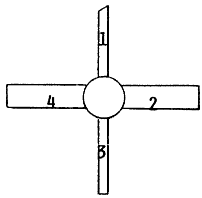
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT .5W
- POWER GAIN 10dB
- COMMON EMITTER



X0 72 (M108)
epoxy sealed

ORDER CODE	**BRANDING**
SD1080-07	SD1080-7

PIN CONNECTION



S88SD1080-7-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1080-7 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device utilizes improved metallization systems to achieve extreme ruggedness under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	.150	A
P_{tot}	Total Power Dissipation	1.3	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	35.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

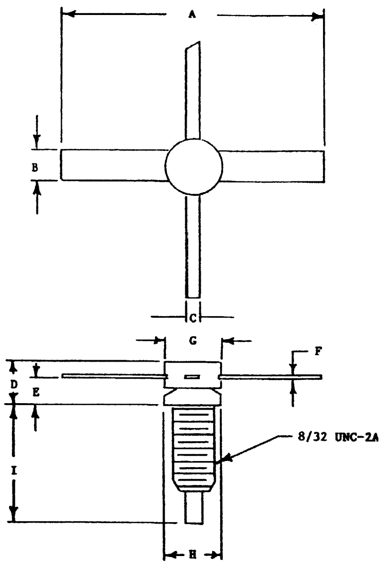
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 1mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 5mA	I_B = 0	18.0			V
BV_{EBO}	I_E = .1mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 12.0V	I_E = 0			.01	mA
h_{FE}	V_{CE} = 5.0V	I_C = 50mA	10.0		200.0	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		.5			W
G_P	f = 470MHz	V_{CE} = 12.5V		10.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.0V	I_E = 0			4.5	pF

PACKAGE MECHANICAL DATA

X0 72



S88SD1080-7-02

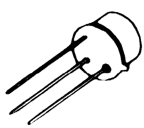
	Minimum Inches	Maximum Inches
A	.890	
B	.120	.130
C	.027	.033
D		.195
E	.098	.112
F	.003	.007
G	.201	.207
H	.201	.207
I	.425	.465

SGS-THOMSON
MICROELECTRONICS

SD1127

RF & MICROWAVE TRANSISTORS
130... 230MHz FM MOBILE APPLICATIONS

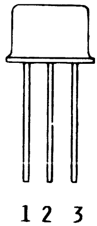
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 4.0W
- POWER GAIN 10.0dB
- GROUNDED EMITTER



TO 39 (M134)

ORDER CODE	BRANDING
SD1127	SD1127

PIN CONNECTION



1 emitter
2 base
3 collector

DESCRIPTION

The SD1127 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. The chip of this transistor is mounted on a beryllia pill to isolate the collector lead and ground the emitter lead to the package for high gain performance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	.64	A
P_{tot}	Total Power Dissipation	8.0	W
T_{stg}	Storage Temperature	− 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	21.9	°C/W

March 1989

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

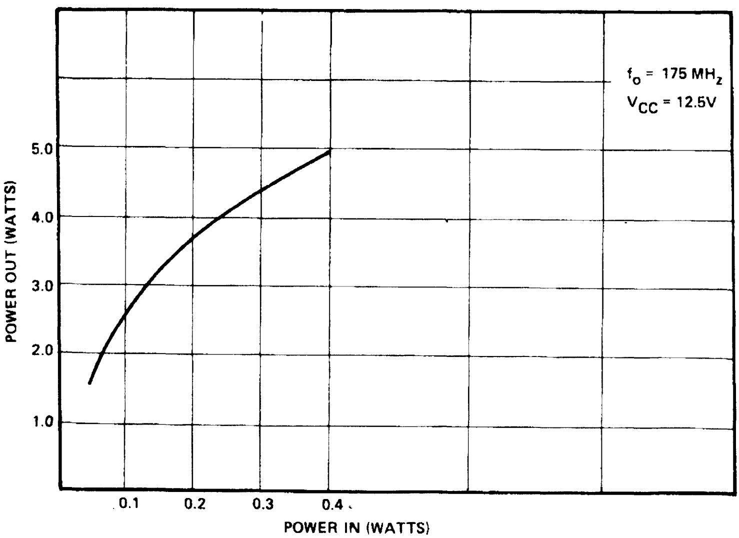
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 5mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 10mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 1mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			.25	mA
h_{FE}	V_{CE} = 5.0V	I_C = 50mA	5.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		4.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		10.0	12.0		dB
C_{OB}	f = 1MHz	V_{CB} = 15.0V	I_E = 0			20.0	pF

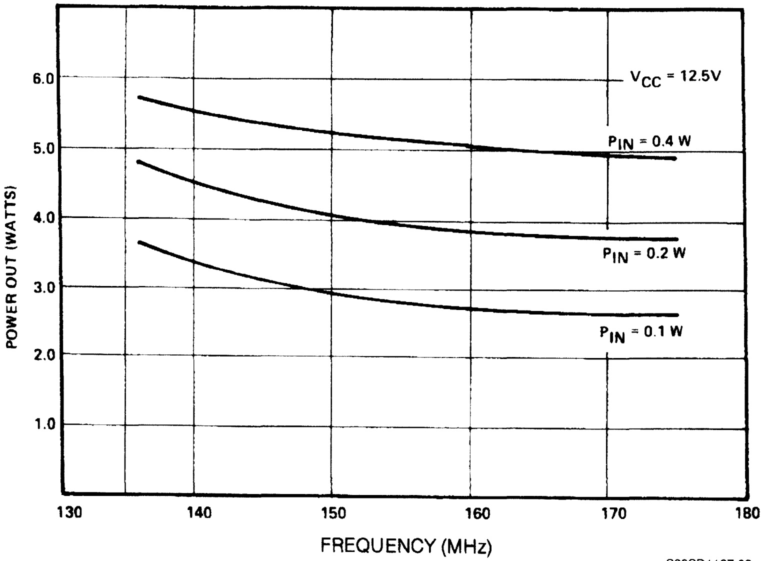
APPLICATION INFORMATION (typical curves)

POWER OUT VS. POWER IN.



S88SD1127-02

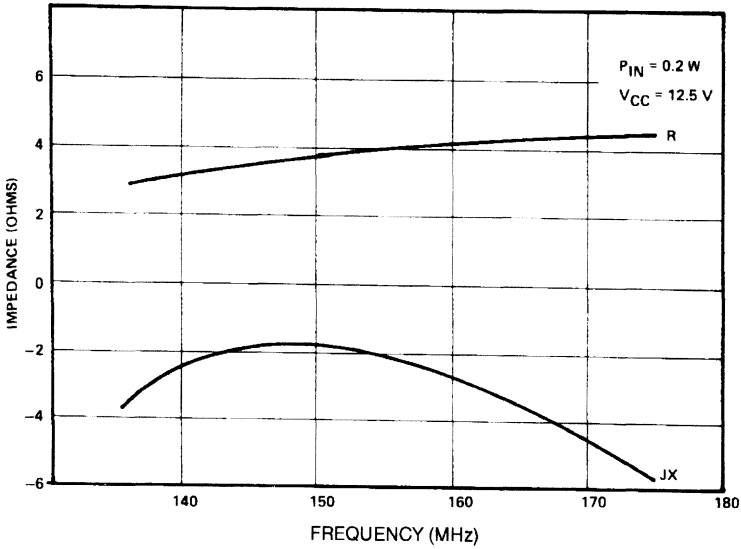
POWER OUT VS. FREQUENCY



S88SD1127-03

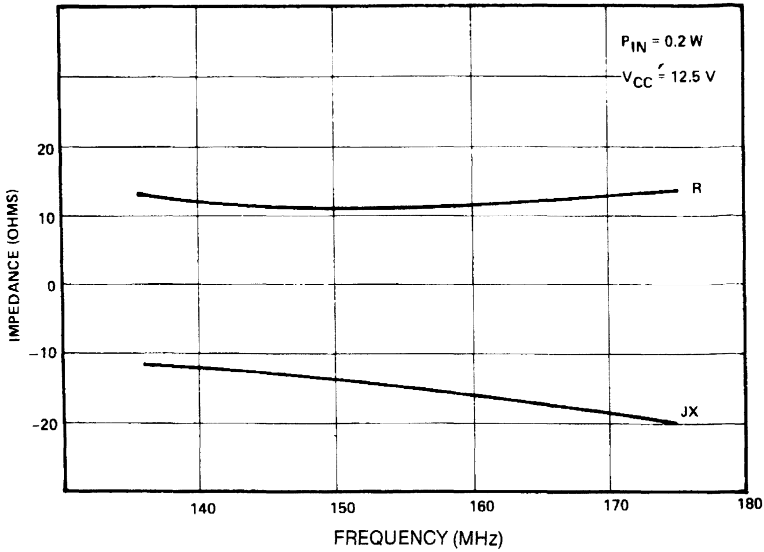
IMPEDANCE DATA (typical)

SERIES SOURCE IMPEDANCE VS. FREQUENCY



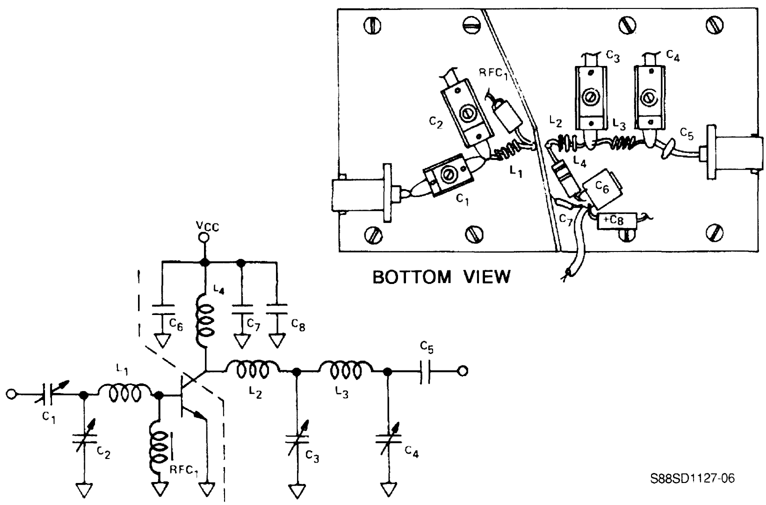
S88SD1127-04

SERIES COLLECTOR LOAD VS. FREQUENCY



S88SD1127-05

TEST CIRCUIT



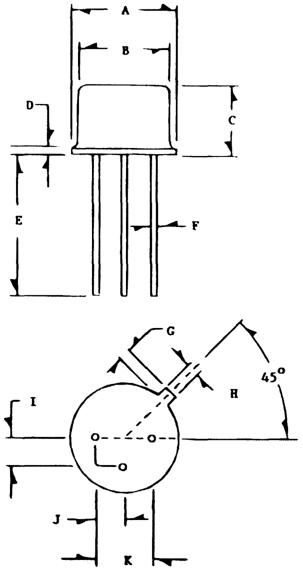
S88SD1127-06

COMPONENT LIST

C_1	- ARCO 402
C_2	- ARCO 421
C_3	- ARCO 423
C_4	- ARCO 422
C_5	- .001µf DISC
C_6	- 1000pf UNELCO
C_7	- .01µf DISC
C_8	- 10µf TANTALITIC
L_1	- 4TURNS #22 AWG 1/8 ID x 1/4 LG.
L_2, L_3	- 3 1/2 TURNS #22 AWG 1/8 ID x 3/16 LG.
L_4	.22µh MOLDED CHOKE
RFC	FERROXCUBE – 3B

PACKAGE MECHANICAL DATA

TO 39



	Minimum Inches	Maximum Inches
A	.350	.370
B	.315	.335
C	.240	.260
D	.015	.045
E	.500	
F	.016	.019

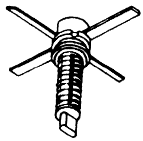
	Minimum Inches	Maximum Inches
G	.029	.040
H	.028	.034
I	.095	.105
J	.095	.105
K	.190	.210

SGS-THOMSON
MICROELECTRONICS

SD1132-5

RF & MICROWAVE TRANSISTORS
450-512MHz CLASS C MOBILE APPLICATIONS

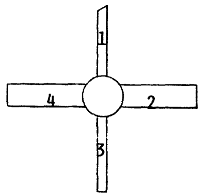
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 0.6W
- POWER GAIN 13.0dB
- COMMON EMITTER



X0 72 (M108)
epoxy sealed

ORDER CODE	BRANDING
SD1132-05	1132-5

PIN CONNECTION



1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1132-5 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for UHF predriver applications. This device uses nichrome aluminium metallization to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	0.7	A
P_{tot}	Total Power Dissipation	2.5	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	70.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

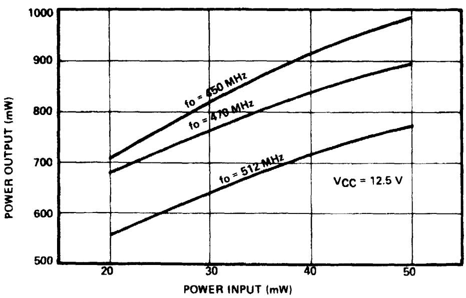
Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CES}	I_C = 10mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 10mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 12.5V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 150A	20.0			

DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	f = 470MHz	V_{CE} = 12.5V		0.6			W
G_P	f = 470MHz	V_{CE} = 12.5V		13.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0			4.0	pF

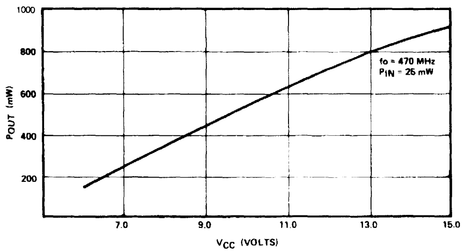
APPLICATION INFORMATION (typical curves)

POWER OUT vs POWER IN



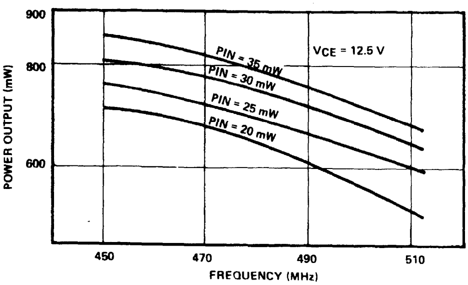
S88SD1132-5-02

POWER OUT vs VCC



S88SD1132-5-03

POWER OUT vs FREQUENCY



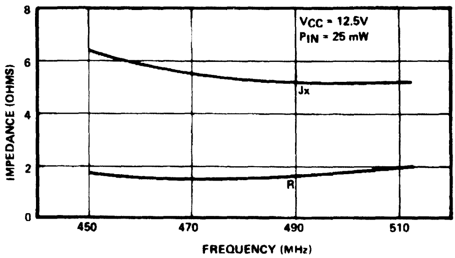
S88SD1132-5-04

IMPEDANCE DATA (typical)

Z_S = 1.5 + j 0.5.5Ω
Z_{CL} = 14 + j .43Ω

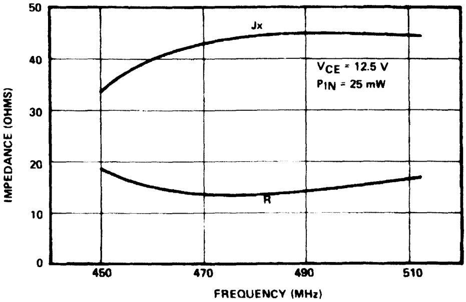
F = 470MHz
V_{CE} = 12.5V
P_i = 0.025W

SOURCE IMPEDANCE vs FREQUENCY



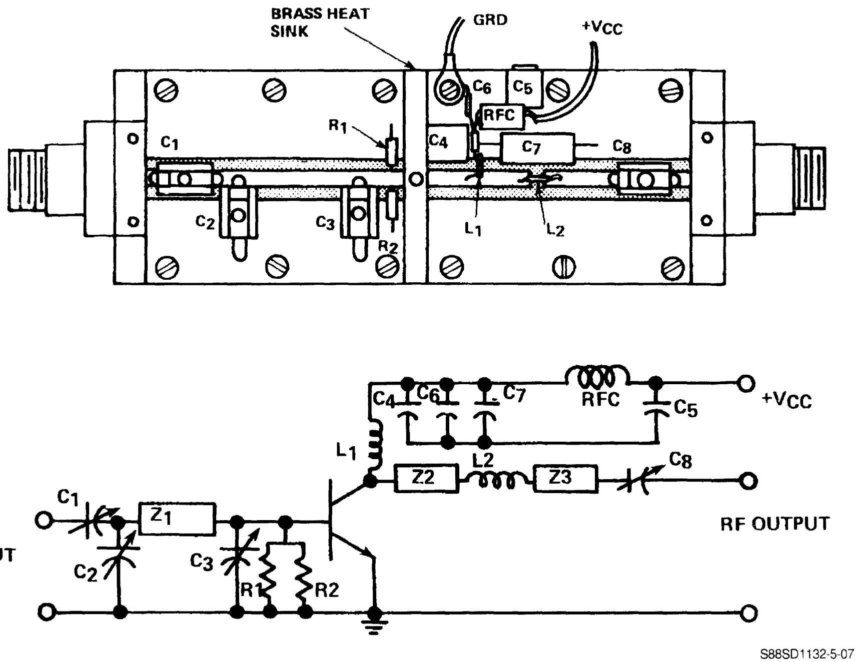
S88SD1132-5-05

COLLECTOR LOAD IMPEDANCE vs FREQUENCY



S88SD1132-5-06

TEST CIRCUIT (450-512MHz)



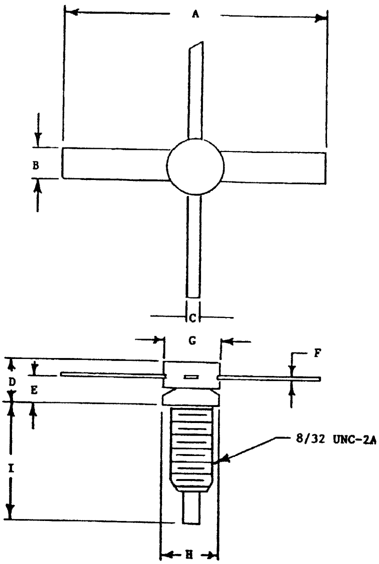
COMPONENT LIST

C_1, C_2, C_3	0.9-7pf ARCO 400
C_4, C_5	-1000pf UNELCO
C_6.	01f CERAMIC DISK
C_7	10f 50V ELECTROLYTIC
C_8	8-60pf ARCO 404
L_1, L_2	1 TURN, #20 AWG, .125 ID
R_1, R_2	470, WATT
Z_1	50, 1.25" x .1875
Z_2, Z_3	50, .50 x .1875

BOARD MATERIAL DOUBLE SIDED COPPER, .0625 THK, 3M K 6098 MOUNTED ON .375 BRASS PLATES

PACKAGE MECHANICAL DATA

X072

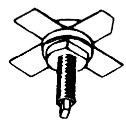


	Minimum Inches	Maximum Inches
A	.890	
B	.120	.130
C	.027	.033
D		.195
E	.098	.112
F	.003	.007
G	.201	.207
H	.201	.207
I	.425	.465

SD1133

RF & MICROWAVE TRANSISTORS 130 ... 230MHz FM MOBILE APPLICATIONS

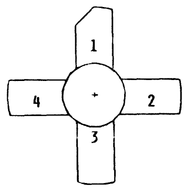
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 10W
- POWER GAIN 10dB
- LEADS ISOLATED FROM STUD
- COMMON EMITTER



.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	BRANDING
SD1133	SD1133

PIN CONNECTION



S88SD1133-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1133 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF mobile and marine transmitters. This device utilizes a nichrome aluminium metallization system to achieve VSWR at rated operation conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	2.0	A
P_{tot}	Total Power Dissipation	37.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	4.6	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

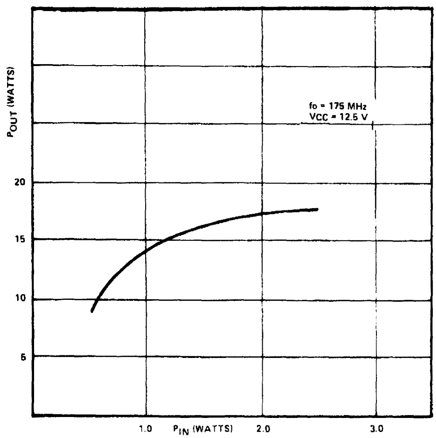
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	16			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			2.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 250A	5.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		10.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		10.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0		45		pF

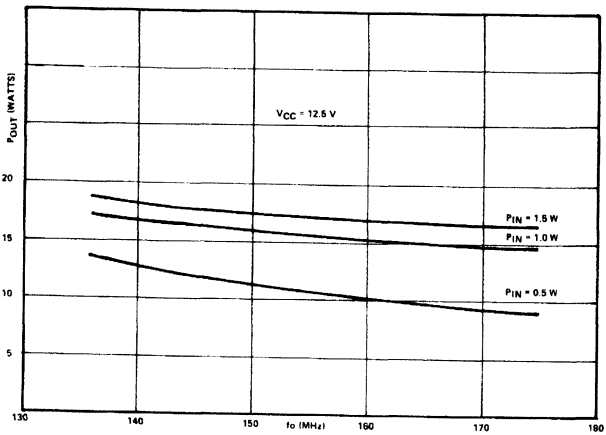
APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS. POWER INPUT.



S88SD1133-02

POWER OUTPUT VS. FREQUENCY.

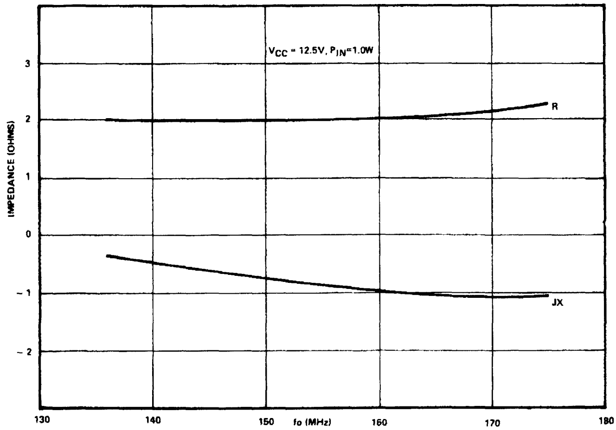


S88SD1133-03

IMPEDANCE DATA (typical)

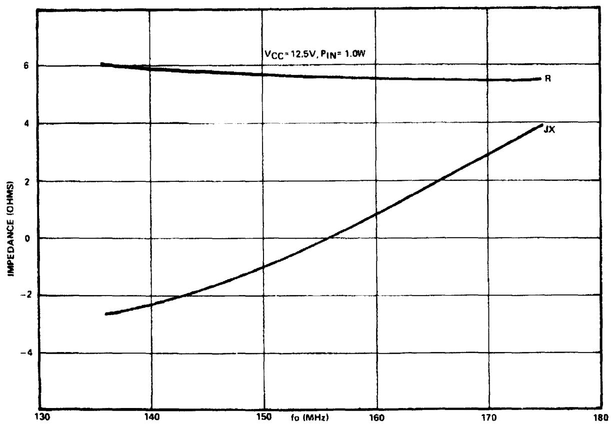
$Z_S = 2.3 - j\ 1.1\Omega$
$Z_{CL} = 5.5 + j\ 4.0\Omega$
$F = 175MHz \quad V_{CE} = 12.5V \quad P_O = 10W$

SOURCE IMPEDANCE VS. FREQUENCY.



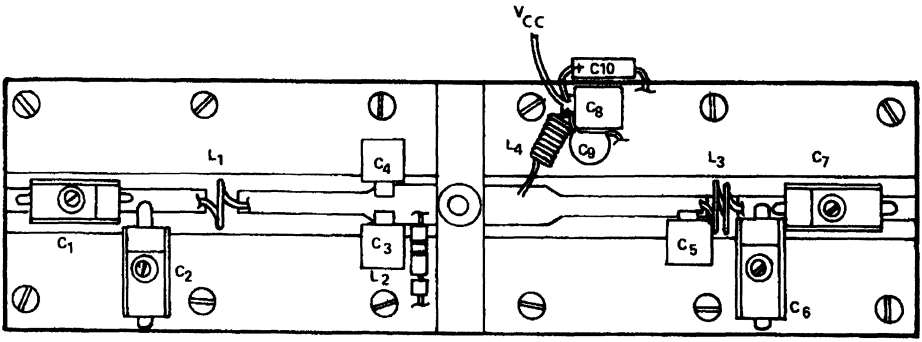
S88SD1133-04

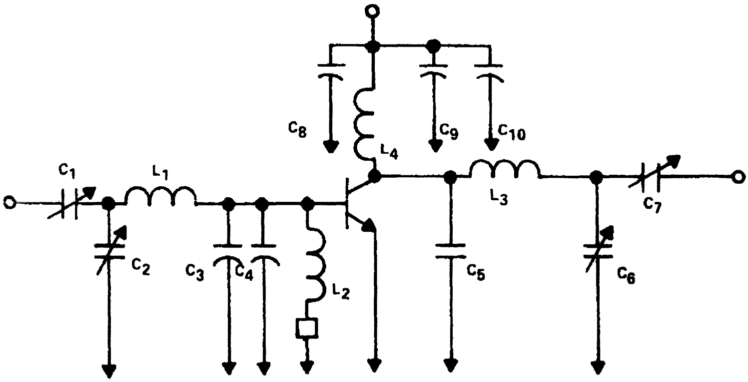
COLLECTOR LOAD IMPEDANCE VS. FREQUENCY.



S88SD1133-05

TEST CIRCUIT





S88SD1133-06

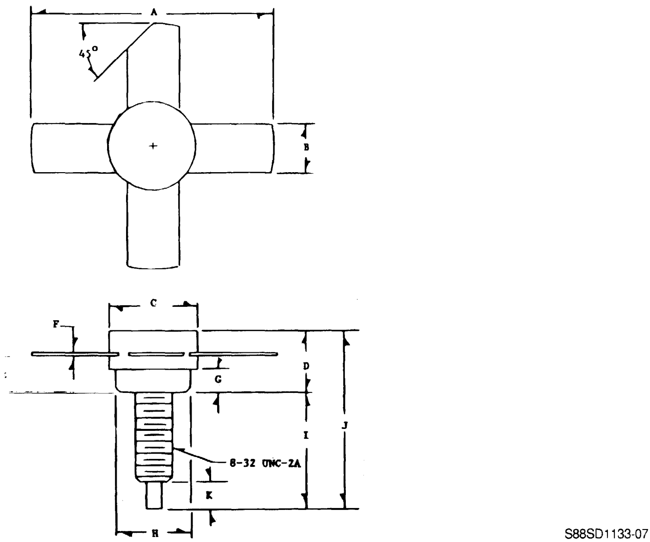
COMPONENT LIST

C1	– ARCO 423
C2, C6	– ARCO 422
C3	– UNELCO 82PF
C4	– UNELCO 120PF
C5	– UNELCO 56PF
C7	– ARCO 425
C8	– UNELCO 1000PF
C9	– .01μF DISC
C10	– 5.6μF TANTALUM
L1	– 1 TURN #16 AWG 3/8 DIA
L2	– .33mh MOLDED CHOKE
L3	– 2 TURNS #16AWG 1/4 DIA

L4 – 10 TURNS #22 AWG 1/8 DIA CLOSE WOUND

PACKAGE MECHANICAL DATA.

.380 4LSTUD



	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

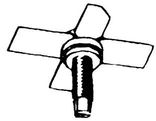
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON
MICROELECTRONICS

SD1134

RF & MICROWAVE TRANSISTORS
450-512MHz CLASS C MOBILE APPLICATIONS

- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 2.0W
- POWER GAIN 10.0dB
- EFFICIENCY 55%
- COMMON EMITTER

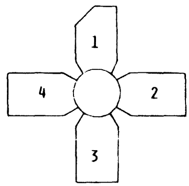


.280 4LSTUD (M122)
epoxy sealed

ORDER CODE
SD1134

BRANDING
SD1134

PIN CONNECTION



S88SD1134-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1134 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device utilizes improved metallization to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	0.75	A
P_{tot}	Total Power Dissipation	5.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	35.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

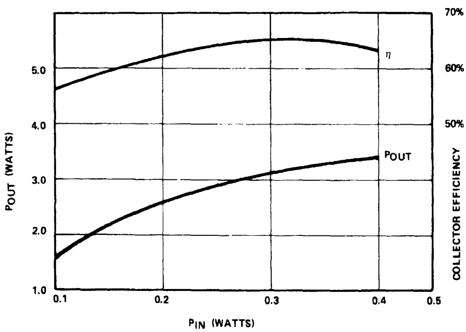
STATIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CES}	I_C = 5mA	V_{BE} = 0		36.0			V
BV_{CEO}	I_C = 25mA	I_B = 0		16.0			V
BV_{EBO}	I_E = 1mA	I_C = 0		4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0				1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 100A		20.0			

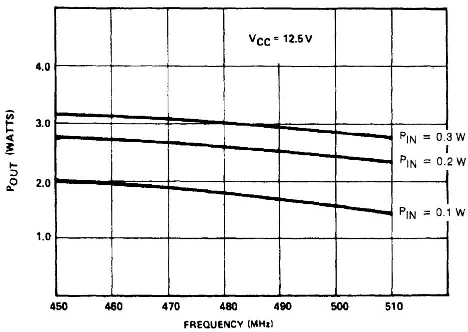
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		2.0			W
G_P	f = 470MHz	V_{CE} = 12.5V		10.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.0V	I_E = 0		6		pF

APPLICATION INFORMATION (typical curves)

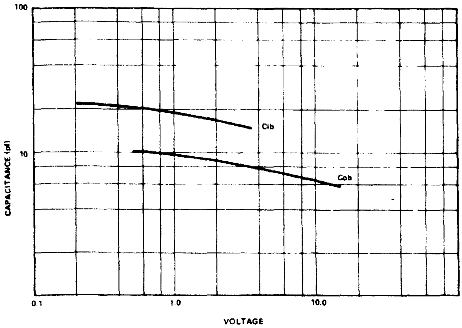


S88SD1134-02



S88SD1134-03

APPLICATION INFORMATION (typical curves) (continued)

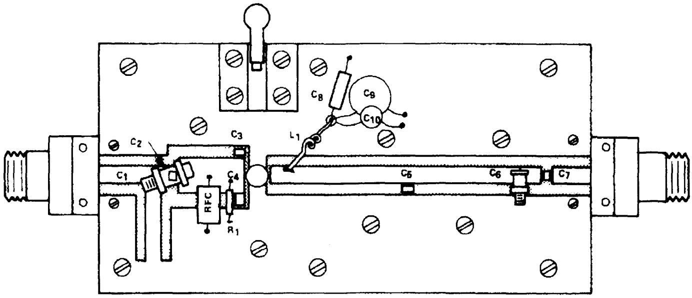


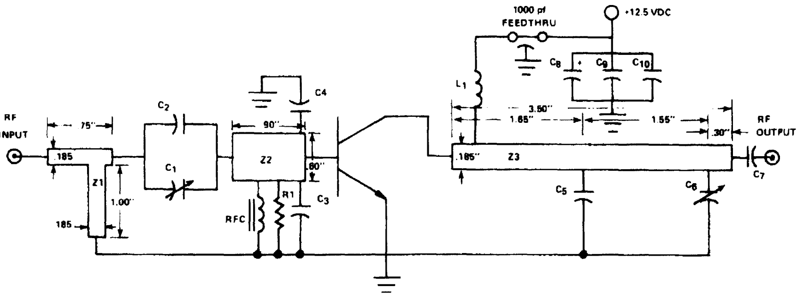
S88SD1134-04

IMPEDANCE DATA (typical)

VCC = 12.5V		
f (MHz)	Zin (Ω)	Zout (Ω)
450	2.7 + J0.9	11.5 – J15.0
470	2.6 + J1.3	12.2 – J13.5
512	2.2 + J1.7	12.7 – J13.0

BROADBAND TEST FIXTURE 450-510MHz





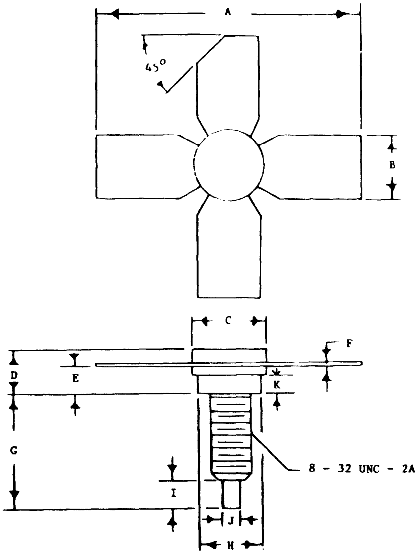
S88SD1134-05

C1	Voltronincs AJ10, 0.8-10pf
C2	Chip Capacitor, ATC 100-B, 7.5pF
C3, C4	Chip Capacitor, ATC 100-B, 24pF
C5	Chip Capacitor, ATC 100-B, 5.6pF
C6	Johanson, 0.6-6pF
C7	Chip Capacitor, ATC 100-B, 200pF
C8	Electrolytic, 5.6µF, 35V
C9	DISC-Ceramic, 0.1µF
C10	DISC-Ceramic, 0.01µF
R1	Carbon Resistor, 360Ω, 1/4W
L1	2 Turns # 22 Enameled 0.1" ID

RFC 2 Turns in Ferrocube
VK 200/19-4B
BOARD MATERIAL 3M-K-6098 1/16" Thk.

PACKAGE MECHANICAL DATA

.280 4LSTUD



S88SD1134-06

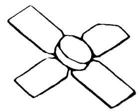
	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SD1134-5

RF & MICROWAVE TRANSISTORS
130 ... 230MHz FM MOBILE APPLICATIONS

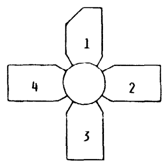
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 7.5V
- POWER OUT 0.5W
- POWER GAIN 7.0dB
- COMMON EMITTER



.280 4LSL (M123)
epoxy sealed

ORDER CODE	**BRANDING**
SD1134-05	1134-5

PIN CONNECTION



S88SD1134-5-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1134-5 is a 7.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. It withstands very high VSWR under operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	0.75	A
P_{tot}	Total Power Dissipation	5.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	35.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

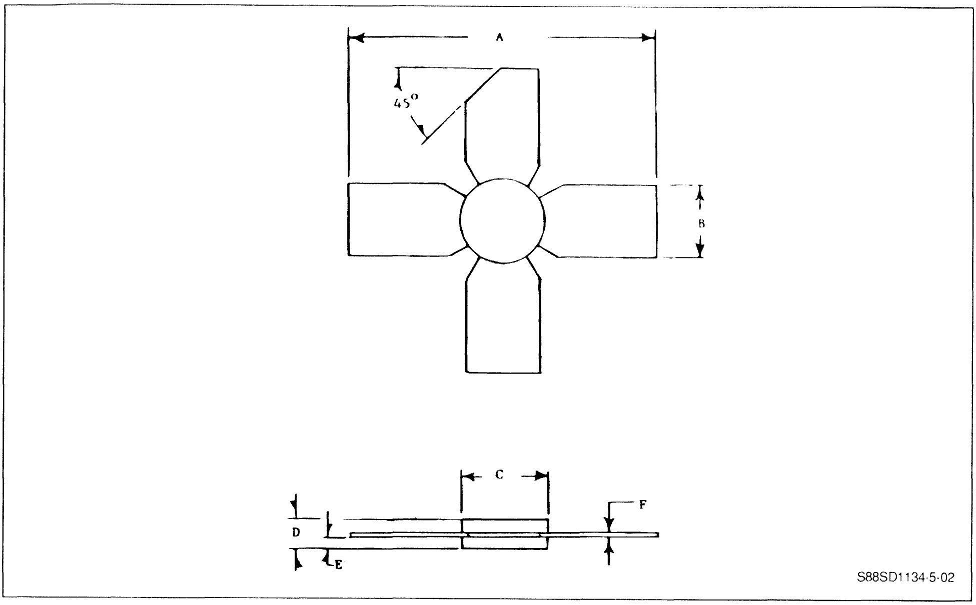
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 5mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 25mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 1mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 100mA	40			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 150MHz	V_{CE} = 7.5V		0.5			W
G_P	f = 150MHz	V_{CE} = 7.5V		7.0			dB
C_{OB}	f = 1MHz	V_{CB} = 7.5V	I_E = 0		6.0		pF
C_{IB}	f = 1MHz	V_{EB} = 0.5V	I_C = 0		20.0		pF

PACKAGE MECHANICAL DATA

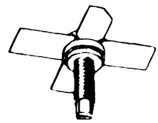
.280 4LSL



	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.118	.130
E	.050	.060
F	.004	.006

RF & MICROWAVE TRANSISTORS
450–512MHz CLASS C MOBILE APPLICATIONS

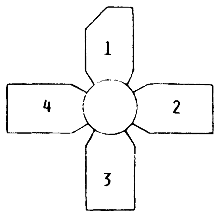
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 5.0W
- POWER GAIN 8.5dB
- EFFICIENCY 60%
- COMMON EMITTER



.280 4LSTUD (M122)
epoxy sealed

ORDER CODE	**BRANDING**
SD1135	SD1135

PIN CONNECTION



S88SD1135–01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1135 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device utilizes improved metallization to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	2.0	A
P_{tot}	Total Power Dissipation	37.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	11.6	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

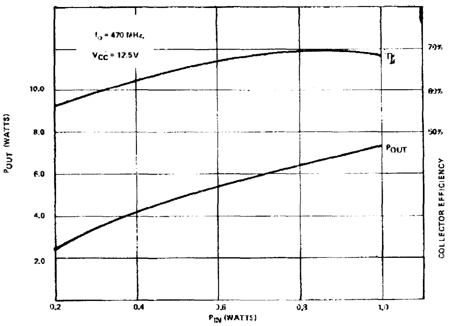
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 10mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_E = 50mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 2mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15V	I_E = 0			10	mA
h_{FE}	V_{CE} = 5.0V	I_C = 20mA	20.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		5.0			W
G_P	f = 470MHz	V_{CE} = 12.5V		8.5			dB
C_{OB}	f = 1MHz	V_{CB} = 12.0V	I_E = 0		19		pF

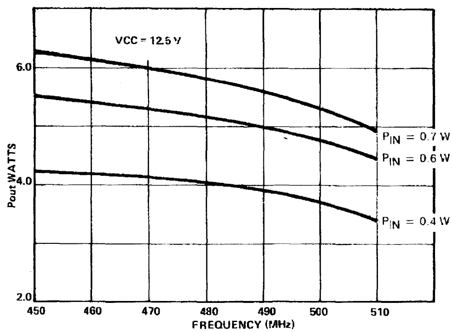
APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS POWER INPUT



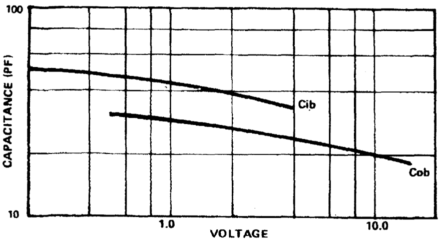
S88SD1135–02

POWER OUTPUT VS FREQUENCY



S88SD1135–03

CAPACITANCE VS VOLTAGE



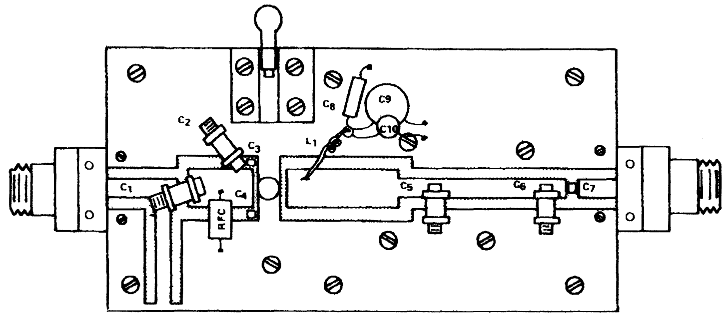
S88SD1135–04

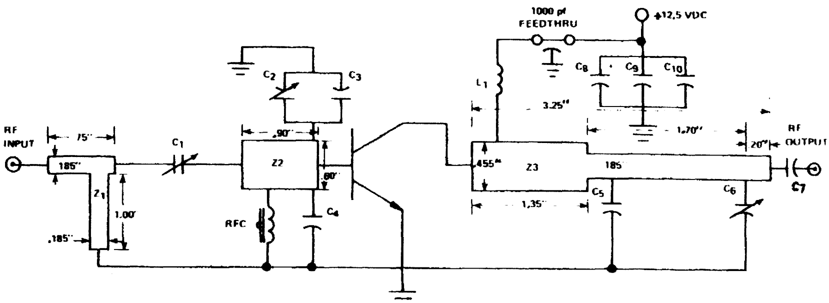
IMPEDANCE VS. FREQUENCY

F_O	Z_{in}	Z_{out}
450	1.4 + J2.0	10.7 – J6.9
470	1.4 + J2.9	11.4 – J5.8
512	1.5 + J3.4	11.9 – J3.2

V_{CC} = 12.5V

450–510MHz BROADBAND TEST FIXTURE





S88SD1135–05

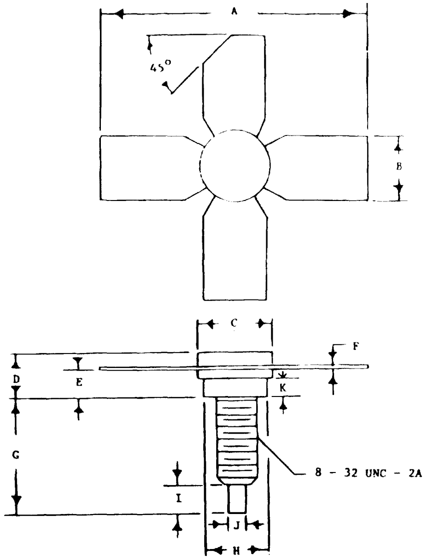
COMPONENT LIST

C1, C2, C5, C6	VOLTRONICS AJ10, 0.8-10pf
C3, C4	CHIP CAPACITOR, ATC 100-B, 16pf
C7	CHIP CAPACITOR, ATC 100-B, 620pf
C8	ELECTROLYTIC, 5.6µf, 35V
C9	DISC - CERAMIC, 0.1µf
C10	DISC - CERAMIC, 0.1µf
L1	2 TURNS #22 ENAMELED, 0.1" ID.
RFC	2 TURNS IN FERROCUBE VK 200/19-4B

BOARD MATERIAL-3M-K-6098, 1/16 THICK.

PACKAGE MECHANICAL DATA

.280 4LSTUD



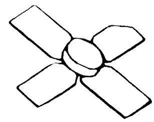
S88SD1135-06

	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

RF & MICROWAVE TRANSISTORS
130... 230MHz FM MOBILE APPLICATIONS

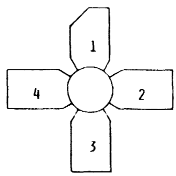
- FM CLASS C TRANSISTOR
- FREQUENCY 150MHz
- VOLTAGE 7.5V
- POWER OUT 2.5W
- POWER GAIN 11.0dB
- COMMON EMITTER



.280 4LSL (M123)

ORDER CODE	**BRANDING**
SD1135-03	SD1135-3

PIN CONNECTION



S88SD1135-3-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1135-3 is a 7.5 volt epitaxial silicon NPN planar transistor designed primarily for VHF communications. It withstands severe mismatch under operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	1.7	A
P_{tot}	Total Power Dissipation	15.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	11.6	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

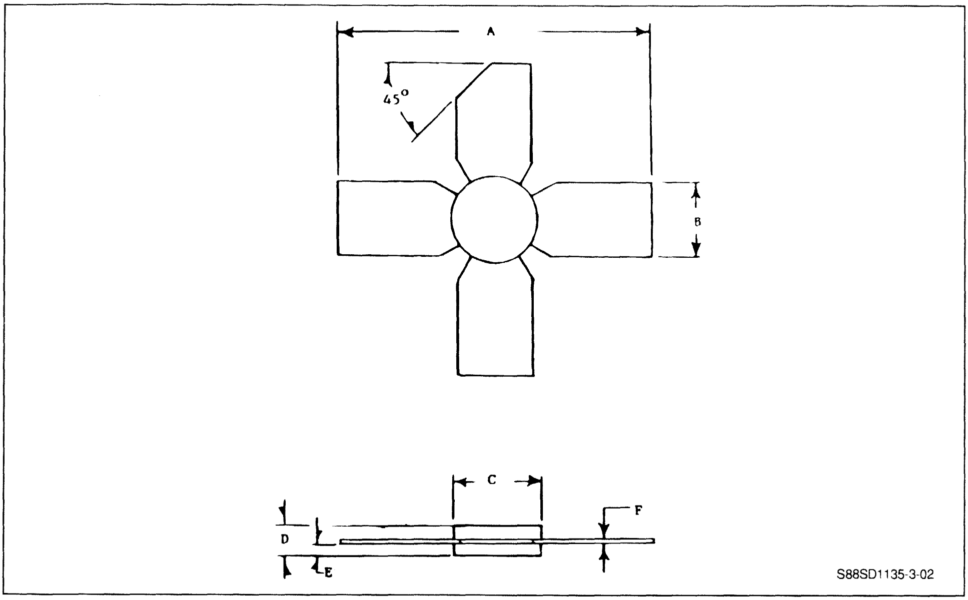
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 10mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 2mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 200mA	20.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 150MHz	V_{CE} = 7.5V		2.5			W
G_P	f = 150MHz	V_{CE} = 7.5V		11.0			dB
C_{OB}	f = 1MHz	V_{CB} = 7.5V	I_E = 0		19.0		pF

PACKAGE MECHANICAL DATA

.280 4LSL



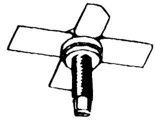
	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.118	.130
E	.050	.060
F	.004	.006

SGS-THOMSON
MICROELECTRONICS

SD1136

RF & MICROWAVE TRANSISTORS
450–512MHz CLASS C MOBILE APPLICATIONS

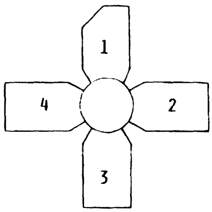
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 10.0W
- POWER GAIN 6.0dB
- EFFICIENCY 60%
- COMMON EMITTER



.280 4LSTUD (M122)
epoxy sealed

ORDER CODE	BRANDING
SD1136	SD1136

PIN CONNECTION



S88SD1136–01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1136 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for UHF communications. It withstands infinite VSWR under operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	3.4	A
P_{tot}	Total Power Dissipation	37.5	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	4.6	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

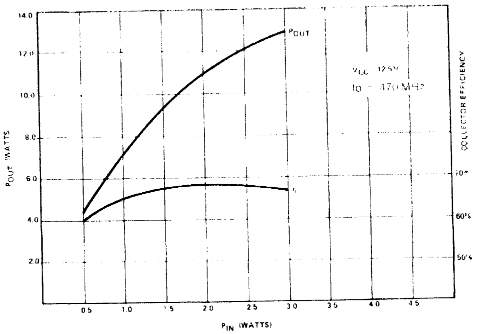
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_E = 50mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			2.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 500mA	20.0			pF

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		10.0			W
G_P	f = 470MHz	V_{CE} = 12.5V		6.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12V	I_E = 0		23		pF
C_{IB}	f = 1MHz	V_{EB} = 0.5V	I_C = 0		85		pF

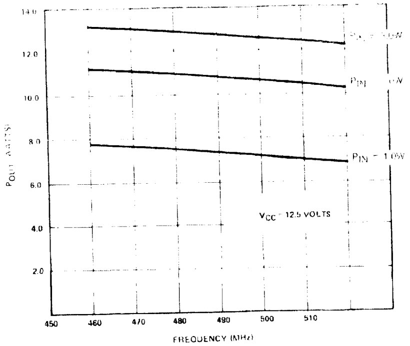
APPLICATION INFORMATION (typical curves)

POWER OUTPUT vs. POWER IN



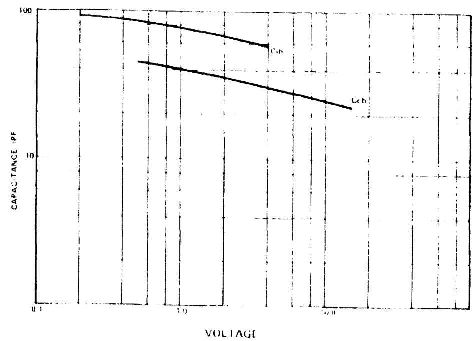
S88SD1136–02

POWER OUTPUT vs. FREQUENCY



S88SD1136–03

CAPACITANCE vs. VOLTAGE

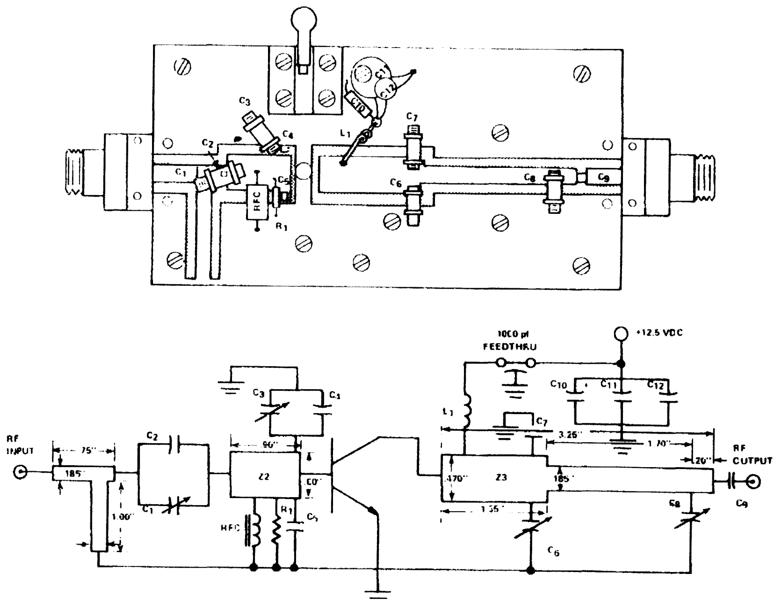


S88SD1136–04

IMPEDANCE VS. FREQUENCY

F_O	Z_{in}	Z_{out}
450	1.4 + J.44	6.4 – J3.4
470	1.5 + J.40	6.6 – J3.6
512	1.6 + J.40	6.3 – J3.7

BROADBAND TEST FIXTURE 450–510MHz



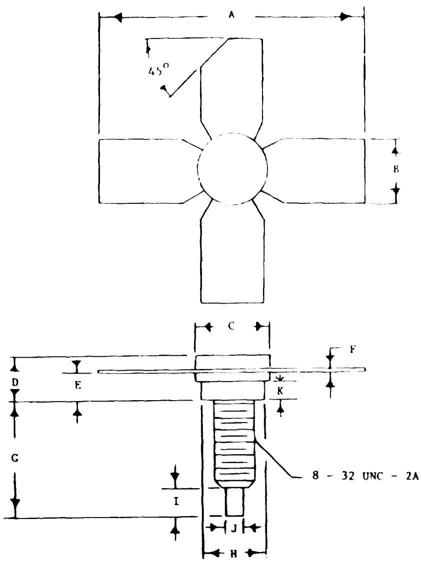
S88SD1136–05

C1, C3, C6, C7, C8	- Voltronics, AJ10, 0.8-10pf
C2	- Chip Capacitor, ATC 100B, 11pf
C4, C5	- Chip Capacitor, ATC 100B, 16pf
C9	- Chip Capacitor, ATC 100B, 620pf
C10	- Electrolytic, 5.6µf, 35V
C11	- DISC-Ceramic, 0.1µf
C12	- DISC-Ceramic, 0.01µf
R1	- Carbon Resistor, 270Ω, 1/4w
L1	- 2 Turns #22 Enameled 0.1" ID
RFC	- 2 Turns in Ferrocube VK200/19-4B

BOARD MATERIAL - 3M-K-6098 1/16" Thk.

PACKAGE MECHANICAL DATA

.280 4LSTUD



S88SD1136-06

	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

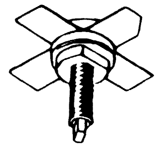
	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SGS-THOMSON
MICROELECTRONICS

SD1143

RF & MICROWAVE TRANSISTORS
130... 230MHz FM MOBILE APPLICATIONS

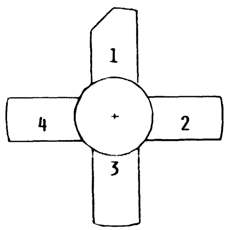
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 10W
- POWER GAIN 10dB
- COMMON EMITTER



.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	**BRANDING**
SD1143	SD1143

PIN CONNECTION



S88SD1143-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1143 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. It withstands very high VSWR under operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	2.0	A
P_{tot}	Total Power Dissipation	20.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	8.75	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 C)

STATIC

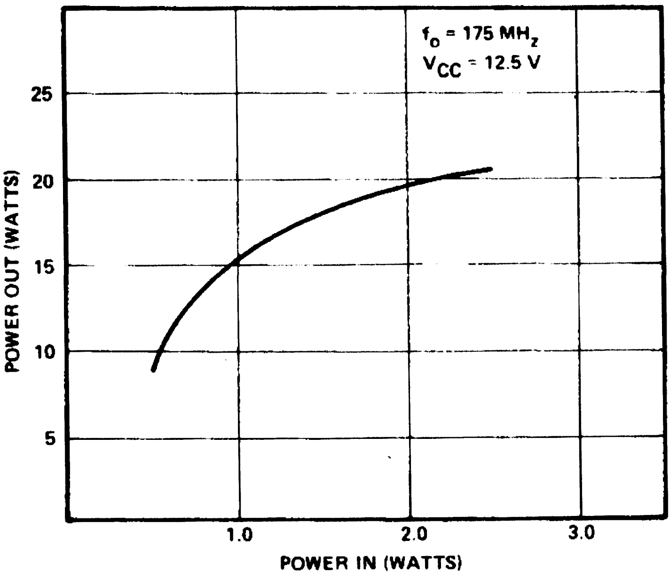
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 15mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 2.5mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 250A	5.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		10.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		10.0			dB
C_{OB}	f = 1MHz	V_{CB} = 15.0V	I_E = 0			45	pF

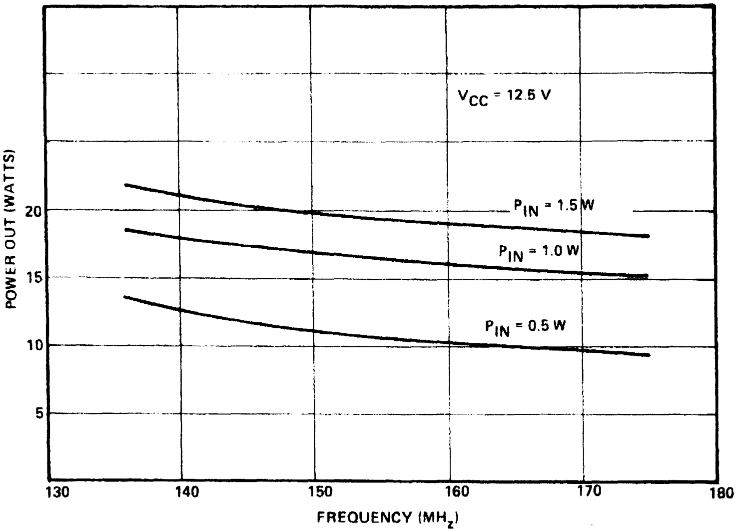
APPLICATION INFORMATION (typical curves)

POWER OUT VS. POWER IN



S88SD1143-02

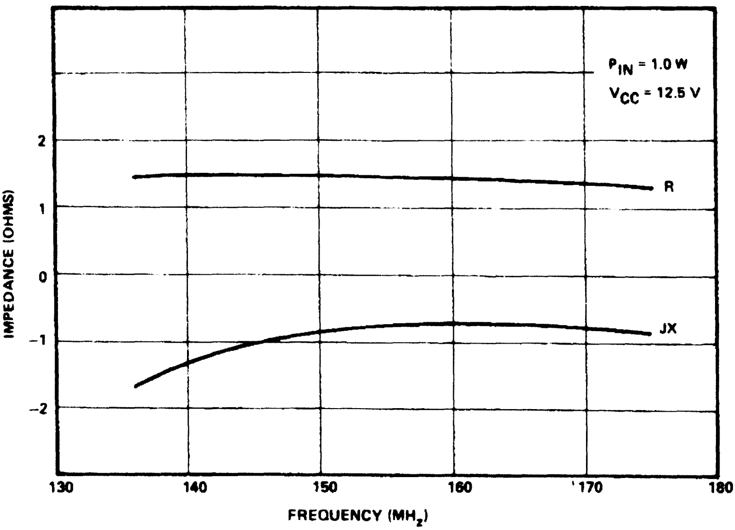
POWER OUT VS. FREQUENCY



S88SD1143-03

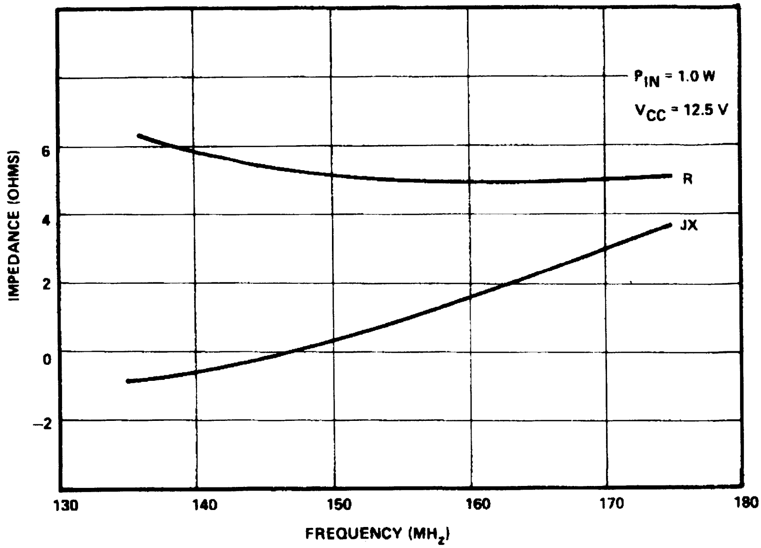
IMPEDANCE DATA (typical)

SERIES SOURCE IMPEDANCE VS. FREQUENCY



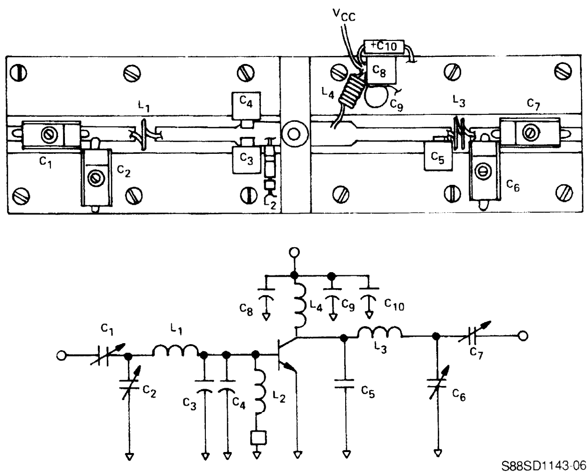
S88SD1143-04

SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY



S88SD1143-05

TEST CIRCUIT



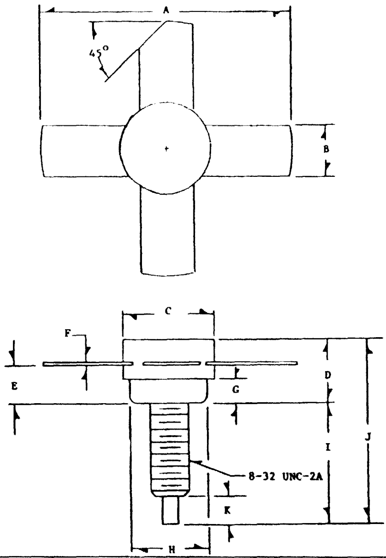
S88SD1143-06

COMPONENT LIST

C_1	- ARCO 423
C_2, C_6	- ARCO 422
C_3	- UNELCO 82pf
C_4	- UNELCO 120pf
C_5	- UNELCO 56pf
C_7	- ARCO 425
C_8	- UNELCO 1000pf
C_9	- .01µf DISC
C_{10}	- 5.6µf TANTALUM
L_1	- 1 TURN #16 AWG 3/8 DIA
L_2	- .33µh MOLDED CHOKE
L3	- 2 TURNS #16 AWG 1/4 DIA
L4	- 10 TURNS #22 AWG 1/8 DIA CLOSE WOUND

PACKAGE MECHANICAL DATA

.380 4LSTUD



S88SD1143-07

	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

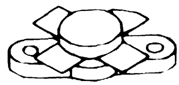
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON
MICROELECTRONICS

SD1143-1

RF & MICROWAVE TRANSISTORS
130... 230MHz FM MOBILE APPLICATIONS

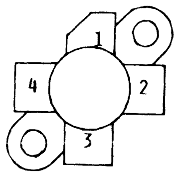
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 10W
- POWER GAIN 10dB
- COMMON EMITTER



.380 4LFL (M113)
(epoxy sealed)

ORDER CODE	BRANDING
SD1143-01	SD1143-1

PIN CONNECTION



S88SD1143-1-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1143-1 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. It withstands very high VSWR under operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	2.0	A
P_{tot}	Total Power Dissipation	20.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	8.75	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

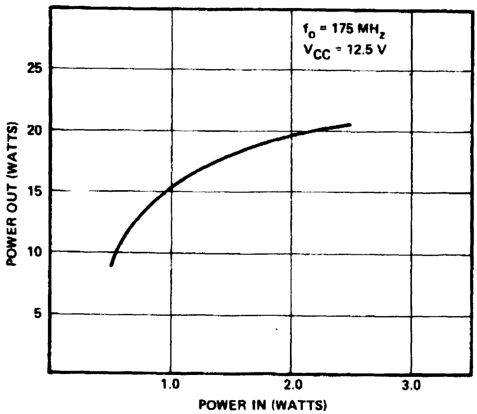
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0		36.0			V
BV_{CEO}	I_C = 15mA	I_B = 0		18.0			V
BV_{EBO}	I_E = 2.5mA	I_C = 0		4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0				2.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 250mA		5.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		10.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		10.0			dB
C_{OB}	f = 1MHz	V_{CB} = 15.0V	I_E = 0			45.0	pF

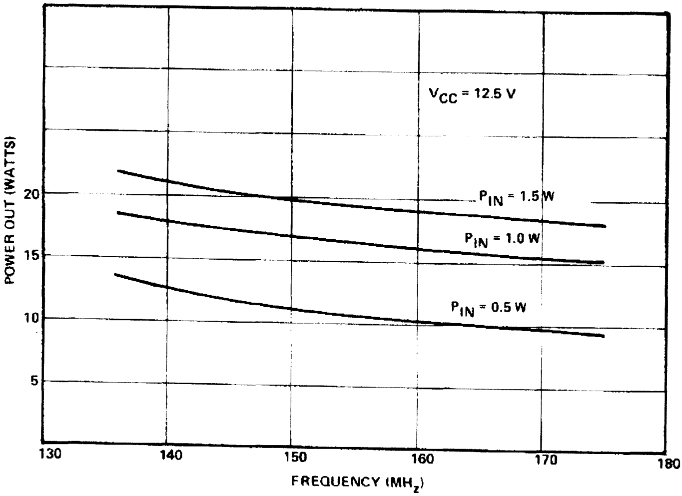
APPLICATION INFORMATION (typical curves)

POWER OUT VS. POWER IN.



S88SD1143-1-02

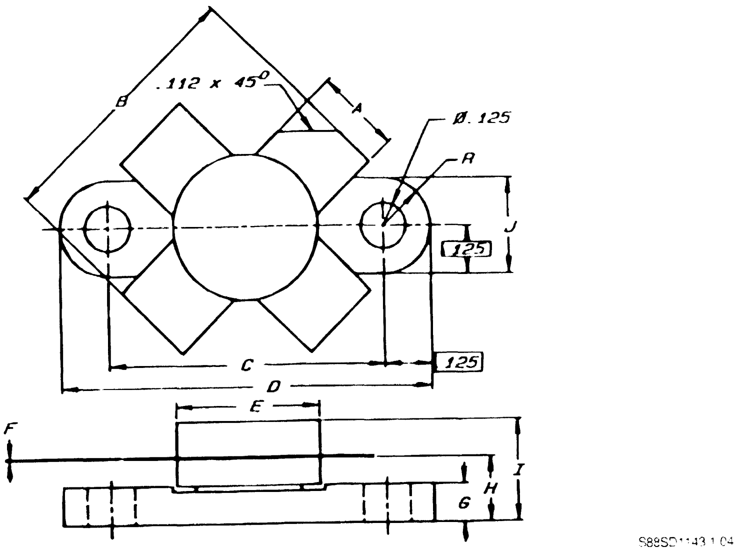
POWER OUT VS. FREQUENCY.



S88SD1143-1-03

PACKAGE MECHANICAL DATA

.380 4LFL



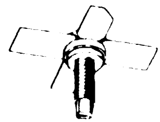
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON

SD1150

RF & MICROWAVE TRANSISTORS 450-512MHz CLASS C, MOBILE APPLICATIONS

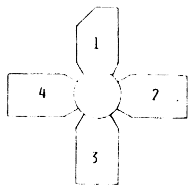
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 4.0W
- POWER GAIN 8.0dB
- COMMON EMITTER



.280 4LSTUD (M122)
epoxy sealed

ORDER CODE	BRANDING
SD1150	SD1150

PIN CONNECTION



1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1150 is a 12.5V silicon epitaxial NPN planar transistor designed primarily for UHF large-signal, amplifier applications in both industrial and commercial FM communications equipment operating up to 512MHz. It withstands infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	2.0	A
P_{tot}	Total Power Dissipation	25.0	W
T_{stg}	Storage Temperature	− 65 to 150	C
T	Junction Temperature	200	C

THERMAL DATA

$R_{th(j-c)}$	Junction to Case Thermal Resistance	7.0	C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

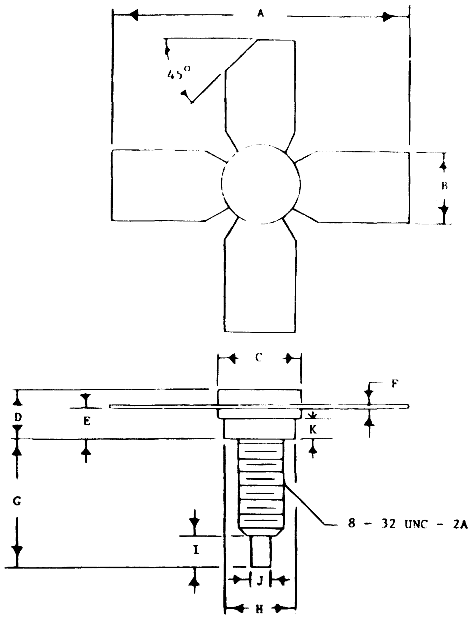
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 100 mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 2mA	I_C = 0	4			V
I_{CBO}	V_{CB} = 15V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5V	I_C = 0.2A	20			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		4.0			W
G_P	f = 470MHz	V_{CE} = 12.5V		8.0			dB
C_{ob}	f = 1MHz	V_{CB} = 12.5V	I_E = 0			30	pF

PACKAGE MECHANICAL DATA

.280 4LSTUD



	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

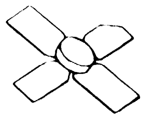
	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SGS-THOMSON MICROELECTRONICS

SD1150-3

RF & MICROWAVE TRANSISTORS 450-512MHz CLASS C, MOBILE APPLICATIONS

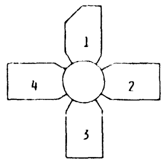
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 4.0W
- POWER GAIN 8.0dB
- COMMON EMITTER



.280 4LSL (M123)
epoxy sealed

ORDER CODE	BRANDING
SD1150-03	SD1150-3

PIN CONNECTION



S88SD1150-3-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1150-3 is a 12.5V silicon epitaxial NPN planar transistor designed primarily for UHF large-signal, amplifier applications in both industrial and commercial FM communications equipment operating 470 to 512MHz. It withstands infinite VSWR at rated conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	2.0	A
P_{tot}	Total Power Dissipation	25.0	W
T_{stg}	Storage Temperature	− 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	7.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

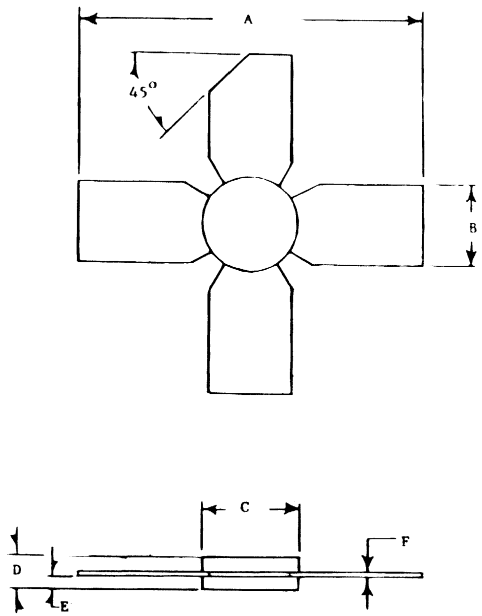
Symbol	Test Conditions			Value		Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100mA	V_{BE} = 0V	36.0			V
BV_{CEO}	I_C = 100mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 2mA	I_C = 0	4			V
I_{CBO}	V_{CB} = 15V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5V	I_C = 0.2A	20			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		4.0			W
G_P	f = 470MHz	V_{CE} = 12.5V		8.0			dB
C_{OB}	f = 1MHz	V_{EB} = 12.5V	I_E = 0			30	pF

PACKAGE MECHANICAL DATA

.280 4LSL

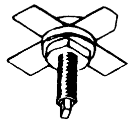


	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.118	.130
E	.050	.060
F	.004	.006

SD1219

RF & MICROWAVE TRANSISTORS
108...152MHz APPLICATIONS

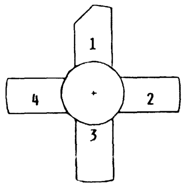
- FREQUENCY 150MHz
- VOLTAGE 28V
- POWER OUT 60W
- POWER GAIN 7.0dB
- COMMON EMITTER



.380 4LSTUD(M135)
epoxy sealed

ORDER CODE	**BRANDING**
SD1219	SD1219

PIN CONNECTION



S88SD1219-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1219 is an epitaxial silicon NPN planar transistor designed primarily for 12.5V AM Class C RF amplifiers functional in the aviation band 118-136MHz and for 28V Class C RF amplifiers utilized in ground station transmitters. This device utilizes emitter ballasting resistors and improved metallization systems to achieve optimum load mismatch capability.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	35.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	6.5	A
P_{tot}	Total Power Dissipation	75.0	W
T_{stg}	Storage Temperature	− 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	2.3	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CES}	I_C = 200mA	V_{BE} = 0		65.0			V
BV_{CEO}	I_C = 200mA	I_B = 0		35.0			V
BV_{EBO}	I_E = 10mA	I_C = 0		4.0			V
I_{CBO}	V_{CB} = 30.0V	I_E = 0				2.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 500mA		5.0			
I_{CES}	V_{CE} = 30.0V	V_{BE} = 0	T_{case} = 125°C			10	mA

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 150MHz	V_{CE} = 28.0V		60.0			W
P_G	f = 150MHz	V_{CE} = 28.0V		7.0			dB
C_{OB}	f = 1MHz	V_{CB} = 30.0V	I_E = 0			80.0	pF
C_{IB}	f = 1MHz	V_{EB} = 0.5V	I_C = 0		450		pF

When used at 13.5V, the performances at 150MHz are :
P_O = 19.0W (typ.)
G_P = 5.5dB (typ.)

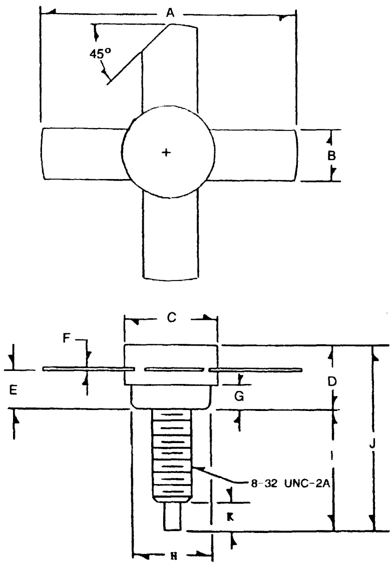
IMPEDANCE DATA

Z_S = 1.0 + j 2.0W
Z_{CL} = 4.0 - j 3.9W

F = 150MHz
V_{CE} = 28.0V
P_O = 60W

PACKAGE MECHANICAL DATA

.380 4LSTUD



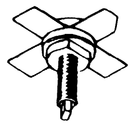
	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SD1219-5

RF & MICROWAVE TRANSISTORS
108-152MHz APPLICATIONS

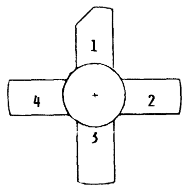
- CLASS C TRANSISTOR
- FREQUENCY 136MHz
- VOLTAGE 28V
- POWER OUT 50W
- POWER GAIN 10dB
- COMMON EMITTER



.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	BRANDING
SD1219-05	SD1219-5

PIN CONNECTION



S88SD1219-5-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1219-5 is a 28V epitaxial silicon NPN planar transistor designed primarily for VHF communications. This device utilizes nichrome aluminum metallization systems to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	35.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	6.5	A
P_{tot}	Total Power Dissipation	75.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	2.3	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 50mA	I_E = 0	65.0			V
BV_{CES}	I_C = 50mA	V_{BE} = 0	65.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	35.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 25.0V	I_E = 0			2.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1.4A	15.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 136MHz	V_{CE} = 28.0V		50.0			W
G_P	f = 136MHz	V_{CE} = 28.0V		10.0			dB
C_{OB}	f = 1MHz	V_{CB} = 30.0V	I_E = 0			80.0	pF
C_{IB}	f = 1MHz	V_{EB} = 0.5V	I_C = 0		450.0		pF

When used at 12.5V. performances are (at 136MHz) :
P_O = 13W (typ.)
G_P = 8.5dB (typ.)

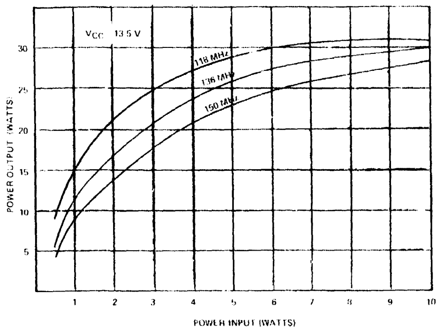
IMPEDANCE DATA

$Z_S = 0.8 - j\,1.0\Omega$
$Z_{CL} = 4.7 + j\,3.3\Omega$

P_O = 50W
V_{CE} = 28V
F = 136MHz

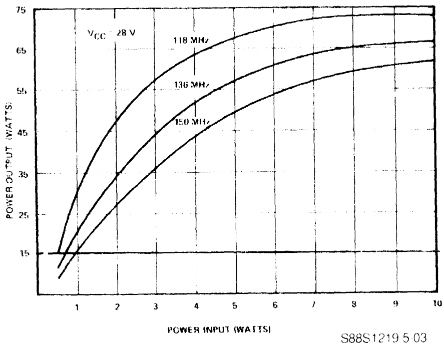
APPLICATION INFORMATION (typical curves)

POWER OUT vs. POWER IN (13.5V)



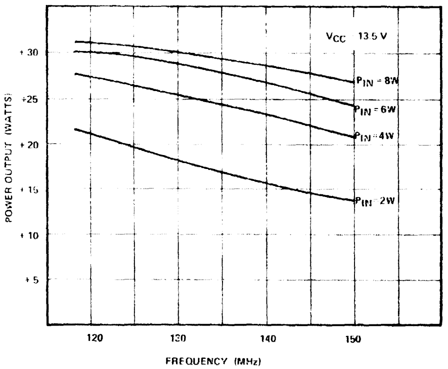
S88SD1219 5 02

POWER OUT vs. POWER IN (28V)



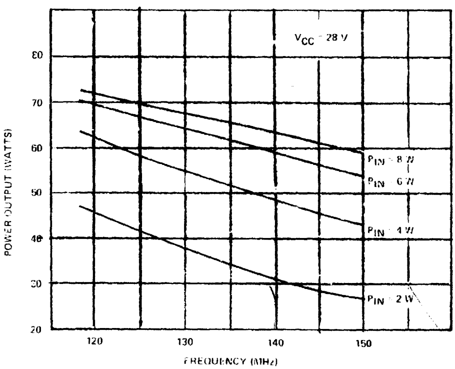
S88S1219 5 03

POWER OUT vs. FREQUENCY (13.5V)



S88SD1219-5-04

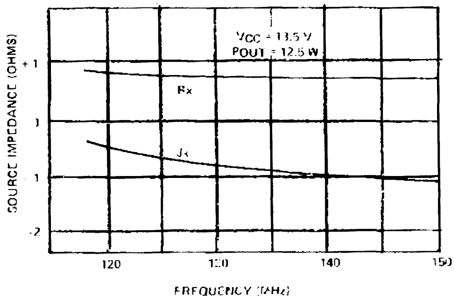
POWER OUT vs. FREQUENCY (28V)



S88SD1219-5-05

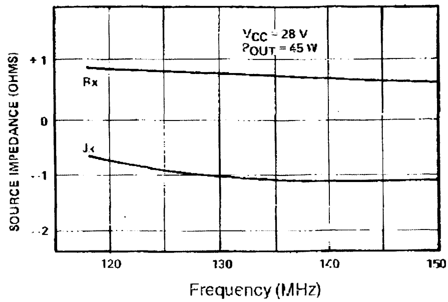
IMPEDANCE DATA (typical)

SERIES SOURCE IMPEDANCE vs. FREQUENCY



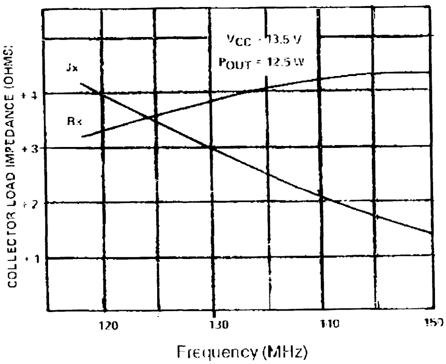
S88SD1219-5-06

SERIES SOURCE IMPEDANCE vs. FREQUENCY



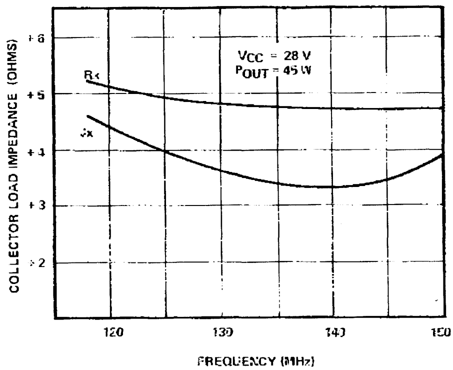
S88S1219-5-07

SERIES COLLECTOR LOAD IMPEDANCE vs. FREQUENCY



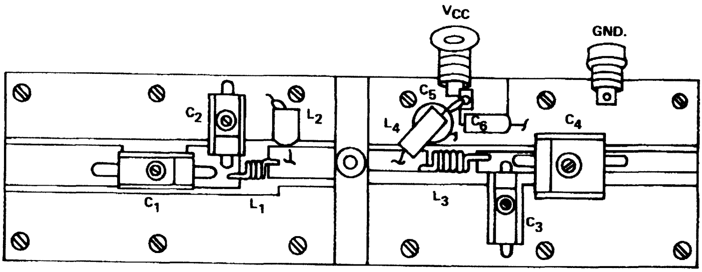
S88SD1219-5-08

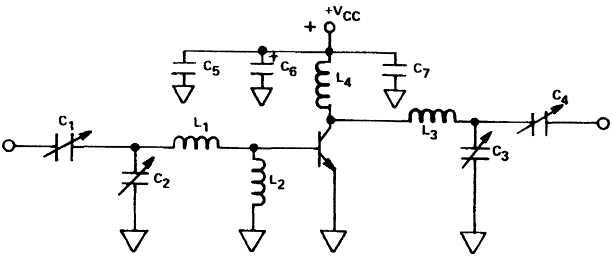
SERIES COLLECTOR LOAD IMPEDANCE vs. FREQUENCY



S88SD1219-5-09

TEST CIRCUIT





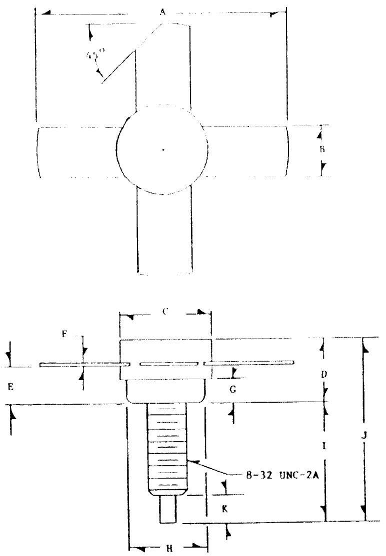
S88SD1219-5-10

PARTS LIST

C_1, C_2	ARCO 422
C_3	ARCO 422
C_4	ARCO 463
C_5	1000pF UNELCO
C_6	10µF ELECTROLYTIC 35V
C_7	.01pF CERAMIC DISC.
L_1	3T # 22, 1/8ID
L_2	RFC FERROXCUBE
L_3	3T # 18, 1/4ID
L_4	.47 µh MOLDED CHOKE

PACKAGE MECHANICAL DATA

.380 4LSTUD



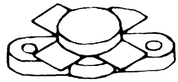
	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SD1220-1

RF & MICROWAVE TRANSISTORS 108-152MHz APPLICATIONS

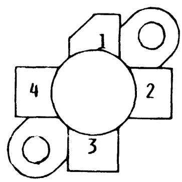
- FM CLASS C TRANSISTOR
- FREQUENCY 136MHz
- VOLTAGE 28V
- POWER OUT 7W
- POWER GAIN 8.4dB
- EFFICIENCY 55%TYP
- COMMON EMITTER



.380 4LFL (M113)
epoxy sealed

ORDER CODE	BRANDING
SD1220-01	SD1220-1

PIN CONNECTION



S88SD1220-1-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1220-1 is a 28V epitaxial silicon NPN planar transistor designed for 108-152 MHz AM Class C and FM applications.
This device utilizes diffused emitter resistors to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector – Base Voltage	65.0	V
V_{CEO}	Collector – Emitter Voltage	35.0	V
V_{CES}	Collector – Emitter Voltage	65.0	V
V_{EBO}	Emitter – Base Voltage	4.0	V
I_C	Collector Current	1.0	A
P_{tot}	Total Power Dissipation	15.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	11.7	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 200mA	I_E = 0	65.0			V
BV_{CES}	I_C = 200mA	V_{BE} = 0	65.0			V
BV_{CEO}	I_C = 200mA	I_B = 0	35.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 30.0V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 100mA	5.0		200	

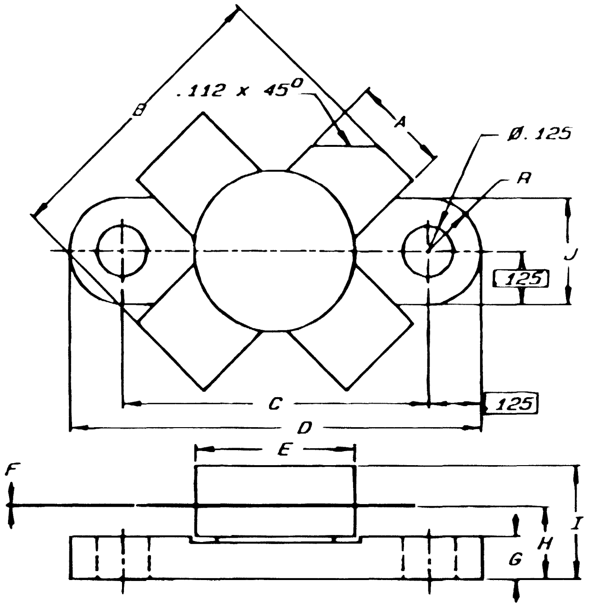
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 136MHz	V_{CE} = 28.0V		7.0			W
G_p	f = 136MHz	V_{CE} = 28.0V		8.4			dB
C_{ob}	f = 1MHz	V_{CB} = 30.0V	I_E = 0			20	pF
η_C	f = 136MHz	V_{CE} = 28.0V			60		%

When used at 13.6Volts, the performances are :
P_{out} = 3W typical
G_p = 8.5dB typical.

PACKAGE MECHANICAL DATA

.380 4LFL



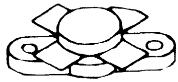
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON
MICROELECTRONICS

SD1222-5

RF & MICROWAVE TRANSISTORS
108-152MHz APPLICATIONS

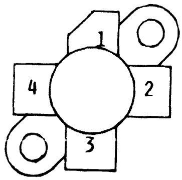
- FM CLASS C TRANSISTOR
- FREQUENCY 136MHz
- VOLTAGE 28V
- POWER OUT 20W
- POWER GAIN 8.2dB
- EFFICIENCY 55%
- COMMON EMITTER



.340 4LFL (M113)
epoxy sealed

ORDER CODE	**BRANDING**
SD1222-05	SD1222-5

PIN CONNECTION



S88SD1222-5-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1222-5 is a 28V epitaxial silicon NPN planar transistor designed for 108-152MHz AM class C and FM applications.
This device utilizes diffused emitter resistors to achieve VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	35.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	3.0	A
P_{tot}	Total Power Dissipation	30.0	W
T_{stg}	Storage Temperature	− 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	5.83	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

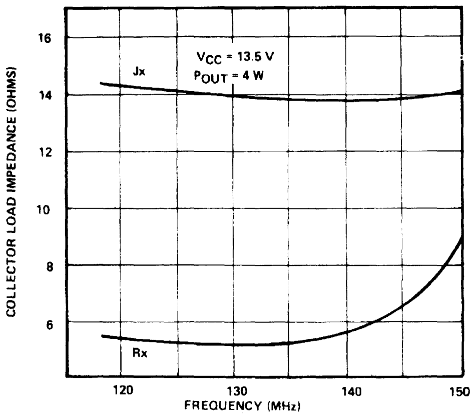
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 200mA	I_E = 0	65.0			V
BV_{CES}	I_C = 200mA	V_{BE} = 0	65.0			V
BV_{CEO}	I_C = 200mA	I_B = 0	35.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 30.0V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 200mA	5.0			

DYNAMIC

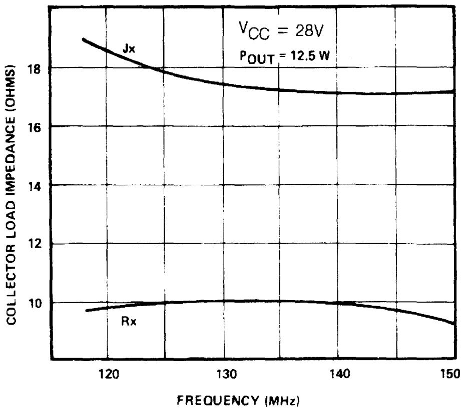
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 136MHz	V_{CE} = 28.0V		20.0			W
G_P	f = 136MHz	V_{CE} = 28.0V		8.2			dB
C_{OB}	f = 1MHz	V_{CB} = 30.0V	I_E = 0			35.0	pF

APPLICATION INFORMATION (typical curves)



SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY

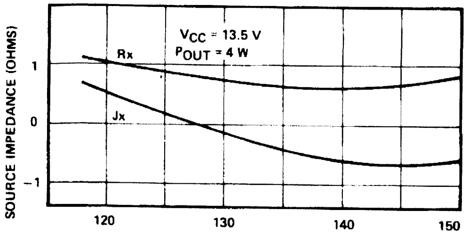
S88SD1222-5-02



SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY

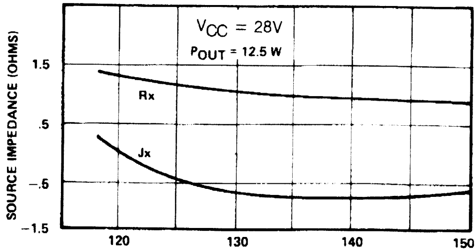
S88S1222-5-03

APPLICATION INFORMATION (typical curves) (continued)



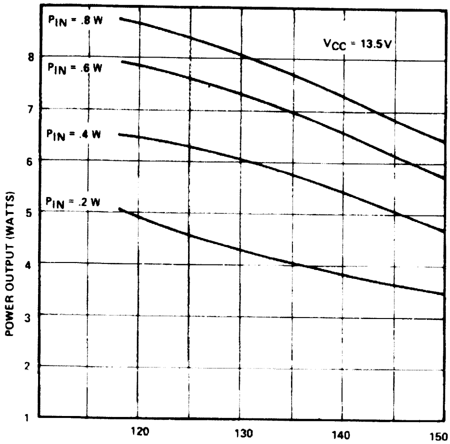
FREQUENCY (MHz)
SERIES SOURCE IMPEDANCE VS. FREQUENCY

S88SD1222-5-04



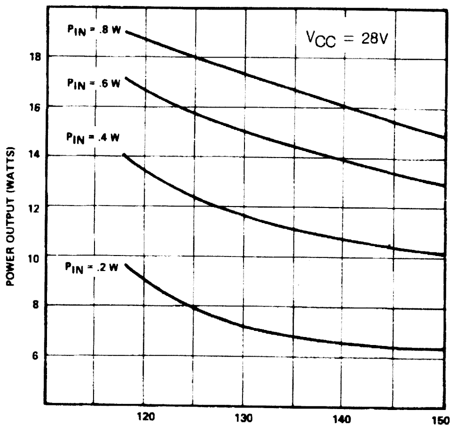
FREQUENCY (MHz)
SERIES SOURCE IMPEDANCE VS. FREQUENCY

S88S1222-5-05



FREQUENCY (MHz)
POWER OUTPUT VS. FREQUENCY

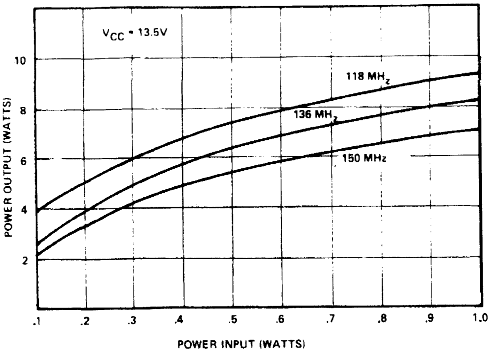
S88SD1222-5-06



FREQUENCY (MHz)
POWER OUTPUT VS. FREQUENCY

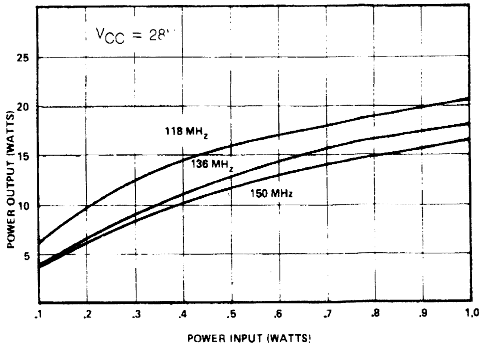
S88S1222-5-07

APPLICATION INFORMATION (typical curves) (continued)



POWER OUTPUT VS. POWER INPUT

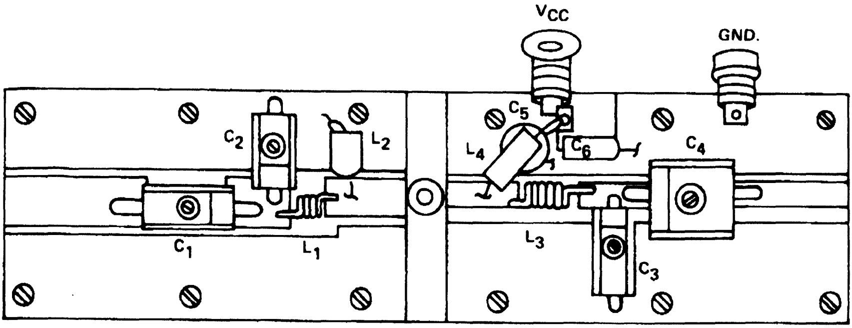
S88SD1222-5-08

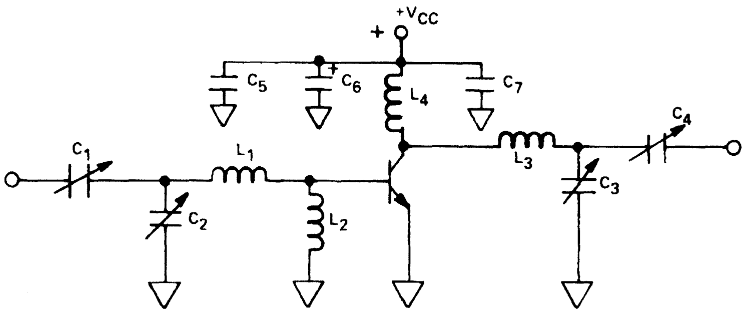


POWER OUTPUT VS. POWER INPUT

S88S1222-5-09

TEST FIXTURE





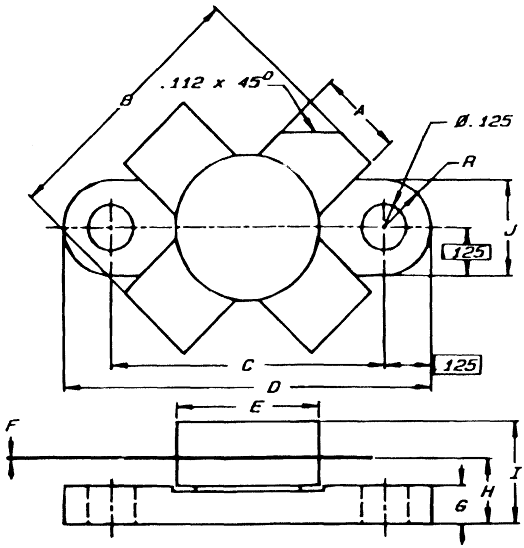
S88SD1222-5-10

PARTS LIST

C1, C2	ARCO 422	L1	3T#22, 1/8 ID
C3	ARCO 422	L2	RFC FERROXCUBE
C4	ARCO464	L3	2T#18, 1/4 ID
C5	1000pF UNELCO	L4	.47μH MOLDED CHOKE
C6	.10μF ELECTROLYTIC 35V		
C7	.01pF CERAMIC DISC.		

PACKAGE MECHANICAL DATA

.380 4LFL



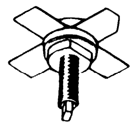
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON
MICROELECTRONICS

SD1222-6

RF & MICROWAVE TRANSISTORS
108-152MHz APPLICATIONS

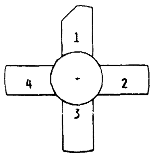
- FM CLASS C TRANSISTOR
- FREQUENCY 136MHz
- VOLTAGE 28V
- POWER OUT 15W
- POWER GAIN 11dB
- EFFICIENCY 55%TYP
- COMMON EMITTER



.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	BRANDING
SD1222-06	SD1222-6

PIN CONNECTION



S88SD1222-6-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1222-6 is a 28V epitaxial silicon NPN planar transistor designed for 108-152 MHz AM class C and FM applications.
This device utilizes diffused emitter resistors to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	35.0	V
V_{CES}	Collector - Emitter Voltage	65	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	3.0	A
P_{tot}	Total Power Dissipation	30.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	5.83	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

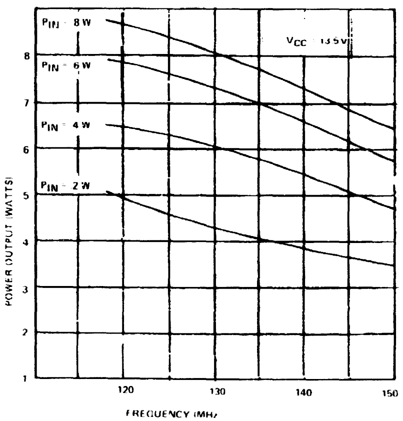
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 200mA	I_E = 0	65.0			V
BV_{CES}	I_C = 200mA	V_{BE} = 0	65.0			V
BV_{CEO}	I_C = 200mA	I_B = 0	35.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 30V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 200mA	5.0			

DYNAMIC

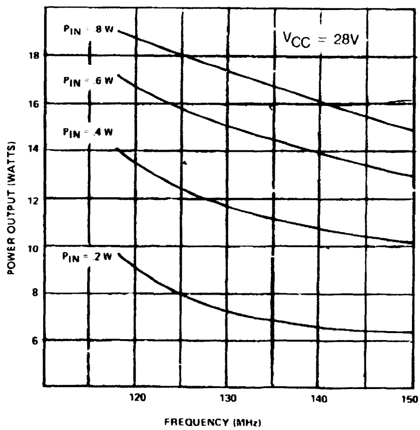
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 136MHz	V_{CC} = 28.0V		15.0			W
G_P	f = 136MHz	V_{CC} = 28.0V		11.0			dB
η_c	f = 136MHz	V_{CC} = 28V			60		%
C_{ob}	f = 1MHz	V_{CB} = 30.0V	I_E = 0			35.0	pF

APPLICATION INFORMATION (typical curves)



POWER OUTPUT VS FREQUENCY

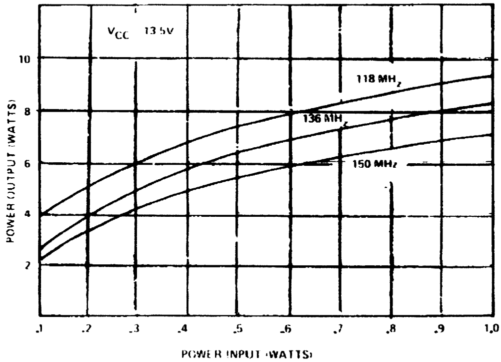
S88-SD1222-6-02



POWER OUTPUT VS FREQUENCY

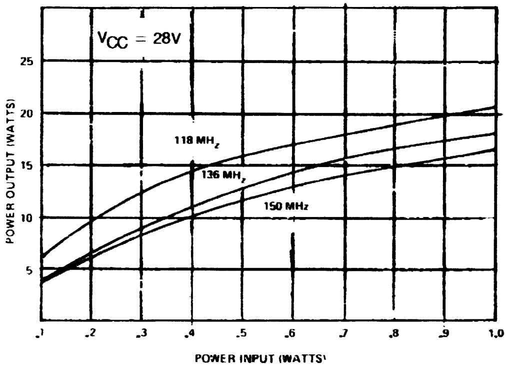
S88-SD1222-6-03

APPLICATION INFORMATION (typical curves) (continued)



POWER OUTPUT VS POWER INPUT

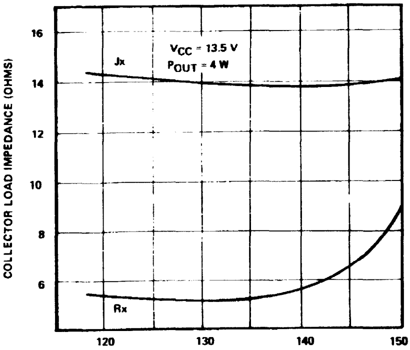
S88-SD1222-6-04



POWER OUTPUT VS POWER INPUT

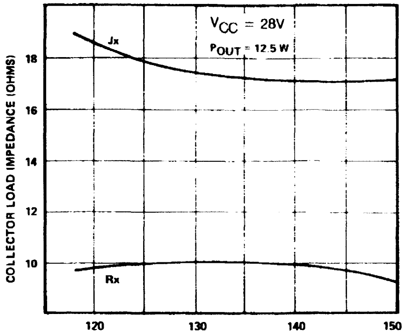
S88-SD1222-6-05

IMPEDANCES DATA (typical)



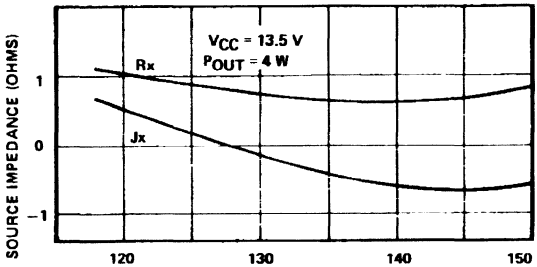
SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY

S88-SD1222-6-06



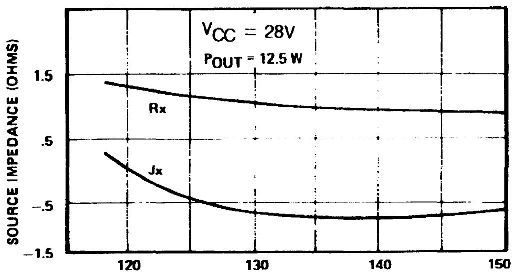
SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY

S88-SD1222-6-07



SERIES SOURCE IMPEDANCE VS. FREQUENCY

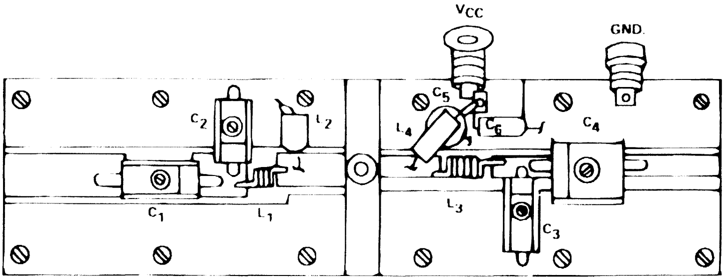
S88-SD1222-6-08

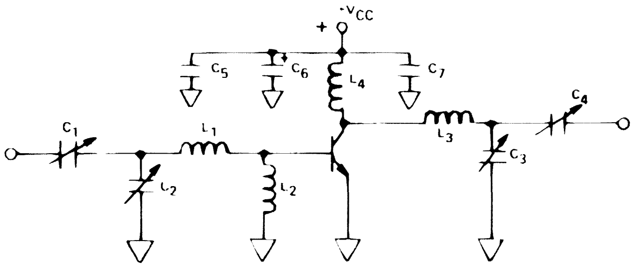


SERIES SOURCE IMPEDANCE VS. FREQUENCY

S88-SD1222-6-09

TEST FIXTURE (typical)





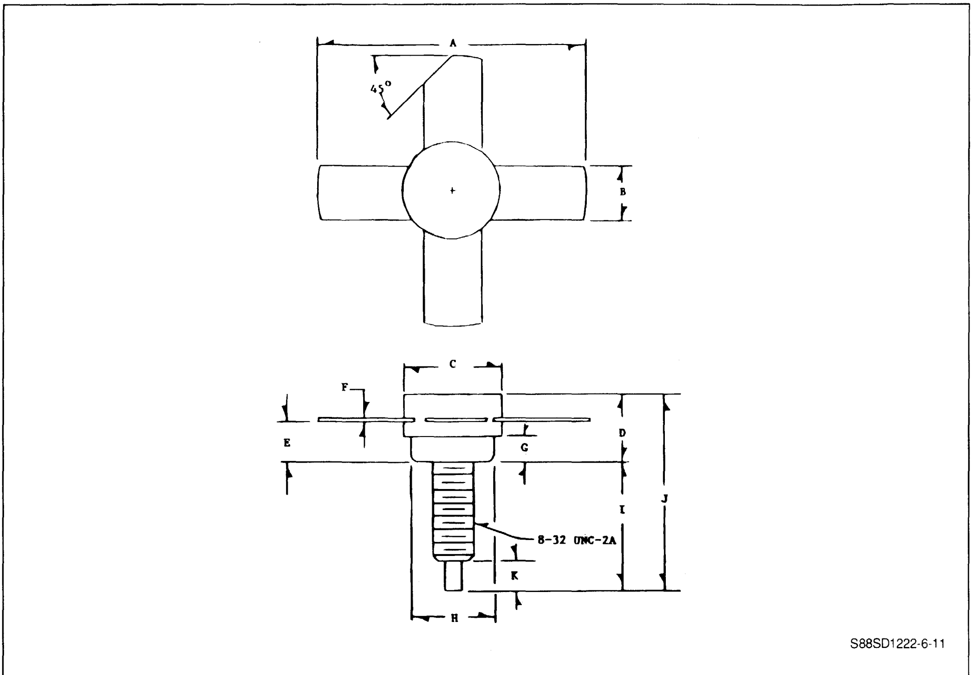
S88-SD1222-6-10

PARTS LIST

C_1, C_2	ARCO 422
C_3	ARCO 422
C_4	ARCO 464
C_5	1000pf UNELCO
C_6	10µf, ELECTROLYTIC 35V
C_7	.01pf CERAMIC DISC
L_1	3T #22, 1/8 ID
L_2	RFC FERROXCUBE
L_3	2T #18, 1/4 ID
L_4	.47µH MOLDED CHOKE.

PACKAGE MECHANICAL DATA

.380 4LST



	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

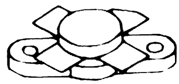
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON
MICROELECTRONICS

SD1224-2

RF & MICROWAVE TRANSISTORS
108...152MHz APPLICATIONS

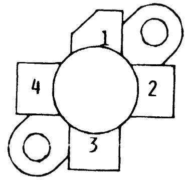
- CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 28V
- POWER OUT 40W
- POWER GAIN 7.6dB
- EFFICIENCY 60%
- GOLD METALLIZATION
- COMMON EMITTER



.380 4LFL (M113)
epoxy sealed

ORDER CODE	BRANDING
SD1224-02	SD1224-2

PIN CONNECTION



S88SD1224-2-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1224-2 is an epitaxial silicon NPN planar transistor designed primarily for 12.5V AM Class C RF amplifiers functional in the aviation band 118-136MHz and for 28V FM Class C RF amplifiers utilized in ground station transmitters. It withstands extremely high VSWR under rated conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	35.0	V
V_{CES}	Collector - Emitter Voltage	65	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	5.0	A
P_{tot}	Total Power Dissipation	60.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	2.9	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

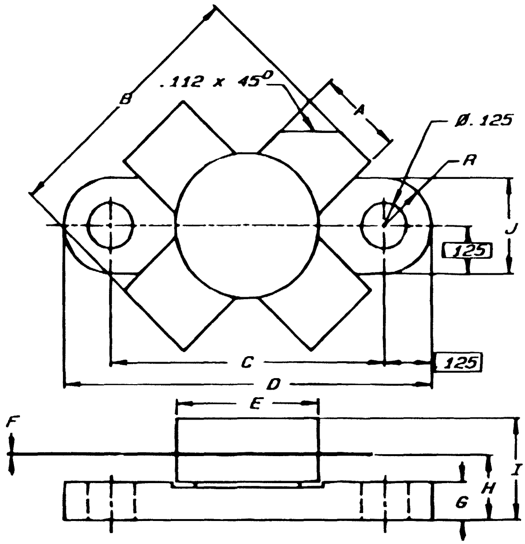
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 200mA	V_{BE} = 0	65.0			V
BV_{CEO}	I_C = 200mA	I_B = 0	35.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 30.0V	I_E = 0			1	mA
h_{FE}	V_{CE} = 5.0V	I_C = 500mA	5.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 28.0V		40.0			W
G_P	f = 175MHz	V_{CE} = 28.0V		7.6			dB
η_C	f = 175MHz	V_{CE} = 28V	P_o = 40W	60			%
C_{OB}	f = 1MHz	V_{CB} = 30.0V	I_E = 0			65.0	pF

PACKAGE MECHANICAL DATA

.380 4LFL



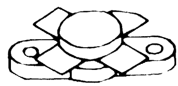
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON
MICROELECTRONICS

SD1224-10

RF & MICROWAVE TRANSISTORS
SSB APPLICATIONS

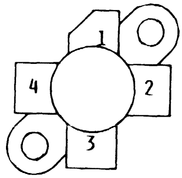
- SEMI LINEAR TRANSISTOR
- OPTIMIZED FOR SSB
- FREQUENCY 30MHz
- VOLTAGE 28V
- POWER OUT 30W
- POWER GAIN 18dB
- I_{MD} −28dB
- GOLD METALLIZATION
- COMMON EMITTTER



.380 4LFL(M113)
epoxy sealed

ORDER CODE	BRANDING
SD1224-10	SD1224-10

PIN CONNECTION



S88SD1224-10-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1224-10 is a 28V epitaxial silicon NPN planar transistor designed primarly for SSB communications. This device utilizes emitter ballasting for improved ruggedness and reliability.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CEO}	Collector - Emitter Voltage	36	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	4.5	A
P_{tot}	Total Power Dissipation	80	W
T_{stg}	Storage Temperature	− 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	2.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

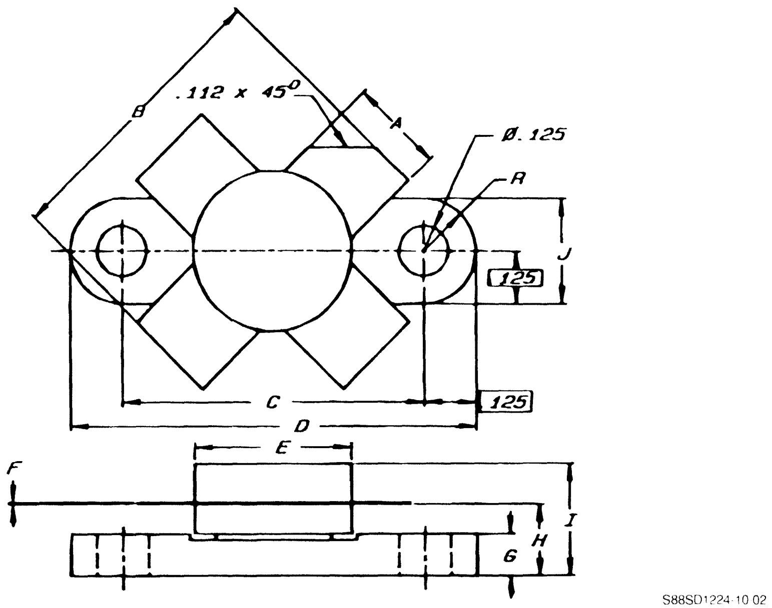
Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CES}	I_C = 200 mA	V_{BE} = 0	65			V
BV_{CEO}	I_C = 200 mA	I_B = 0	35			V
BV_{EBO}	I_E = 10 mA	I_C = 0	4			V
I_{CBO}	V_{CB} = 30 V	I_E = 0			1	mA
h_{FE}	V_{CE} = 5 V	I_C = 0.5 A	5	50		

DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	f = 30 MHz	V_{CE} = 28 V	I_{cq} = 25 mA	30			W
G_P	f = 30 MHz	V_{CE} = 28 V	I_{cq} = 25 mA	18	20		dB
IMD	f = 30 MHz	V_{CE} = 28 V	I_{cq} = 25 mA		– 32	– 28	dB
C_{ob}	f = 1 MHz	V_{CB} = 30 V	I_E = 0			70	pF

PACKAGE MECHANICAL DATA

.380 4LFL



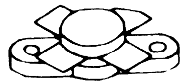
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON MICROELECTRONICS

SD1229-1

RF & MICROWAVE TRANSISTORS
130... 230MHz FM MOBILE APPLICATIONS

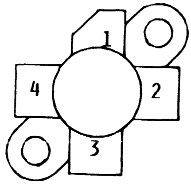
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 25W
- POWER GAIN 5dB
- COMMON EMITTER



.380 4LFL (M113)
epoxy sealed

ORDER CODE	**BRANDING**
SD1229-01	SD1229-1

PIN CONNECTION



S88SD1229-1-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1229-1 is an epitaxial silicon NPN planar transistor designed primarily for UHF communication transmitters. This device utilizes ballasted emitter resistors and improved metallization systems to achieve very high VSWR under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	25.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	4.0	A
P_{tot}	Total Power Dissipation	65.0	W
T_{stg}	Storage Temperature	− 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	2.7	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

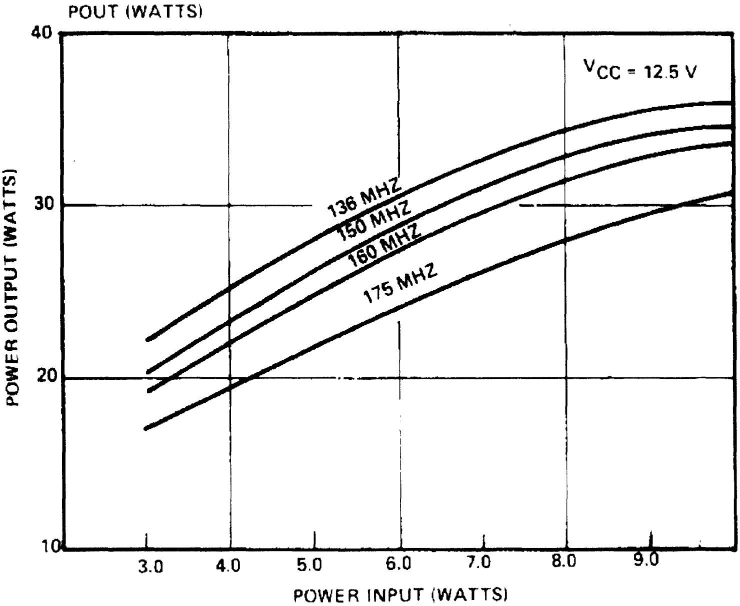
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 15mA	V_{BE} = 0	36			V
BV_{CEO}	I_C = 100mA	I_B = 0	18			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1A	20.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		25.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		5.0			dB
C_{OB}	f = 1MHz	V_{CB} = 15.0V	I_E = 0			120	pF

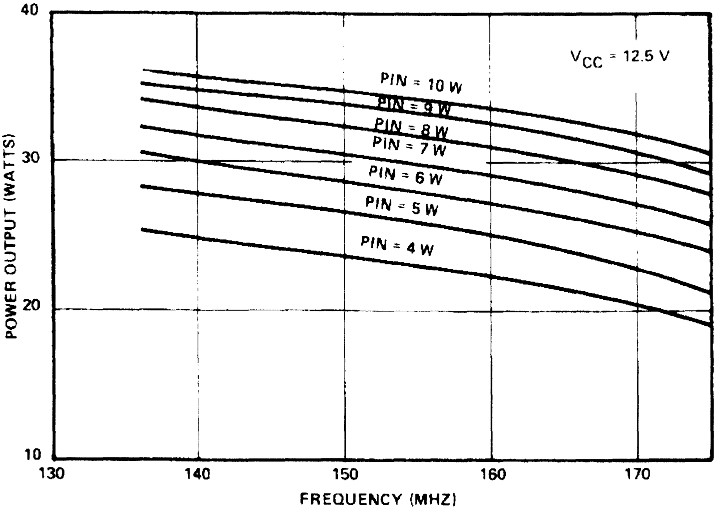
APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS. POWER INPUT



S88SD1229-1-02

POWER OUTPUT VS. FREQUENCY

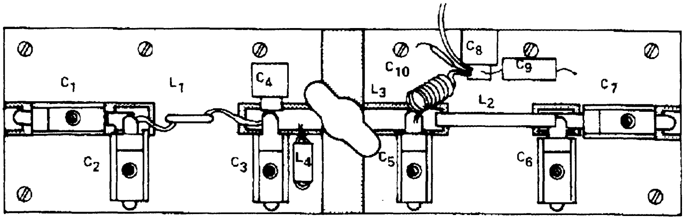


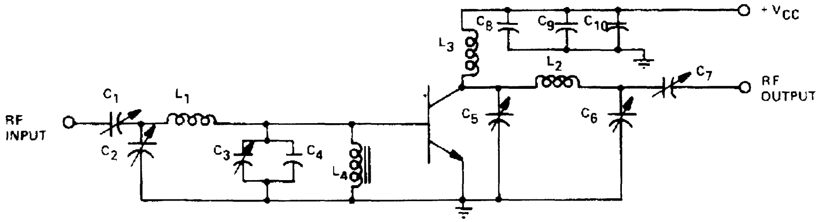
S88SD1229-1-03

IMPEDANCE DATA (typical)

V_{cc}	P_{IN} (W)	P_{OUT} (W)	f_o (MHz)	Z_S	Z_{CL}
12.5V	7.0	30.5	150.	1.58 + J .65Ω	2.87 + J 1.83Ω
12.5V	7.0	26.0	175.	1.00 + J 1.83Ω	2.89 + J 4.1

TEST CIRCUIT



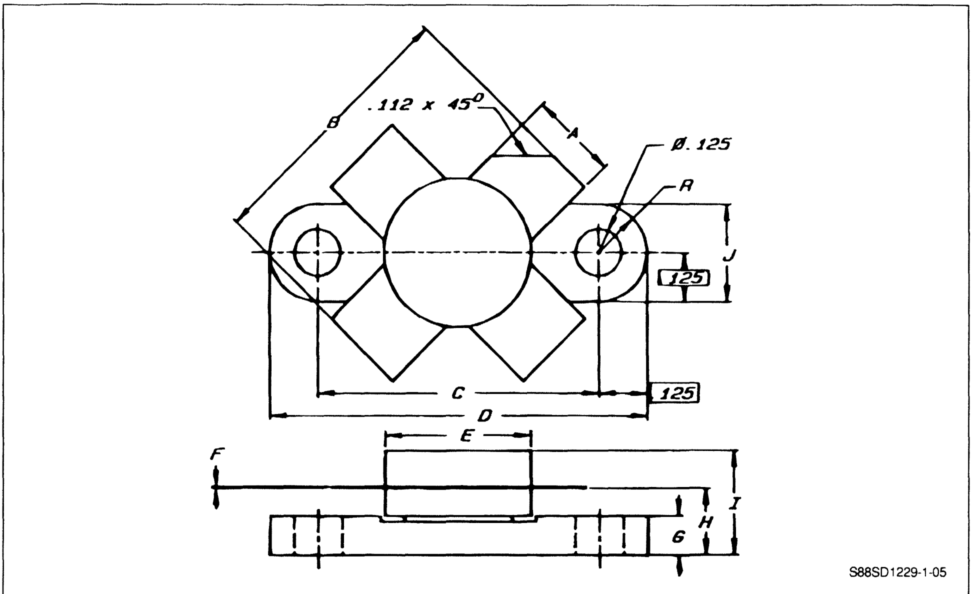


S88SD1229-1-04

C_1, C_2, C_6	- 4 – 40pf, ARCO 422	C_{10}	- .01µf disc
C_3, C_5	- 7 – 100pf, ARCO 423	L_1	- 1 turn, No. 18awg., 5/16" ID
C_7	- 24 – 200pf, ARCO 425	L_2	- Cµ .003", 1 3/4" L, 3/16" WΩ5/16"
C_4	- 25pf UNELCO	L_3	- 10 turns No. 22 enameled tight wind on 300Ω 1/2 watt carbon resistor
C_8	- 1000pf UNELCO		
C_9	- 10µf electrolytic 35 VDC	L_4	- RFC, 2 1/2 turns on VK2K/07-3B ferrocube

PACKAGE MECHANICAL DATA

.380 4LFL



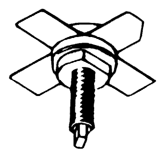
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON
MICROELECTRONICS

SD1272

RF & MICROWAVE TRANSISTORS
130... 230MHz FM MOBILE APPLICATIONS

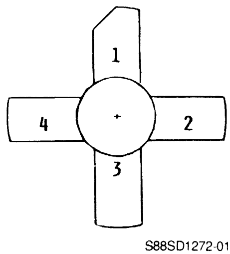
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 25W
- POWER GAIN 9.2dB
- COMMON EMITTER



.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	BRANDING
SD1272	SD1272

PIN CONNECTION



1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1272 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. This device utilizes a nichrome aluminum metallization system to withstand infinite VSWR under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	4.0	A
P_{tot}	Total Power Dissipation	65.0	W
T_{stg}	Storage Temperature	− 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

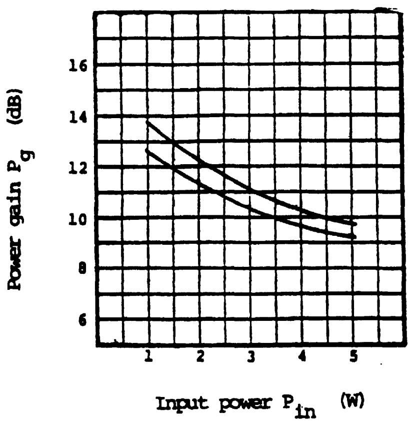
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 20mA	I_E = 0	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 250mA	5.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		25.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		9.2			dB
C_{OB}	f = 1MHz	V_{CB} = 15.0V	I_E = 0			130.0	pF

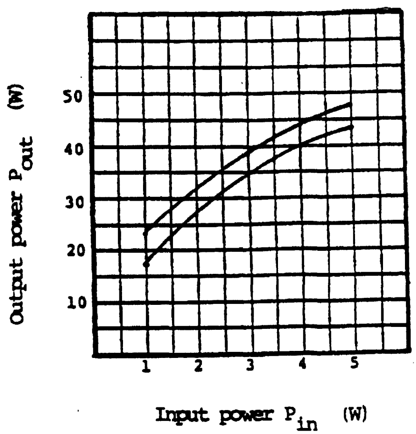
APPLICATION INFORMATION (typical curves)

POWER GAIN VS INPUT POWER



S88SD1272-02

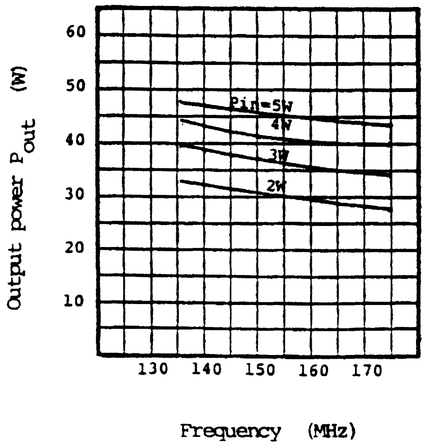
OUTPUT POWER VS INPUT POWER



S88SD1272-03

APPLICATION INFORMATION (typical curves)

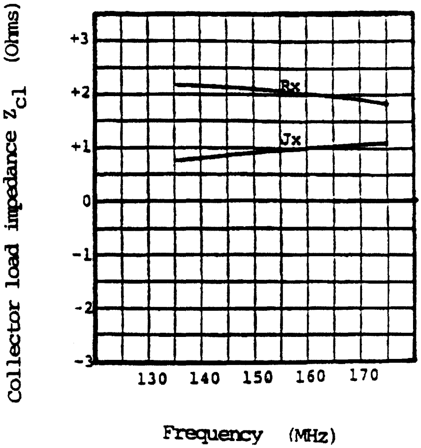
OUTPUT POWER VS FREQUENCY



S88SD1272-05

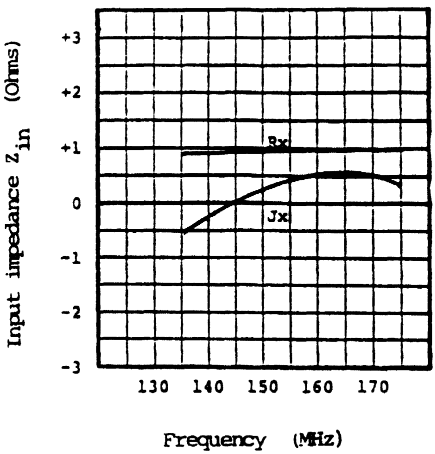
IMPEDANCE DATA (typical)

COLLECTOR LOAD IMPEDANCE VS FREQUENCY



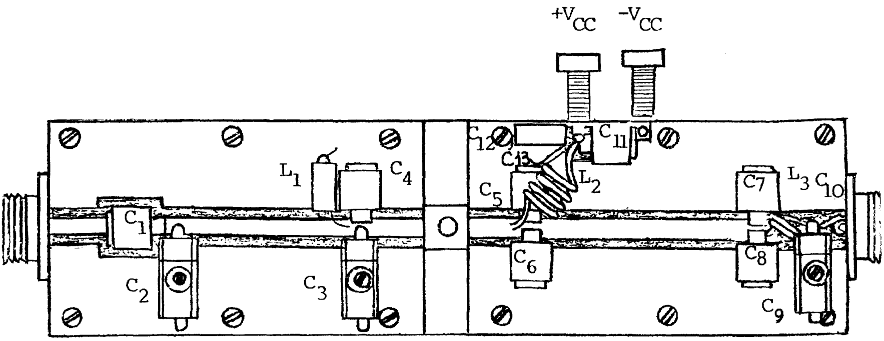
S88SD1272-07

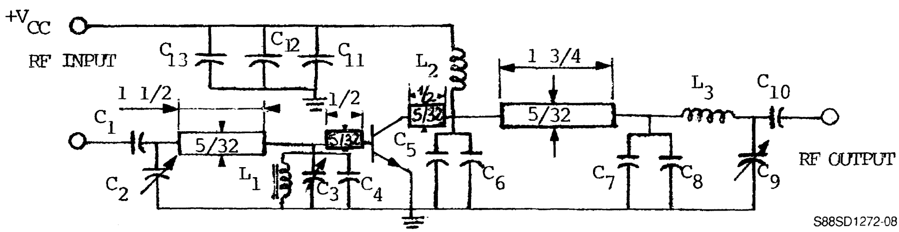
INPUT IMPEDANCE VS FREQUENCY



S88SD1272-06

TEST CIRCUIT



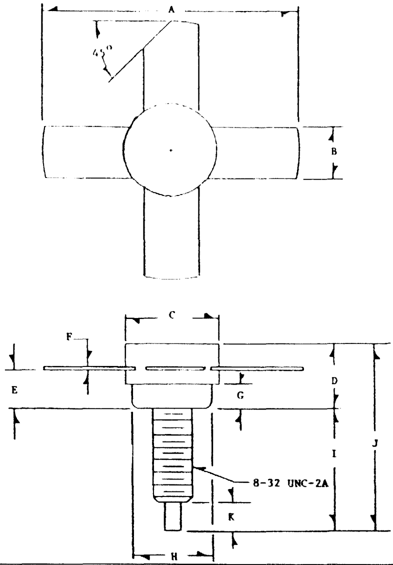


C_1, C_{11}	: 1000pf, UNELCO	C_{12}	: 10μF, ELECTROLYTIC, 35 VDC
C_2, C_3	: 24-200pf, ARCO	C_{13}	: 0.10μF ERIE RED CAP
C_4	: 56pf, UNELCO	L_1	: RFC, 2 1/2 turns on VK 211/07-3B Ferrocube
C_5, C_6	: 150pf, UNELCO	L_2	: 4 turns, # 18AWG, enameled, 3/8" I.D.
C_7, C_8	: 51pf, UNELCO	L_3	: 2 1/2 turns, # 18 AWG, enameled, 1/4" I.D.
C_9	: 7-100pf, ARCO		
C_{10}	: 0.01μF, ERIE RED CAP		

Material board double sided copper, 1/16" THK, 3M– K– 6098, mounted on 3/8 brass plates.

PACKAGE MECHANICAL DATA

.380 4LSTUD



	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

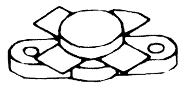
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON
MICROELECTRONICS

SD1272-2

RF & MICROWAVE TRANSISTORS
130... 230MHz FM MOBILE APPLICATIONS

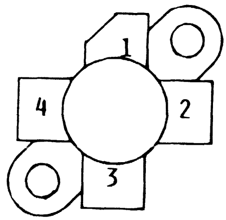
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 25W
- POWER GAIN 9.2dB
- COMMON EMITTER



.380 4LFL (M113)
epoxy sealed

ORDER CODE	**BRANDING**
SD1272-02	SD1272-2

PIN CONNECTION



S88SD1272-2-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1272-2 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. This device utilizes a nichrome aluminium metallization system to withstand very high VSWR under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	4.0	A
P_{tot}	Total Power Dissipation	65.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

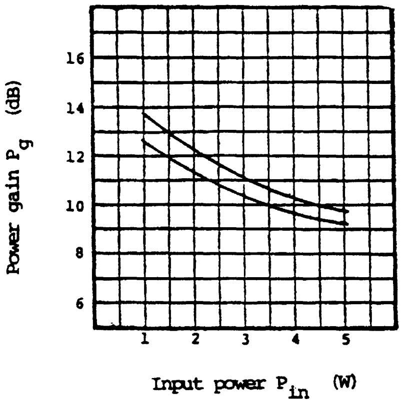
Symbol	Test Conditions			Value		Unit
				Min.	Typ.	Max.	
BV_{CBO}	I_C = 20mA	I_E = 0	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 250mA	20.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		25.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		9.2			dB
C_{OB}	f = 1MHz	V_{CB} = 15.0V	I_E = 0			130.0	pF

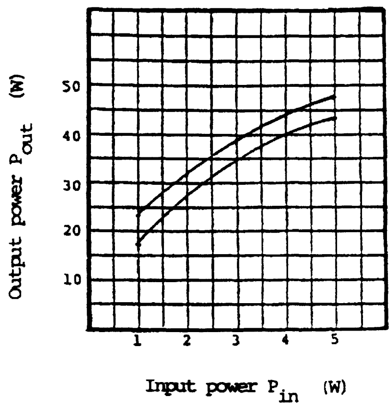
APPLICATION INFORMATION (typical curves)

POWER GAIN VS INPUT POWER



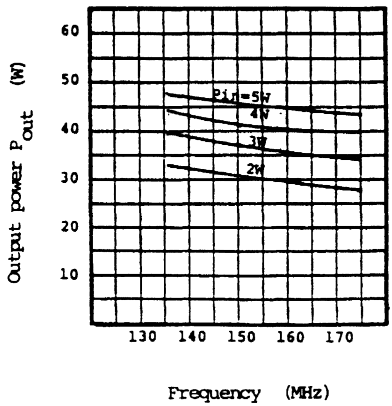
S88SD1272-1-02

OUTPUT POWER VS INPUT POWER



S88SD1272-2-03

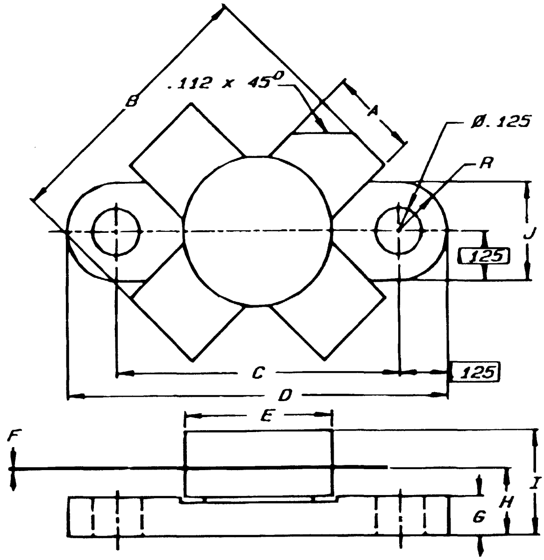
OUTPUT POWER VS FREQUENCY



S88SD1272-3-04

PACKAGE MECHANICAL DATA

.380 4LFL

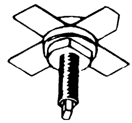


	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SD1274

RF & MICROWAVE TRANSISTORS
130...230MHz FM MOBILE APPLICATIONS

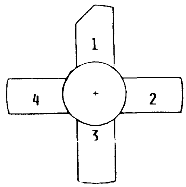
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 30W
- POWER GAIN 10dB
- COMMON EMITTER



.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	**BRANDING**
SD1274	SD1274

PIN CONNECTION



S88SD1274-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1274 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. This device utilizes a nichrome aluminum metallization system to withstand very high VSWR under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	8.0	A
P_{tot}	Total Power Dissipation	70.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

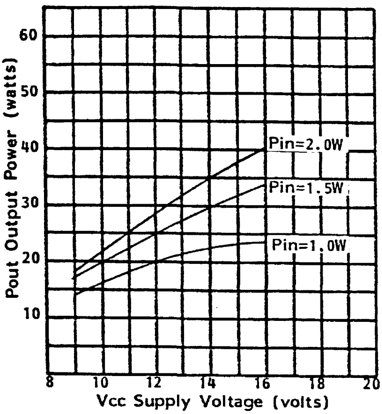
Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
BV_{CES}	I_C = 15.0mA	V_{BE} = 0		36.0			V
BV_{CEO}	I_C = 50.0mA	I_E = 0		18.0			V
BV_{EBO}	I_E = 5.0mA	I_C = 0		4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0				5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 250mA		20.0			

DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	f = 175MHz	V_{CE} = 12.5V		30.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		10.0			dB
C_{OB}	f = 1.0MHz	V_{CB} = 15.0V	I_E = 0		95.0		pF

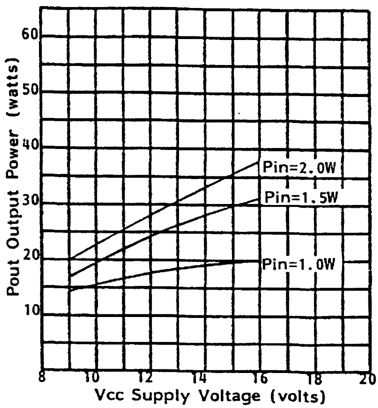
APPLICATION INFORMATION (typical curves)

Output Power vs Supply Voltage
F = 136 MHz



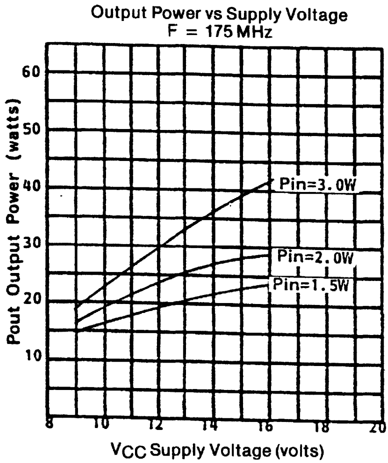
S88SD1274-02

Output Power vs Supply Voltage
F = 150 MHz

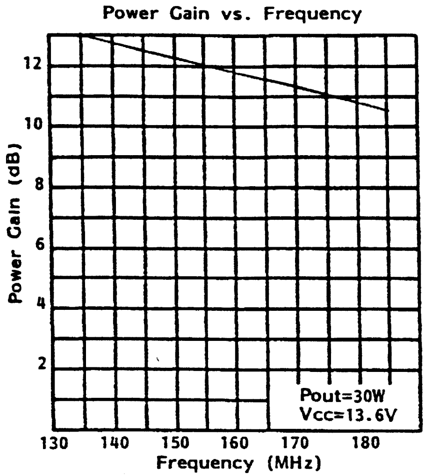


S88S1274-03

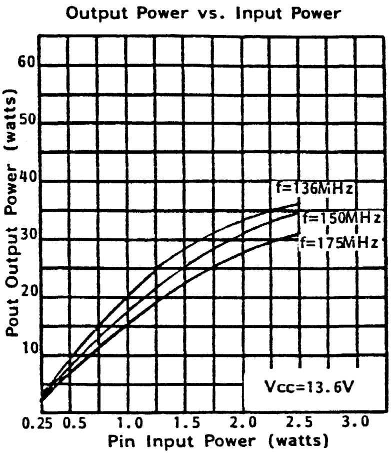
APPLICATION INFORMATION (typical



S88SD1274-04



S88S1274-05



S88SD1274-06

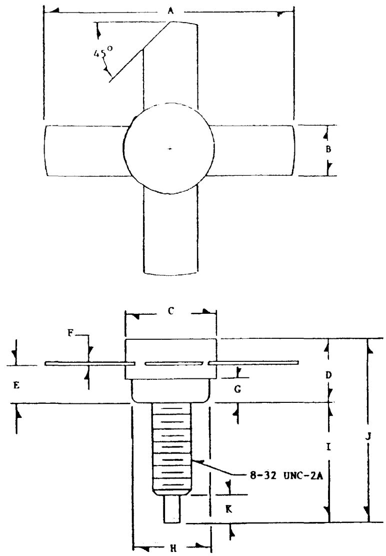
IMPEDANCE DATA (typical)

$Z_S = 1.0 + j\,0.4\Omega$
$Z_{CL} = 2.3 + 0.1\Omega$

F = 175MHz
$P_{IN} = 3.0W$
$V_{CC} = 12.5V$

PACKAGE MECHANICAL DATA

.380 4LSTUD



S88SD1274-08

	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

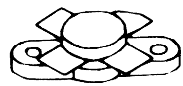
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON
MICROELECTRONICS

SD1274-1

RF & MICROWAVE TRANSISTORS 130...230MHz FM MOBILE APPLICATIONS

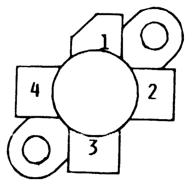
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 30W
- POWER GAIN 10dB
- COMMON EMITTER



.380 4LFL (M113)
epoxy sealed

ORDER CODE	**BRANDING**
SD1274-01	SD1274-1

PIN CONNECTION



S88SD1274-1-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1274-1 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. This device utilizes a nichrome aluminum metallization system to withstand very high VSWR under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	8.0	A
P_{tot}	Total Power Dissipation	70.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

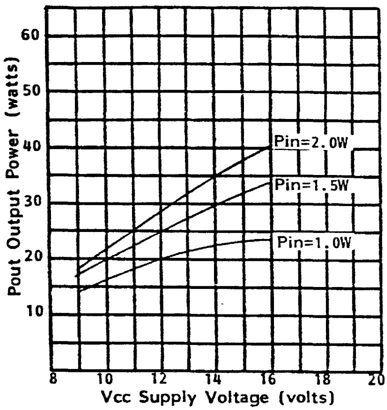
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 15.0mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50.0mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 5.0mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 250mA	20.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		30.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		10.0			dB
η_C	f =	V_{CE} =					%
C_{OB}	f = 1.0MHz	V_{CB} = 15.0V	I_E = 0		95.0		pF

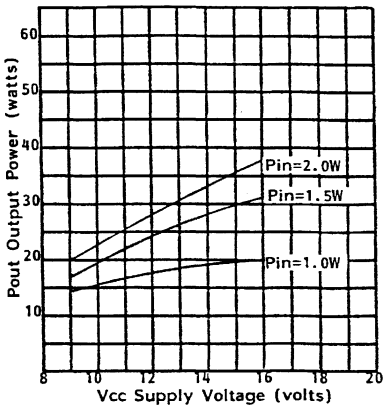
APPLICATION INFORMATION (typical curves)

Output Power vs Supply Voltage
F = 136 MHz



S88SD1274-1-02

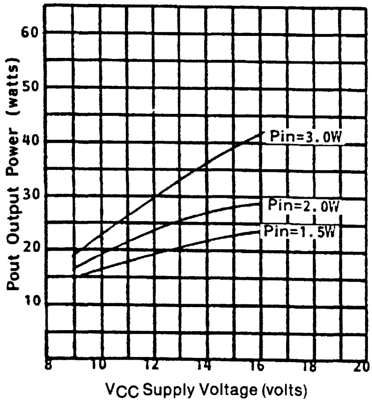
Output Power vs Supply Voltage
F = 150 MHz



S88S1274-1-03

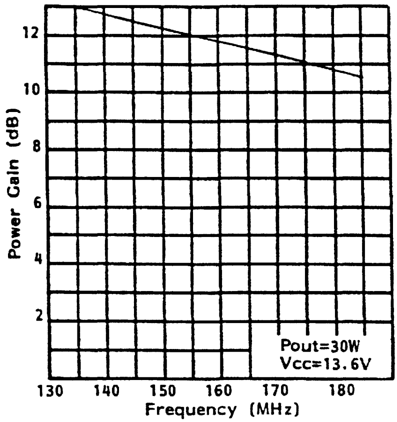
APPLICATION INFORMATION (typical curves) (continued)

Output Power vs Supply Voltage
F = 175 MHz



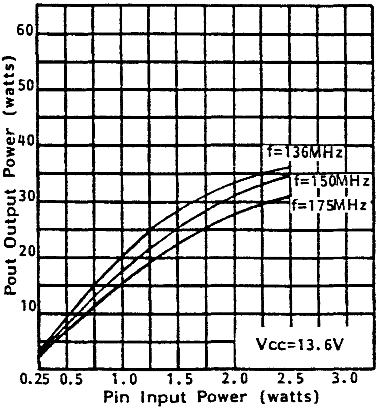
S88SD1274-1-04

Power Gain vs. Frequency



S88S1274-1-05

Output Power vs. Input Power



S88SD1274-1-06

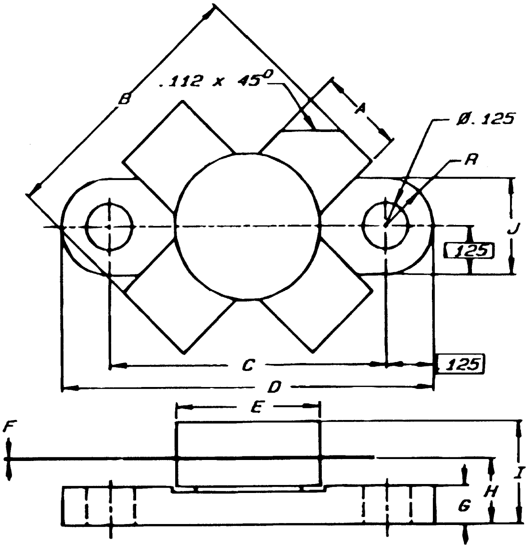
IMPEDANCE DATA (typical)

$Z_S = 1.0 + j\,0.4\Omega$
$Z_{CL} = 2.3 + j\,0.1\Omega$

F = 175MHz
$P_{IN} = 3.0W$
$V_{CC} = 12.5V$

PACKAGE MECHANICAL DATA

.380 4LFL



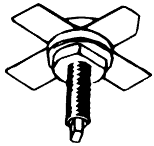
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON MICROELECTRONICS

SD1275

RF & MICROWAVE TRANSISTORS 130... 230MHz FM MOBILE APPLICATIONS

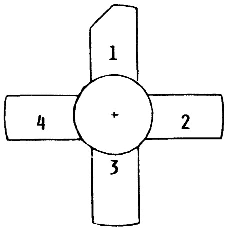
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 40W
- POWER GAIN 9.0dB
- COMMON EMITTER



.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	**BRANDING**
SD1275	SD1275

PIN CONNECTION



1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1275 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. This device utilizes a nichrome aluminum metallization system to withstand extremely high VSWR under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	8.0	A
P_{tot}	Total Power Dissipation	70.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

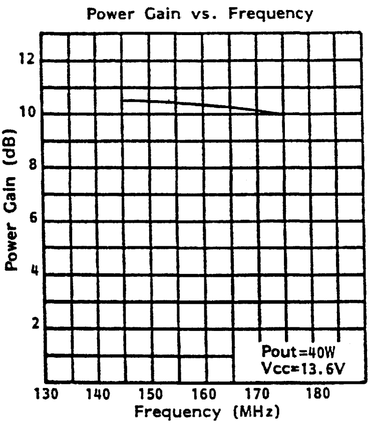
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 15.0mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50.0mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 5.0mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 250mA	20.0			

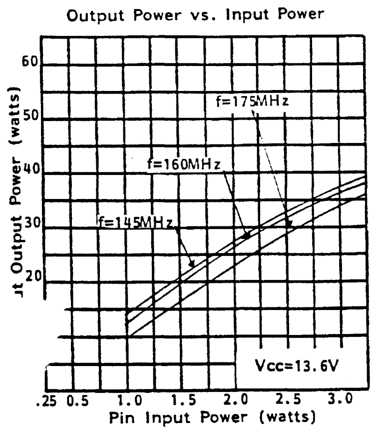
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 160MHz	V_{CE} = 13.6V		40.0			W
G_P	f = 160MHz	V_{CE} = 13.6V		9.0			dB
C_{OB}	f = 1.0MHz	V_{CB} = 15.0V	I_E = 0		95.0		pF

APPLICATION INFORMATION (typical curves)

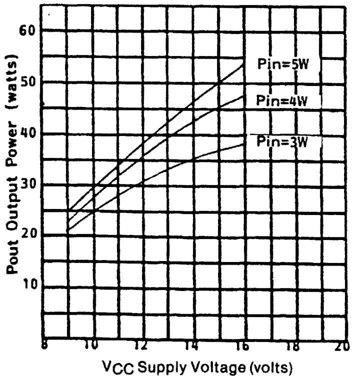


S88SD1275-02



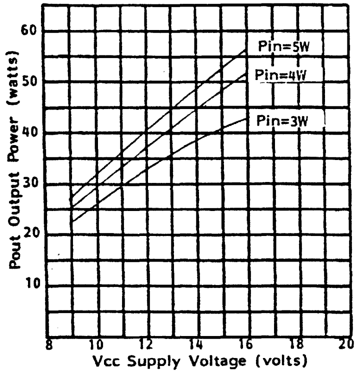
S88SD1275-03

Output Power vs Supply Voltage
F = 175 MHz



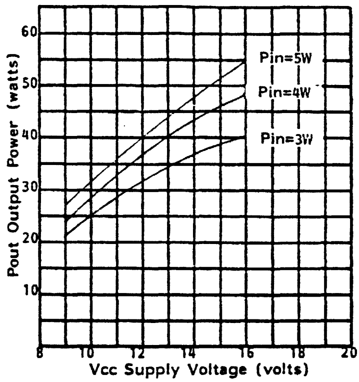
S88SD1275-04

Output Power vs Supply Voltage
F = 145 MHz



S88SD1275-05

Output Power vs Supply Voltage
F = 160 MHz



S88SD1275-06

IMPEDANCE DATA (typical)

$Z_S = 1.0 + j\,0.4\Omega$

$Z_{CL} = 2.3 + j\,0.1\Omega$

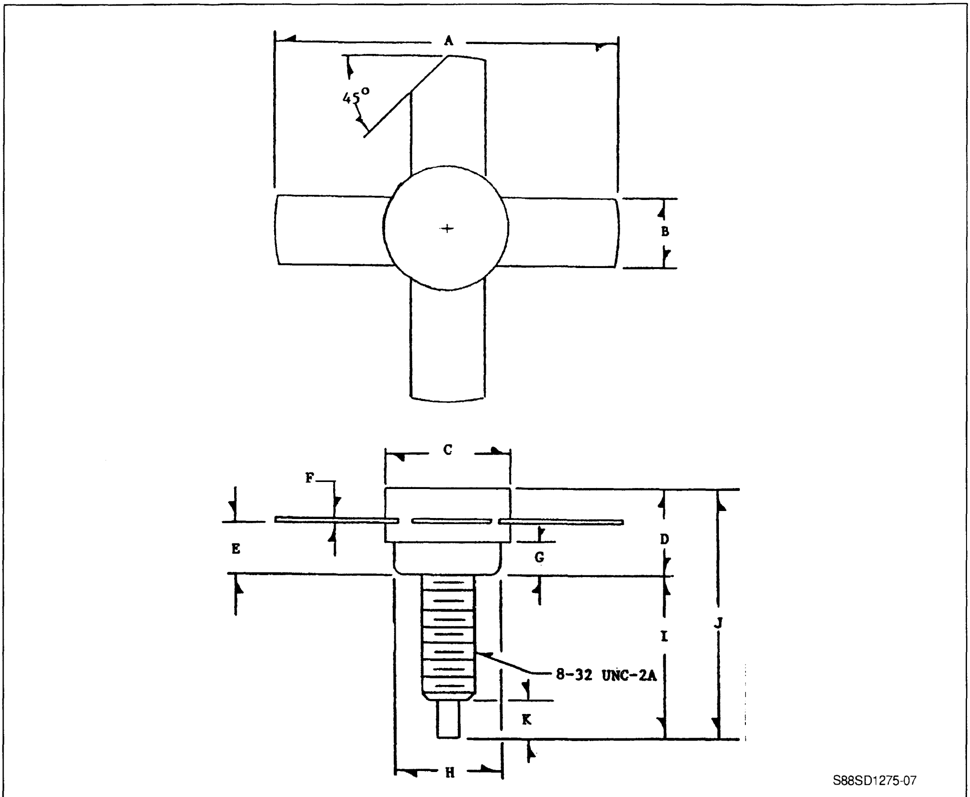
F = 175MHz

$P_{IN} = 3.0W$

$V_{CC} = 12.5V$

PACKAGE MECHANICAL DATA

.380 4LSTUD



	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

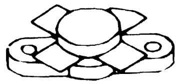
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON
MICROELECTRONICS

SD1275-1

RF & MICROWAVE TRANSISTORS
130...230MHz FM MOBILE APPLICATIONS

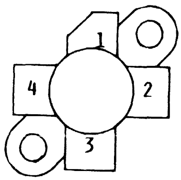
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER ONT 40W
- POWER GAIN 9.0dB
- COMMON EMITTER



.380 4LFL (M113)
epoxy sealed

ORDER CODE	**BRANDING**
SD1275-01	SD1275-1

PIN CONNECTION



S88SD1275 1 01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1275-1 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. This device utilizes a nichrome aluminum metallization system to withstand extremely high VSWR under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	8.0	A
P_{tot}	Total Power Dissipation	70.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

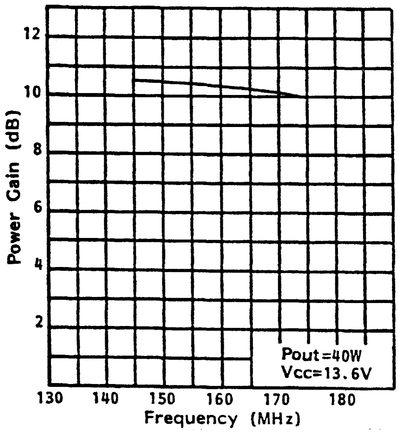
Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CES}	I_C = 15.0mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50.0mA	I_E = 0	18.0			V
BV_{EBO}	I_E = 5.0mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 250mA	20.0			

DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	f = 160MHz	V_{CE} = 13.6V		40.0			W
G_P	f = 160MHz	V_{CE} = 13.6V		9.0			dB
C_{OB}	f = 1.0MHz	V_{CB} = 15.0V	I_E = 0		95.0		pF

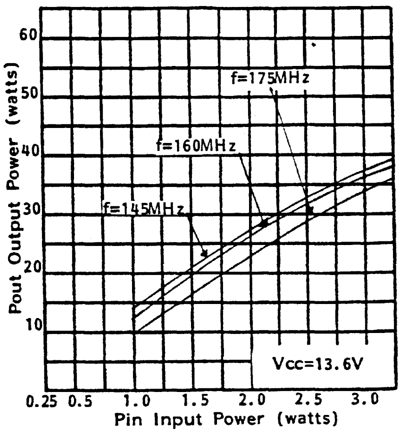
APPLICATION INFORMATION (typical curves)

Power Gain vs. Frequency



S88SD1275-1-02

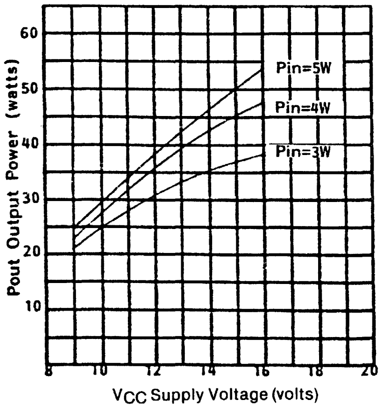
Output Power vs. Input Power



S88S1275-1-03

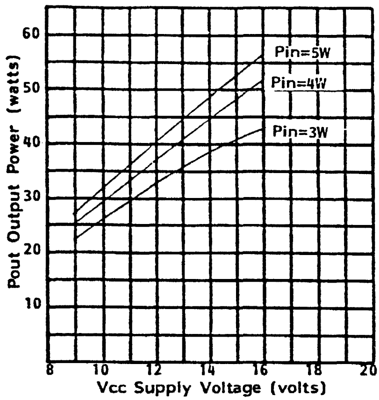
APPLICATION INFORMATION (typical curves) (continued)

Output Power vs Supply Voltage
F = 175 MHz



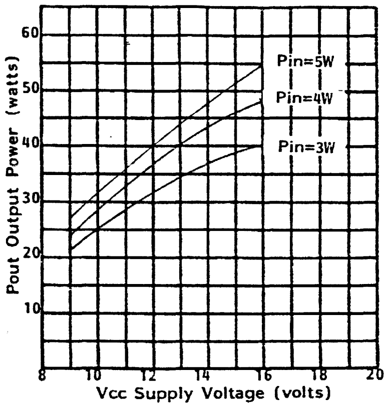
S88SD1275-1-04

Output Power vs Supply Voltage
F = 145 MHz



S88S1275-1-05

Output Power vs Supply Voltage
F = 160 MHz



S88SD1275-1-06

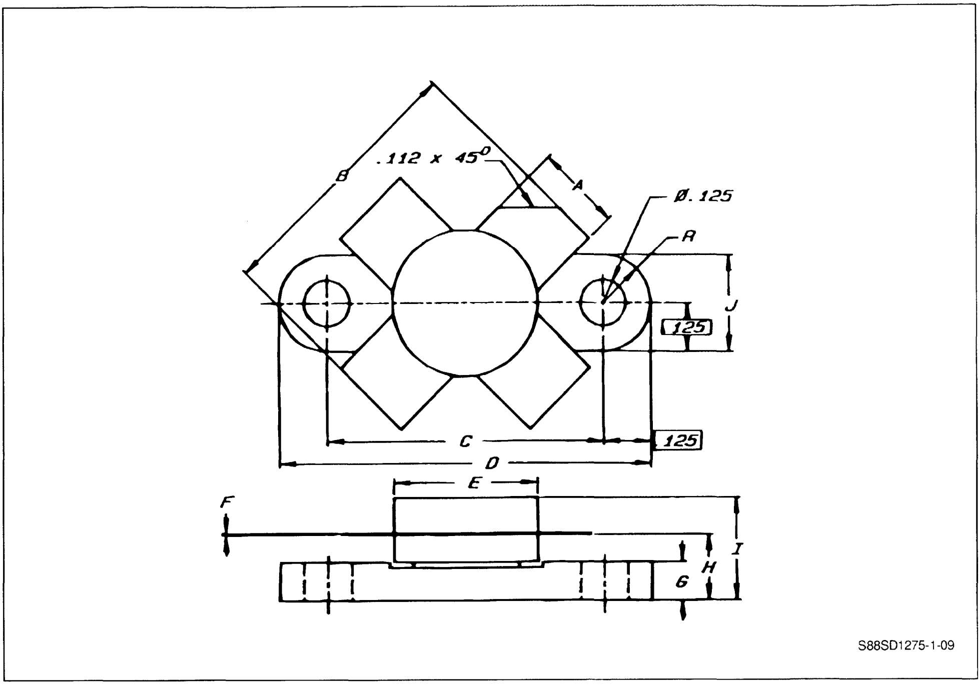
IMPEDANCE DATA (typical)

$Z_S = 1.0 + j\,0.4\ \Omega$
$Z_{CL} = 2.3 + j\,0.1\ \Omega$

$P_{IN} = 3.0W$
$V_{CC} = 12.5V$
F = 175MHz

PACKAGE MECHANICAL DATA

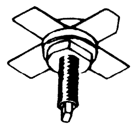
.380 4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

RF & MICROWAVE TRANSISTORS
130...230MHz FM MOBILE APPLICATIONS

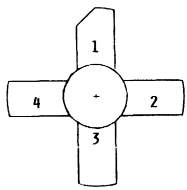
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 40W
- POWER GAIN 6.0dB
- COMMON EMITTER



.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	**BRANDING**
SD1278	SD1278

PIN CONNECTION



S88SD1278-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1278 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. This device utilizes a nichrome aluminum metallization system to achieve very high VSWR at rated conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	6.0	A
P_{tot}	Total Power Dissipation	80.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	2.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

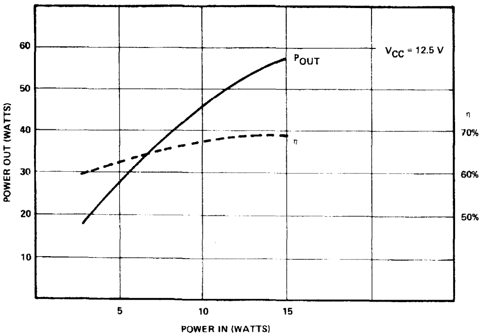
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 200mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 200mA	I_E = 0	18.0			V
BV_{EBO}	I_E = 2.5mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 250mA	5.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		40.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		6.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0		200		pF

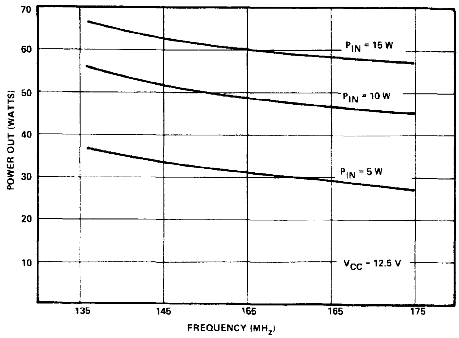
APPLICATION INFORMATION (typical curves)

POWER OUT VS POWER IN



S88SD1278-02

POWER OUT VS FREQUENCY



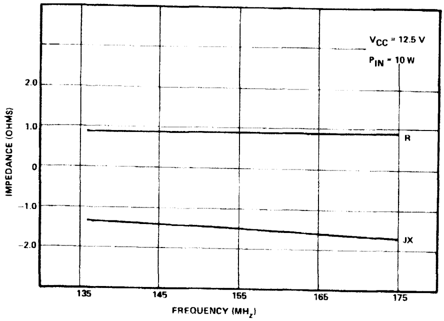
S88S1278-03

IMPEDANCE DATA (typical)

$Z_S = 0.85 - j\,1.75\Omega$
$Z_{CL} = 1.50 - j\,0.8\Omega$

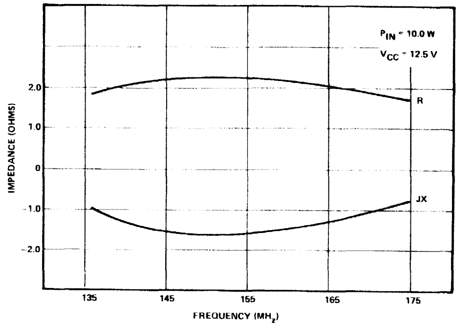
F = 175MHz
$V_{CE} = 12.5V$
$P_i = 10W$

SERIES SOURCE IMPEDANCE VS FREQUENCY



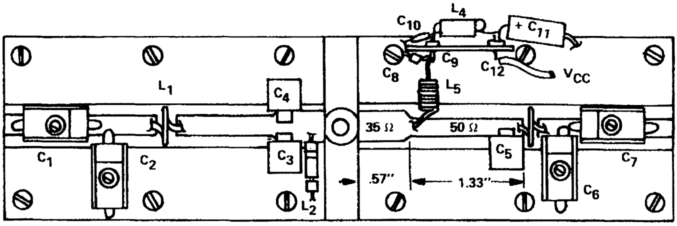
S88SD1278-04

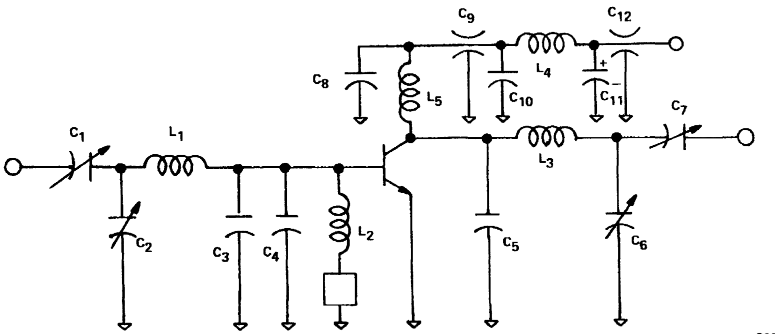
SERIES COLLECTOR LOAD IMPEDANCE VS FREQUENCY



S88SD1278-05

TEST CIRCUIT



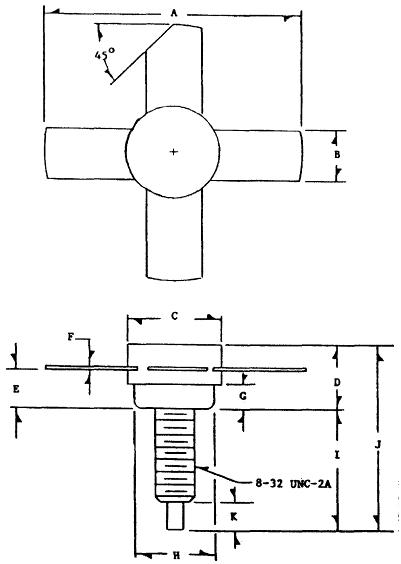


S88S1278-06

C1, C7	ARCO 423
C2, C6	ARCO 422
C3	UNELCO 82pF
C4	UNELCO 120pF
C5	UNELCO 56pF
C8	0.1µF ERIE RED CAP
C9, C12	470pF FEEDTHRU
C10	0.1µF DISC
C11	10µF, 35V TANTALITIC
L1, L3	1TURN # 16 AWG 3/8 DIA.
L2	CHOKE .33µh WITH FERROXCUBE 3B BEAD
L4	RFC FERROXCUBE 3B
L5	10 TURNS # 22 AWG 1/8" DIA. CLOSE WOUND

PACKAGE MECHANICAL DATA

.380 4LSTUD



	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

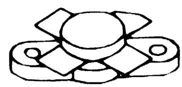
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON
MICROELECTRONICS

SD1285

RF & MICROWAVE TRANSISTORS SSB APPLICATIONS

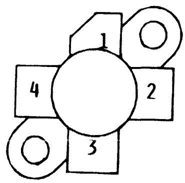
- OPTIMIZED FOR SSB
- FREQUENCY 30MHz
- VOLTAGE 12.5V
- POWER OUT 20W
- POWER GAIN 15dB
- I_{MD} – 30dB
- GOLD METALLIZATION
- COMMON EMITTER



.380 4LSTUD (M113)
epoxy sealed

ORDER C5ODE	**BRANDING**
SD12	SD1285

PIN CONNECTION



S88SD1285-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1285 is a 12.5V epitaxial NPN planar transistor designed primarily for SSB communications. This device utilizes emitter ballasting to achieve extreme ruggedness under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector – Base Volage	36	V
V_{CEO}	Collector – Emitter Voltage	18	V
V_{EBO}	Emitter – Base Voltage	4	V
I_C	Collector Current	4.5	A
P_{tot}	Total Power Dissipation	80	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction Case Thermal Resistance	2.2	°C/W

STATIC

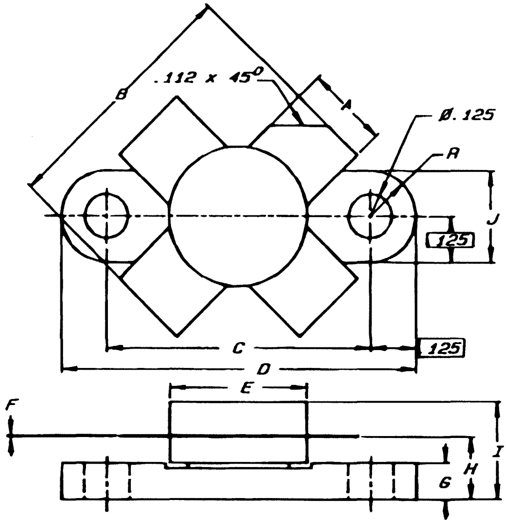
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	$I_C = 50$ mA	$V_{BE} = 0$	36			V
BV_{CEO}	$I_C = 50$ mA	$I_B = 0$	18			V
BV_{EBO}	$I_E = 5$ mA	$I_C = 0$	4			V
I_{CBO}	$V_{CB} = 15$ V	$I_C = 0$			5	mA
h_{FE}	$V_{CE} = 5$ V	$I_C = 1$ A	10	50		

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 30 MHz	$V_{CE} = 12\ .5$ V	$I_{cq} = 25$ mA	20			W
G_P	f = 30 MHz	$V_{CE} = 12.5$ V	$I_{cq} = 25$ mA	15	18		dB
IMD	f = 30 MHz	$V_{CE} = 12.5$ V	$I_{cq} = 25$ mA			– 30	dB
C_{ob}	f = 1 MHz	$V_{CB} = 12.5$ V	$I_E = 0$		100		pF

PACKAGE MECHANICAL DATA

.380 4 LFL



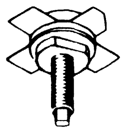
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON
MICROELECTRONICS

SD1290

RF & MICROWAVE TRANSISTORS 27-88MHz FM APPLICATIONS

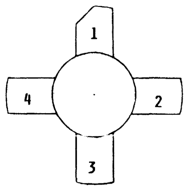
- FM CLASS C TRANSISTOR
- FREQUENCY 50 MHz
- VOLTAGE 12.5 V
- POWER OUT 40 W
- POWER GAIN 10 dB
- EFFICIENCY 55 %
- GOLD METALLIZATION
- COMMON EMITTER



.500 4LSTUD (M130)
epoxy sealed

ORDER CODE	BRANDING
SD1290	SD1290

PIN CONNECTION



S88SD1290-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1290 is a 12.5 V epitaxial silicon NPN planar transistor designed primarily for land mobile transmitter applications. This device utilizes emitter ballasting and is extremely stable and capable of withstanding extremely high VSWR under rated conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector – Base Voltage	36	V
V_{CEO}	Collector – Emitter Voltage	18	V
V_{EBO}	Emitter – Base Voltage	4	V
I_C	Collector Current	10	A
P_{tot}	Total Power Dissipation	115	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th\ (j-c)}$	Junction-case Thermal Resistance	1.55	°C/W

March 1989

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100 mA	V_{BE} = 0	36			V
BV_{CEO}	I_C = 50 mA	I_B = 0	18			V
BV_{EBO}	I_E = 10 mA	I_C = 0	4			V
I_{CBO}	V_{CB} = 15 V	I_E = 0			10	mA
h_{FE}	V_{CE} = 5 V	I_C = 1 A	10	60		

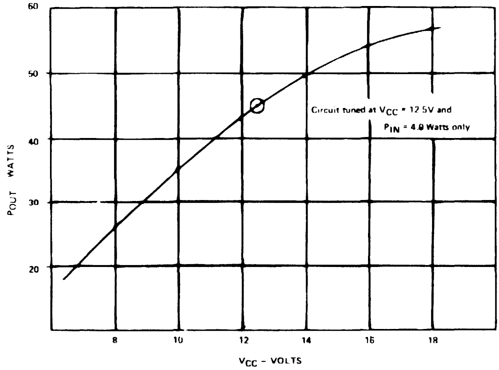
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 50 MHz	V_{CE} = 12.5 V		40			W
G_P	f = 50 MHz	V_{CE} = 12.5 V		10	10.5		dB
η_C	f = 50 MHz	V_{CE} = 12.5 V		55	60		%
C_{ob}	f = 1 MHz	V_{CB} = 12.5 V	I_E = 0		200		pF

APPLICATION INFORMATION

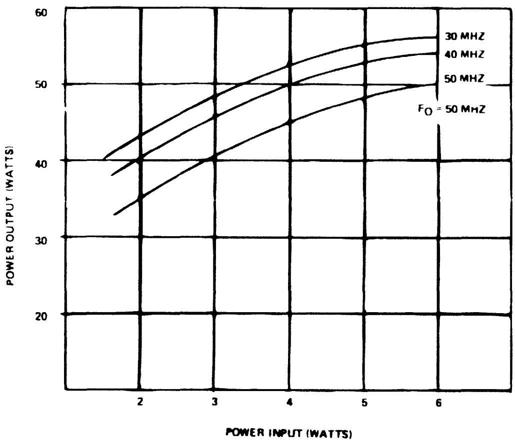
TYPICAL CURVES

Power out vs. Frequency.



S88SD1290-02

Power out vs. Power in.



S88SD1290-03

IMPEDANCES DATAS (typical)

at f = 50 MHz

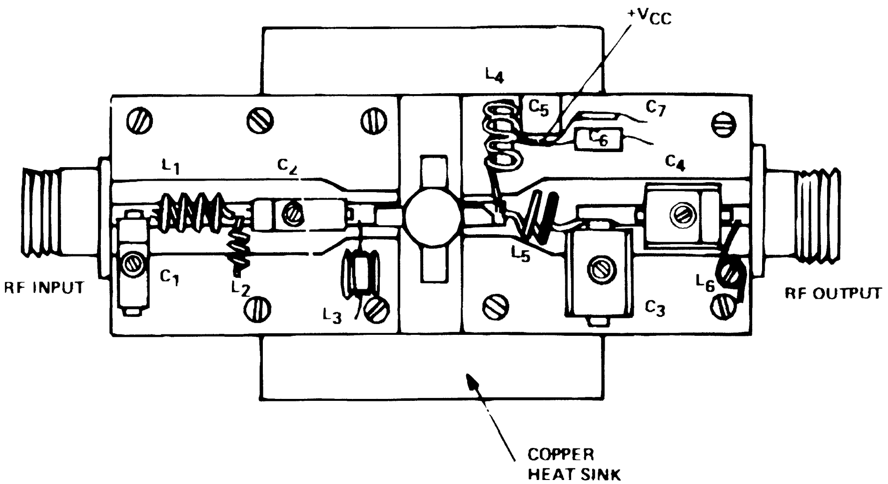
V_{CC} = 12.5 V

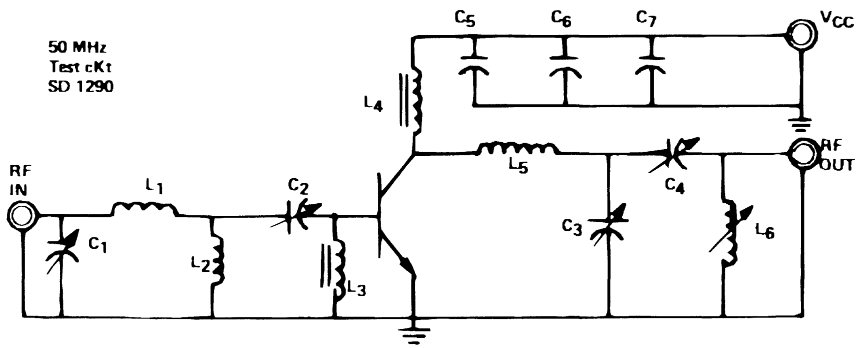
P_O = 40 W.

$Z_S = 1.2 + j_o$ OHMS

$Z_L = 1.75 + j_o$ OHMS.

TEST FIXTURE





S88SD1290-04

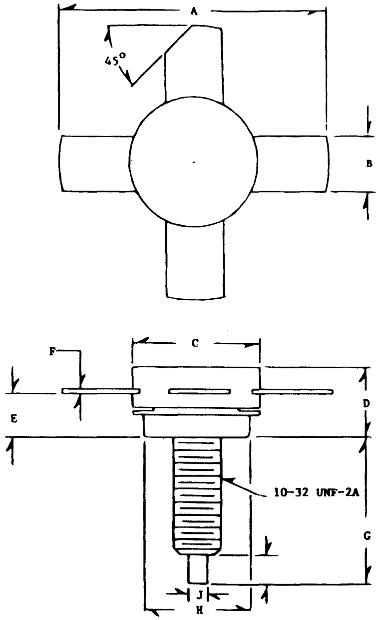
COMPONENT LIST

C_1, C_2 24-200pfd ARCO 425
C_3 50-380pfd ARCO 465
C_4 9-180pfd ARCO 463
L_1 10 TURNS #16, .4" ID, .6" LONG
L_2 4 TURNS #14, .25" ID, .3" LONG
L_3 10 TURNS #28, ENAMELED ON FERROXCUBE SLEEVE #3B
L_4 11 TURNS #16, ENAMELED ON MICROMETAL TOROID T50-2
L_5 1$^1/_2$ TURNS #12, .375" ID, .225" LONG
L_6 8 TURNS #18 ON .25" ID COIL FORM, .5" LENGTH WITH FERRITE SLUG
BOARD MATERIAL – DOUBLE SIDED COPPER .065" THK 3M K-6098

C_5 1000pfd UNELCO
C_6 10ufd-35 VDC ELECTROLYTIC
C_7 .01ufd ERIE RED-CAP

PACKAGE MECHANICAL DATA

.500 4LSTUD



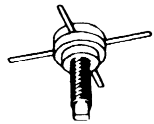
	Minimum Inches	Maximum Inches
A		1.030
B	.220	.230
C	.490	.510
D	.250	.290
E	.160	.180
F	.004	.006
G	.550	.600
H	.415	.425
I	.100	.130
J	.065	.075

SGS-THOMSON
MICROELECTRONICS

SD1317

RF & MICROWAVE TRANSISTORS
UHF SMALL SIGNAL

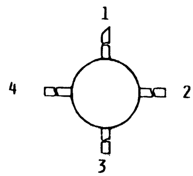
- HIGH FT – 4GHz
- VERY LOW NOISE
- ALL GOLD METALLIZED



TO-117A (M148)
epoxy sealed

ORDER CODE	**BRANDING**
SD1317	SD1317

PIN CONNECTION



S88SD1317-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1317 is a silicon NPN transistor designed to be utilized in broadband linear amplifier circuitry such as CATV trunk, bridger and line extender amplifiers.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CEO}	Collector - Emitter Voltage	20	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.2	A
P_{TOT}	Total Device Dissipation at + 25°C	5	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	35	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

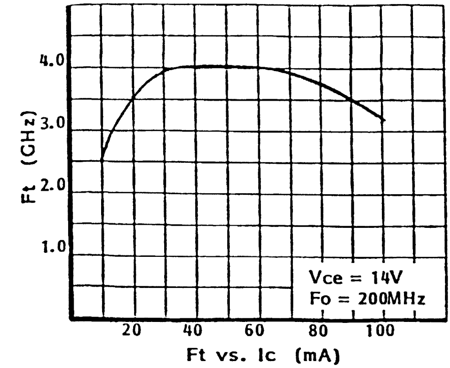
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1.0mA	I_E = 0	40			V
BV_{CEO}	I_C = 5.0mA	V_{BE} = 0	20			V
BV_{EBO}	I_E = 0.1mA	I_C = 0	3.5			V
h_{FE}	V_{CE} = 5.0V	I_C = 50mA	70		300	

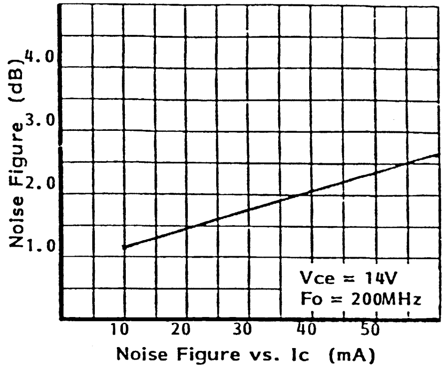
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
f_t	f = 200MHz	V_{CE} = 14V	I_C = 50mA		4.0		GHz
N. F.	f = 200MHz	V_{CE} = 14V	I_C = 20mA		2.0		dB
X MOD (7ch)	f = Channel 13	V_{CE} = 14V	I_C = 60mA		– 60		dB
dso (2nd ordr)	f = Channel 13	V_{CE} = 14V	I_C = 60mA		– 57		dB
C_{cb}	F = 1.0MHz	V_{CB} = 14V			1.5		pF

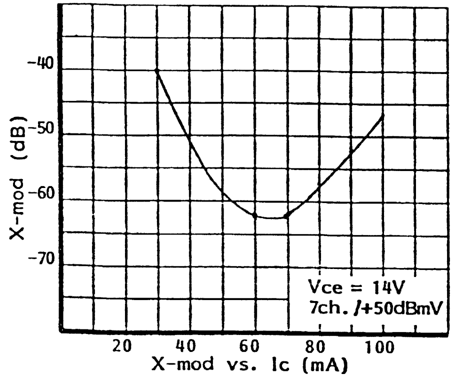
APPLICATION INFORMATION (typical curves)



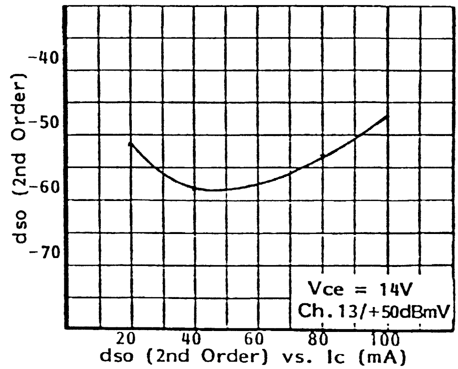
S88SD1317-02



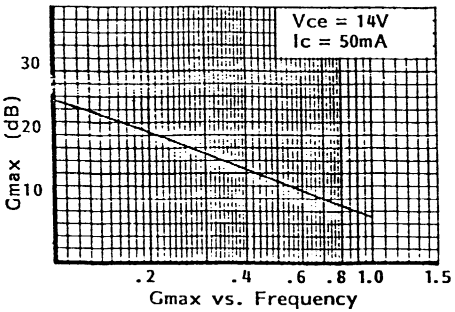
S88SD1317-03



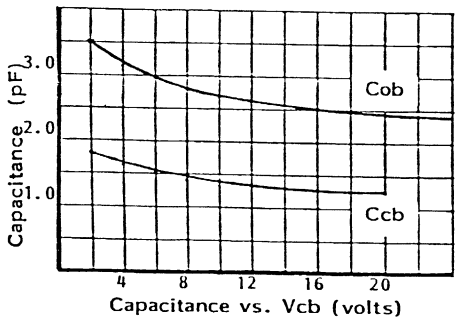
S88SD1317-04



S88SD1317-05



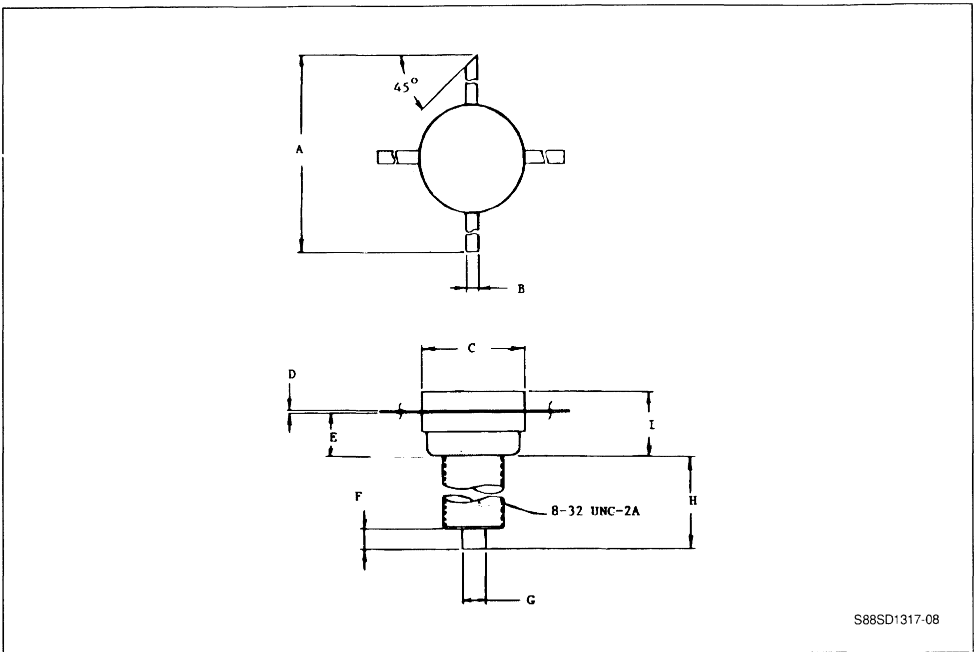
S88SD1317-06



S88SD1317-07

PACKAGE MECHANICAL DATA

TO-117A



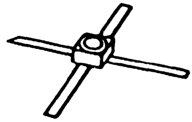
	Minimum Inch/mm	Maximum Inch/mm
A	.910/23.11	
B	.024/0.61	.034/0.86
C	.270/6.86	.290/7.37
D	.003/0.08	.007/0.18
E	.110/2.79	.130/3.30
F	.115/2.92	.145/3.68
G	.055/1.40	.065/1.65
H	.435/11.05	.465/11.81
I	.175/4.45	.210/5.33

SGS-THOMSON
MICROELECTRONICS

SD1331

RF & MICROWAVE TRANSISTORS
UHF SMALL SIGNAL

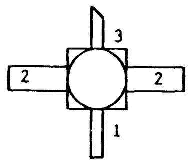
- HIGH F (T) – 6 GHz
- VERY LOW NOISE
- ALL GOLD METALLIZATION
- HERMETIC PACKAGE



.100 x .100 4L (M150)
hermetic sealed

ORDER CODE	**BRANDING**
SD1331	SD1331

PIN CONNECTION



S88SD1331-01

1 base
2 emitter
3 collector

DESCRIPTION

The SD1331 is a gold metallized NPN silicon transistor featuring high gain and low noise. It utilizes an all gold system and a ceramic hermetic package suitable for HI REL and military applications.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	15.0	V
V_{CEO}	Collector - Emitter Voltage	12.0	V
V_{EBO}	Emitter - Base Voltage	3.0	V
I_C	Collector Current (max.)	80	A
P_{TOT}	Total Device Dissipation at + 25°C	350	W
T_{STG} T_J	Storage and Junction Temperatures	– 65 to + 200 + 200	°C °C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	200	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 0.1mA	I_E = 0	15			V
BV_{CEO}	I_C = 1.0mA	I_B = 0	12			V
BV_{EBO}	I_E = 0.1mA	I_C = 0	3			V
h_{FE}	V_{CE} = 5.0V	I_C = 30mA	40			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
F_T	F = 1000MHz	V_{CE} = 5.0V	I_C = 30mA		5.5		GHz
N. F.	F = 1000MHz	V_{CE} = 5.0V	I_C = 5.0mA		2.0		dB
G max	F = 1000MHz	V_{CE} = 5.0V	I_C = 30mA		16.5		dB
C_{cb}	F = 1.0MHz	V_{CB} = 5.0V			0.65		pF

Input Power : – 33.00dBm

Test Cond. (Volts/Amps)	Freq. (Hz)	S11 (Mag/angle)	S21 (dB/angle)	S12 (Mag/angle)	S22 (Mag/angle)
5.00/ 4.92m	100.00M	835.12m –42.42	22.73 154.19	32.74m 67.63	926.35m –21.14
	200.00M	796.11m –76.94	21.26 135.22	54.21m 51.33	780.35m –36.36
	300.00M	768.01m–101.76	19.56 121.53	65.97m 40.89	655.61m –46.20
	400.00M	751.74m–119.07	17.94 111.58	72.73m 33.99	567.75m –52.64
	500.00M	740.57m–131.32	16.48 104.15	76.54m 29.70	507.97m –57.03
	600.00M	730.40m–140.42	15.14 98.34	79.00m 27.05	467.62m –59.95
	700.00M	721.62m–147.59	13.98 93.46	81.01m 25.08	440.70m –62.29
	800.00M	713.56m–153.72	12.93 89.40	82.47m 23.84	420.99m –64.01
	900.00M	706.38m–159.09	11.99 85.72	84.06m 22.85	406.17m –65.53
	1.00G	703.14m–163.93	11.14 82.37	84.70m 22.18	396.57m –66.96
	1.20G	706.00m–172.02	9.62 75.34	86.27m 21.96	384.67m –70.06
	1.40G	712.30m–178.18	8.28 69.40	88.96m 21.84	378.36m –73.03
	1.60G	713.10m 177.16	7.28 64.26	90.00m 22.85	375.17m –75.08
	1.80G	708.43m 172.51	6.39 59.41	91.25m 23.92	367.64m –77.65
	2.00G	708.75m 167.47	5.49 55.39	93.05m 26.10	354.18m –80.88
	2.20G	723.80m 163.07	4.63 51.59	95.68m 26.95	339.58m –86.05
	2.40G	743.57m 160.00	3.83 47.16	96.72m 28.21	335.74m –92.89
	2.60G	755.42m 157.57	3.07 42.35	98.13m 30.24	345.20m –99.22
	2.80G	767.59m 153.62	2.49 38.92	102.90m 32.43	354.23m–103.22
	3.00G	764.43m 147.14	2.39 36.89	108.68m 32.13	347.20m–106.27
5.00/ 10.00m	100.00M	731.87m –63.58	27.15 145.30	28.20m 60.40	843.22m –32.14
	200.00M	720.68m–184.41	24.62 124.14	41.59m 44.07	628.53m –50.96
	300.00M	717.81m–127.45	22.21 111.61	47.39m 36.50	490.09m –61.35
	400.00M	717.58m–141.37	20.18 103.34	50.80m 32.79	407.23m –67.63
	500.00M	715.55m–150.78	18.49 97.36	52.99m 31.44	356.48m –71.66
	600.00M	711.68m–157.67	17.05 92.67	55.01m 31.35	323.69m –74.25
	700.00M	708.21m–163.02	15.80 88.81	56.98m 31.39	303.05m –75.98
	800.00M	703.43m–167.63	14.71 85.52	59.10m 32.15	288.10m –77.19
	900.00M	708.77m–171.85	13.74 82.58	61.29m 32.71	277.11m –78.12
	1.00G	701.80m–175.64	12.85 79.81	63.11m 33.43	269.94m –78.97
	1.20G	706.85m 178.10	11.29 74.01	67.45m 35.26	262.12m –80.85
	1.40G	713.32m 173.27	9.94 68.87	72.49m 36.42	258.10m –82.52
	1.60G	718.38m 169.57	8.91 64.19	77.25m 38.38	256.05m –82.76
	1.80G	704.32m 165.33	8.82 59.87	82.30m 39.66	250.54m –83.99
	2.00G	705.88m 160.75	7.16 56.14	87.86m 41.64	328.81m –86.30
	2.20G	723.22m 156.86	6.32 52.89	93.64m 42.07	226.60m –91.38
	2.40G	742.92m 154.37	5.52 48.93	98.01m 42.62	224.85m –98.96
	2.60G	754.17m 152.53	4.78 44.70	102.39m 43.87	236.86m–105.35
	2.80G	765.80m 148.77	4.24 41.30	110.01m 44.74	247.39m–108.54
	3.00G	758.37m 142.21	4.12 38.56	118.50m 43.47	241.56m–110.48

S-PARAMETERS

Input Power : – 33.00dBm (continued)

Test Cond. (Volts/Amps)	Freq. (Hz)	S11 (Mag/angle)	S21 (dB/angle)	S12 (Mag/angle)	S22 (Mag/angle)
5.00/ 29.99m	100.00M	623.54m–110.68	31.06 128.88	18.43m 50.00	650.72m –48.70
	200.00M	691.40m–143.31	26.78 109.65	23.61m 40.28	408.85m –66.35
	300.00M	712.50m–157.08	23.69 100.38	26.18m 39.79	301.33m –74.25
	400.00M	721.41m–164.88	21.37 94.47	28.82m 41.90	247.79m –78.74
	500.00M	724.17m–170.21	19.53 90.10	31.51m 44.21	218.82m –81.37
	600.00M	722.52m–174.29	18.00 86.56	34.33m 46.90	201.94m –82.65
	700.00M	721.11m–177.62	16.72 83.53	37.57m 48.72	193.03m –83.23
	800.00M	720.70m 179.30	15.60 80.92	40.72m 50.61	186.64m –83.33
	900.00M	720.33m 176.43	14.60 78.48	44.26m 51.58	182.47m –83.24
	1.00G	722.00m 173.80	13.71 76.28	47.54m 52.82	188.49m –83.23
	1.20G	729.81m 169.38	12.14 71.37	54.33m 54.44	180.74m –83.72
	1.40G	734.77m 165.81	10.76 66.68	61.67m 54.90	182.15m –84.08
	1.60G	729.56m 162.89	9.69 62.45	69.14m 56.04	184.82m –82.55
	1.80G	723.46m 159.13	8.80 58.35	76.30m 56.18	183.09m –82.56
	2.00G	728.30m 154.91	7.96 54.86	83.86m 56.99	174.02m –84.09
	2.20G	748.20m 151.69	7.11 51.65	91.29m 56.36	164.22m –89.43
	2.40G	767.22m 149.80	6.33 48.23	97.56m 55.96	164.23m –98.13
	2.60G	777.97m 148.36	5.57 44.23	103.45m 56.24	178.20m–105.15
	2.80G	790.36m 144.86	5.04 40.81	111.99m 56.05	190.91m–107.67
	3.00G	784.52m 138.05	4.89 37.76	121.81m 53.86	186.54m–108.66

Input Power : – 33.00 dBm

TYPICAL DEVICE

Test Cond. (Volts/Flops)	Freq. (Hz)	S11 (Mag/angle)	S21 (dB/angle)	S12 (Mag/angle)	S22 (Mag/angle)
10.00/ 4.92m	100.00M	847.64m –39.88	22.71 155.29	27.93m 68.71	939.02m –17.93
	200.00M	806.51m –72.98	21.34 136.75	46.91m 53.22	808.27m –30.85
	300.00M	773.67m –97.63	19.75 123.06	57.73m 42.76	695.24m –38.99
	400.00M	752.84m–115.15	18.20 112.95	61.28m 36.02	613.49m –44.23
	500.00M	738.86m–127.81	16.77 105.37	67.95m 31.56	558.19m –47.77
	600.00M	727.07m–137.30	15.46 99.34	70.34m 29.00	522.15m –50.20
	700.00M	717.28m–144.84	14.31 94.31	71.99m 26.82	496.47m –52.10
	800.00M	707.56m–151.29	13.26 90.08	73.52m 25.73	479.20m –53.57
	900.00M	700.28m–156.92	12.32 86.27	75.04m 24.81	467.08m –54.95
	1.00G	695.53m–161.94	11.48 82.76	75.70m 24.17	458.39m –56.35
	1.20G	697.16m–170.42	9.97 75.52	77.07m 23.92	449.50m –59.38
	1.40G	703.24m–176.89	8.62 69.41	79.14m 23.97	445.32m –62.28
	1.60G	705.10m 178.26	7.62 64.27	80.32m 25.15	443.75m –64.63
	1.80G	699.85m 173.38	6.71 59.32	81.33m 26.31	437.97m –67.21
	2.00G	700.68m 168.22	5.77 55.06	82.85m 28.19	424.41m –70.31
	2.20G	716.45m 163.57	4.88 51.19	85.09m 29.31	409.60m –74.85
	2.40G	736.04m 160.34	4.09 46.51	85.92m 30.85	402.54m –80.92
	2.60G	748.71m 157.85	3.34 41.58	87.33m 33.24	409.43m –86.82
	2.80G	760.57m 153.90	2.71 38.09	91.64m 35.45	418.00m –90.73
	3.00G	758.37m 147.32	2.53 36.48	96.59m 35.67	410.80m –93.35

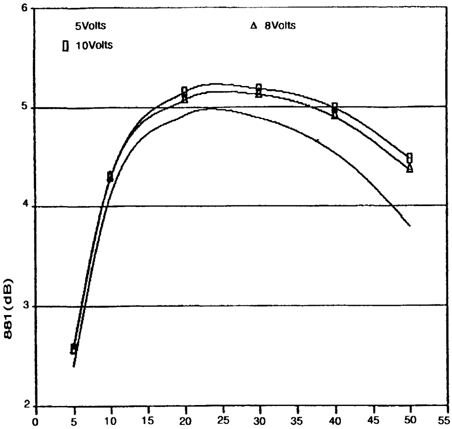
S-PARAMETERS

Input Power : – 33.00dBm (continued)

Test Cond. (Volts/Amps)	Freq. (Hz)	S11 (Mag/angle)		S21 (dB/angle)		S12 (Mag/angle)		S22 (Mag/angle)	
TYPICAL DEVICE (continued)									
10.00/19.99m	100.00M	658.72m	–86.22	30.33	136.42	19.79m	55.21	753.13m	–36.78
	200.00M	682.95m	–125.63	26.76	115.59	26.70m	41.93	515.94m	–51.64
	300.00M	694.86m	–144.25	23.92	104.81	29.88m	38.34	394.63m	–57.36
	400.00M	699.66m	–154.80	21.69	97.88	32.38m	38.35	331.27m	–59.99
	500.00M	701.35m	–161.89	19.90	92.84	34.56m	39.59	296.30m	–61.30
	600.00M	698.60m	–167.21	18.38	88.86	36.72m	41.71	276.17m	–61.93
	700.00M	696.56m	–171.40	17.12	85.47	39.36m	42.82	265.69m	–62.34
	800.00M	694.25m	–175.13	15.99	82.55	42.01m	44.53	258.92m	–62.54
	900.00M	693.34m	–178.54	15.00	79.91	44.96m	45.75	255.03m	–62.78
	1.00G	694.56m	178.36	14.12	77.41	47.52m	46.78	253.77m	–63.19
	1.20G	701.53m	173.18	12.55	72.06	53.31m	49.05	254.68m	–64.63
	1.40G	708.16m	169.16	11.16	67.15	59.42m	49.78	257.03m	–66.23
	1.60G	703.58m	165.90	10.10	62.87	65.55m	51.45	262.19m	–66.46
	1.80G	697.23m	162.03	9.19	58.58	71.58m	52.09	261.96m	–67.55
	2.00G	700.27m	157.70	8.31	54.83	78.05m	53.10	253.62m	–69.25
	2.20G	719.72m	154.17	7.46	51.67	84.30m	52.90	241.48m	–73.41
	2.40G	739.95m	152.09	6.67	47.88	89.85m	52.94	236.51m	–80.36
	2.60G	751.24m	150.56	5.92	43.74	94.65m	53.53	245.83m	–87.18
	2.80G	762.80m	146.96	5.34	40.06	102.22m	53.82	257.51m	–90.89
	3.00G	756.21m	140.31	5.15	37.58	110.70m	52.08	254.67m	–92.33
10.00/29.99m	100.00M	633.84m	–101.16	31.30	131.03	17.37m	51.60	688.15m	–40.95
	200.00M	679.80m	–136.92	27.21	111.21	22.47m	41.52	449.61m	–54.13
	300.00M	695.90m	–152.51	24.18	101.51	25.19m	40.13	341.95m	–58.23
	400.00M	702.65m	–161.25	21.88	95.30	27.66m	41.76	288.53m	–59.84
	500.00M	704.91m	–167.17	20.05	90.70	30.16m	44.20	260.88m	–60.58
	600.00M	702.78m	–171.73	18.52	86.99	32.69m	46.71	246.16m	–60.74
	700.00M	701.24m	–175.30	17.24	83.84	35.57m	48.21	239.44m	–60.95
	800.00M	699.49m	–178.59	16.11	81.13	38.61m	50.14	235.75m	–61.03
	900.00M	699.63m	178.37	15.10	78.62	41.82m	51.18	234.05m	–61.18
	1.00G	700.89m	175.56	14.22	76.26	44.78m	52.35	234.30m	–61.53
	1.20G	708.20m	170.93	12.64	71.06	50.94m	53.95	238.13m	–63.04
	1.40G	714.69m	167.27	11.25	66.37	57.52m	54.49	242.59m	–64.54
	1.60G	709.78m	164.27	10.19	62.12	64.22m	55.59	249.88m	–64.84
	1.80G	703.53m	160.52	9.28	57.80	70.37m	55.94	251.23m	–65.88
	2.00G	707.80m	156.27	8.39	54.27	77.28m	56.80	243.83m	–67.51
	2.20G	727.18m	152.96	7.54	51.00	83.78m	56.34	232.55m	–71.74
	2.40G	747.72m	151.07	6.74	47.32	89.30m	56.10	228.47m	–78.80
	2.60G	759.36m	149.54	6.00	43.16	94.60m	56.55	237.65m	–85.95
	2.80G	771.83m	146.03	5.40	39.61	102.35m	56.54	250.26m	–89.69
	3.00G	766.02m	139.43	5.18	36.99	110.96m	54.64	247.92m	–91.18

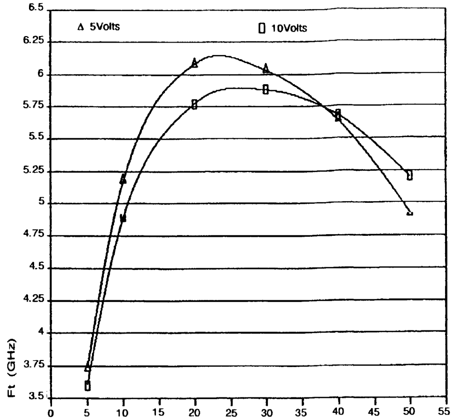
S-PARAMETERS

1330 S21(dB) vs. COLLECTOR CURRENT (mA.) @3.0GHz



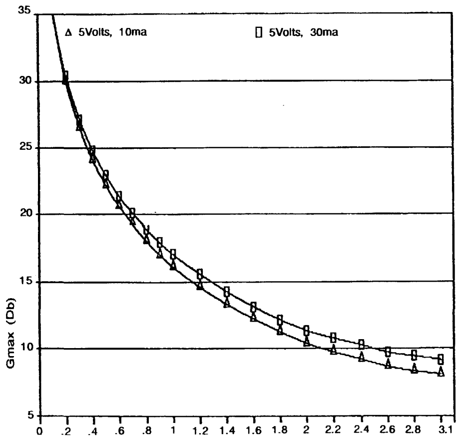
S88SD1331-01

1330 Ft vs. CURRENT AT F=1GHz

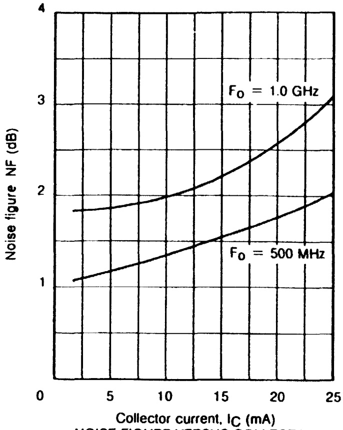


S88SD1331-02

1330 Gmax vs. FREQUENCY

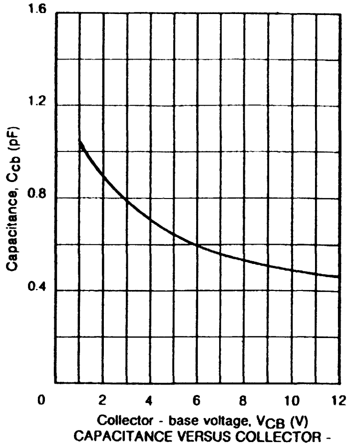


S88SD1331-03



NOISE FIGURE VERSUS COLLECTOR CURRENT

S88SD1331-04

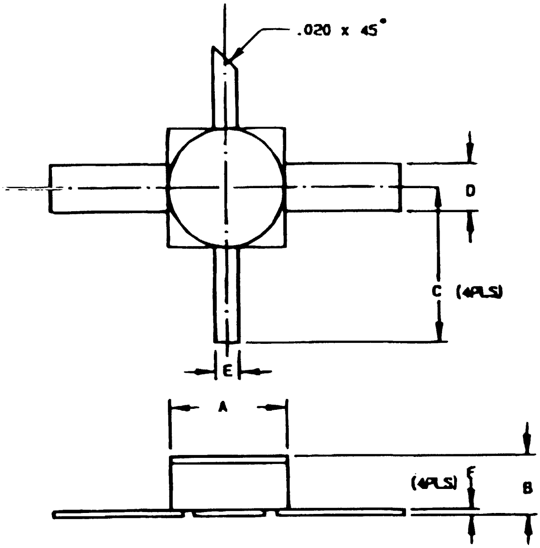


CAPACITANCE VERSUS COLLECTOR - BASE VOLTAGE

S88SD1331-05

PACKAGE MECHANICAL DATA

.100 x .100 4L



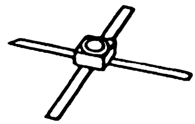
	Minimum Inches/mm	Maximum Inches/mm
A	.090/2.29	.105/2.67
B	.035/0.89	.055/1.40
C		.340/8.64
D	.035/0.89	.043/1.09
E	.016/0.41	.024/0.61
F	.003/0.08	.006/0.15

SGS-THOMSON MICROELECTRONICS

SD1332

RF & MICROWAVE TRANSISTORS UHF SMALL SIGNAL

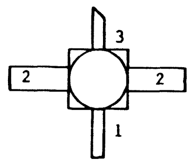
- HIGH FT – 5.5 GHz
- VERY LOW NOISE
- ALL GOLD METALLIZED
- HERMETIC PACKAGE



.100 x .100 4L (M150)
hermetic sealed

ORDER CODE	**BRANDING**
SD1332	SD1332

PIN CONNECTIONS



1 base
2 emitter
3 collector

DESCRIPTION

The SD1332 is an all gold metallized NPN silicon transistor featuring high gain and very low noise. It is suitable for low noise broad band amplifiers such as CATV.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	20.0	V
V_{CEO}	Collector - Emitter Voltage	15.0	V
V_{EBO}	Emitter - Base Voltage	3.0	V
I_C	Collector Current (max.)	30.0	A
P_{TOT}	Total Device Dissipation at + 25°C	180	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	500	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10µA		20			V
BV_{CEO}	I_C = 1.0mA	V_{BE} = 0	15			V
BV_{EBO}	I_E = 10µA		2			V
I_{CEO}	V_{CE} = 10V	I_B = 0			50	nA
h_{FE}	V_{CE} = 10V	I_C = 14mA	50		300	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
F_T	F = 1000MHz	V_{CE} = 10V	I_C = 14mA		5.5		GHz
N. F.	F = 1000MHz	V_{CE} = 5V	I_C = 5mA		2.5		dB
G max	F = 1000MHz	V_{CE} = 10V	I_C = 15mA		17		dB
C_{cb}	F = 1.0MHz	V_{CB} = 10V				0.5	pF

Input Power : – 33.00dBm

Test Cond. (Volts/Amps)	Freq. (Hz)	S11 (Mag/angle)	S21 (dB/angle)	S12 (Mag/angle)	S22 (Mag/angle)
TYPICAL DEVICE					
5.00/4.92m	100.00M	753.17m –33.72	22.27 158.81	17.22m 73.55	963.08m –11.57
	200.00M	682.71m –61.06	21.08 143.83	29.84m 61.83	886.63m –20.19
	300.00M	632.22m –82.55	19.85 132.64	38.68m 54.15	816.20m –26.57
	400.00M	602.34m –99.27	18.67 123.89	45.25m 49.01	758.18m –31.51
	500.00M	583.74m–112.28	17.56 116.88	50.10m 45.52	713.51m –35.47
	600.00M	569.11m–122.57	16.51 111.00	53.97m 43.23	677.29m –38.66
	700.00M	556.71m–131.20	15.56 105.93	57.23m 41.33	648.71m –41.27
	800.00M	546.55m–138.83	14.67 101.55	59.89m 40.16	624.68m –43.36
	900.00M	537.79m–145.80	13.86 97.48	62.64m 39.10	605.05m –45.18
	1.00G	532.67m–152.15	13.14 93.74	64.81m 38.34	588.72m –46.82
	1.20G	536.46m–163.06	11.81 86.03	68.74m 37.55	565.07m –49.94
	1.40G	547.67m–171.29	10.59 79.77	72.76m 36.83	547.77m –52.63
	1.60G	548.34m–177.09	9.65 74.71	75.72m 37.31	535.14m –54.32
	1.80G	540.96m 177.01	8.76 69.74	78.67m 37.41	520.37m –56.13
	2.00G	538.89m 170.09	7.83 65.24	81.89m 37.93	498.78m –58.03
	2.20G	557.07m 163.97	6.97 61.20	85.45m 37.67	475.30m –68.99
	2.40G	582.10m 159.87	6.28 56.53	88.19m 37.55	459.02m –65.28
	2.60G	602.02m 157.15	5.60 51.71	90.64m 38.45	457.06m –69.85
	2.80G	612.13m 152.32	4.96 47.95	95.04m 39.49	459.15m –72.90
	3.00G	595.91m 144.68	4.59 46.62	100.21m 38.40	448.31m –74.19
5.00/10.80m	100.00M	648.48m –49.52	26.82 151.87	15.36m 68.52	915.43m –16.88
	200.00M	605.46m –86.07	24.92 133.32	24.76m 55.75	782.42m –27.05
	300.00M	584.72m–110.35	23.02 121.18	30.11m 48.94	684.20m –32.68
	400.00M	575.93m–126.59	21.34 112.65	33.85m 45.87	617.49m –36.32
	500.00M	570.37m–138.81	19.87 106.30	36.81m 44.74	573.26m –39.01
	600.00M	564.23m–146.67	18.57 101.19	39.31m 44.45	542.74m –40.97
	700.00M	558.64m–153.62	17.43 96.90	41.79m 44.53	521.73m –42.54
	800.00M	553.35m–159.66	16.41 93.25	44.24m 44.98	505.68m –43.85
	900.00M	549.90m–165.17	15.49 89.97	46.72m 45.29	493.14m –45.00
	1.00G	550.25m–170.21	14.68 86.89	49.03m 45.75	483.57m –46.23
	1.20G	558.65m–178.44	13.22 80.43	54.05m 46.55	471.20m –48.67
	1.40G	569.09m 175.45	11.90 75.05	59.20m 47.03	463.09m –50.91
	1.60G	566.76m 170.94	10.89 70.59	63.58m 48.34	458.71m –52.13
	1.80G	559.77m 165.77	9.97 66.10	68.08m 48.82	450.96m –53.65
	2.00G	561.44m 159.82	9.01 62.17	72.99m 49.50	435.13m –55.23
	2.20G	582.59m 154.82	8.15 58.63	78.05m 49.06	416.18m –57.92
	2.40G	608.24m 151.85	7.42 54.59	82.28m 48.98	402.20m –62.24
	2.60G	624.92m 149.93	6.75 50.14	86.39m 49.32	401.77m –67.06
	2.80G	637.90m 145.58	6.09 46.67	92.19m 49.94	406.49m –70.16
	3.00G	623.18m 137.64	5.71 44.99	98.23m 48.32	399.05m –71.14

S-PARAMETERS

Input Power : –33.00dBm

Test Cond. (Volts/Amps)	Freq. (Hz)	S11 (Mag/angle)	S21 (dB/angle)	S12 (Mag/angle)	S22 (Mag/angle)
TYPICAL DEVICE (continued)					
5.00/29.99m	100.00M	587.73m–106.85	29.12 133.14	10.44m 56.91	775.27m –20.28
	200.00M	576.33m–139.23	25.32 113.69	14.40m 49.22	631.24m –23.53
	300.00M	600.62m–153.92	22.45 104.10	16.73m 49.58	572.86m –24.15
	400.00M	612.21m–162.35	20.25 97.89	19.24m 51.42	545.82m –25.16
	500.00M	617.24m–168.20	18.48 93.25	21.73m 53.96	532.77m –26.64
	600.00M	619.68m–172.72	17.00 89.45	24.28m 55.84	526.89m –28.21
	700.00M	619.85m–176.52	15.73 86.08	26.78m 57.21	523.97m –29.91
	800.00M	620.88m 179.97	14.62 83.26	29.33m 58.73	523.03m –31.52
	900.00M	623.23m 176.69	13.64 80.57	32.00m 59.00	522.44m –33.17
	1.00G	628.19m 173.59	12.78 78.01	34.60m 59.58	523.15m –34.89
	1.20G	640.61m 168.54	11.24 72.37	39.64m 60.97	525.53m –38.45
	1.40G	650.90m 164.60	9.85 67.59	44.58m 60.72	527.20m –41.91
	1.60G	648.90m 161.06	8.78 63.52	49.38m 62.36	529.98m –44.55
	1.80G	646.69m 156.68	7.81 59.07	53.83m 62.36	526.64m –47.34
	2.00G	655.82m 151.74	6.82 55.38	58.93m 63.36	513.55m –50.16
	2.20G	682.91m 148.03	5.92 52.14	63.73m 62.75	496.14m –53.90
	2.40G	707.22m 145.91	5.19 48.27	68.36m 63.04	484.02m –58.86
	2.60G	720.85m 144.51	4.45 44.10	72.72m 63.99	483.39m –64.12
	2.80G	737.97m 140.55	3.75 40.81	78.76m 64.31	487.66m –67.83
	3.00G	739.80m 132.34	3.34 39.29	85.36m 63.15	478.55m –69.83

Input Power : – 33.00dBm

Test Cond. (Volts/Amps)	Freq. (Hz)	S11 (Mag/angle)	S21 (dB/angle)	S12 (Mag/angle)	S22 (Mag/angle)
TYPICAL DEVICE					
10.00/4.92m	100.00M	768.75m –32.35	22.17 159.15	15.11m 73.99	969.12m –10.13
	200.00M	693.05m –58.58	21.03 144.40	26.20m 62.70	901.18m –17.69
	300.00M	638.14m –79.43	19.83 133.29	34.17m 55.50	839.18m –23.25
	400.00M	604.02m –95.83	18.68 124.48	40.15m 50.39	787.83m –27.62
	500.00M	581.42m–108.85	17.60 117.34	44.73m 47.19	745.82m –31.16
	600.00M	564.52m–119.23	16.57 111.35	48.28m 44.77	714.31m –33.98
	700.00M	550.54m–127.92	15.62 106.09	51.19m 42.85	688.83m –36.29
	800.00M	537.97m–135.71	14.74 101.59	53.78m 41.97	667.60m –38.19
	900.00M	527.77m–142.82	13.93 97.46	56.34m 40.82	650.25m –39.86
	1.00G	522.12m–149.43	13.20 93.58	58.36m 40.19	636.26m –41.46
	1.20G	524.19m–160.64	11.88 85.66	62.13m 39.24	615.82m –44.45
	1.40G	534.21m–169.03	10.65 79.24	66.11m 38.62	601.76m –47.21
	1.60G	534.75m–174.96	9.71 74.12	68.61m 39.05	591.09m –49.06
	1.80G	526.71m 179.05	8.81 69.01	71.35m 39.17	578.14m –51.05
	2.00G	524.17m 172.08	7.85 64.38	74.15m 39.75	557.50m –53.19
	2.20G	541.47m 165.72	6.97 60.16	77.56m 39.57	535.43m –56.11
	2.40G	567.69m 161.59	6.28 55.35	79.80m 39.33	519.96m –60.28
	2.60G	589.14m 158.80	5.61 50.35	82.22m 40.32	516.76m –64.75
	2.80G	599.08m 153.93	4.95 46.53	86.30m 41.33	518.61m –67.82
	3.00G	581.90m 146.27	4.50 45.47	90.66m 40.58	507.20m –69.33

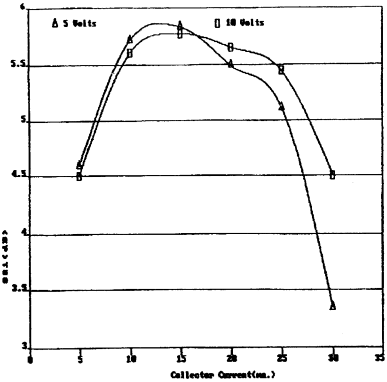
S-PARAMETERS

Input Power : – 33.00dBm

Test Cond. (Volts/Amps)	Freq. (Hz)	S11 (Mag/angle)		S21 (dB/angle)		S12 (Mag/angle)		S22 (Mag/angle)	
TYPICAL DEVICE (continued)									
10.00/15.00m	100.00M	622.94m	–56.61	28.47	148.35	12.68m	66.45	899.33M	–16.75
	200.00M	587.97m	–95.37	26.17	128.59	19.59m	53.90	758.53m	–25.09
	300.00M	573.10m	–119.12	23.98	116.49	23.48m	48.82	666.68m	–28.75
	400.00M	567.79m	–134.33	22.11	108.26	26.48m	46.99	610.33m	–30.80
	500.00M	563.38m	–144.81	20.52	182.19	28.92m	47.15	576.89m	–32.38
	600.00M	557.84m	–152.67	19.14	97.34	31.32m	48.33	555.78m	–33.72
	700.00M	552.92m	–158.92	17.94	93.27	33.35m	48.63	542.47m	–34.89
	800.00M	548.77m	–164.42	16.87	89.83	35.82m	49.68	533.02m	–36.83
	900.00M	546.85m	–169.48	15.92	86.68	38.30m	50.53	526.88m	–37.11
	1.00G	546.76m	–174.06	15.07	83.79	40.66m	50.96	522.34m	–38.27
	1.20G	556.55m	178.53	13.58	77.52	45.40m	52.22	518.08m	–40.85
	1.40G	567.41m	173.04	12.22	72.39	50.26m	52.42	515.28m	–43.41
	1.60G	565.11m	168.88	11.18	68.14	54.49m	53.68	515.49m	–45.13
	1.80G	557.73m	163.98	10.21	63.76	58.94m	53.98	511.47m	–47.09
	2.00G	562.37m	158.25	9.24	59.81	63.45m	54.63	498.02m	–49.06
	2.20G	583.82m	153.56	8.34	56.24	68.40m	54.20	480.58m	–51.93
	2.40G	610.61m	150.85	7.61	52.25	72.44m	54.25	467.83m	–56.20
	2.60G	627.71m	149.13	6.94	47.91	76.16m	54.72	466.88m	–60.95
	2.80G	640.68m	144.94	6.25	44.30	81.51m	55.21	472.01m	–64.21
	3.00G	628.69m	136.84	5.77	43.00	87.13m	53.82	464.52m	–65.64
10.00/25.00m	100.00M	554.27m	–75.51	30.18	141.35	11.14m	63.04	847.61m	–19.30
	200.00M	562.91m	–115.73	27.11	120.68	16.25m	51.54	686.88m	–25.65
	300.00M	569.30m	–136.41	24.50	189.34	18.98m	49.16	604.62m	–27.27
	400.00M	574.17m	–148.69	22.40	101.95	21.51m	49.11	562.19m	–28.87
	500.00M	575.49m	–156.95	20.67	96.55	23.80m	50.55	539.64m	–29.05
	600.00M	574.09m	–163.19	19.19	92.23	26.24m	52.44	528.13m	–30.05
	700.00M	571.61m	–168.22	17.93	88.62	28.57m	53.71	521.86m	–31.15
	800.00M	569.55m	–172.71	16.81	85.51	30.91m	54.91	518.42m	–32.28
	900.00M	570.29m	–176.90	15.82	82.66	33.57m	55.62	516.77m	–33.54
	1.00G	572.67m	179.35	14.95	80.04	36.01m	56.22	516.35m	–34.84
	1.20G	584.37m	173.20	13.41	74.26	40.94m	57.38	517.39m	–37.76
	1.40G	594.27m	168.59	12.01	69.37	45.77m	57.52	519.10m	–48.62
	1.60G	592.00m	164.88	10.95	65.39	50.23m	58.69	522.80m	–42.68
	1.80G	587.33m	160.32	9.96	61.17	54.63m	59.10	520.62m	–44.99
	2.00G	593.91m	154.98	8.97	57.25	59.38m	59.49	508.56m	–47.27
	2.20G	618.55m	150.78	8.06	53.90	64.17m	59.09	492.63m	–50.41
	2.40G	644.54m	148.54	7.34	50.10	68.27m	58.85	480.79m	–54.86
	2.60G	660.17m	146.97	6.63	45.87	72.38m	59.86	480.31m	–59.76
	2.80G	675.73m	142.85	5.91	42.38	77.80m	60.39	485.24m	–63.23
	3.00G	668.10m	134.80	5.44	41.07	83.65m	58.74	478.23m	–64.86

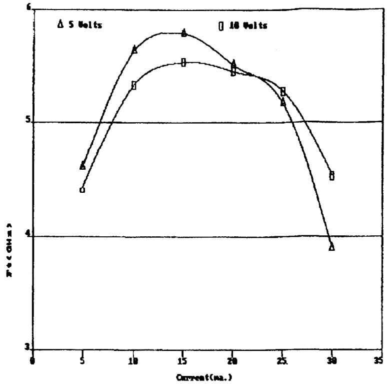
S-PARAMETERS

1332 S21 VS. COLLECTOR CURRENT AT 3GHZ



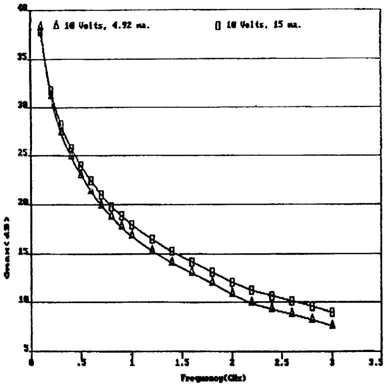
S88SD1332-01

1332 FT. VS. CURRENT AT 1GHZ

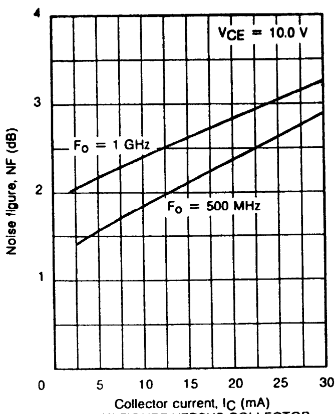


S88SD1332-02

1332 GMAX VS. FREQUENCY

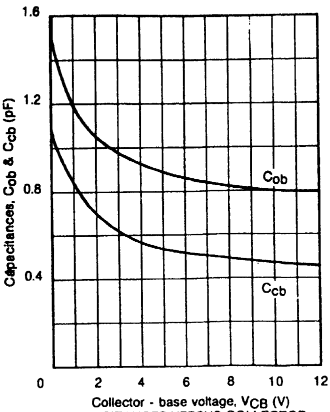


S88SD1332-03



NOISE FIGURE VERSUS COLLECTOR CURRENT

S88SD1332-04

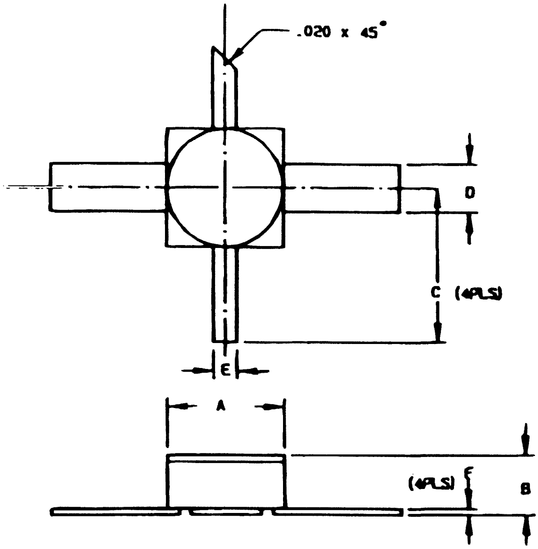


CAPACITANCES VERSUS COLLECTOR - BASE VOLTAGE

S88SD1332-05

PACKAGE MECHANICAL DATA

.100 x .100 4L



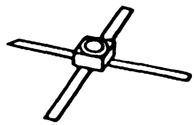
	Minimum Inches/mm	Maximum Inches/mm
A	.090/2.29	.105/2.67
B	.035/0.89	.055/1.40
C		.340/8.64
D	.035/0.89	.043/1.09
E	.016/0.41	.024/0.61
F	.003/0.08	.006/0.15

SGS-THOMSON
MICROELECTRONICS

SD1333

RF & MICROWAVE TRANSISTORS
UHF SMALL SIGNAL

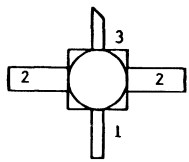
- HIGH FT – 5.5 GHz
- VERY LOW NOISE
- ALL GOLD METALLIZED
- HERMETIC PACKAGE



.100 x .100 4L (M150)
hermetic sealed

ORDER CODE	**BRANDING**
SD1333	SD1333

PIN CONNECTIONS



S88SD1333-01

1 base
2 emitter
3 collector

DESCRIPTION

The SD1333 is an all gold metallized NPN silicon transistor featuring high gain and very low noise. It is suitable low noise broad band amplifiers such as CATV.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	20.0	V
V_{CEO}	Collector - Emitter Voltage	15.0	V
V_{EBO}	Emitter - Base Voltage	3.0	V
I_C	Collector Current (max.)	70.0	A
P_{TOT}	Total Device Dissipation at + 25°C	0.5	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	500	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 0.1mA		20			V
BV_{CEO}	I_C = 1.0mA	V_{BE} = 0	15			V
BV_{EBO}	I_E = 0.1mA		3			V
h_{FE}	V_{CE} = 10V	I_C = 50mA	70		200	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
F_T	F = 1000MHz	V_{CE} = 10V	I_C = 50mA		5.0		GHz
N. F.	F = 1000MHz	V_{CE} = 10V	I_C = 10mA		2.5		dB
G max	F = 1000MHz	V_{CE} = 10V	I_C = 60mA		14.0		dB
C_{cb}	F = 1.0MHz	V_{CB} = 10V				1.5	pF

Input Power : – 33.00dBm

Test Cond. (Volts/Amps)	Freq. (Hz)	S11 (Mag/angle)	S21 (dB/angle)	S12 (Mag/angle)	S22 (Mag/angle)
TYPICAL DEVICE					
5.00/10.00m	100.00M	774.48m –92.79	25.25 127.41	49.06m 43.07	690.32m –65.02
	200.00M	740.95m–131.49	21.08 105.54	60.03m 27.03	498.10m –95.49
	300.00M	733.23m–149.08	17.99 93.92	63.30m 20.89	429.81m–111.54
	400.00M	731.37m–159.13	15.64 85.78	64.54m 18.37	407.76m–120.82
	500.00M	729.60m–165.89	13.77 79.29	64.92m 17.54	403.70m–126.43
	600.00M	728.56m–171.08	12.21 73.74	65.38m 17.61	408.18m–130.05
	700.00M	727.83m–175.26	10.88 68.71	65.89m 18.28	417.19m–132.60
	800.00M	728.29m–179.00	9.72 64.22	66.64m 19.32	427.98m–134.74
	900.00M	730.93m 177.49	8.66 59.97	67.10m 20.44	440.02m–136.69
	1.00G	735.70m 174.37	7.68 55.81	67.60m 21.88	454.54m–138.52
	1.20G	748.46m 168.97	5.88 47.72	69.00m 25.72	486.73m–142.37
	1.40G	761.02m 164.45	4.31 40.05	71.79m 29.54	516.20m–146.28
	1.60G	767.72m 160.15	3.06 32.35	75.81m 34.80	542.83m–150.19
	1.80G	775.11m 155.32	1.96 25.77	81.45m 39.52	568.55m–154.67
	2.00G	796.99m 150.18	934.57m 21.01	89.13m 44.77	593.55m–159.72
	2.20G	827.99m 146.31	–152.20m 16.88	97.75m 47.90	625.09m–165.18
	2.40G	854.31m 143.68	–1.43 12.10	105.64m 50.36	663.50m–170.13
	2.60G	866.50m 141.30	–2.67 7.66	115.15m 52.61	701.44m–174.22
	2.80G	893.27m 136.91	–3.37 4.89	129.37m 53.67	730.43m–178.13
	3.00G	924.62m 128.45	–3.31 –102.39	146.93m 52.38	755.45m–177.55
5.00/80.00m	100.00M	764.69m–156.25	28.70 104.85	17.15m 35.67	413.93m–115.30
	200.00M	792.96m–170.48	23.04 92.45	20.47m 39.70	353.43m–140.00
	300.00M	799.56m–176.64	19.59 85.74	24.12m 45.37	346.83m–148.64
	400.00M	802.87m 179.40	17.12 80.59	28.32m 49.81	351.45m–152.11
	500.00M	803.28m 176.26	15.21 76.04	32.58m 53.18	358.64m–153.60
	600.00M	802.13m 173.44	13.64 71.97	37.12m 55.60	367.33m–154.20
	700.00M	801.82m 170.90	12.32 68.21	41.86m 57.02	376.39m–154.40
	800.00M	802.92m 168.37	11.18 64.66	46.56m 57.93	386.00m–154.70
	900.00M	806.09m 165.95	10.15 61.26	51.34m 58.58	395.52m–155.04
	1.00G	810.80m 163.62	9.19 58.00	55.77m 58.97	407.11m–155.42
	1.20G	821.10m 159.55	7.47 51.24	64.95m 59.98	431.86m–156.73
	1.40G	827.61m 156.01	5.96 44.57	74.68m 60.14	456.40m–158.49
	1.60G	827.23m 152.29	4.76 37.68	85.52m 60.66	477.81m–160.60
	1.80G	831.69m 147.84	3.72 31.43	96.00m 61.01	500.56m–163.70
	2.00G	852.98m 143.15	2.81 27.03	107.94m 62.15	525.52m–167.53
	2.20G	883.62m 139.83	1.82 23.02	119.63m 61.63	558.46m–171.92
	2.40G	904.85m 137.79	642.83m 18.71	128.82m 61.38	598.07m–175.76
	2.60G	911.94m 135.82	–488.94m 14.41	139.36m 61.41	636.65m–178.90
	2.80G	937.16m 131.62	–1.12 10.96	155.70m 60.43	665.72m–177.92
	3.00G	969.73m 123.11	–1.07 5.22	174.11m 57.28	690.45m–174.23

S-PARAMETERS

Input Power : –33.00dBm

Test Cond. (Volts/Amps)	Freq. (Hz)	S11 (Mag/angle)		S21 (dB/angle)		S12 (Mag/angle)		S22 (Mag/angle)	
TYPICAL DEVICE (continued)									
5.00/100.00m	100.00M	782.26m	–162.69	25.61	104.05	14.21m	37.31	289.12m	–90.12
	200.00M	809.38m	–173.63	19.99	92.98	17.75m	43.52	250.06m	–108.26
	300.00M	817.27m	–178.58	16.66	86.66	21.50m	49.67	269.42m	–117.12
	400.00M	821.05m	178.07	14.29	81.35	25.72m	53.82	299.16m	–122.56
	500.00M	822.77m	175.25	12.44	76.52	29.98m	56.96	329.16m	–126.45
	600.00M	823.71m	–172.68	10.92	72.09	34.07m	59.20	357.46m	–129.43
	700.00M	824.57m	–170.29	9.62	67.94	38.67m	60.59	383.29m	–131.95
	800.00M	827.27m	167.88	8.50	64.03	43.03m	61.96	406.71m	–134.38
	900.00M	832.43m	165.50	7.48	60.33	47.60m	62.47	427.98m	–136.72
	1.00G	838.21m	165.31	6.53	56.83	52.07m	63.13	448.88m	–139.04
	1.20G	849.72m	159.35	4.75	49.48	61.13m	64.77	488.24m	–143.65
	1.40G	858.26m	155.74	3.20	42.53	71.12m	65.45	521.83m	–148.09
	1.60G	859.18m	151.80	1.95	35.33	82.89m	66.32	549.39m	–152.42
	1.80G	865.18m	147.22	886.15m	29.28	94.50m	66.63	574.47m	–157.27
	2.00G	888.32m	142.51	–70.35m	25.14	108.02m	67.41	598.62m	–162.50
	2.20G	920.18m	139.08	–1.08	21.63	121.14m	66.78	629.99m	–168.02
	2.40G	939.49m	136.93	–2.31	17.78	131.56m	66.08	667.60m	–172.89
	2.60G	943.83m	134.97	–3.53	14.37	143.34m	65.44	703.28m	–176.98
	2.80G	971.04m	130.65	–4.11	11.83	161.30m	64.16	730.63m	–179.23
	3.00G	1.00m	121.85	–3.98	6.98	181.38m	60.51	753.52m	–174.97

Input Power : – 33.00dBm

Test Cond. (Volts/Amps)	Freq. (Hz)	S11 (Mag/angle)		S21 (dB/angle)		S12 (Mag/angle)		S22 (Mag/angle)	
TYPICAL DEVICE									
10.00/4.92m	100.00M	859.14m	–62.08	21.50	139.89	53.21m	54.22	835.38m	–38.33
	200.00M	779.21m	–102.23	18.72	115.53	75.23m	34.19	644.43m	–61.05
	300.00M	741.53m	–125.28	16.15	100.45	82.74m	23.57	544.48m	–74.65
	400.00M	726.58m	–139.55	14.02	89.64	85.21m	17.14	500.33m	–83.89
	500.00M	718.61m	–149.23	12.23	81.13	85.44m	13.14	485.87m	–90.90
	600.00M	713.75m	–156.42	10.69	73.90	84.63m	10.50	486.73m	–96.52
	700.00M	711.46m	–162.15	9.35	67.65	83.45m	8.75	496.51m	–101.25
	800.00M	711.13m	–167.06	8.14	62.03	81.92m	7.75	509.68m	–105.50
	900.00M	713.25m	–171.48	7.04	56.67	80.14m	7.21	524.41m	–109.54
	1.00G	718.05m	–175.48	6.03	51.69	77.61m	7.23	541.68m	–113.48
	1.20G	733.63m	177.68	4.11	41.78	73.18m	9.26	578.23m	–120.88
	1.40G	751.25m	172.08	2.43	33.02	69.77m	13.17	610.05m	–127.86
	1.60G	762.17m	166.97	1.08	24.72	67.19m	20.27	637.43m	–134.19
	1.80G	773.82m	161.53	–171.26m	17.79	67.81m	28.48	658.93m	–140.75
	2.00G	796.75m	155.86	–1.37	12.99	71.74m	37.81	676.86m	–147.51
	2.20G	829.77m	151.34	–2.62	8.81	78.85m	44.61	701.13m	–154.44
	2.40G	855.37m	148.06	–4.04	3.81	86.67m	49.87	733.67m	–160.86
	2.60G	870.57m	145.20	–5.44	–104.69m	96.75m	53.74	767.36m	–166.25
	2.80G	898.20m	140.42	–6.31	–2.16	111.64m	56.12	793.44m	–171.08
	3.00G	929.44m	131.81	–6.32	–5.42	129.75m	55.76	814.68m	–176.05

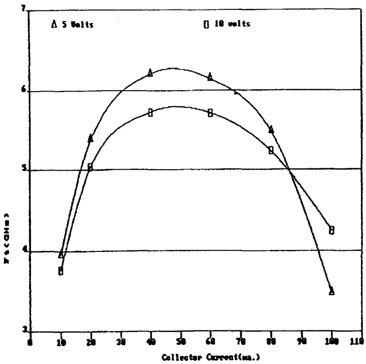
S-PARAMETERS

Input Power : – 33.00dBm

Test Cond. (Volts/Amps)	Freq. (Hz)	S11 (Mag/angle)	S21 (dB/angle)	S12 (Mag/angle)	S22 (Mag/angle)
TYPICAL DEVICE (continued)					
10.00/39.99m	100.00M	729.04m–132.20	29.46 112.59	24.69m 36.64	488.69m –91.48
	200.00M	745.92m–157.43	24.14 96.72	28.37m 32.66	359.54m–120.62
	300.00M	751.48m–167.69	20.77 88.62	31.25m 34.94	328.91m–133.40
	400.00M	754.09m–173.70	18.33 82.64	34.42m 38.17	322.92m–139.44
	500.00M	753.56m 178.09	16.42 77.65	37.79m 41.35	324.21m–142.42
	600.00M	752.25m 178.30	14.86 73.23	41.46m 44.09	329.87m–143.84
	700.00M	751.05m 175.22	13.55 69.17	45.32m 45.95	335.86m–144.42
	800.00M	751.25m 172.31	12.40 65.42	49.23m 47.54	343.65m–144.87
	900.00M	752.74M 169.54	11.36 61.83	53.26M 48.72	352.52m–145.26
	1.00G	757.02m 166.87	10.43 58.34	57.19m 49.63	363.98m–145.73
	1.20G	767.28m 162.43	8.70 51.23	64.87m 51.23	389.35m–146.99
	1.40G	774.74m 158.72	7.18 44.17	73.02m 52.19	414.56m–148.77
	1.60G	776.43m 155.04	5.98 36.87	81.85m 53.63	438.31m–150.80
	1.80G	780.38m 150.66	4.94 30.41	90.32m 54.67	462.49m–153.95
	2.00G	799.70m 146.81	3.98 25.46	100.51m 56.48	487.77m–158.13
	2.20G	830.60m 142.52	2.98 20.93	110.11m 56.84	521.19m–163.07
	2.40G	854.33m 140.32	1.77 15.96	117.90m 57.39	562.99m–167.60
	2.60G	865.73m 138.35	599.44m 11.12	127.57m 58.13	605.26m–171.24
	2.80G	891.74m 134.11	–102.73m 7.13	141.52m 57.97	637.15m–174.61
	3.00G	921.39m 125.98	–84.01m 1.83	158.21m 55.81	662.55m–178.59
10.00/59.99m	100.00M	732.87m–141.85	29.73 109.05	20.61m 36.29	438.95m –98.15
	200.00M	755.76m–162.77	24.23 94.71	24.03m 35.72	331.91m–125.79
	300.00M	761.73m–171.31	20.82 87.26	27.25m 40.00	310.11m–137.09
	400.00M	764.66m–176.47	18.36 81.63	30.93m 43.88	308.04m–142.05
	500.00M	764.97m 179.66	16.46 76.82	34.81m 46.96	312.00m–144.21
	600.00M	764.24m 176.43	14.88 72.55	38.80m 49.79	318.54m–145.11
	700.00M	763.15m 173.56	13.57 68.61	43.02m 51.10	326.78m–145.31
	800.00M	762.67m 170.83	12.41 64.92	47.38m 52.71	336.04m–145.52
	900.00M	766.29m 168.23	11.38 61.36	51.81m 53.27	346.08m–145.73
	1.00G	770.18m 165.72	10.44 57.99	55.89m 53.88	358.11m–146.05
	1.20G	780.48m 161.46	8.69 50.96	64.12m 55.14	385.35m–147.20
	1.40G	787.91m 157.82	7.18 43.94	72.63m 55.88	412.19m–148.91
	1.60G	788.55m 154.14	5.96 36.90	82.08m 56.96	436.47m–150.99
	1.80G	793.59m 149.80	4.89 30.57	91.05m 57.75	461.90m–154.18
	2.00G	812.71m 145.15	3.96 25.67	101.75m 59.29	487.41m–158.44
	2.20G	845.46m 141.72	2.93 21.37	112.03m 59.50	521.35m–163.45
	2.40G	868.22m 139.68	1.74 16.59	120.59m 59.76	563.05m–167.99
	2.60G	879.34m 137.62	578.04m 11.71	130.38m 60.13	605.28m–171.62
	2.80G	905.77m 133.41	–147.53m 8.01	144.96m 59.76	637.14m–175.05
	3.00G	934.69m 125.12	–73.58m 2.53	162.25m 57.18	661.78m –179.00

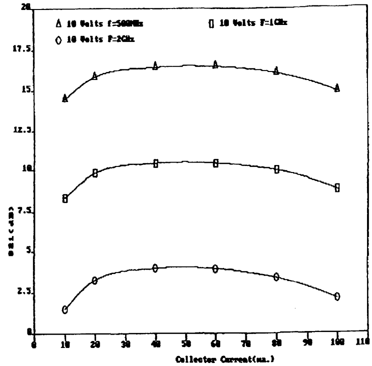
S-PARAMETERS

1333 (ft. vs. Current at 1GHz)



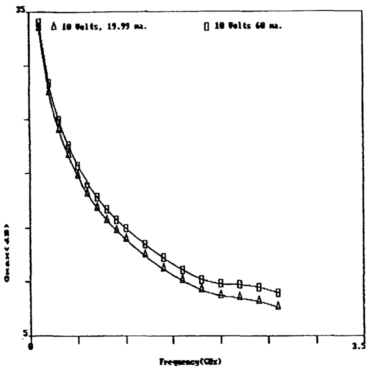
S88SD1333-02

1333 (S21 vs. Current)



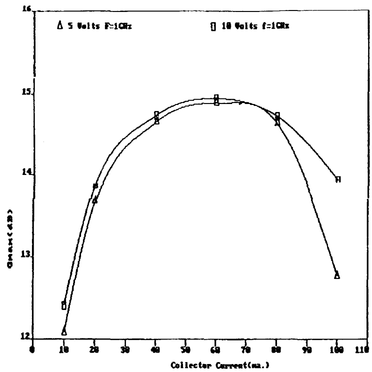
S88SD1333-03

1333 (Gmax vs. Frequency)

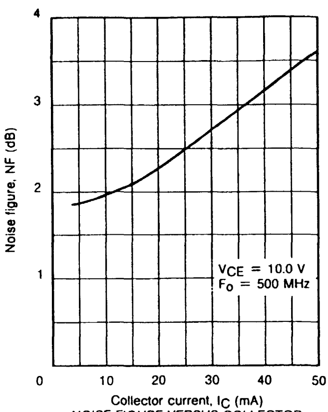


S88SD1333-04

1333 (Gmax vs. Current)

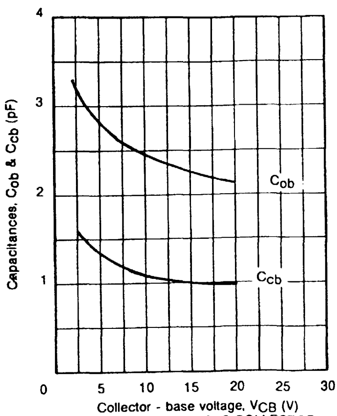


S88SD1333-05



NOISE FIGURE VERSUS COLLECTOR CURRENT

S88SD1333-06

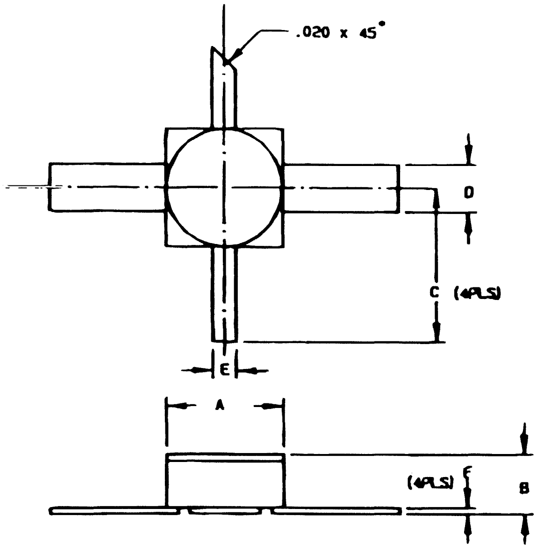


CAPACITANCES VERSUS COLLECTOR - BASE VOLTAGE

S88SD1333-07

PACKAGE MECHANICAL DATA

.100 x .100 4L



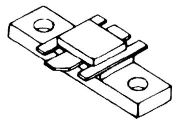
S88SD1333-08

	Minimum Inches/mm	Maximum Inches/mm
A	.090/2.29	.105/2.67
B	.035/0.89	.055/1.40
C		.340/8.64
D	.035/0.89	.043/1.09
E	.016/0.41	.024/0.61
F	.003/0.08	.006/0.15

SD1400

RF & MICROWAVE TRANSISTORS 850-900MHz CLASS C BASE STATIONS

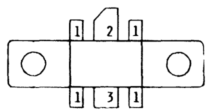
- CLASS C TRANSISTOR
- FREQUENCY 875MHz
- VOLTAGE 24V
- POWER OUT 9.0W
- POWER GAIN 9.5dB
- GOLD METTALLIZATION
- COMMON BASE



.230 6 LEAD FLANGE (M118)
epoxy sealed

ORDER CODE	BRANDING
SD1400	SD1400

PIN CONNECTION



S88SD1400-01

1 base
2 collector
3 emitter

DESCRIPTION

The SD1400 is a 24 Volt epitaxial silicon NPN planar transistor designed primarily for 800MHz mobile communications. This device utilizes matched input technology (Tuned Q) to increase bandwidth and power gain over the complete range of 850-900MHz. It withstands 10:1 VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	55.0	V
V_{CEO}	Collector - Emitter Voltage	28.0	V
V_{CES}	Collector - Emitter Voltage	55.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	2.0	A
P_{tot}	Total Power Dissipation	50.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

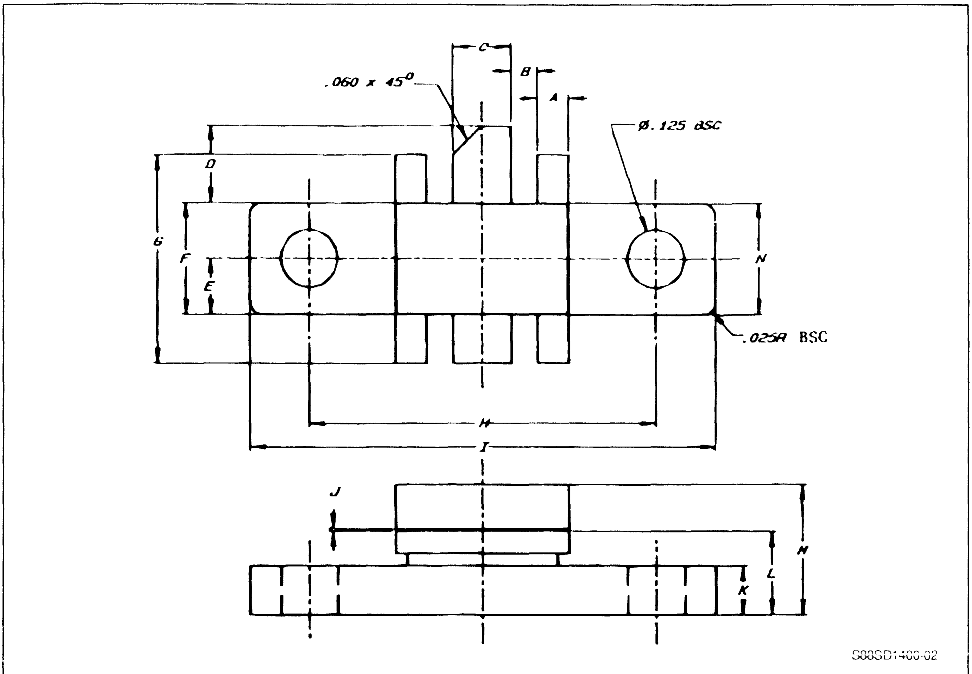
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	55.0			V
BV_{CEO}	I_C = 50mA	I_E = 0	28.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15V	I_E = 0			2.5	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1.0A	20.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 875MHz	V_{CE} = 24V		9.0			W
G_P	f = 875MHz	V_{CE} = 24V		9.5			dB
C_{OB}	f = 1MHz	V_{CB} = 24V	I_E = 0		12.0		pF

PACKAGE MECHANICAL DATA

.230 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.060/1.52	.070/1.78
B	.055/1.40 BSC	
C	.115/2.92	.125/3.18
D	.160/4.06 BSC	
E	.115/2.92 BSC	
F	.225/5.72	.235/5.97
G	.415/10.54	.445/11.30

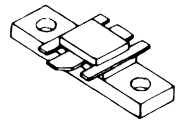
	Minimum Inches/mm	Maximum Inches/mm
H	.720/18.29	.730/18.52
I	.970/24.64	.980/24.89
J	.003/0.08	.007/0.18
K	.120/3.05	.130/3.30
L	.160/4.32	.180/4.57
M		.280/7.11
N	.225/5.72	.235/5.97

SGS-THOMSON MICROELECTRONICS

SD1400-2

RF & MICROWAVE TRANSISTORS 860-900MHz CLASS C, BASE STATIONS

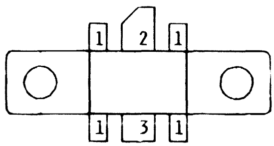
- CLASS C TRANSISTOR
- FREQUENCY875MHz
- VOLTAGE 24V
- POWER OUT 14.0W
- POWER GAIN 9.7dB
- EFFICIENCY 55%
- GOLD METALLIZATION
- COMMON BASE



.230 6LFL (M118)
epoxy sealed

ORDER CODE	**BRANDING**
SD1400-02	SD1400-2

PIN CONNECTION



S88SD1400-2-01

1 base
2 collector
3 emitter

DESCRIPTION

The SD1400-2 is a 24V NPN epitaxial silicon Planar Transistor designed for base station applications in cellular telephone systems. The SD1400-2 uses matched input technology (tuned Q) to increase bandwidth and power gain over the 806 to 900MHz range. It Withstands 20:1 VSWR at rated conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	55.0	V
V_{CEO}	Collector - Emitter Voltage	28.0	V
V_{CES}	Collector - Emitter Voltage	55.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	2.0	A
P_{tot}	Total Power Dissipation	57.5	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

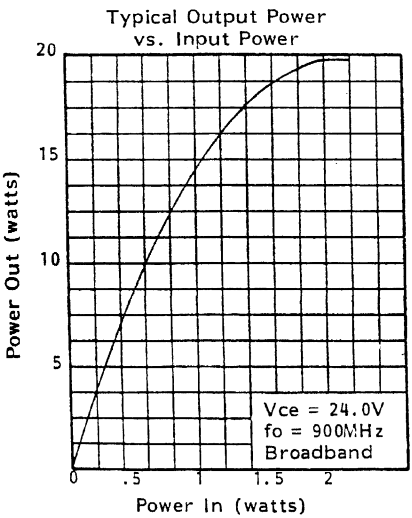
STATIC

Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CES}	I_C = 50.0mA	V_{BE} = 0	55.0			V
BV_{CEO}	I_C = 50.0mA	I_B = 0	28.0			V
BV_{EBO}	I_E = 10.0mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			2.5	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1.0A	20.0			

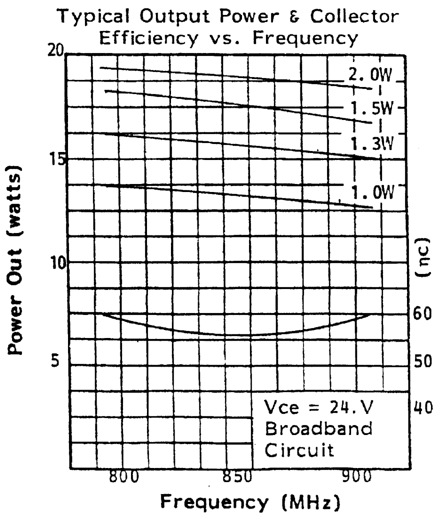
DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	f = 875MHz	V_{CE} = 24.0V	PIN = 1.5W	14.0			W
G_P	f = 875MHz	V_{CE} = 24.0V	PIN = 1.5W	9.7			dB
η_C	f = 875MHz	V_{CE} = 24.0V	PIN = 1.5W		55.0		%
C_{OB}	f = 1MHz	V_{CB} = 24.0V	I_E = 0		12.0		pF

APPLICATION INFORMATION (typical curves)



S88SD1400-2-02

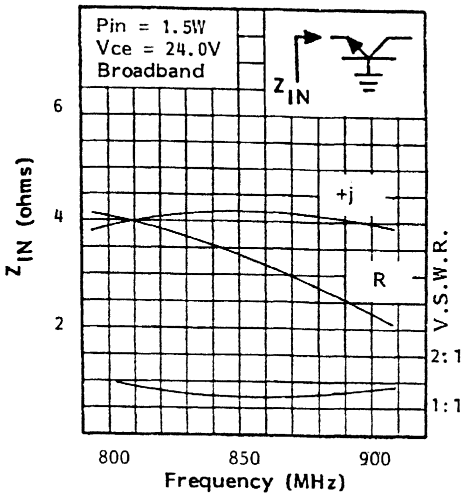


S88SD1400-2-03

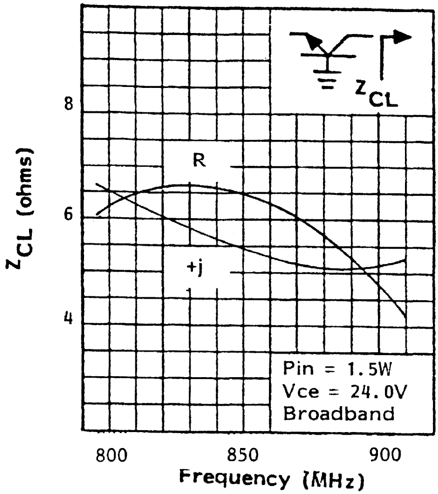
IMPDANCE DATA (typical)

$Z_{IN} = 2.3 + j4.0\Omega$
$Z_{CL} = 4.8 + j5.2\Omega$

F = 900MHz Pout = 14.0W
V_{CE} = 24.0V



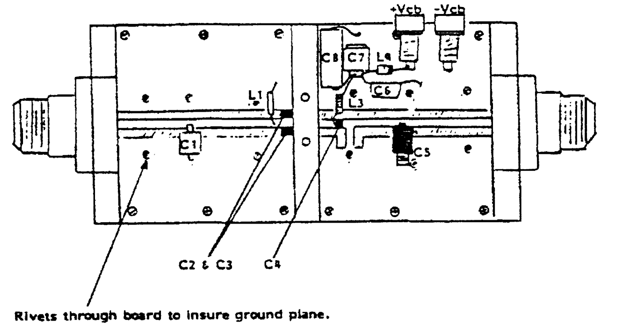
S88SD1400-2-04



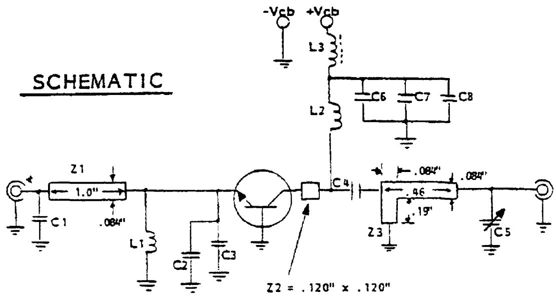
S88SD1400-2-05

TEST CIRCUIT

LAY-OUT (800-900MHz Vcb = +25V)



SCHEMATIC

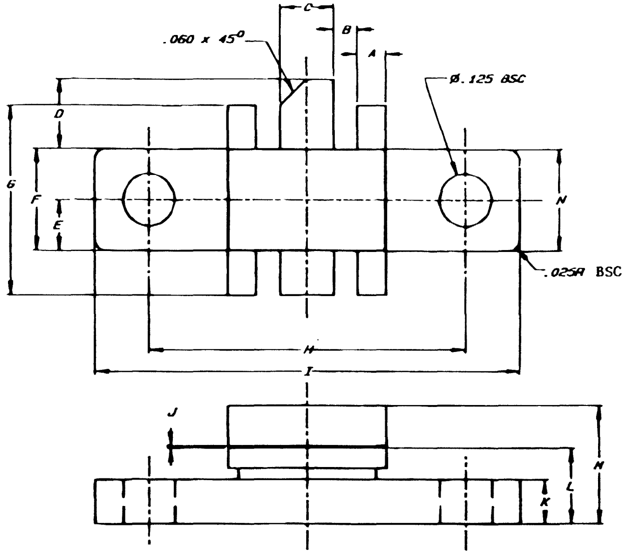


S88SD1400-2-06

PARTS LIST
C1 = 5pF Unelco
C2 = 12pF ATC 100mils Chip Capacitor
C3 = 12pF ATC 100mils Chip Capacitor
C4 = 18pF ATC 100mils Chip Capacitor
C5 = 0.6pF ATC 100mils Chip Capacitor
C6 = .0.1μF Disc
C7 = 1.000pF Unelco
C8 = 47μF 63V Electrolytic
L1 = .15mH Molded Choke
L2 = #24 AWG insulated 12 turns with .090" diameter
L3 = #22 Enamel with 2 turns in a Ferrocube Bead (ferrite) #56-590-65/38
Board Material : Glass Teflon 1/32" thick #3M-K-6098

PACKAGE MECHANICAL DATA

.230 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.060/1.52	.070/1.78
B	.055/1.40 BSC	
C	.115/2.92	.125/3.18
D	.160/4.06 BSC	
E	.115/2.92 BSC	
F	.225/5.72	.235/5.97
G	.415/10.54	.4345/11.30

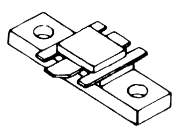
	Minimum Inches/mm	Maximum Inches/mm
H	.720/18.29	.730/18.52
I	.970/24.64	.980/24.89
J	.003/0.08	.007/0.18
K	.120/3.05	.130/3.30
L	.160/4.32	.180/4.57
M		.280/7.11
N	.225/5.72	.235/5.97

SGS-THOMSON
MICROELECTRONICS

SD1400-3

RF & MICROWAVE TRANSISTORS 900-960MHz CLASS C, BASE STATIONS

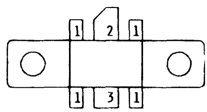
- CLASS C TRANSISTOR
- FREQUENCY 930MHz
- VOLTAGE 24V
- POWER OUT 14.0W
- POWER GAIN 9.5dB
- EFFICIENCY 50%
- GOLD METALLIZATION
- COMMON BASE



.230 6LFL (M118)
epoxy sealed

ORDER CODE	BRANDING
SD1400-03	SD1400-3

PIN CONNECTION



S88SD1400-3-01

1 base
2 collector
3 emitter

DESCRIPTION

The SD1400-3 is a 24V epitaxial silicon NPN planar transistor designed primarily for amplifier applications in the 900-960MHz frequency range. Internal input matching and common base configuration assure optimum gain and efficiency across the entire frequency band.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	55.0	V
V_{CEO}	Collector - Emitter Voltage	28.0	V
V_{CES}	Collector - Emitter Voltage	55.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	2.0	A
P_{tot}	Total Power Dissipation	50.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

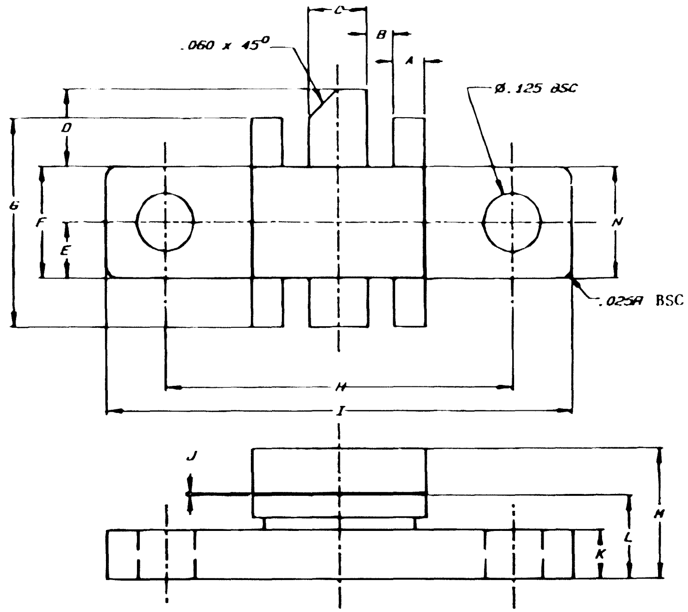
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50.0mA	V_{BE} = 0	55.0			V
BV_{CEO}	I_C = 50.0mA	I_B = 0	28.0			V
BV_{EBO}	I_E = 10.0mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15V	I_E = 0			2.5	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1.0A	30.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 960MHz	V_{CE} = 24V		14.0			W
G_P	f = 960MHz	V_{CE} = 24V		9.5			dB
ηc	f = 960MHz	V_{CE} = 24V		50.0			%
C_{OB}	f = 1MHz	V_{CB} = 24V	I_E = 0		12.5	18	pF

PACKAGE MECHANICAL DATA

.230 6LFL



S88SD1400-3-02

	Minimum Inches/mm	Maximum Inches/mm
A	.135/3.43	.145/3.68
B	.125/3.18 BSC	
C	.380/9.65	.390/9.91
D	.885/22.48	
E	.392/9.96	.402/10.29
F	.645/16.38	.655/16.64

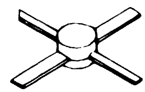
	Minimum Inches/mm	Maximum Inches/mm
G	.895/22.73	.905/22.99
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.105/2.67	.125/3.18
K		.230/5.84
L	.392/9.96	.402/10.29

SGS-THOMSON MICROELECTRONICS

SD1402

RF & MICROWAVE TRANSISTORS
860-960MHz CLASS C, MOBILE APPLICATION

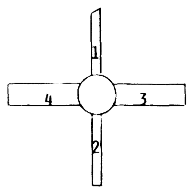
- CLASS C TRANSISTOR
- FREQUENCY 870MHz
- VOLTAGE 12.5V
- POWER OUT 0.3W
- POWER GAIN 8.0dB
- COMMON BASE



XO 72SL (M107)
epoxy sealed

ORDER CODE	**BRANDING**
SD1402	SD1402

PIN CONNECTION



1 collector	3 base
2 emitter	4 base

DESCRIPTION

The SD1402 transistor is a silicon epitaxial planar transistor, wired common base, that was specifically designed for low level amplifier and multiplier use in 800MHz mobile and portable equipment. It achieves infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Emitter Voltage	36.0	V
V_{CES}	Collector - Emitter Voltage	18.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	0.3	A
P_{tot}	Total Power Dissipation	3.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	58.3	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions			Value		Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 10.0mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_E = 10.0mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 5.0mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 12.5V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 150mA	20.0			

DYNAMIC

Symbol	Test Conditions				Value		Unit
				Min.	Typ.	Max.	
P_O	f = 870MHz	V_{CC} = 12.5V		0.3			W
G_P	f = 870MHz	V_{CC} = 12.5V		8			dB
η_C	f = 870MHz	V_{CC} = 12.5V			60		%
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0			4.0	pF

IMPEDANCE DATA (typical)

Z_s = 29.0 + j 0.9 ohms

Z_{cl} = 9.9 + j 45.0 ohms

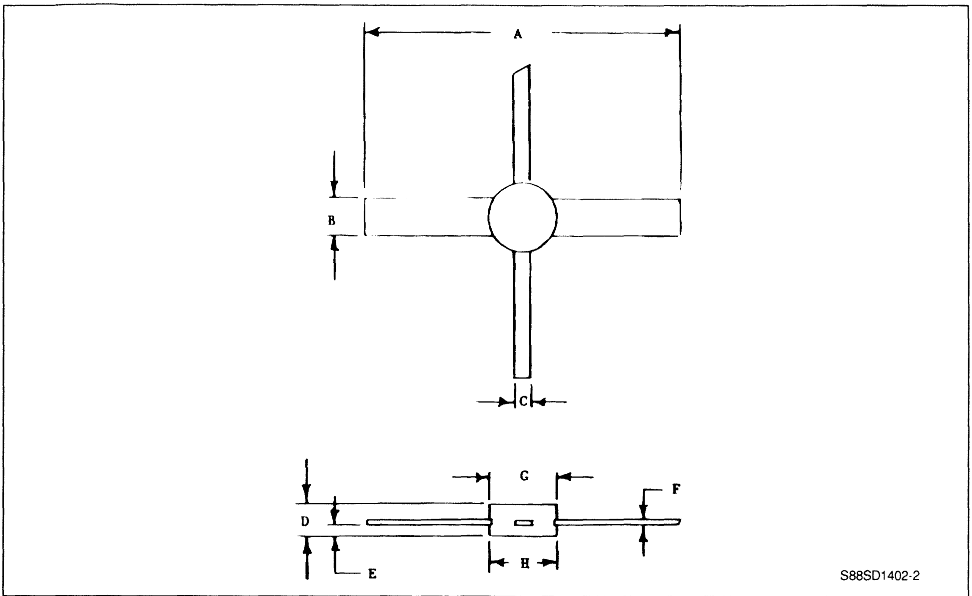
F = 870MHz

V_{CE} = 12.5V

P_o = 0.3W

PACKAGE MECHANICAL DATA

X0 72SL



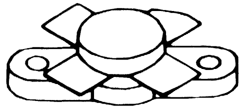
	Minimum Inches	Maximum Inches
A	.890	
B	.120	.130
C	.027	.033
D		.135
E	.40	.050
F	.003	.007
G	.201	.207
H	.201	.207

SGS-THOMSON
MICROELECTRONICS

SD1405

RF & MICROWAVE TRANSISTORS
SSB APPLICATIONS

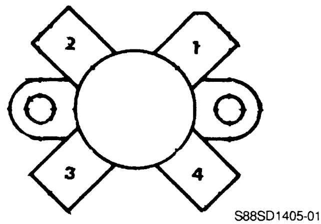
- SEMI LINEAR TRANSISTOR
- OPTIMIZED FOR SSB
- FREQUENCY 30MHz
- VOLTAGE 12.5V
- POWER OUT 75W
- POWER GAIN 13dB
- I_{MD} –32dB
- GOLD METALLIZATION
- COMMON EMITTER



.500 4LFL (M174)
epoxy sealed

ORDER CODE	**BRANDING**
SD1405	SD1405

PIN CONNECTION



1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1405 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for HF communications. This device utilizes diffused emitter resistors to achieve infinite VSWR under operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36	V
V_{CEO}	Collector - Emitter Voltage	18	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	20	A
P_{tot}	Total Power Dissipation	270	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.65	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

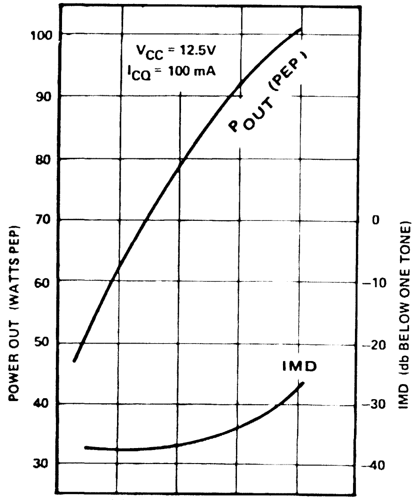
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100 mA	V_{BE} = 0	36			V
BV_{CEO}	I_C = 100 mA	I_B = 0	18			V
BV_{EBO}	I_E = 10 mA	I_C = 0	4			V
I_{CES}	V_{CE} = 5 V	V_{BE} = 0			15	mA
h_{FE}	V_{CE} = 5 V	I_C = 5 A	20	60		

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 30 MHz	V_{CE} = 12.5 V		75			W
G_P	f = 30 MHz	V_{CE} = 12.5 V		13			dB
IMD*	f = 30 MHz	V_{CE} = 12.5 V				– 32	dB
C_{ob}	f = 1 MHz	V_{CB} = 12 V	I_E = 0		354		pF

* at P_O = 60W.

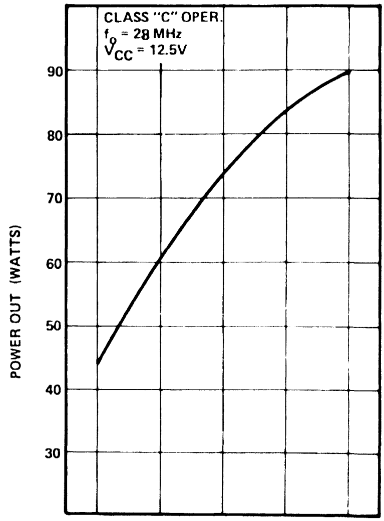
APPLICATION INFORMATION



POWER IN (WATTS PEP)
TWO TONE TEST
28.000 & 28.001 MHz

S88SD1405-02

TYPICAL CURVES



POWER IN (WATTS)
POWER OUT VS. POWER IN

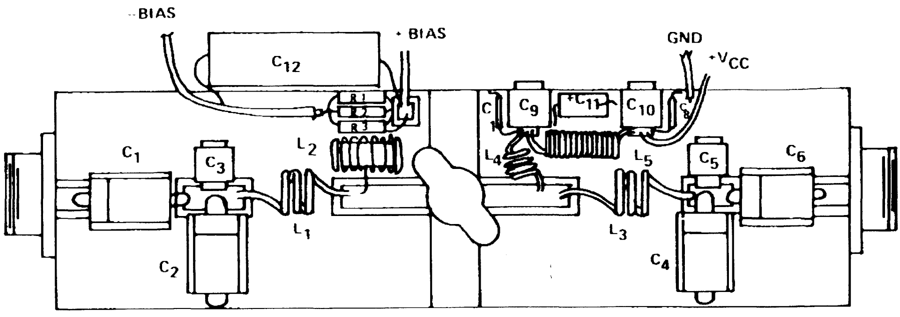
S88SD1405-03

IMPEDANCE INFORMATIONS (typical value)

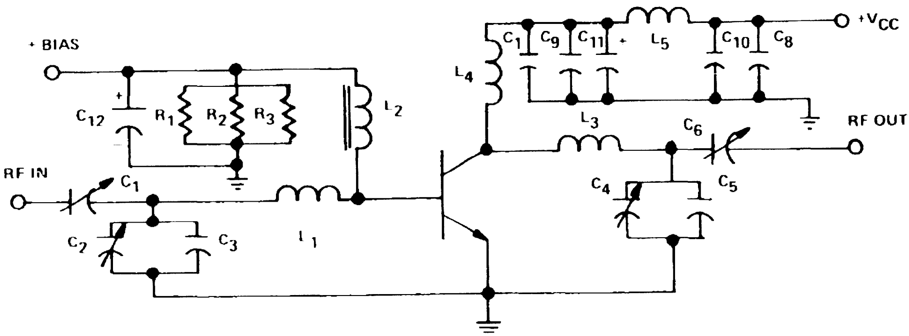
Z : 0.7 + j 0.75Ω at nominal conditions

Z : 1.2 + j 1Ω at nominal conditions.

TEST FIXTURE DRAWING



S88SD1405-04



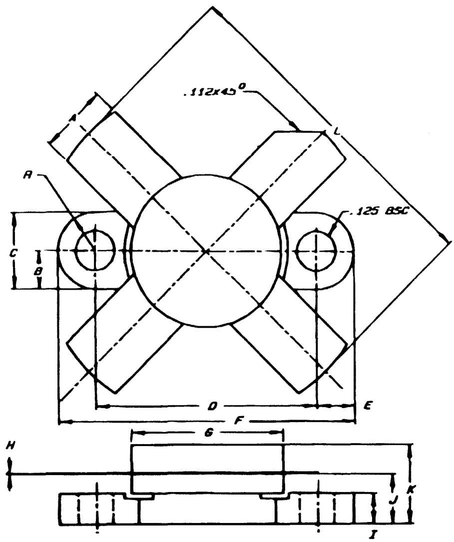
S88SD1405-05

COMPONENT LIST

C_1	– 9-180 pf, ARCO 463
C_2, C_4	– 5-380 pf, ARCO 465
C_3, C_5	– 200 pf, UNELCO
C_6	– 110-580 pf, ARCO 467
C_7, C_8	– 0.1 µf CERAMIC DISK
C_9, C_{10}	– 1000 pf, UNELCO
C_{11}	– 10 µf. ELECTROLYTIC, 35 V DC
C_{12}	– 1000 µf, ELECTROLYTIC, 50 V DC
L_1, L_3	– 2 1/2 TURNS, #14 AWG, 1/4" I.D. LOOSE WOUND
L_2	– 16 TURNS, #16 AWG, ENAMELED WIRE ON MICROMETALS TORROID #T-94
L_4	– 3 1/2 TURNS, #16 AWG, ENAMELED WIRE, 1/4" I.D.
L_5	– 14 TURNS, #16 AWG, ENAMELED WIRE, 1/4" I.D.
R_1, R_2, R_3	– 1.5 OHM, 1 WATT CARBON

PACKAGE MECHANICAL DATA

. 500 4LFL



S88SD1405-06

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

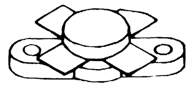
	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

SGS-THOMSON MICROELECTRONICS

SD1407

RF & MICROWAVE TRANSISTORS SSB APPLICATIONS

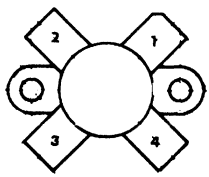
- SEMI LINEAR TRANSISTOR
- OPTIMIZED FOR SSB
- FREQUENCY 30MHz
- VOLTAGE 28V
- POWER OUT 100W
- POWER GAIN 15dB
- IMD –30dB
- GOLD METALLIZATION
- COMMON EMITTER



.500 4LFL (M174)
epoxy sealed

ORDER CODE	**BRANDING**
SD1407	SD1407

PIN CONNECTION



S88SD1407-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1407 is a 28V epitaxial silicon NPN planar transistor designed primarily for SSB communications. This device utilizes state-of-the-art diffused emitter ballasting for improved ruggedness and reliability.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CEO}	Collector - Emitter Voltage	36	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	20	A
P_{tot}	Total Power Dissipation	270	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.65	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

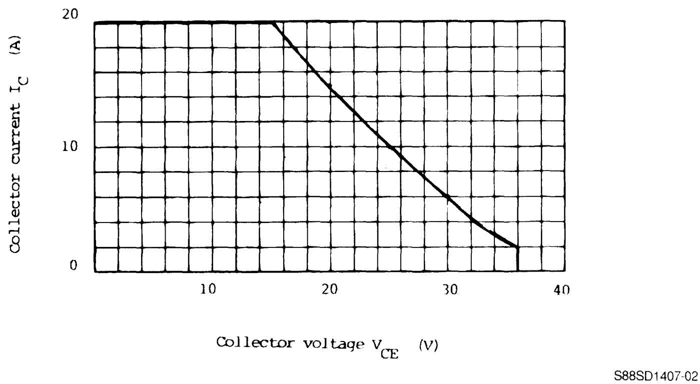
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100 mA	V_{BE} = 0	65			V
BV_{CEO}	I_C = 100 mA	I_B = 0	36			V
BV_{EBO}	I_E = 10 mA	I_C = 0	4			V
I_{CES}	V_{CE} = 30 V	V_{EB} = 0			15	mA
h_{FE}	V_{CE} = 5 V	I_C = 5 A	10	50		

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 30 MHz	V_{CE} = 28 V	I_{cq} = 100 mA	100			W
G_P	f = 30 MHz	V_{CE} = 28 V	I_{cq} = 100 mA	15	16		dB
IMD*	f = 30 MHz	V_{CE} = 28 V	I_{cq} = 100 mA		– 34	– 30	dB
C_{ob}	f = 1 MHz	V_{EB} = 30 V	I_E = 0		250		pF

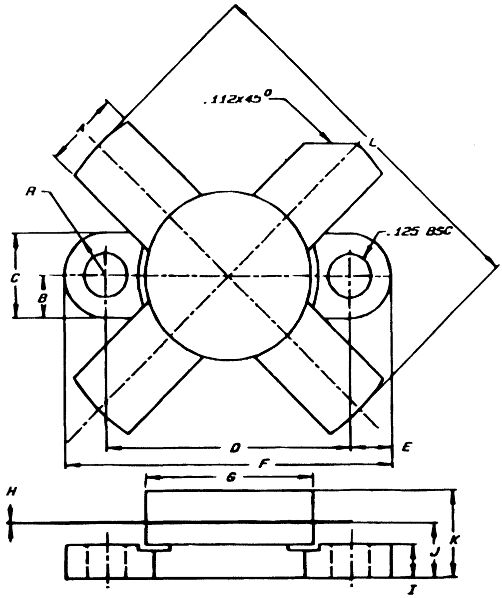
* At P_O = 100 W PEP.

Safe Operating Area.



PACKAGE MECHANICAL DATA

.500 4LFL



S88SD1407-03

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

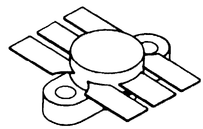
	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

SGS-THOMSON MICROELECTRONICS

SD1407-08

RF & MICROWAVE TRANSISTORS 27-88MHz FM APPLICATIONS

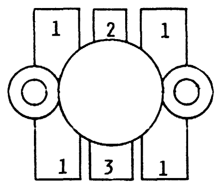
- FM CLASS C TRANSISTOR
- FREQUENCY 80MHz
- VOLTAGE 28V
- POWER OUT 100W
- POWER GAIN 9.5dB
- EFFICIENCY 60%
- GOLD METALLIZATION
- COMMON EMITTER



.500 6LFL (M111)
epoxy sealed

ORDER CODE	BRANDING
SD1407-08	SD1407-08

PIN CONNECTION



S88SD1407-08-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1407-08 is a 28V epitaxial silicon NPN planar transistor designed primarily for land mobile transmitter applications. This device utilizes emitter ballasting and is extremely stable and capable of withstanding extremely high VSWR under rated conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector – Base Voltage	65.0	V
V_{CEO}	Collector – Emitter Voltage	35.0	V
V_{EBO}	Emitter – Base Voltage	4.0	V
I_C	Collector Current	15.0	A
P_{tot}	Total Power Dissipation	270.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.65	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100mA	V_{BE} = 0	65.0			V
BV_{CEO}	I_C = 100mA	I_B = 0	35.0			V
BV_{EBO}	I_E = 10.0mA	I_C = 0	4.0			V
I_{CES}	V_{CB} = 30.0V	V_{BE} = 0			15.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 5.0A	10.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 80MHz	V_{CE} = 28.0V		100.0			W
G_P	f = 80MHz	V_{CE} = 28.0V		9.5			dB
η_C	f = 80MHz	V_{CE} = 28.0V		60.0			%
C_{ob}	f = 1MHz	V_{CB} = 28.0V	I_E = 0			335.0	pF

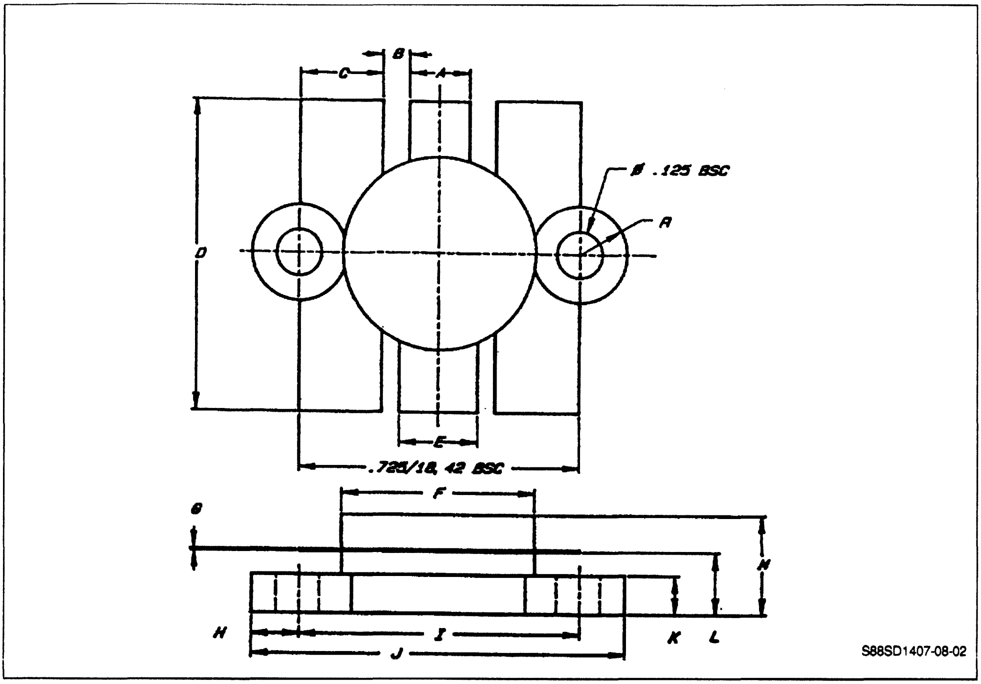
IMPEDANCES DATAS (typical)

Z_L : 4.31 + j1.30Ω
Z_S : 0.86 – j0.65Ω

at f = 80MHz
V_{CE} = 28V
P_{out} = 100W

PACKAGE MECHANICAL DATA

.500 6LFL

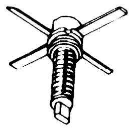


	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

RF & MICROWAVE TRANSISTORS
806-866MHz CLASS C, MOBILE APPLICATIONS

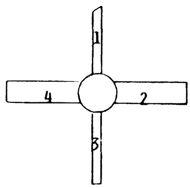
- CLASS C TRANSISTOR
- FREQUENCY 870MHz
- VOLTAGE 12.5V
- POWER OUT 2.0W
- POWER GAIN 8.0dB
- COMMON BASE



X0 72 (M108)
epoxy sealed

ORDER CODE	BRANDING
SD1409	SD1409

PIN CONNECTION



S88SD1409-01

1 collector
2 base
3 emitter
4 base

DESCRIPTION

The SD1409 transistor is a common base silicon epitaxial planar transistor, that was specifically designed for amplifier applications in the 800-870MHz Mobile Frequency Band. This device offers optimum gain over the entire frequency band, and achieves infinite VSWR at rated operating condi-

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	0.6	A
P_{tot}	Total Power Dissipation	8.75	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	20.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

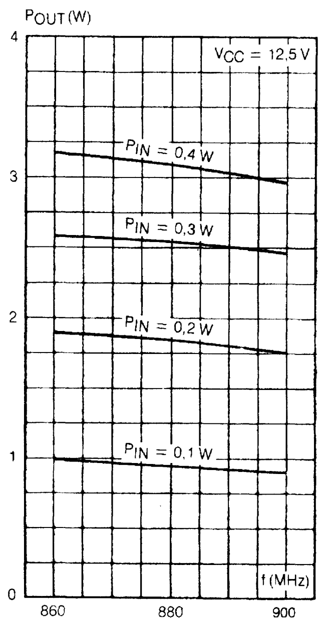
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 10mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_E = 10mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = ?V	I_E = 0				mA
h_{FE}	V_{CE} = 5.0V	I_C = 100mA	10.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 870MHz	V_{CE} = 12.5V		2.0			W
G_P	f = 870MHz	V_{CE} = 12.5V		8.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0		7.5		pF

APPLICATION INFORMATION (typical curves)

Figure 1 : Output Power versus Frequency (typical values).



S88SD1409-02

IMPEDANCE DATA (typical)

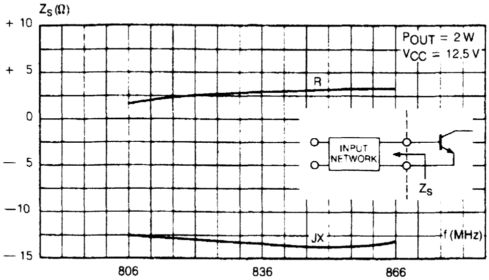


Figure 2 : Source Impedance versus Frequency.

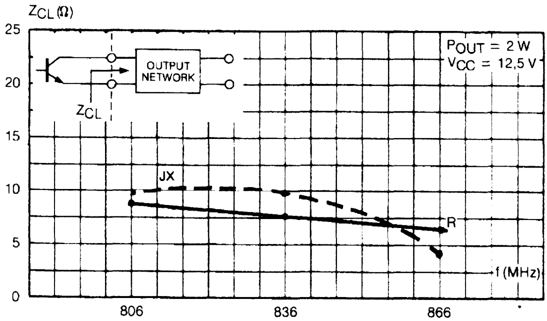


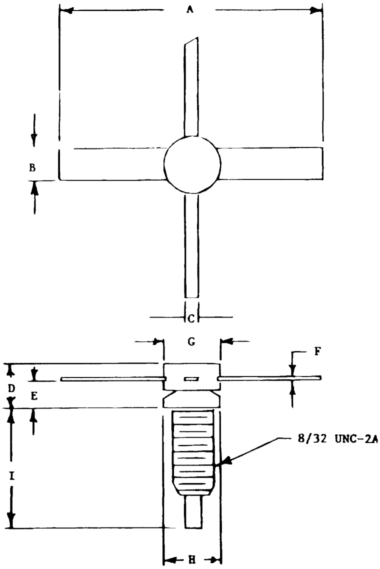
Figure 3 : Collector Load Impedance versus Frequency.

Frequency	Z_S (Ω)	Z_{CL} (Ω)
806MHz	2.8 – j13	8.8 + j9
836MHz	3.0 – j13	8.0 + j9.9
866MHz	3.0 – j14	6.6 + j4.3

V_{CC} = 12.5V
Power out = 2.0W

PACKAGE MECHANICAL DATA

X0 72



S88SD1409-04

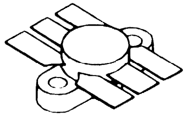
	Minimum Inches	Maximum Inches
A	.890	
B	.120	.130
C	.027	.033
D		.195
E	.098	.112
F	.003	.007
G	.201	.207
H	.201	.207
I	.425	.465

SGS-THOMSON
MICROELECTRONICS

SD1410

RF & MICROWAVE TRANSISTORS
806-866MHz CLASS C, MOBILE APPLICATIONS

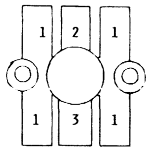
- CLASS C TRANSISTOR
- FREQUENCY 836MHz
- VOLTAGE 12.5V
- POWER OUT 6.0W
- POWER GAIN 8.0dB
- COMMON BASE



.380 6LFL (M136)
epoxy sealed

ORDER CODE	BRANDING
SD1410	SD1410

PIN CONNECTION



S88SD1410-01

1 base
2 collector
3 emitter

DESCRIPTION

The SD1410 is an NPN silicon epitaxial planar transistor that was designed for amplifier/multiplier applications in the 806-866MHz mobile range. This transistor is wired common base for optimum gain and efficiency over the frequency range. It withstands infinite VSWR at rated conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	A
I_C	Collector Current	5.0	W
P_{tot}	Total Power Dissipation	28.0	°C
T_{stg}	Storage Temperature	+ 200	°C
T_j	Junction Temperature	− 65 to + 150	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	6.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

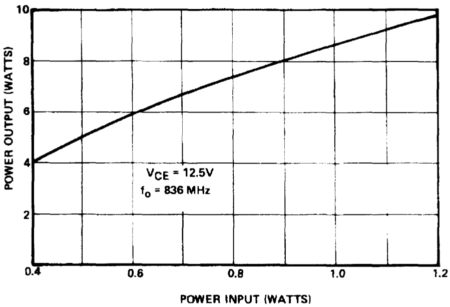
STATIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0		36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0		16.0			V
BV_{EBO}	I_E = 10mA	I_C = 0		4.0			V
I_{CES}	V_{CE} = 15V	V_{BE} = 0				10.0	mA
h_{FE}	V_{CE} = 6.0V	I_C = 1.0A		20.0			

DYNAMIC

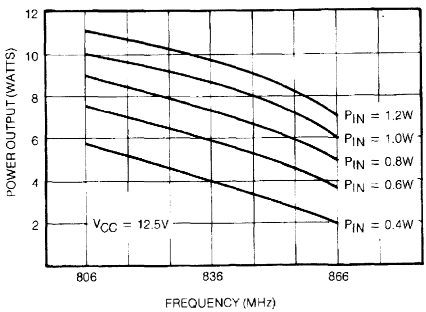
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 836MHz	V_{CE} = 12.5V		6.0			W
G_P	f = 836MHz	V_{CE} = 12.5V		8.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0		16.0		pF

APPLICATION INFORMATION (typical curves)



POWER OUTPUT VS. POWER INPUT

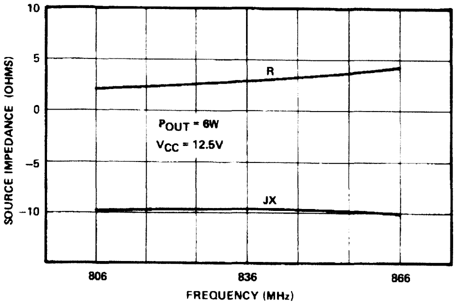
S88SD1410-02



POWER OUTPUT VS. FREQUENCY

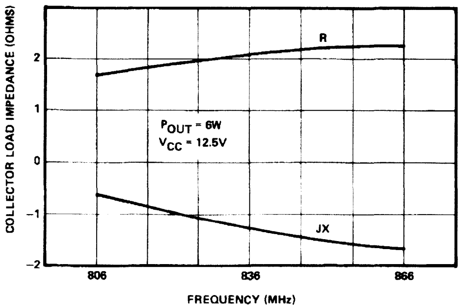
S88SD1410-03

IMPEDANCE DATA (typical)



SERIES SOURCE IMPEDANCE VS. FREQUENCY

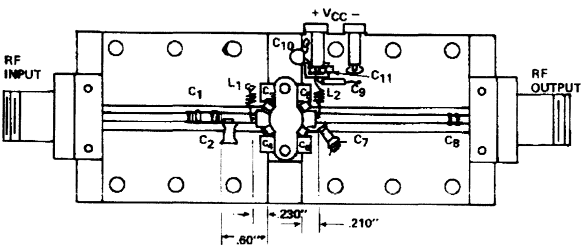
S88SD1410-04

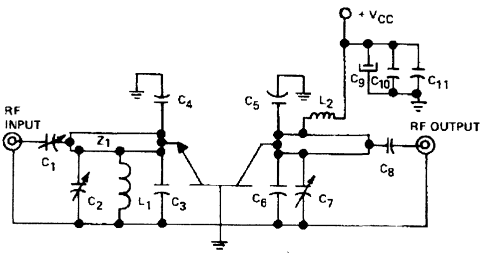


SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY

S88SD1410-05

TEST CIRCUIT





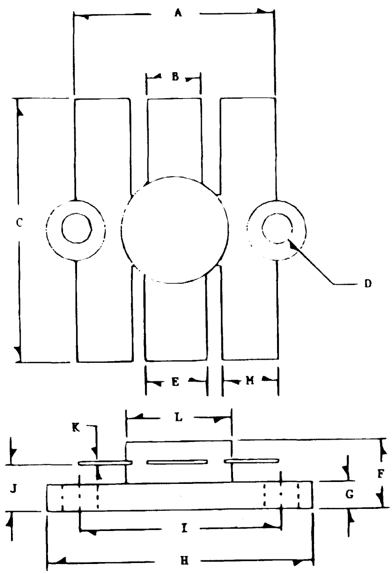
S88SD1410-06

COMPONENT LIST

C_1, C_2, C_7	VOLTRONIC .8-10pF
C_3, C_4	ATC 5.6pF CHIP 100B
C_5, C_6	ATC 7.5pF CHIP 100B
C_6	ATC 250pF CHIP 100B
C_9	10μF ELECTROLYTIC
C_{10}	0.1μF ERIE DISK
C_{11}	ATC 510pF CHIP 100B
L_1	TURNS, AWG#22, CLOSE WD, 3/32"I.D.
L_2	4 1/2 TURNS, AWG#22, CLOSE WD, 3/32"I.D.
Z_1	.09" WIDE X-1.60" LONG, 1/32" THICK BOARD MATERIAL - 3M-K-6098
Z_2	.33"WIDE X 1.48" LONG, 1/32" THICK BOARD MATERIAL - 3M-K-6098

PACKAGE MECHANICAL DATA

.380 6LFL



	Minimum mm	Maximum mm
A	18.1	18.4
B	4.7	5.0
C	24	24.4
D	2.8	3.3
E	5.4	5.7
F	6.3	6.7
G	2.4	2.7

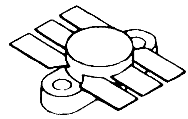
	Minimum mm	Maximum mm
H	24.6	25
I	18.3	18.5
J	4.0	4.6
K	0.10	0.15
L	9.4	9.7
M	4.9	5.2

SGS-THOMSON
MICROELECTRONICS

SD1410-1

RF & MICROWAVE TRANSISTORS
450-512MHz CLASS C, MOBILE APPLICATIONS

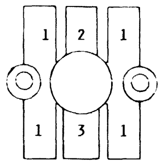
- CLASS C TRANSISTOR
- FREQUENCY 512MHz
- VOLTAGE 12.5V
- POWER OUT 10.0W
- POWER GAIN 6.0dB
- COMMON EMITTER



.380 6LFL (M136)
epoxy sealed

ORDER CODE	BRANDING
SD1410-01	SD1410-1

PIN CONNECTION



1 emitter
2 collector
3 base

DESCRIPTION

The SD1410-1 is a 12V epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device incorporates a state-of-the-art geometry to optimize the broadband power gain and maintain ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector – Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	3.0	A
P_{tot}	Total Power Dissipation	28.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	6.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

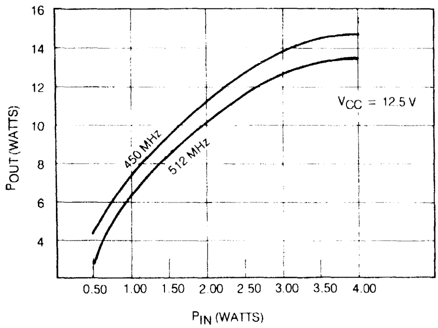
STATIC

Symbol	Test Conditions			Value		Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 200mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_E = ?mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 4mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 500mA	20.0			

DYNAMIC

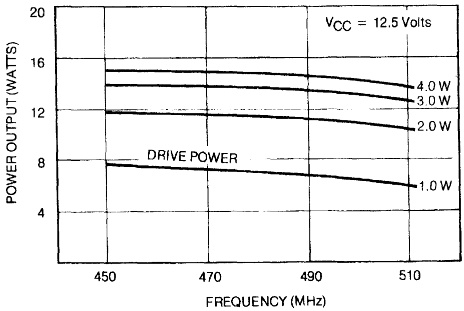
Symbol	Test Conditions				Value		Unit
				Min.	Typ.	Max.	
P_O	f = 512MHz	V_{CE} = 12.5V		10.0			W
G_P	f = 512MHz	V_{CE} = 12.5V		6.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0			25.0	pF

APPLICATION INFORMATION (typical curves)



POWER OUTPUT VS POWER INPUT

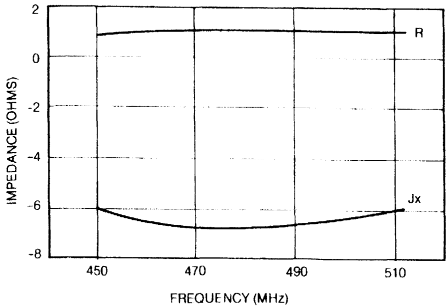
S88-SD1410-1-02



POWER OUTPUT VS FREQUENCY

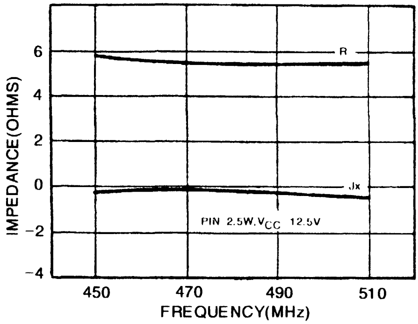
S88-SD1410-1-03

IMPEDANCE INFORMATION



SOURCE IMPEDANCE VS FREQUENCY

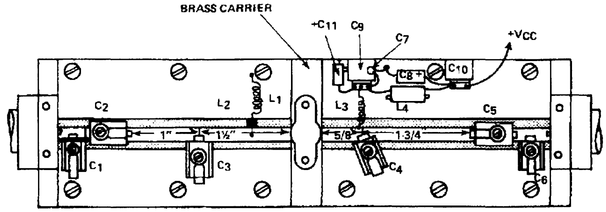
S88-SD1410-04

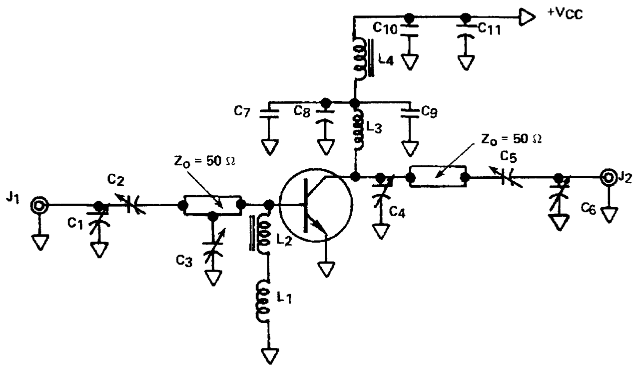


COLLECTOR LOAD IMPEDANCE VS FREQUENCY

S88-SD1410-05

TEST CIRCUIT



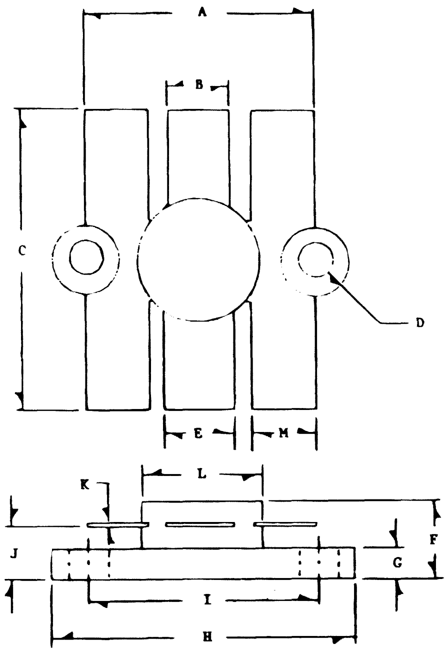


PARTS LIST

	L4	VK200	RFC
4EA.	C1, C3, C4, C6	ARCO TRIMMER #402	1.5pF - 20pF
1EA.	C2	ARCO TRIMMER #400	0.9pF - 7.0pF
1EA.	C5	ARCO TRIMMER #404	8.0pF - 60pF
2EA.	C9, C10	UNELCO	1000pF
2EA.	C8, C11	ELECTROLYTIC	10µFMIN
1EA.	C7	DISC.	.01µF
1EA.	L1	12TURNS#24WIRE ON .15"DIA.	
1EA.	L2	FERROCUBE SLEEVE #3BON LEAD OF L_1	
1EA.	L3	4TURNS#20.I.C.B.ON.20"DIA.	

PACKAGE MECHANICAL DATA

.380 6LFL



S88SD1410-1-07

	Minimum mm	Maximum mm
A	18.1	18.4
B	4.7	5.0
C	24	24.4
D	2.8	3.3
E	5.4	5.7
F	6.3	6.7
G	2.4	2.7

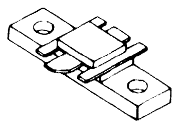
	Minimum mm	Maximum mm
H	24.6	25
I	18.3	18.5
J	4.0	4.6
K	0.10	0.15
L	9.4	9.7
M	4.9	5.2

SGS-THOMSON
MICROELECTRONICS

SD1410-3

RF & MICROWAVE TRANSISTORS
806-866MHz CLASS C MOBILE APPLICATIONS

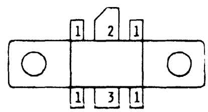
- CLASS C TRANSISTOR
- FREQUENCY 806-866MHz
- VOLTAGE 12.5V
- POWER OUT 7.0W
- POWER GAIN 7.5dB
- COMMON BASE



.230 6 LFL (M118)
epoxy sealed

ORDER CODE	BRANDING
SD1410-03	SD1410-3

PIN CONNECTION



S88SD1410-3-01

1 base
2 collector
3 emitter

DESCRIPTION

The SD1410-3 is an NPN silicon epitaxial planar transistor that was designed for amplifier applications in the 806-866MHz mobile range. This transistor is wired common base for optimum gain and efficiency over the frequency range. It with-stands infinite VSWR at rated conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	5.0	A
P_{tot}	Total Power Dissipation	28.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	6.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50.0mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_E = 50.0mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 10.0mA	I_C = 0	4.0			V
I_{CES}	V_{CE} = 15V				10	mA
h_{FE}	V_{CE} = 6.0V	I_C = 1.0A	20.0			

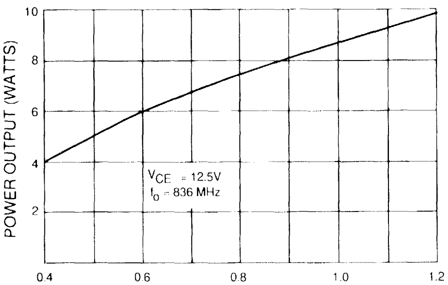
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 836MHz	V_{CE} = 12.5V		7.0			W
G_P	f = 836MHz	V_{CE} = 12.5V		7.5			dB
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0			16.0	pF

IMPEDANCE DATA (typical)

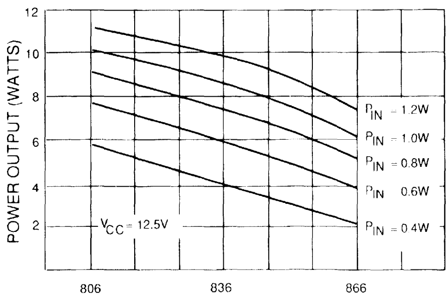
$Z_S = 2.8 - j\,9.7\Omega$
$Z_{CL} = 2.1 - j\,1.3\Omega$
F = 836MHz
V_{CE} = 12.5V
P_O = 6.0W

APPLICATION INFORMATION (typical curves)



POWER INPUT (WATTS)
POWER OUTPUT VS. POWER INPUT

S88SD1410-3-02

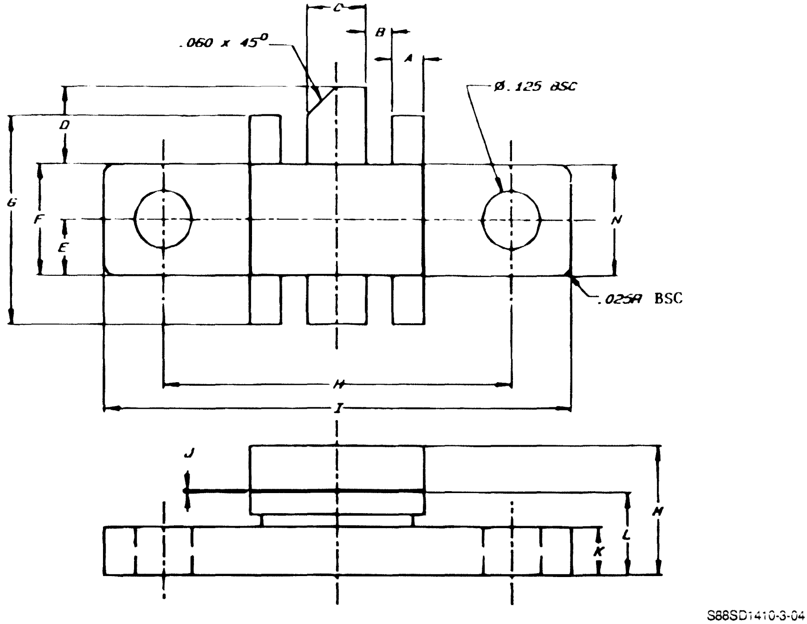


FREQUENCY (MHz)
POWER OUTPUT VS. FREQUENCY

S88SD1410-3-03

PACKAGE MECHANICAL DATA

.230 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.060/1.52	.070/1.78
B	.055/1.40 BSC	
C	.115/2.92	.125/3.18
D	.160/4.06 BSC	
E	.115/2.92 BSC	
F	.225/5.72	.235/5.97
G	.415/10.54	.445/11.30

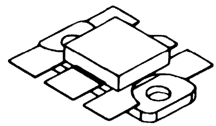
	Minimum Inches/mm	Maximum Inches/mm
H	.720/18.29	.730/18.52
I	.970/24.64	.980/24.89
J	.003/0.08	.007/0.18
K	.120/3.05	.130/3.30
L	.160/4.32	.180/4.57
M		.280/7.11
N	.225/5.72	.235/5.97

SGS-THOMSON
MICROELECTRONICS

SD1411

RF & MICROWAVE TRANSISTORS SSB APPLICATIONS

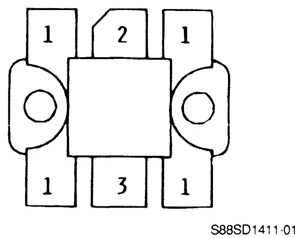
- SEMI LINEAR TRANSISTOR
- OPTIMIZED FOR SSB
- FREQUENCY 30MHz
- VOLTAGE 40 V
- POWER OUT 200 W PEP
- POWER GAIN 16dB
- IMD – 30dB
- GOLD METALLIZATION
- COMMON EMITTER



.400 x .425 6LFL (M153)
epoxy sealed

ORDER CODE	**BRANDING**
SD1411	SD1411

PIN CONNECTION



1 emitter
2 base
3 collector

DESCRIPTION

The SD1411 is an NPN silicon transistor designed for telecommunications in HF and VHF frequency bands. This device utilizes gold metalized die with diffused emitter resistors to achieve high reliability and ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	110	V
V_{CEO}	Collector - Emitter Voltage	55	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	40	A
P_{tot}	Total Power Dissipation	330	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.36	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

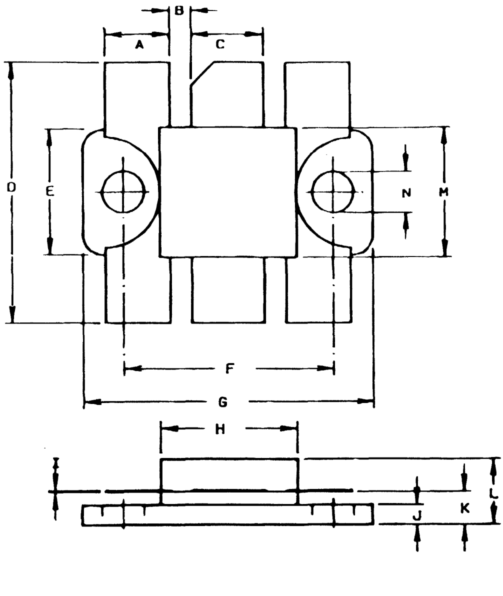
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 200 mA	V_{BE} = 0	110			V
BV_{CEO}	I_C = 200 mA	I_B = 0	55			V
BV_{EBO}	I_E = 20 mA	I_C = 0	4			V
I_{CES}	V_{CE} = 45 V	V_{BE} = 0			20	mA
h_{FE}	V_{CE} = 6 V	I_C = 10 A	15		80	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 30 MHz	V_{CE} = 40 V	I_{cq} = 150 mA	200			WPEP
G_P	f = 30 MHz	V_{CE} = 40 V	I_{cq} = 150 mA	16			dB
IMD	f = 30 MHz	V_{CE} = 40 V	I_{cq} = 150 mA			– 30	dB
C_{ob}	f = 1 MHz	V_{CB} = 50 V	I_E = 0			360	pF

PACKAGE MECHANICAL DATA

.400 x .425 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.195/4.95	.205/5.21
B	.066/1.68 REF	
C	.220/5.59	.230/5.84
D	.790/20.07	.810/20.57
E	.380/9.65	.390/9.91
F	.645/16.38	.655/16.64
G	.885/22.48	.905/22.98

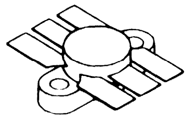
	Minimum Inches/mm	Maximum Inches/mm
H	.420/10.67	.430/10.92
I	.003/0.08	.007/0.18
J	.055/1.40	.065/1.65
K	.0095/2.41	.110/2.79
L	.200/5.08	.212/5.38
M	.395/10.03	.405/10.29
N	.130/3.30 DIA BASIC	

SGS-THOMSON
MICROELECTRONICS

SD1412

RF & MICROWAVE TRANSISTORS
806-866MHz CLASS C, MOBILE APPLICATIONS

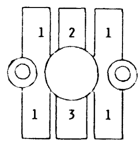
- CLASS C TRANSISTOR
- FREQUENCY 806-866MHz
- VOLTAGE 12.5V
- POWER OUT 20.0W
- POWER GAIN 6.0dB
- COMMON BASE



.380 6LFL (M136)
epoxy sealed

ORDER CODE	**BRANDING**
SD1412	SD1412

PIN CONNECTION



1 base
2 collector
3 emitter

DESCRIPTION

The SD1412 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for 800MHz mobile communications. This device utilizes matched input technology (Tuned Q) to increase bandwidth and power gain over the complete range of 806-866MHz. It withstands 10:1 VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36	V
V_{EBO}	Emitter - Base Voltage	4.0	A
I_C	Collector Current	7.0	W
P_{tot}	Total Power Dissipation	46.0	°C
T_{stg}	Storage Temperature	− 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.8	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

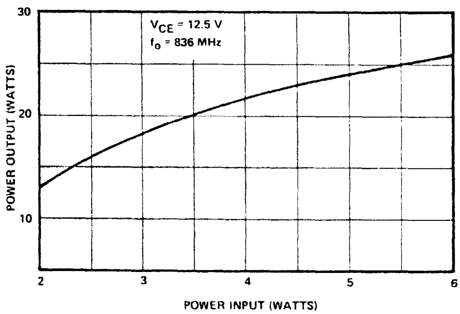
STATIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0		36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0		16.0			V
BV_{EBO}	I_E = 10mA	I_C = 0		4.0			V
I_{CES}	V_{CB} = 15V	V_{BE} = 0				10	mA
h_{FE}	V_{CE} = 6.0V	I_C = 1.0A		20.0			

DYNAMIC

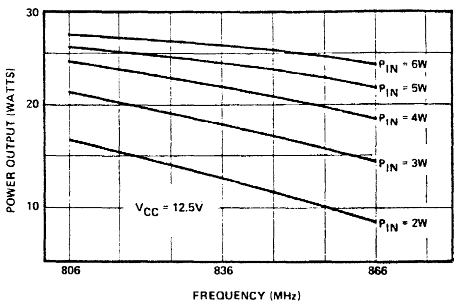
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 836MHz	V_{CE} = 12.5V		20.0			W
G_P	f = 836MHz	V_{CE} = 12.5V		6.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0		20.0		pF

APPLICATION INFORMATION (typical curves)



POWER OUTPUT VS. POWER INPUT

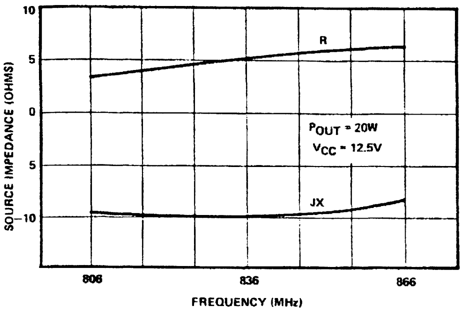
S88SD1412-02



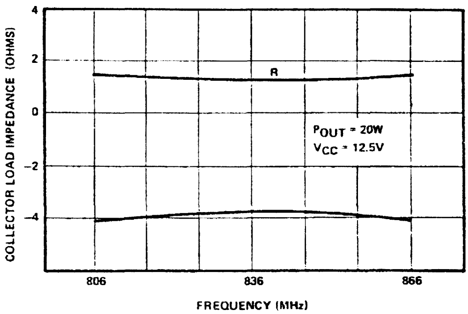
POWER OUTPUT VS. FREQUENCY

S88SD1412-03

IMPEDANCE DATA (typical)



SERIES SOURCE IMPEDANCE VS. FREQUENCY

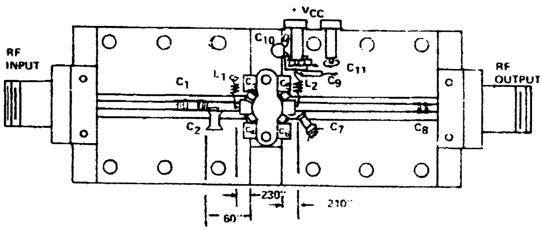


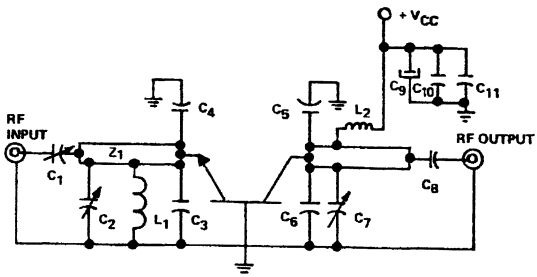
SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY

S88SD1412-04

S88SD1412-05

TEST CIRCUIT



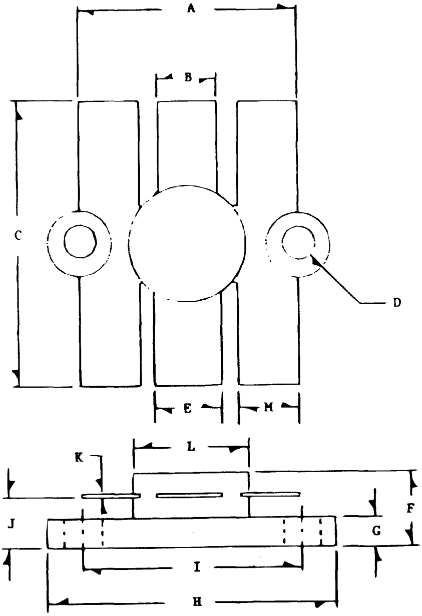


COMPONENT LIST

C_1, C_2, C_7	VOLTRONIC .8.10pF
C_8	ATC 250pF CHIP 100B
C_3, C_4	ATC 5.6pF CHIP 100B
C_9	4.7pF ELECTROLYTIC
C_{10}	01µF SERIE DISK
C_{11}	ATC 510pF CHIP 100B
L_1	4 TURNS, AWG#22, CLOSE WD..3/32"I.D.
L_2	41/2 TURNS, AWG#22, CLOSE WD.. 3/32" THICK
Z_1	090" WIDE X .600" LONG, 1/32" THICK BOARD MATERIAL - 3M.K.6098
Z_2	105"WIDE X 1.7103 LONG, 1/32" THICK BOARD MATERIAL - 3M.K.6098

PACKAGE MECHANICAL DATA

.380 6LFL



	Minimum mm	Maximum mm
A	18.1	18.4
B	4.7	5.0
C	24	24.4
D	2.8	3.3
E	5.4	5.7
F	6.3	6.7
G	2.4	2.7

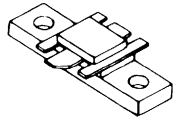
	Minimum mm	Maximum mm
H	24.6	25
I	18.3	18.5
J	4.0	4.6
K	0.10	0.15
L	9.4	9.7
M	4.9	5.2

SGS-THOMSON
MICROELECTRONICS

SD1412-3

RF & MICROWAVE TRANSISTORS
806-866MHz CLASS C, MOBILE APPLICATIONS

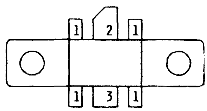
- CLASS C TRANSISTOR
- FREQUENCY 836MHz
- VOLTAGE 12.5V
- POWER OUT 18.0W
- POWER GAIN 6.0dB
- COMMON BASE



.230 6LFL (M118)
epoxy sealed

ORDER CODE	**BRANDING**
SD1412-03	SD1412-3

PIN CONNECTION



S88SD1412-3-01

1 base
2 collector
3 emitter

DESCRIPTION

The SD1412-3 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for 800MHz mobile communications. The device utilizes matched input technology (Tuned Q) to increase bandwidth and power gain over the complete range of 806-866MHz. It withstands 10:1 VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	7.0	A
P_{tot}	Total Power Dissipation	46.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.8	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CES}	V_{CE} = 15V				10	mA
h_{FE}	V_{CE} = 6.0V	I_C = 1.0A	20.0			

DYNAMIC

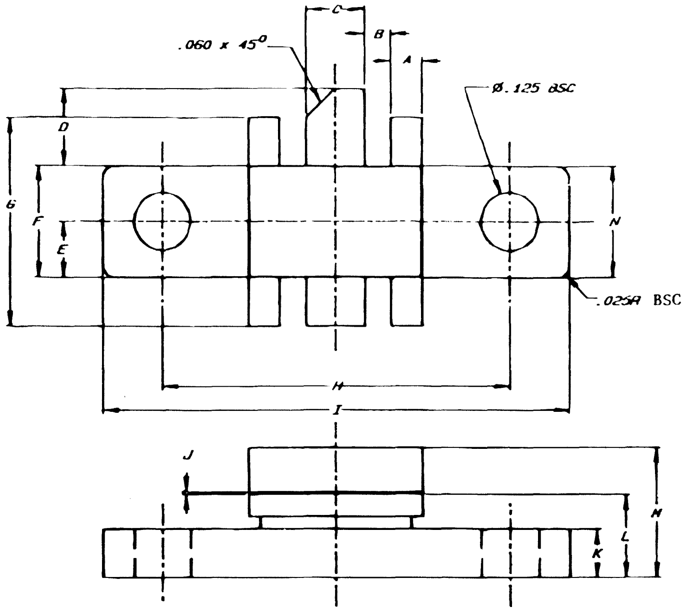
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 836MHz	V_{CE} = 12.5V		18.0			W
G_P	f = 836MHz	V_{CE} = 12.5V		6.0			dB
C_{ob}	f = 1MHz	V_{CB} = 12.5V	I_E = 0		20.0		pF

IMPEDANCE DATA (typical)

Z_S = 3.0 – j 4.8Ω
Z_{CL} = 1.6 – j 2.5Ω
F = 836MHz
V_{CE} = 12.5V
P_o = 15.0W

PACKAGE MECHANICAL DATA

.230 6LFL



S88SD1412-3-02

	Minimum Inches/mm	Maximum Inches/mm
A	.060/1.52	.070/1.78
B	.055/1.40 BSC	
C	.115/2.92	.125/3.18
D	.160/4.06 BSC	
E	.115/2.92 BSC	
F	.225/5.72	.235/5.97
G	.415/10.54	.445/11.30

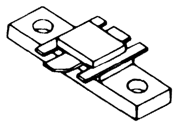
	Minimum Inches/mm	Maximum Inches/mm
H	.720/18.29	.730/18.52
I	.970/24.64	.980/24.89
J	.003/0.08	.007/0.18
K	.120/3.05	.130/3.30
L	.160/4.32	.180/4.57
M		.280/7.11
N	.225/5.72	.235/5.97

SGS-THOMSON
MICROELECTRONICS

SD1414

RF & MICROWAVE TRANSISTORS
806-866MHz CLASS C, MOBILE APPLICATIONS

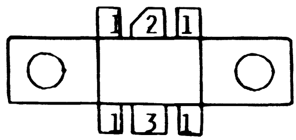
▪ CLASS C TRANSISTOR	
▪ FREQUENCY	836MHz
▪ VOLTAGE	12.5V
▪ POWER OUT	45.0W
▪ POWER GAIN	4.5dB
▪ COMMON BASE	



.230 6LFL (M142)
epoxy sealed

ORDER CODE	BRANDING
SD1414	SD1414

PIN CONNECTION



S88SD1414-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1414 is an NPN Silicon Epitaxial Planar Transistor that was designed for amplifier applications in the 806-866MHz frequency range. Internal input matching and Common Base Configuration assure optimum gain and efficiency across the entire frequency band. It Withstands infinite VSWR at rated power output.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	9.0	A
P_{tot}	Total Power Dissipation	150.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.17	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

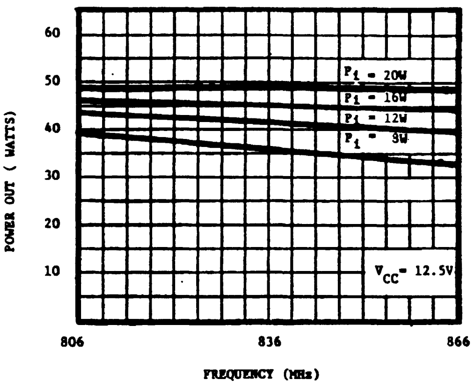
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1.0A	5.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 836MHz	V_{CE} = 12.5V		45.0			W
G_P	f = 836MHz	V_{CE} = 12.5V		4.7			dB
C_{ob}	f = 1MHz	V_{CB} = 12.5V	I_E = 0		80.0		pF

APPLICATION INFORMATION (typical curves)

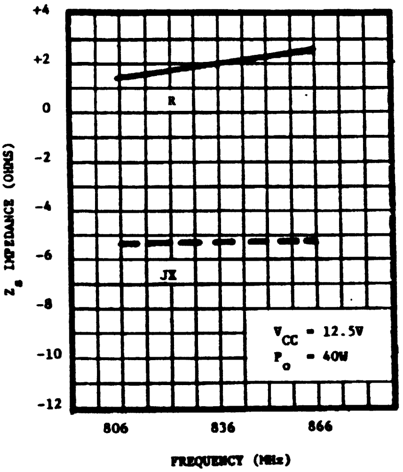
TYPICAL POWER OUT vs. FREQUENCY



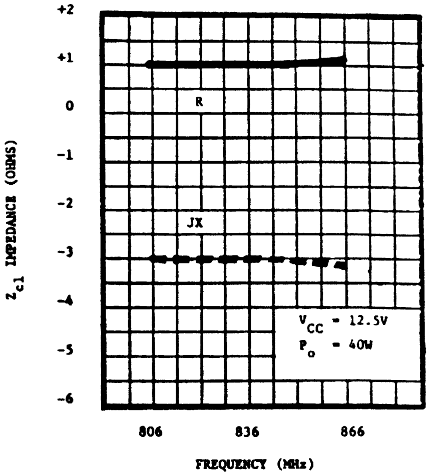
S88SD1414-02

IMPEDANCE DATA (typical)

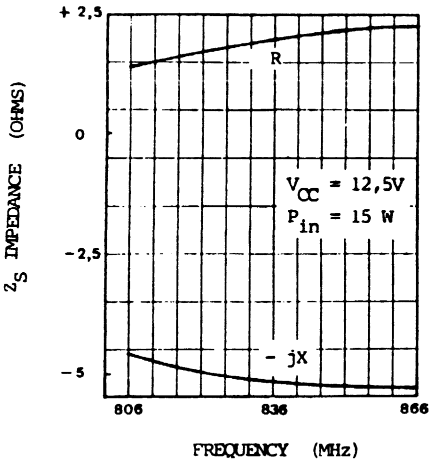
TYPICAL SERIES SOURCE IMPEDANCE



S88SD1414-03

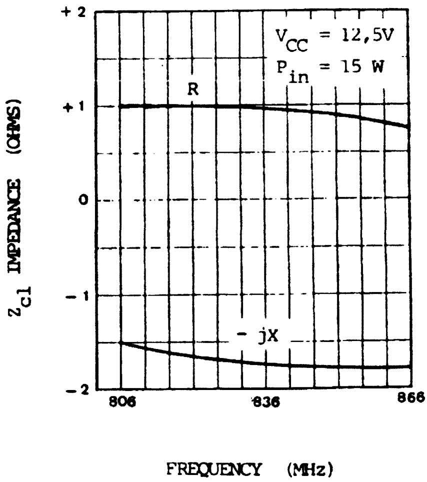


S88SD1414-04



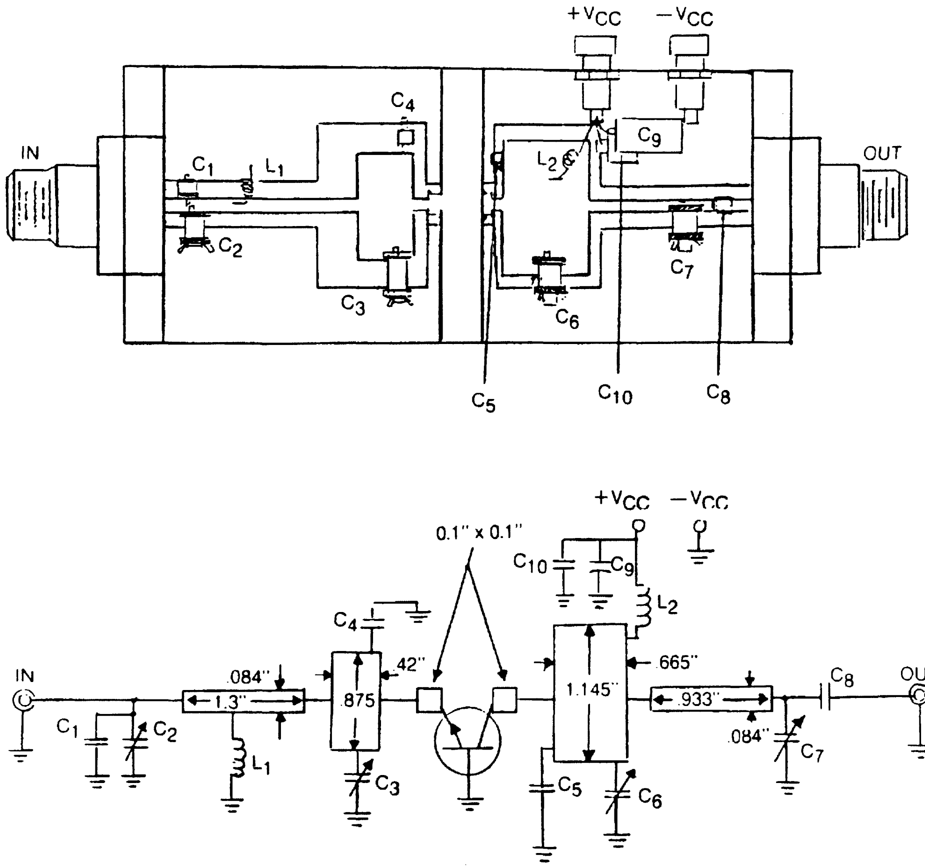
S88SD1414-05

TYPICAL COLLECTOR LOAD IMPEDANCE vs. FREQUENCY



S88SD1414-06

TEST CIRCUIT

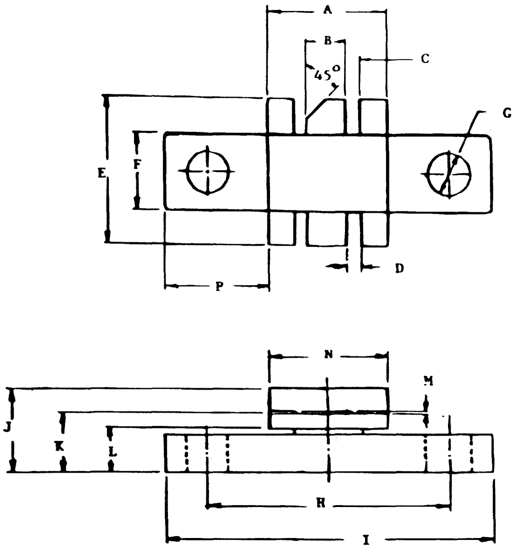


S88SD1414-07

PARTS LIST
C1 - 5pF ATC 100mils chip capacitor
C2 - 1-12pF variable capacitor
C3 - 6-6pF variable capacitor
C4 - 5pF ATC 100mils chip capacitor
C5 - 2pF "A" size chip capacitor
C6 - Voltronic .6-12pF variable capacitor
C7 - Voltronic .6-12pF variable capacitor
C8 - 480pF ATC 100mils chip capacitor
C9 - 47μF - 63V electrolytic capacitor
C10 - 1000pF unelco capacitor
L1, L2 - 5 turns of 24AWG enamel
Board Material - 3M-K- 6098-11 12.9mils thick

PACKAGE MECHANICAL DATA

.230 6LFL



	Minimum Inch/mm	Maximum Inch/mm
A	.355/9.01	.365/9.27
B	.115/2.92	.125/3.18
C	.075/1.91	.085/2.16
D	.035/0.89	.045/1.14
E	.425/10.80	.435/11.05
F	.225/5.72	.235/5.97
G	.115/2.92	.130/3.30
H	.720/18.29	.730/18.54

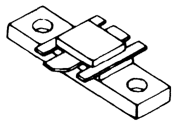
	Minimum Inch/mm	Maximum Inch/mm
I	.970/24.64	.980/24.89
J	.230/5.84	.260/6.60
K	.155/3.94	.175/4.45w
L	.120/3.05	.130/3.30
M	.004/0.10	.006/0.15
N	.345/8.76	.360/9.14
P	.300/7.62	.314/7.98

SGS-THOMSON
MICROELECTRONICS

SD1418

RF & MICROWAVE TRANSISTORS
806-866MHz CLASS C, MOBILE APPLICATIONS

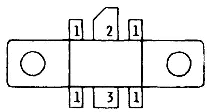
- CLASS C TRANSISTOR
- FREQUENCY 836MHz
- VOLTAGE 12.5V
- POWER OUT 15.0W
- POWER GAIN 5.2dB
- COMMON EMITTER



.230 6LFL (M118)
epoxy sealed

ORDER CODE	**BRANDING**
SD1418	SD1418

PIN CONNECTION



S88SD1418-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1418 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for 800MHz mobile communications. This device utilizes matched input technology (Tuned Q) to increase bandwidth and power gain over the complete range of 806-866MHz. It Withstands infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	7.0	A
P_{tot}	Total Power Dissipation	46.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.8	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

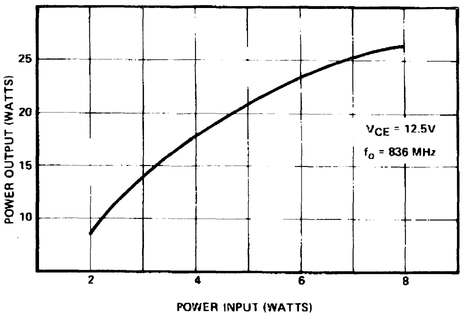
STATIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0		36.0			V
BV_{CEO}	I_E = 50mA	I_B = 0		16.0			V
BV_{EBO}	I_E = 10mA	I_C = 0		4.0			V
I_{CES}	V_{CB} = 15V	V_{BE} = 0				10.0	mA
h_{FE}	V_{CE} = 6.0V	I_C = 1.0A		20.0			

DYNAMIC

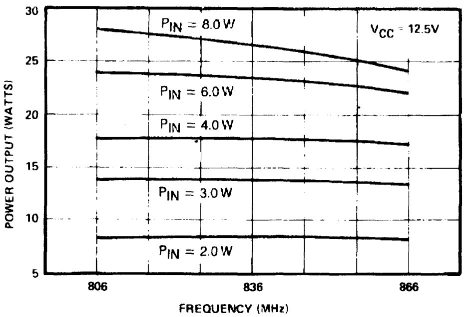
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 836MHz	V_{CE} = 12.5V		15.0			W
G_P	f = 836MHz	V_{CE} = 12.5V		5.2			dB
C_{Ob}	f = 1MHz	V_{CB} = 12.5V	I_E = 0		20.0		pF

APPLICATION INFORMATION (typical curves)



POWER OUTPUT VS. POWER INPUT

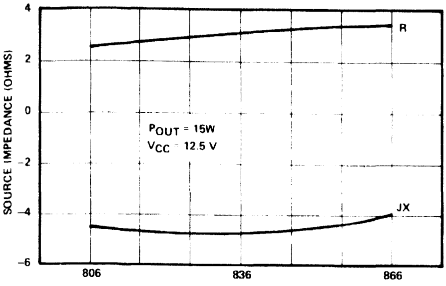
S88SD1418-02



POWER OUTPUT VS. FREQUENCY

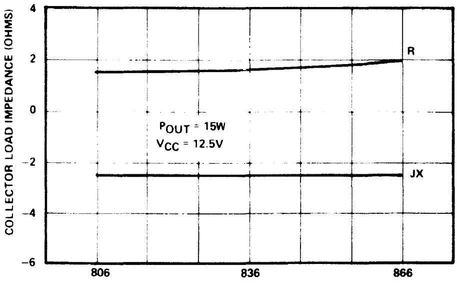
S88SD1418-6-03

IMPEDANCE DATA (typical)



SERIES SOURCE IMPEDANCE VS. FREQUENCY

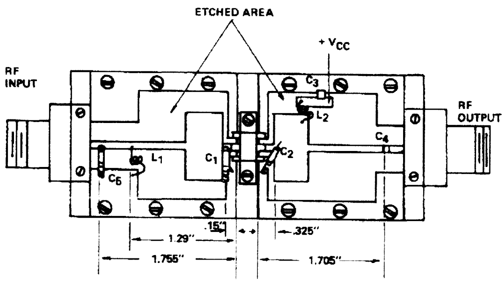
S88SD1418-04

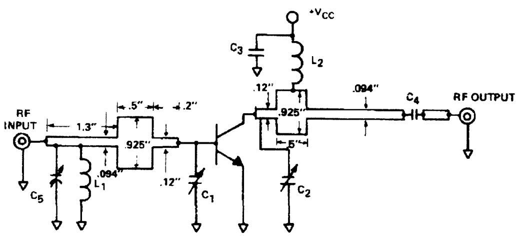


SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY

S88SD1418-05

TEST CIRCUIT



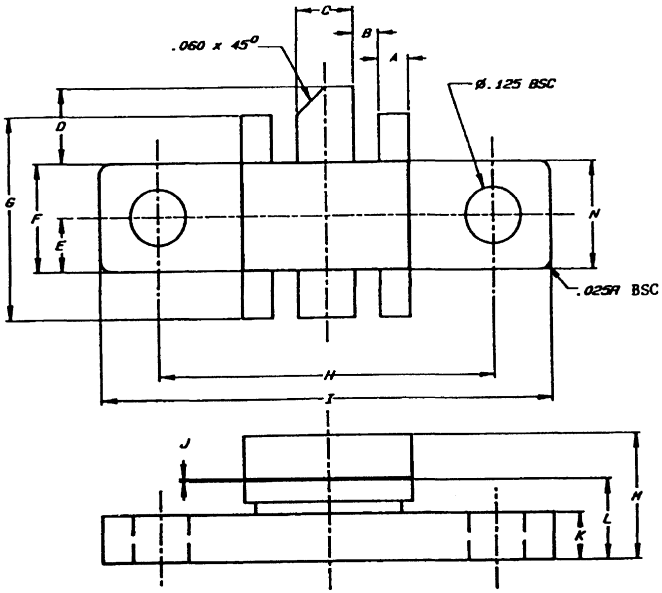


S88SD1418-06

COMPONENTS LIST
C1, C2, C5 .5 - 5.0pF Johanson E5851
L1, L2 4.5 TURNS #22, .09" I.D.
C3 470pF, 100MIL SQ ATC
C4 .001MF 50MIL SQ ATC 200A 102MC 50
BOARD MATERIAL - TEFLON GLASS 1/32"
E, 2.45

PACKAGE MECHANICAL DATA

.230 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.060/1.52	.070/1.78
B	.055/1.40 BSC	
C	.115/2.92	.125/3.18
D	.160/4.06 BSC	
E	.115/2.92 BSC	
F	.225/5.72	.235/5.97
G	.415/10.54	.4345/11.30

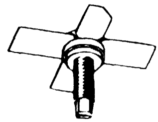
	Minimum Inches/mm	Maximum Inches/mm
H	.720/18.29	.730/18.52
I	.970/24.64	.980/24.89
J	.003/0.08	.007/0.18
K	.120/3.05	.130/3.30
L	.160/4.32	.180/4.57
M		.280/7.11
N	.225/5.72	.235/5.97

SGS-THOMSON MICROELECTRONICS

SD1420

RF & MICROWAVE TRANSISTORS 860-960MHz CLASS AB BASE STATION

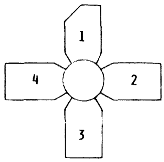
- FREQUENCY 860 - 960MHz
- POWER OUT 2.1W
- VOLTAGE 24V
- POWER GAIN 9.0dB
- CLASS AB
- DESIGNED FOR LINEAR OPERATION
- GOLD METALLIZATION FOR HIGH RELIABILITY
- COMMON EMITTER CONFIGURATION



.280 4LSTUD (M122)
epoxy sealed

ORDER CODE	BRANDING
SD1420	SD1420

PIN CONNECTION



S88SD1420-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1420 is a gold metallized epitaxial silicon NPN Planar Transistor designed for high linearity Class AB operation for Cellular Base Station applications. The SD1420 was developed as a driver for the SD1423. The SD1420 is available in a studless package as the SD1420-01.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40.0	V
V_{CEO}	Collector - Emitter Voltage	28.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	.250	A
P_{TOT}	Total Device Dissipation at + 25°C	7.0	W
T_{STG}	Storage Temperature	– 55 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	20.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

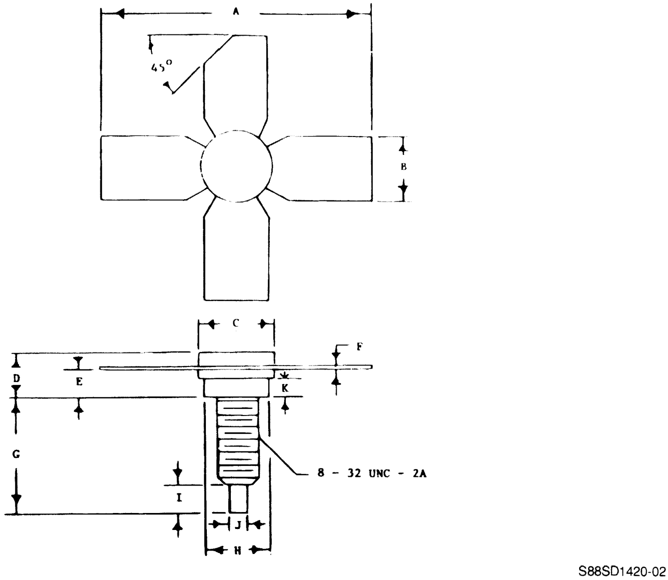
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CEO}	I_C = 1mA	28	30		V
BV_{CBO}	I_C = 1mA	40.0			V
BV_{EBO}	I_E = .25mA	3.5			V
I_{CEO}	V_{CB} = 24.0V			.5	mA
h_{FE}	V_C = 5.0V I_C = .1A	20		120	

DYNAMIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_O	f = 960MHz V_{ce} = 24V I_{cq} = .2A	2.1			W
P_G	f = 960MHz V_{ce} = 24V	8.9	9.0		dB
Cob	f = 1MHz V_{ce} = 28.0V			5.0	pF

PACKAGE MECHANICAL DATA

.280 4LSTUD



	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

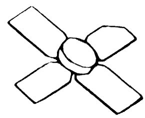
	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SGS-THOMSON
MICROELECTRONICS

SD1420-01

RF & MICROWAVE TRANSISTORS
860-960MHz CLASS AB BASE STATION

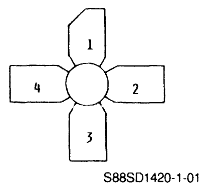
- FREQUENCY 860 - 960MHz
- POWER OUT 2.1W
- VOLTAGE 24V
- POWER GAIN 9.0dB
- CLASS AB
- DESIGNED FOR LINEAR OPERATION
- GOLD METALLIZATION FOR HIGH RELIABILITY
- COMMON EMITTER CONFIGURATION



.280 4LSL (M123)
epoxy sealed

ORDER CODE	**BRANDING**
SD1420-01	SD1420-1

PIN CONNECTION



1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1420-01 is a gold metallized epitaxial silicon NPN Planar Transistor designed for high Linearity Class AB operation for Cellular Base Station applications. The SD1420-01 was developed as a driver for the SD1423. The SD1420-01 is available in a stud package as the SD1420.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40.0	V
V_{CEO}	Collector - Emitter Voltage	28.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	.250	A
P_{TOT}	Total Device Dissipation at + 25°C	7.0	W
T_{STG}	Storage Temperature	– 55 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	20.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

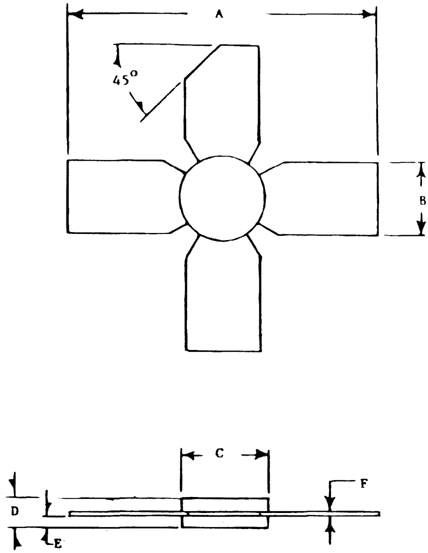
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 1mA		28	30		V
BV_{CBO}	I_C = 1mA		40.0			V
BV_{EBO}	I_E = .25mA		3.5			V
I_{CEO}	V_{CB} = 24.0V				.5	mA
h_{FE}	V_C = 5.0V	I_C = .1A	20		120	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 960MHz	V_{ce} = 24V	I_{cq} = .2A	2.1			W
P_G	f = 960MHz	V_{ce} = 24.0V		8.9	9.0		dB
Cob	f = 1MHz	V_{ce} = 28.0V				5.0	pF

PACKAGE MECHANICAL DATA

.280 4LSL

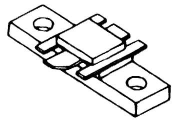


	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.118	.130
E	.050	.060
F	.004	.006

SD1421

RF & MICROWAVE TRANSISTORS
806-866MHz CLASS C, MOBILE APPLICATIONS

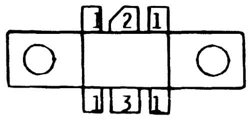
- CLASS C TRANSISTOR
- FREQUENCY 836MHz
- VOLTAGE 12.5V
- POWER OUT 25.0W
- POWER GAIN 5.5dB
- EFFICIENCY 60%
- COMMON BASE



.230 6LFL (M142)
epoxy sealed

ORDER CODE	**BRANDING**
SD1421	SD1421

PIN CONNECTION



S88SD1421-01

1 collector
2 emitter
3 base

DESCRIPTION

The SD1421 is an NPN silicon epitaxial planar transistor that was designed for amplifier applications in the 806-866MHz frequency range. Internal input matching and common base configuration assure optimum gain and efficiency across the entire frequency band. It Withstands infinite VSWR at rated power output.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	7.5	A
P_{tot}	Total Power Dissipation	70.0	W
T_{stg}	Storage Temperature	− 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	2.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

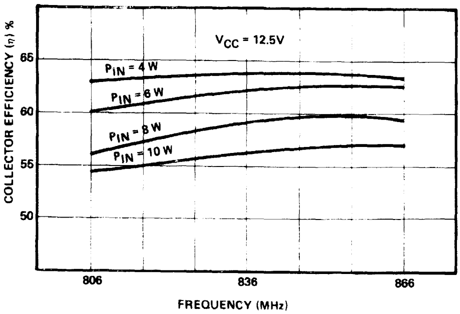
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_E = 50mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1.0A	15.0			

DYNAMIC

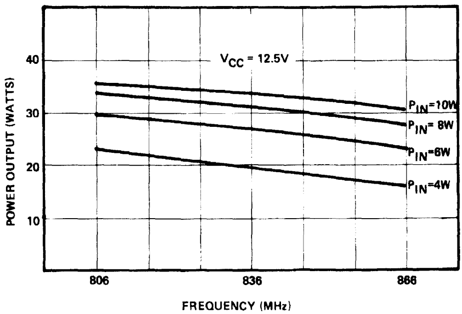
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 836MHz	V_{CE} = 12.5V		25.0			W
G_P	f = 836MHz	V_{CE} = 12.5V		5.5			dB
C_{Ob}	f = 1MHz	V_{CB} = 12.5V	I_E = 0			75.0	pF

APPLICATION INFORMATION (typical curves)



COLLECTOR EFFICIENCY (η) % VS. FREQUENCY

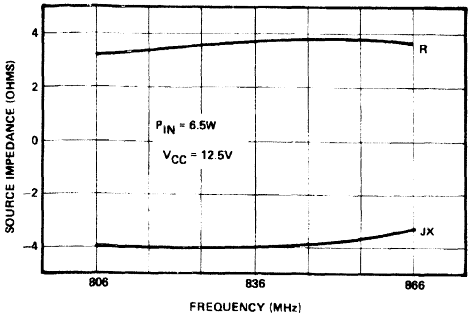
S88SD1421-02



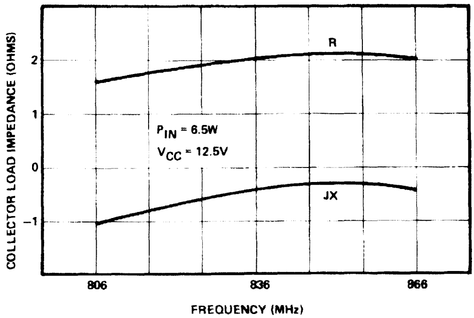
POWER OUTPUT VS. FREQUENCY

S88SD1421-03

IMPEDANCE DATA (typical values)



SERIES SOURCE IMPEDANCE VS. FREQUENCY

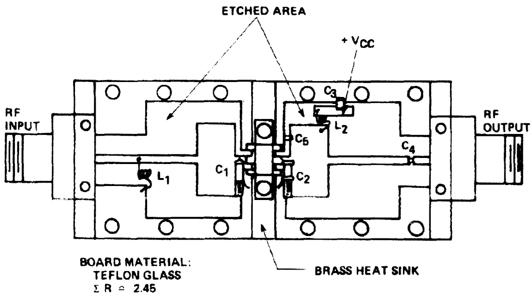


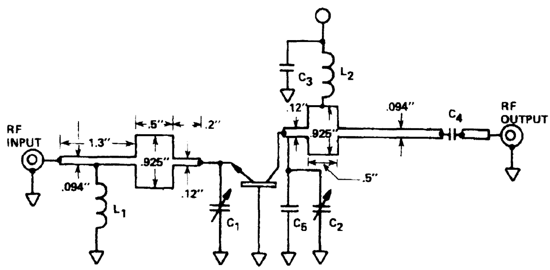
SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY

S88SD1421-04

S88SD1421-05

TEST CIRCUIT





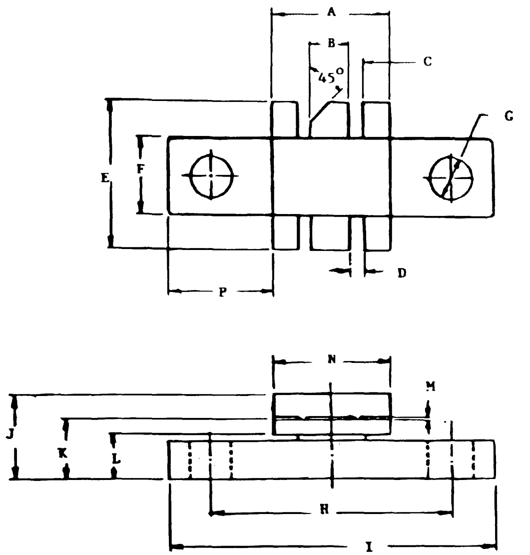
S88SD1421-06

COMPONENTS LIST

C1, C2 .5 - 5.0pF Johanson E5851
L1, L2 4.5 TURNS # 22. .09" I.D.
C3 470pF, 100MIL SQ ATC
C4 .001MF 50MIL SQ ATC 200A 102MC 50
C5 3.2pF 50MIL SQ ATC

PACKAGE MECHANICAL DATA

.230 6LFL

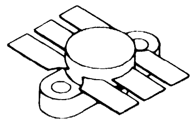


	Minimum Inch/mm	Maximum Inch/mm
A	.355/9.01	.365/9.27
B	.115/2.92	.125/3.18
C	.075/1.91	.085/2.16
D	.035/0.89	.045/1.14
E	.425/10.80	.435/11.05
F	.225/5.72	.235/5.97
G	.115/2.92	.130/3.30
H	.720/18.29	.730/18.54

	Minimum Inch/mm	Maximum Inch/mm
I	.970/24.64	.980/24.89
J	.230/5.84	.260/6.60
K	.155/3.94	.175/4.45w
L	.120/3.05	.130/3.30
M	.004/0.10	.006/0.15
N	.345/8.76	.360/9.14
P	.300/7.62	.314/7.98

RF & MICROWAVE TRANSISTORS
450 - 512MHz CLASS C, MOBILE APPLICATIONS

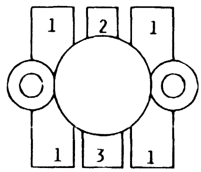
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 25.0W
- POWER GAIN 6.2dB
- COMMON EMITTER
- GOLD METALLIZATION



.500 6LFL (M111)
epoxy sealed

ORDER CODE	**BRANDING**
SD1422	SD1422

PIN CONNECTION



S88SD1422-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1422 is a 12.5Vepitaxial silicon NPN planar transistor designed for broadband applications in the 450-512MHz land mobile radio band. This device utilizes diffused emitter resistors to withstand 20:1 VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36	V
V_{EBO}	Emitter - Base Voltage	4.0	A
I_C	Collector Current	4.8	W
P_{tot}	Total Power Dissipation	70.0	°C
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	2.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

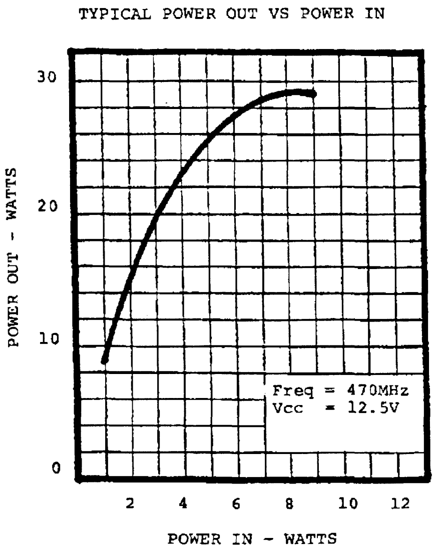
STATIC

Symbol	Test Conditions			Value		Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 10mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CES}	V_{CE} = 12.5V	V_{BE} = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1.0A	10.0			

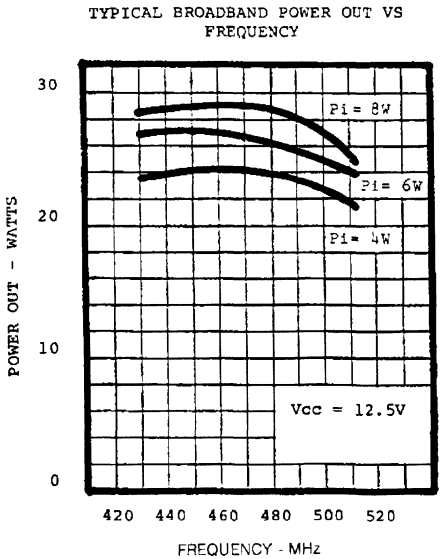
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		25.0			W
G_P	f = 470MHz	V_{CE} = 12.5V		6.2			dB
C_{ob}	f = 1MHz	V_{CB} = 12.5V	I_E = 0		70.0		pF

APPLICATION INFORMATION (typical curves)

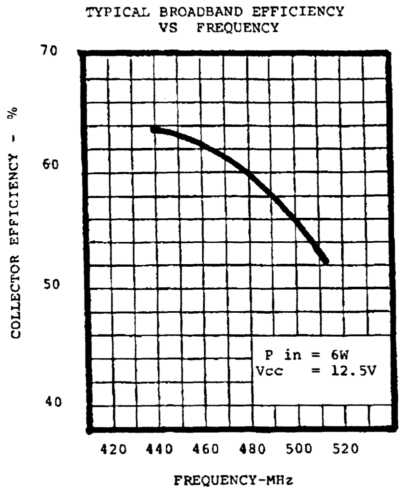


S88SD1422-02

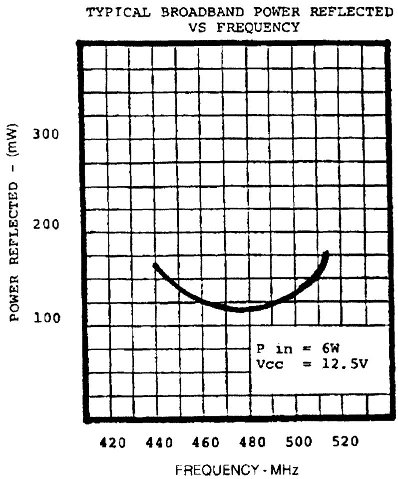


S88S1422-03

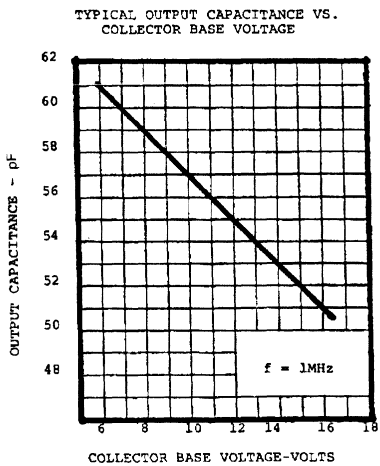
APPLICATION INFORMATION (typical curves) (continued)



S88SD1422-04

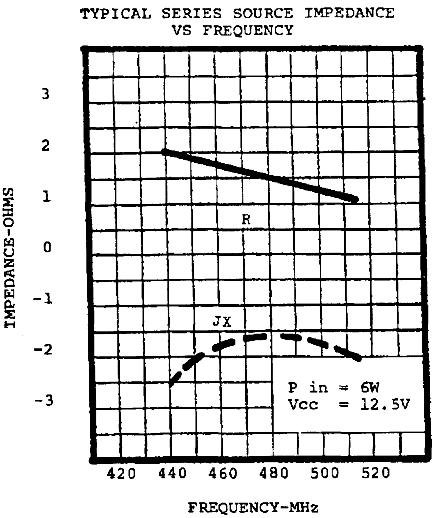


S88S1422-05

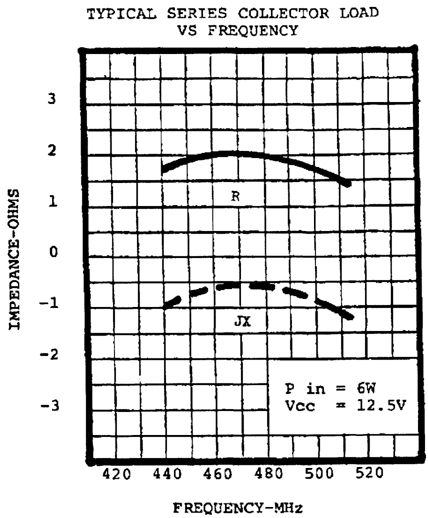


S88SD1422-06

IMPEDANCE DATA (typical)

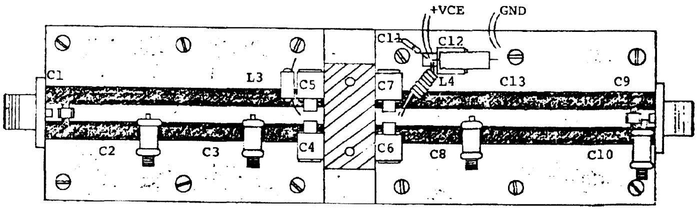


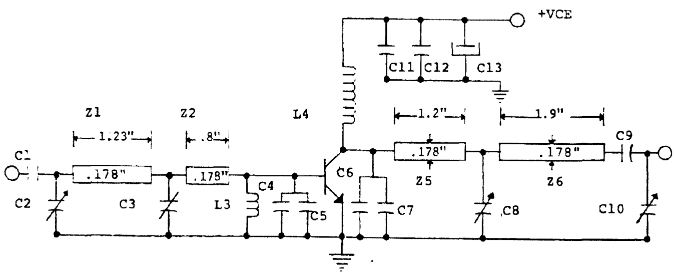
S88SD1422-07



S88S1422-08

TEST CIRCUIT



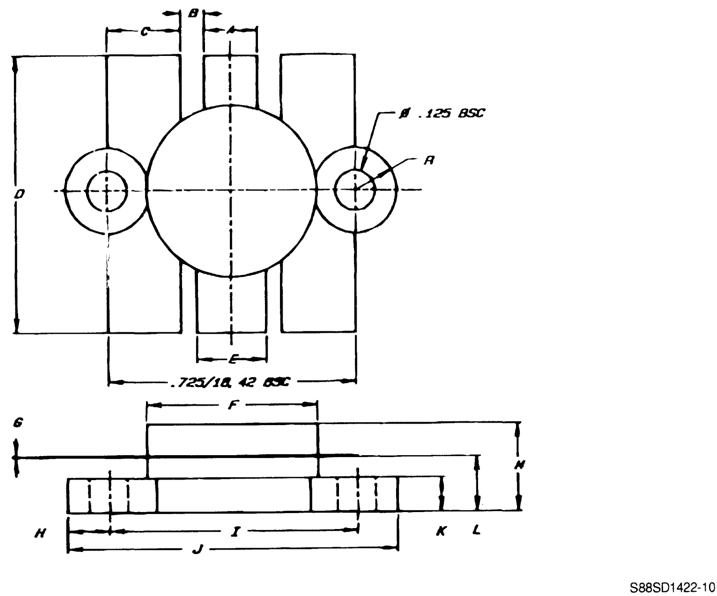


S88S1422-09

C1	ATC 100 Mils Chip Capacitor 75pF	C13	Emectronic Capacitor 8.2µF@ 25VCD
C2, C3, C8, C10	Voltronics Air Variable 1-14pF	Z1	50Ω Microstrip .178"x1.23"
		Z2	50Ω Microstrip .178"x.8"
C4, C5	Unelco 27pF	L3	VK200 21/4B Ferracube 1 1/2 Turn
C6, C7	Unelco 36pF	L4	7 Turns /18AWG .2"I.D. with Wiring Spacing
C9	ATC 100 Mils Chip Capacitor 750pF	Z5	50Ω Microstrip .178"x1.2"
C11	Eric Disk Capacitor .10µF@ 25VDC	Z6	50Ω Microstrip .178"x1.9"
C12	Unelco 1000pF	BOARD MATERIAL 3M-K6098 1/16" Thick	

PACKAGE MECHANICAL DATA

.500 6LPL



	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

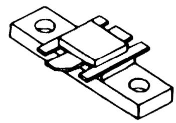
	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SGS-THOMSON MICROELECTRONICS

SD1423

RF & MICROWAVE TRANSISTORS 860-960MHz CLASS AB BASE STATION

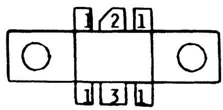
- FREQUENCY 800 - 960MHz
- POWER OUT 15W
- VOLTAGE 24V
- POWER GAIN 8dB
- EFFICIENCY 50%
- CLASS AB
- INTERNAL INPUT MATCHING
- DESIGNED FOR LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION



.230 6LFL (M142)
epoxy sealed

ORDER CODE	**BRANDING**
SD1423	SD1423

PIN CONNECTION



S88SD1423-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1423 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class AB operation for cellular base station applications. The SD1423 was developed as a medium power output device or as the driver for the SD1424.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	48	V
V_{CEO}	Collector - Emitter Voltage	30	V
V_{CES}	Collector - Emitter Voltage	45	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current (max.)	2.5	A
P_{tot}	Total Device Dissipation at + 25°C	29	W
T_{stg}	Storage Temperature	− 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	6	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

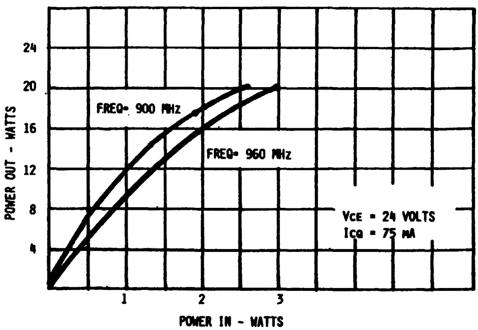
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 20mA		30			V
BV_{CBO}	I_C = 50mA		48			V
BV_{EBO}	I_E = 5mA		4			V
I_{CBO}	V_{CB} = 26V				10	mA
h_{FE}	V_{CE} = 10V	I_E = 100mA	20		100	
BV_{CER}	I_C = 20mA	R_{BE} = 150Ω	40			V

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f_o = 960MHz	V_{CE} = 24V	I_{cq} = 75 mA	15			W
G_P	f_o = 960MHz	V_{CE} = 24V	P_o = 15W	8			dB
η_C	f_o = 960MHz	V_{CE} = 24V	P_o = 15W		50		%
C_{OB}	f_o = 1MHz	V_{CB} = 26V				25	pF

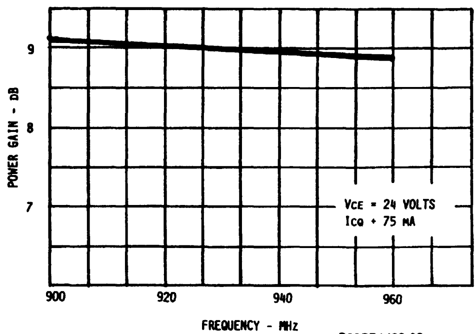
APPLICATION INFORMATION (typical curves)

TYPICAL POWER OUT VS POWER IN



S88SD1423-02

TYPICAL POWER GAIN VS FREQUENCY



S88SD1423-02

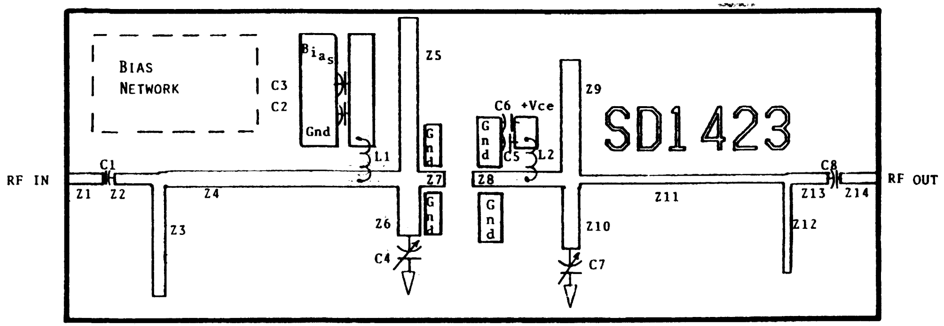
IMPEDANCE DATA (typical)

F	900MHz	930MHz	960MHz
Z_S	1.30 – j 1.98Ω	1.42 – j 2.31Ω	1.45 – j 2.62Ω
Z_{CL}	3.99 + j 5.55Ω	3.18 + j 4.97Ω	2.96 + j 4.07Ω

V_{CE} = 24V I_{CQ} = 75mA P_O = 15W

TEST CIRCUIT

SD1423 : 900 - 960MHz Broadband Amplifier



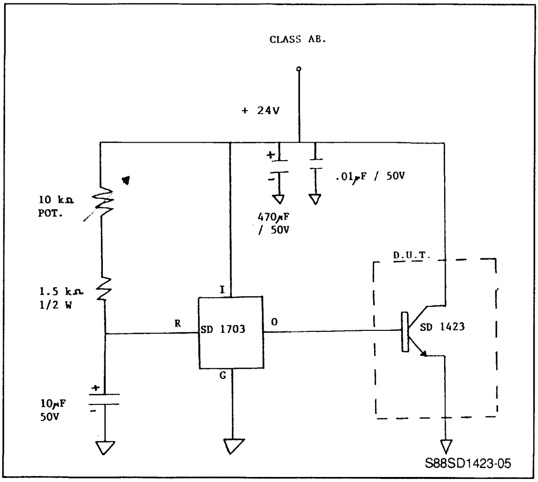
GND = GROUND
CIRCUIT BOARD MATERIAL : TEFLON FIBERGLASS .30" Er = 2.50

PARTS LIST

C1, C2, C5, C10	220pF ATC 100B
C3, C6	4.7MFD
C4, C7	0.8 – 8.0pF GIGA-TRIM JOHANSON
L1, L2	4T#22 0.15"I.D.

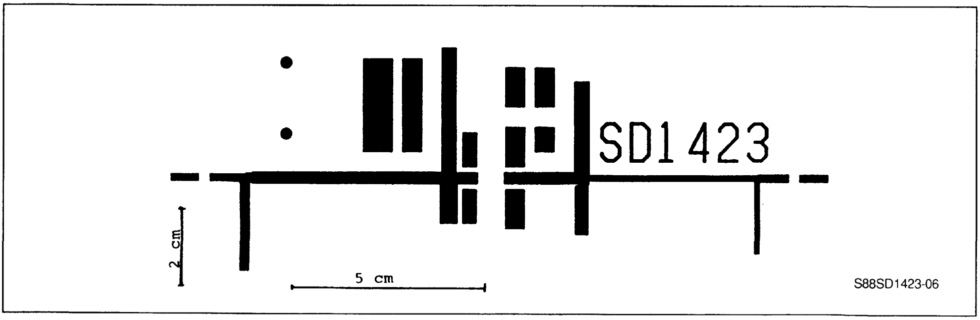
Z1	W = 83.25	L = 300	Z9	W = 155	L = 899
Z2	W = 83.25	L = 300	Z10	W = 135.5	L = 490
Z3	W = 101	L = 892.5	Z11	W = 63.7	L = 1660
Z4	W = 124.5	L = 1909	Z12	W = 59.2	L = 718.5
Z5	W = 149	L = 1242	Z13	W = 83.25	L = 300
Z6	W = 178	L = 393.5	Z14	W = 83.25	L = 300
Z7	W –120	L = 200	* W and L in Mills		
Z8	W = 120	L = 720			

BIAS CIRCUIT
DC BIAS SD1423 : CLASS AB



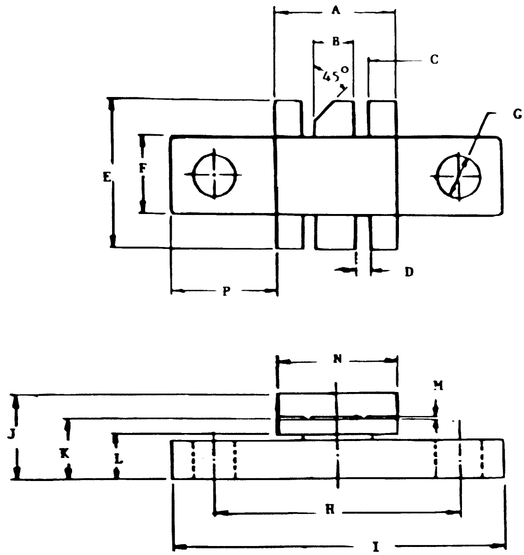
* ADJUST 10KΩ POT FOR AN ICQ OF 75mA
* RF CIRCUITRY NOT SHOWN
* MOUNT SD1705 ON HEAT SINK COMMON WITH SD1423 FOR PROPER THERMAL FEEDBACK

CIRCUIT LAYOUT



PACKAGE MECHANICAL DATA

.230 6LFL



	Minimum Inch/mm	Maximum Inch/mm
A	.355/9.01	.365/9.27
B	.115/2.92	.125/3.18
C	.075/1.91	.085/2.16
D	.035/0.89	.045/1.14
E	.425/10.80	.435/11.05
F	.225/5.72	.235/5.97
G	.115/2.92	.130/3.30
H	.720/18.29	.730/18.54

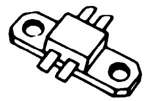
	Minimum Inch/mm	Maximum Inch/mm
I	.970/24.64	.980/24.89
J	.230/5.84	.260/6.60
K	.155/3.94	.175/4.45
L	.120/3.05	.130/3.30
M	.004/0.10	.006/0.15
N	.345/8.76	.360/9.14
P	.300/7.62	.314/7.98

SGS-THOMSON
MICROELECTRONICS

SD1424

RF & MICROWAVE TRANSISTORS
860 – 960MHz CLASS AB BASE STATION

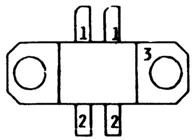
- FREQUENCY 800 – 960MHz
- POWER OUT 30W
- VOLTAGE 24V
- POWER GAIN 7.5dB
- CLASS AB PUSH PULL
- INTERNAL INPUT MATCHING
- DESIGNED FOR LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION



.250 x .320 4LFL (M156)
epoxy sealed

ORDER CODE	BRANDING
SD1424	SD1424

PIN CONNECTION



S88SD1424-01

1 collector
2 base
3 emitter

DESCRIPTION

The SD1424 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class AB operation for cellular base station applications.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	48	V
V_{CES}	Collector - Emitter Voltage	45	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current (max.)	5	A
P_{TOT}	Total Device Dissipation at + 25°C	43	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	3	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

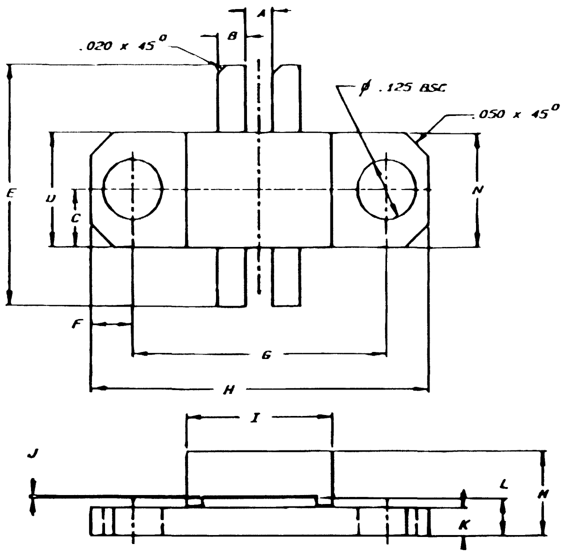
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 20mA		25			V
BV_{CER}	I_C = 40mA	R_{BE} = 75Ω	40			V
BV_{EBO}	I_E = 5mA		4			V
I_{CBO}	V_{CE} = 24V				10	mA
h_{FE}	V_{CE} = 10V	I_E = 100mA	20		100	
C_{ob}	V_{CB} = 25V	f_o = 1MHz			25	pf
BV_{CBO}	I_C = 50mA		48			V

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_o	V_{CE} = 24V	f_o = 960MHz	I_{cq} = 150mA	30			W
P_g	V_{CE} = 24V	f_o = 960MHz	P_o = 30W	7.5			dB
N_c	V_{CE} = 24V	f_o = 960MHz	P_o = 30W		50		%

PACKAGE MECHANICAL DATA

.250 x .320 4LFL



S88SD1424-02

	Minimum Inches/mm	Maximum Inches/mm
A	.060/1.52 BSC	
B	.055/1.40	.065/1.65
C	.124/3.15 BSC	
D	.243/6.17	.253/6.43
E	.635/16.13	.665/16.89
F	.092/2.34 BSC	
G	.555/14.10	.565/14.35

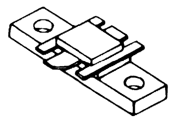
	Minimum Inches/mm	Maximum Inches/mm
H	.739/18.77	.749/19.02
I	.315/8.00	.325/8.26
J	.002/0.05	.006/0.15
K	.055/1.40	.065/1.65
L	.075/1.91	.095/2.41
M		.190/4.83
N	.245/6.22	.255/6.48

SGS-THOMSON
MICROELECTRONICS

SD1425

RF & MICROWAVE TRANSISTORS
860-960MHz BASE STATIONS

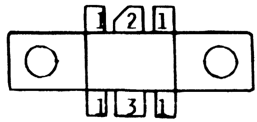
- FREQUENCY 800 - 960MHz
- POWER OUT 30W
- VOLTAGE 24V
- POWER GAIN 7.5dB
- CLASS AB
- INTERNAL INPUT MATCHING
- DESIGNED FOR LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION



.230 6LFL (M142)
epoxy sealed

ORDER CODE	**BRANDING**
SD1425	SD1425

PIN CONNECTION



S88SD1425-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1425 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class AB operation for cellular base station applications.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	48	V
V_{CES}	Collector - Emitter Voltage	45	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current (max.)	5	A
P_{tot}	Total Device Dissipation at + 25°C	43	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

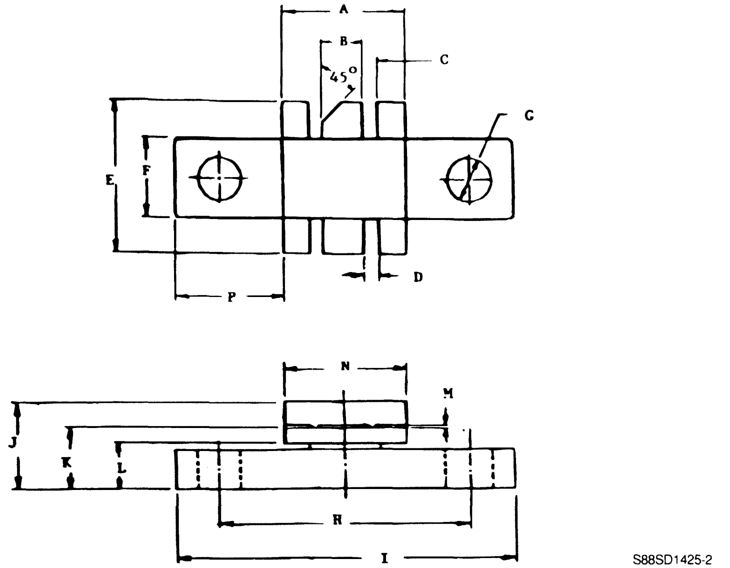
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 50mA		48			V
BV_{CEO}	I_C = 20mA		25			V
BV_{CER}	I_C = 40mA	R_{BE} = 75Ω	40			V
BV_{EBO}	I_E = 5mA				4	V
I_{CBO}	V_{CE} = 24V		10		mA	
h_{FE}	V_{CE} = 10V	I_E = 100mA			20	100
C_{OB}	V_{CB} = 25V	f_o = 1MHz	25			pf

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	V_{CE} = 24V,	f_o = 960MHz	Icc_L = 150mA	30			W
P_G	V_{CE} = 24V,	f_o = 960MHz	P_o = 30W	7.5			dB
ηc	V_{CE} = 24V,	f_o = 960MHz,	P_o = 30W		50		%

PACKAGE MECHANICAL DATA

.230 6LFL



	Minimum Inch/mm	Maximum Inch/mm
A	.355/9.01	.365/9.27
B	.115/2.92	.125/3.18
C	.075/1.91	.085/2.16
D	.035/0.89	.045/1.14
E	.425/10.80	.435/11.05
F	.225/5.72	.235/5.97
G	.115/2.92	.130/3.30
H	.720/18.29	.730/18.54

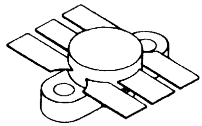
	Minimum Inch/mm	Maximum Inch/mm
I	.970/24.64	.980/24.89
J	.230/5.84	.260/6.60
K	.155/3.94	.175/4.45w
L	.120/3.05	.130/3.30
M	.004/0.10	.006/0.15
N	.345/8.76	.360/9.14
P	.300/7.62	.314/7.98

SGS-THOMSON MICROELECTRONICS

SD1428

RF & MICROWAVE TRANSISTORS 130...230MHz FM MOBILE APPLICATIONS

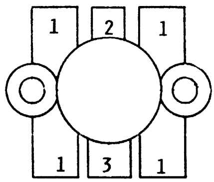
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 45W
- POWER GAIN 6.5dB
- EFFICIENCY 50%
- GOLD METALLIZATION
- COMMON EMITTER



.500 6LFL (M111)
epoxy sealed

ORDER CODE	**BRANDING**
SD1428	SD1428

PIN CONNECTION



S88SD1428-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1428 is an internally matched 12.5V epitaxial silicon NPN planar transistor designed primarily for broadband VHF communications. This device utilizes diffused emitter resistors to achieve infinite VSWR through all phase angles at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	6.0	A
P_{tot}	Total Power Dissipation	145.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

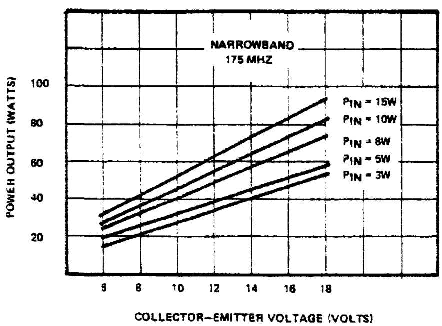
Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CBO}	I_C = 50mA	I_E = 0	36.0			V
BV_{CES}	I_C = 50mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CES}	V_{CE} = 10mA	V_{BE} = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 5.0A	20.0	50.0		

DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	f = 138/175MHz	V_{CE} = 12.5V		45.0	50.0		W
G_P	f = 138/175MHz	V_{CE} = 12.5V		6.5	7.0		dB
η_C	f = 138/175MHz	V_{CE} = 12.5V		50.0	60.0		%
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0		110.0	135.0	pF

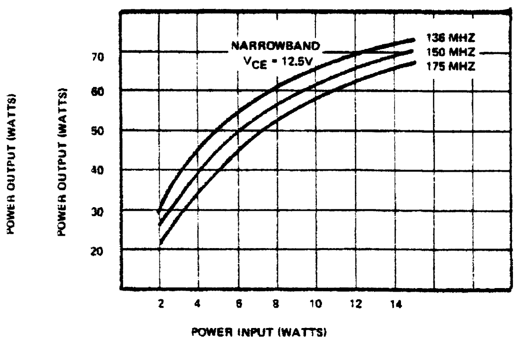
APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS. VCE



S88SD1428-02

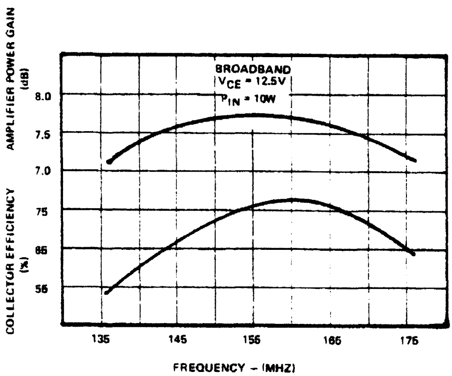
POWER OUTPUT VS.POWER INPUT



S88S1428-03

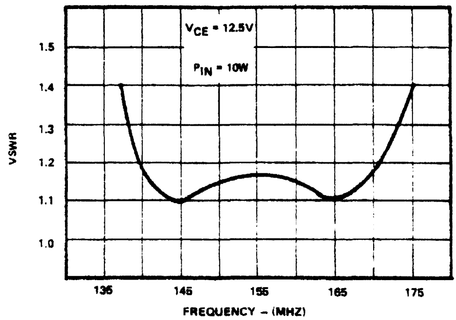
APPLICATION INFORMATION (typical curves) (continued)

AMPLIFIER POWER GAIN & EFFICIENCY VS. FREQUENCY



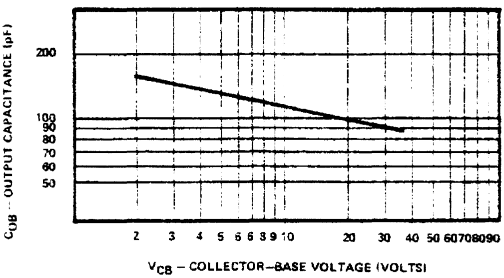
S88SD1428-04

INPUT VSWR VS. FREQUENCY



S88S1428-05

COLLECTOR CAPACITANCE VS. VOLTAGE



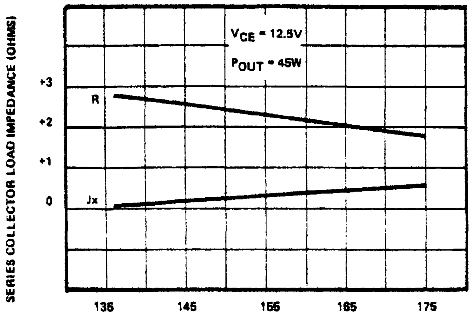
S88S1428-06

IMPEDANCE DATA (typical)

$Z_S = 1.38 + j\ 0.44\Omega$
$Z_{CL} = 1.70 + j\ 0.48\Omega$

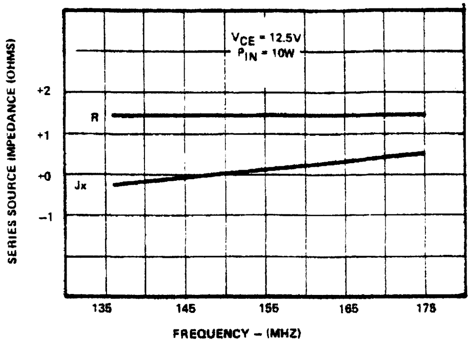
F = 175MHz
$P_O = 45W$
$V_{CE} = 12.5V$

SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY



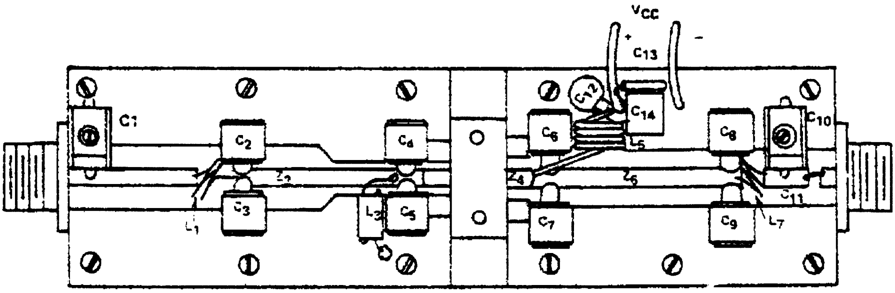
S88SD1428-07

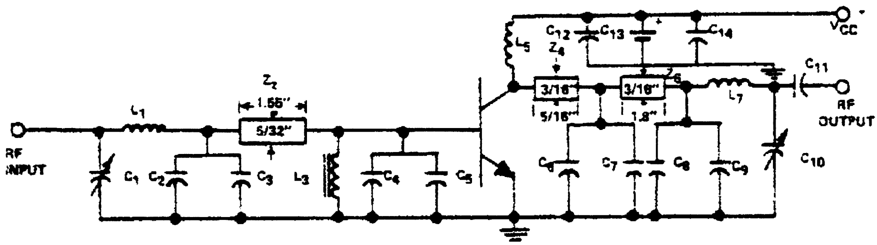
SERIES SOURCE IMPEDANCE VS.FREQUENCY



S88S1428-08

BROADBAND SCHEMATIC & CIRCUIT



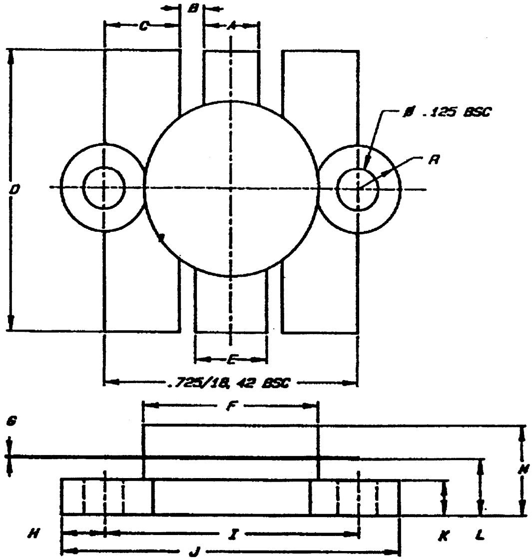


S88SD1428-09

PARTS LIST

C_1, C_{10} - 4-40pf ARCO 403
C_2 - 39pf UNELCO
C_3 - 56pf UNELCO
C_4 - 82pf UNELCO
C_5 - 100pf UNELCO
C_6, C_7 - 200pf UNELCO
C_8, C_9 - 62pf UNELCO
C_{11} - .015f ERIE RED CAP
C_{12} - .01f ERIE DISK
C_{13} - 4.7f ELECTROLYTIC
C_{14} - 1000pf UNELCO
L_1 - 2 TURNS, #18 AWG, 1/4" I.D., WIRE SPACING, ENAMELED
Z_2 - APPROX. 8.1mH
L_3 - VK200 FERROXCUBE
Z_4 - APPROX. 2.3mH
L_5 - 4 TURNS, #16 AWG, 1/4" I.D., CLOSE WOUND, ENAMELED
Z_6 - APPROX. 10.1mH
L_7 - 2 TURNS, #16 AWG, 17/64" I.D., WIRE SPACING, ENAMELED

PACKAGE MECHANICAL DATA
.500 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

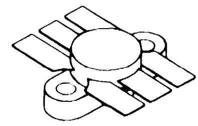
	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SGS-THOMSON
MICROELECTRONICS

SD1429

RF & MICROWAVE TRANSISTORS
450-512MHz CLASS C, MOBILE APPLICATIONS

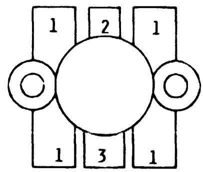
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 12.0W
- POWER GAIN 7.8dB
- COMMON EMITTER



.500 6LFL (M111)
epoxy sealed

ORDER CODE	**BRANDING**
SD1429	SD1429

PIN CONNECTION



S88SD1429-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1429 is a 12.5 Volt epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device utilizes "Tuned Q" technology which consists of an input matching network on the base to achieve optimum gain and broadband characteristics.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	A
I_C	Collector Current	3.4	W
P_{tot}	Total Power Dissipation	37.5	°C
T_{stg}	Storage Temperature	200	°C
T_j	Junction Temperature	– 65 to + 150	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	4.6	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

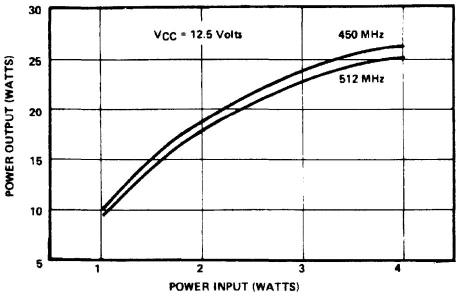
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 200mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 200mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 4mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			2.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 500mA	20			

DYNAMIC

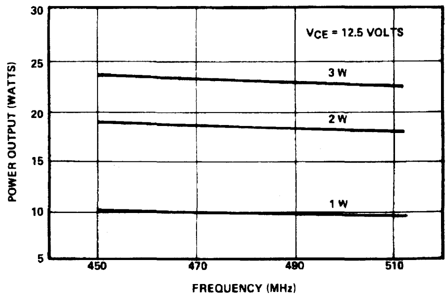
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		12.0			W
G_P	f = 470MHz	V_{CE} = 12.5V		7.8			dB
C_{OB}	f = 1MHz	V_{CB} = 12.0V	I_E = 0			50.0	pF

APPLICATION INFORMATION (typical curves)



POWER OUTPUT VS POWER INPUT

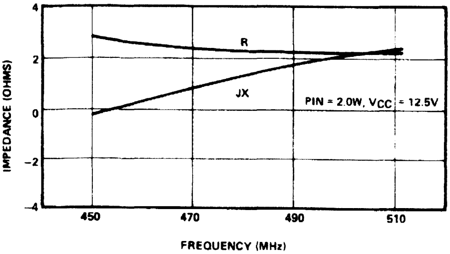
S88SD1429-02



POWER OUTPUT VS FREQUENCY

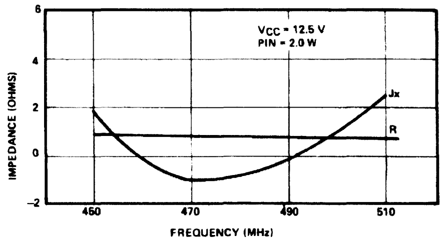
S88SD1429-03

IMPEDANCE INFORMATION



COLLECTOR LOAD IMPEDANCE VS FREQUENCY

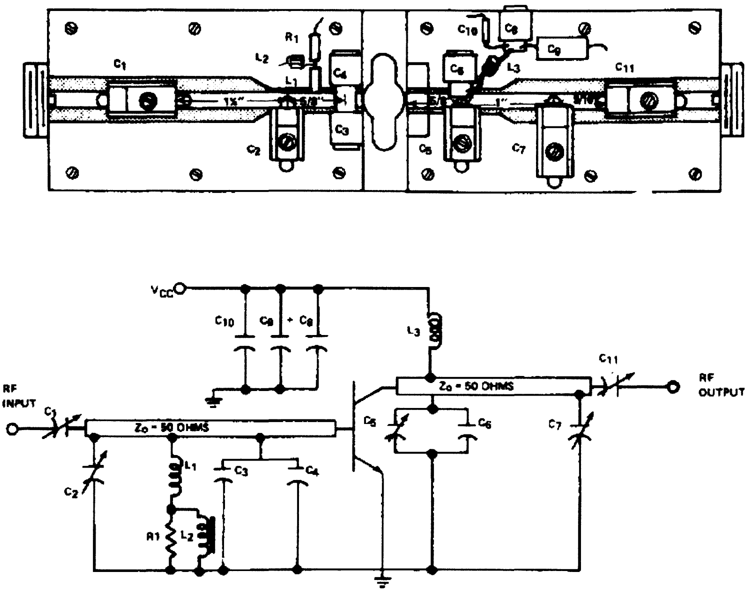
S88SD1429-04



SOURCE IMPEDANCE VS FREQUENCY

S88SD1429-05

TEST CIRCUIT



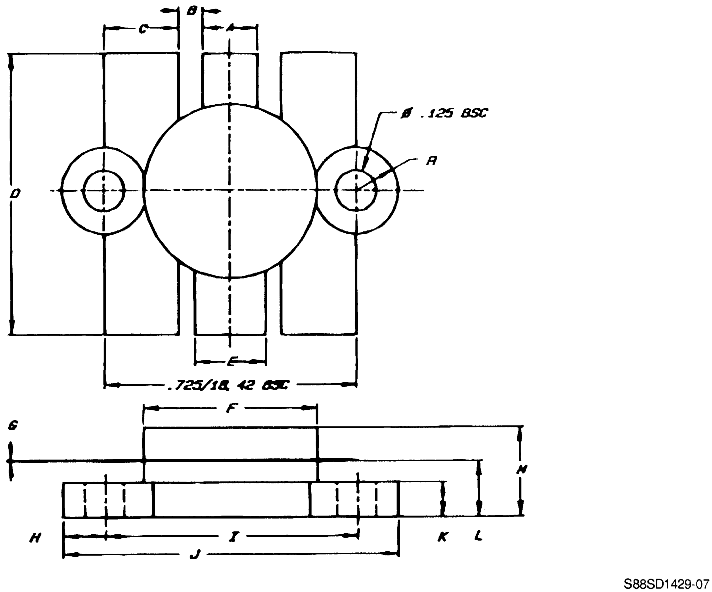
S88SD1429-06

COMPONENT LIST

C_1, C_{11} 4-40pF, ARCO 422
C2, 0.9-7pF, ARCO 400
C3, C4, 20pF, UNELCO
C5, 1.5-20pF, ARCO 402
C6, 15pF, UNELCO
C7, 2-25pF, ARCO421
C8, 1000pF, UNELCO
C9, 10μF, ELECTROLYTIC, 3EVDC
C10, 0.47μF, ERIE RED CAP
L1, 0.10μh, MOLDED CHOKE
L2, 6 TURNS# 28AWG THRU FERROCUBE SLEEVE # 3B1
L3, 6 TURNS, # 20AWG, 0.20ID
R1, 56 Ω, 1/4 WATT
Z0, 50 Ω LINE
BOARD MATERIAL - DOUBLE SIDED COPPER 1/16"THK, 2M-K-6098

PACKAGE MECHANICAL DATA

.500 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

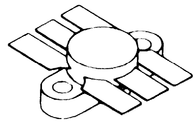
	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SGS-THOMSON
MICROELECTRONICS

SD1429-3

RF & MICROWAVE TRANSISTORS
450-512MHz CLASS C, MOBILE APPLICATIONS

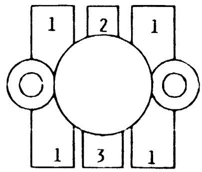
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 15.0W
- POWER GAIN 7.5dB
- COMMON EMITTER



.500 6LFL (M111)
epoxy sealed

ORDER CODE	**BRANDING**
SD1429-03	SD1429-3

PIN CONNECTION



S88SD1429-3-01

1 emitter
2 collector
3 base

DESCRIPTION

The type SD1429-3 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for UHF communications. It withstands infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	3.4	A
P_{tot}	Total Power Dissipation	37.5	W
T_{stg}	Storage Temperature	− 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	4.6	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

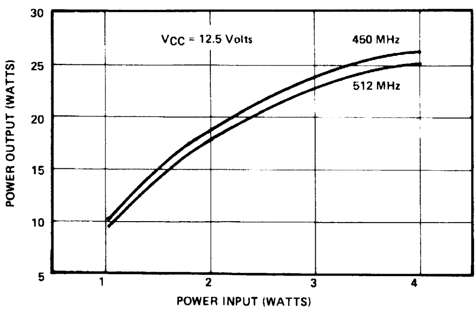
STATIC

Symbol	Test Conditions			Value		Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_E = 50mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CES}	V_{CE} = 15V	V_{BE} = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 500A	20.0			

DYNAMIC

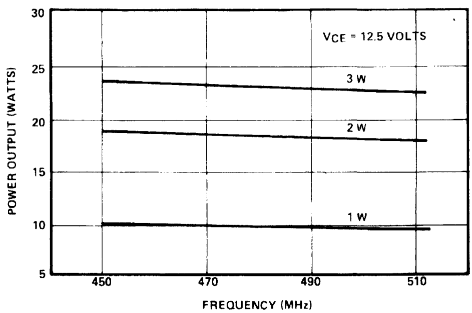
Symbol	Test Conditions				Value		Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		15.0			W
G_P	f = 470MHz	V_{CE} = 12.5V		7.5			dB
C_{Ob}	f = 1MHz	V_{CB} = 12.0V	I_E = 0			50.0	pF

APPLICATION INFORMATION (typical curves)



POWER OUTPUT VS POWER INPUT

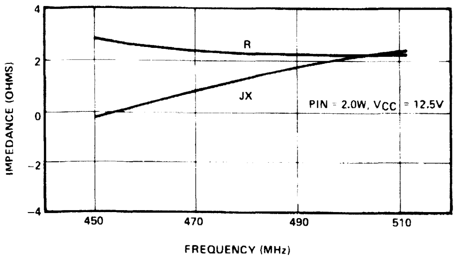
S88SD1429-3-02



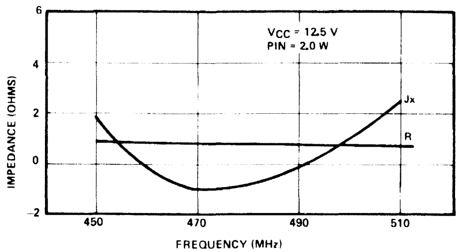
POWER OUTPUT VS FREQUENCY

S88SD1429-3-03

IMPEDANCE INFORMATION



COLLECTOR LOAD IMPEDANCE VS FREQUENCY

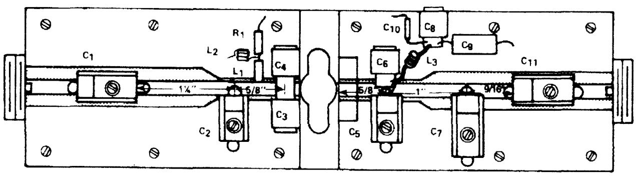


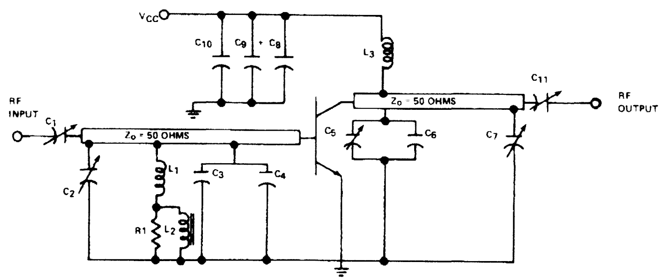
SOURCE IMPEDANCE VS FREQUENCY

S88SD1429-3-04

S88SD1429-3-05

TEST CIRCUIT





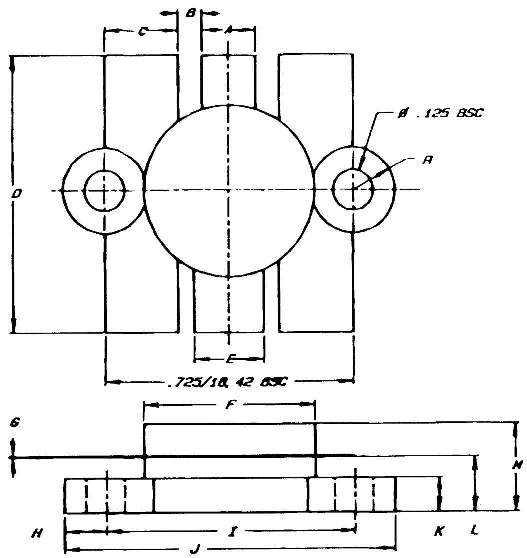
S88SD1429-3-06

COMPONENT LIST

C1, C11 4-40pF, ARCO 422
C2, 0.9-7pF, ARCO400
C3, C4, 20pF, UNELCO
C5, 1.5-20pF, ARCO
C6, 15pF, UNELCO
C7, 2-25pF, ARCO421
C8, 1000pF, UNELCO
C9, 10μF, ELECTROLYTIC, 3EVDC
C10, 0.47μF, ERIE RED CAP
L1, 0.10μh, MOLDED CHOKE
L2, 6 TURNS#28 AWG THRU FERROCUBE SLEEVE #3B1
L3, 6 TURNS, #20AWG, 0.20ID
R1, 56 Ω, 1/4 WATT
Zo, 50Ω LINE
BOARD MATERIAL - DOUBLE SIDED
COPPER 1/16"THK, 3M-K-6098
MOUNTED ON 3/8" BRASS PLATES

PACKAGE MECHANICAL DATA

.500 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

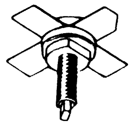
	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SGS-THOMSON
MICROELECTRONICS

SD1430

RF & MICROWAVE TRANSISTORS
108-152MHz APPLICATIONS

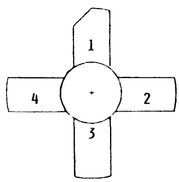
- FM CLASS C TRANSISTOR
- FREQUENCY 136MHz
- VOLTAGE 12.5V
- POWER OUT 40W
- POWER GAIN 7.5dB
- EFFICIENCY 60%TYP
- GOLD METALLIZATION
- COMMON EMITTER



.380 4L STUD (M135)
epoxy sealed

ORDER CODE	BRANDING
SD1430	SD1430

PIN CONNECTION



S88SD1430-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1430 is a 12.5V gold metalized epitaxial silicon NPN planar transistor designed for 108-152 MHz FM applications.
This device utilizes diffused emitter resistors to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	7.0	A
P_{tot}	Total Power Dissipation	87.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	2.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 15mA	I_E = 0	36.0			V
BV_{CES}	I_C = 20mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1.0A	5.0			

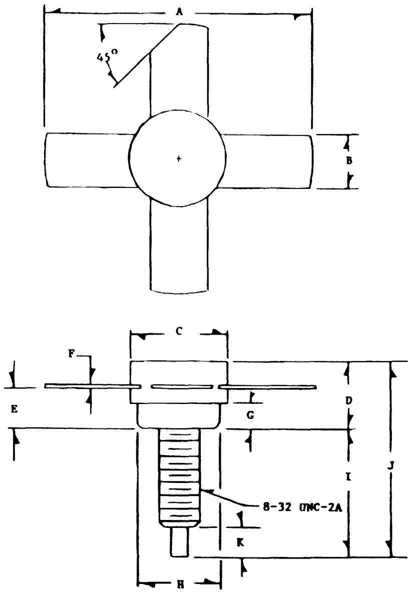
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 136MHz	V_{CE} = 12.5V		40.0			W
G_p	f = 136MHz	V_{CE} = 12.5V		7.5			dB
C_{ob}	f = 1MHz	V_{CB} = 15V	I_E = 0			100.0	pF

When used at V_{CE} = 6.5V performances are :
P_{out} = 11W typical
G_p = 6.0dB typical.

PACKAGE MECHANICAL DATA

.380 4L STUD



	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

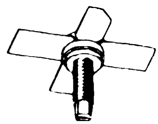
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON MICROELECTRONICS

SD1433

RF & MICROWAVE TRANSISTORS 450-512MHz CLASS C MOBILE APPLICATIONS

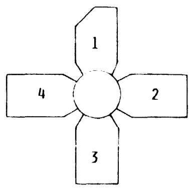
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 10.0W
- POWER GAIN 8.0dB
- EFFICIENCY 60%
- COMMON EMITTER



.280 4LSTUD (M122)
epoxy sealed

ORDER CODE	BRANDING
SD1433	SD1433

PIN CONNECTION



S88SD1433-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1433 is an NPN silicon epitaxial planar transistor designed for driver application in the 450-512MHz frequency range. This device uses an emitter ballasted geometry specifically designed for optimum stable power gain, maximum efficiency and infinite VSWR.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	2.5	A
P_{tot}	Total Power Dissipation	58.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

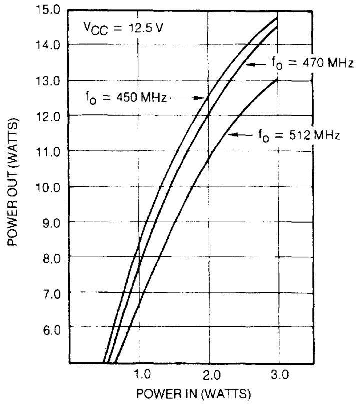
STATIC

Symbol	Test Conditions			Value		Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 25mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_E = 20mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			2.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1.0A	10.0		100.0	

DYNAMIC

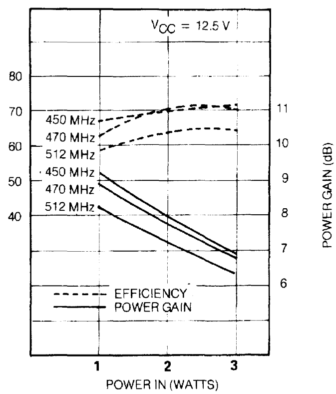
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		10.0			W
G_P	f = 470MHz	V_{CE} = 12.5V		7.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0			19.0	pF

APPLICATION INFORMATION (typical curves)



POWER OUT VS POWER IN

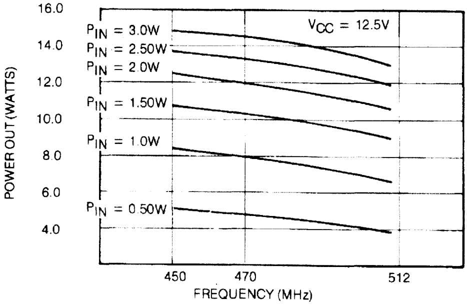
S88SD1433-02



POWER GAIN/EFFICIENCY VS POWER IN

S88S1433-03

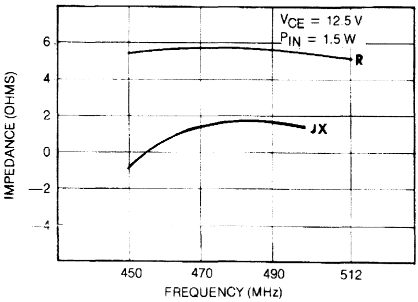
APPLICATION INFORMATION (typical curves) (continued)



POWER OUT VS FREQUENCY

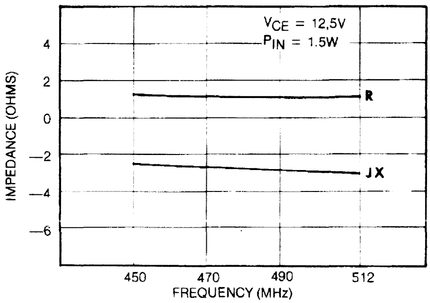
S88SD1433-04

IMPEDANCE DATA



SERIES COLLECTOR LOAD IMPEDANCE VS FREQUENCY

S88SD1433-05

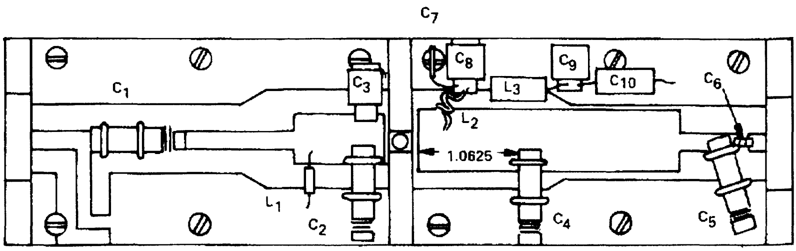


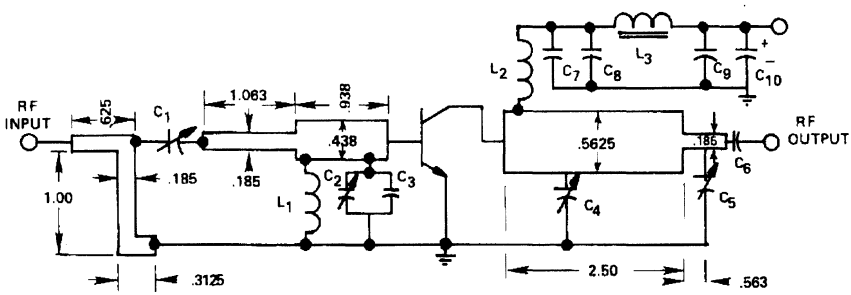
SERIES SOURCE IMPEDANCE VS FREQUENCY

S88SD1433-06

	V_{CE} = 12.5V P_i = 1.5W F = 470MHz
Z_S	1.5 – j2.7Ω
Z_{CL}	5.7 + j1.5Ω

TEST CIRCUIT





S88SD1433-07

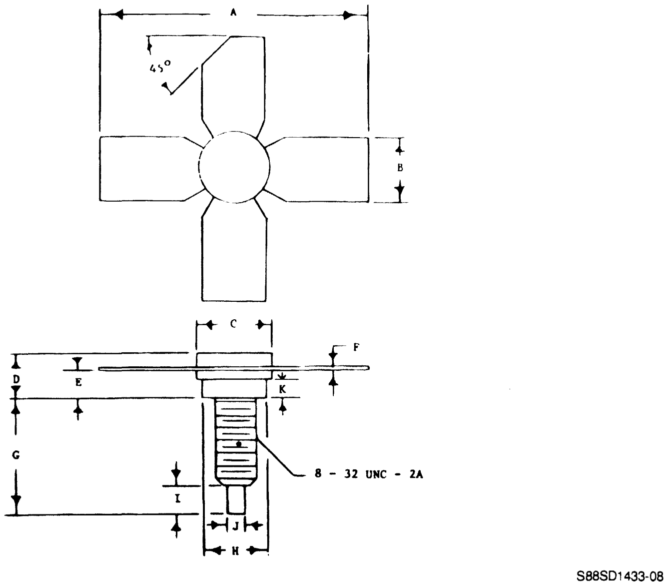
COMPONENT LIST

C1, C2	0.8 pF VOLTRONICS
C4, C5	AJ810
C3	18pF CHIP CAPACITOR
C6	1000pF CHIP CAPACITOR
C7	0.01µF DISC-CERAMIC
C8, C9	1000pF UNELCO
C10	10µF, 35V ELECTROLYTIC
L1	0.47 µh MOLDED CHOKE
L2	2TURNS # 20 AWG, 1/8" ID
L3	2TURNS IN FERROCUBE VK200/19-4B

BOARD MATERIAL - 3M-K6098, 1/16" THICK

PACKAGE MECHANICAL DATA

.280 4LSTUD



	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

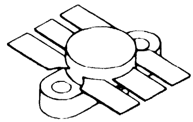
	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SGS-THOMSON MICROELECTRONICS

SD1434

RF & MICROWAVE TRANSISTORS 450-512MHz CLASS C, MOBILE APPLICATIONS

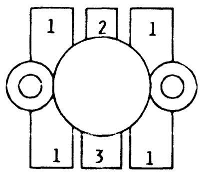
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 45.0W
- POWER GAIN 5.0dB
- COMMON EMITTER



.5006LFL (M111)
epoxy sealed

ORDER CODE	**BRANDING**
SD1434	SD1434

PIN CONNECTION



S88SD1434-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1434 is a 12.5 Volt epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device utilizes diffused emitter resistors to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	10.0	A
P_{tot}	Total Power Dissipation	175.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

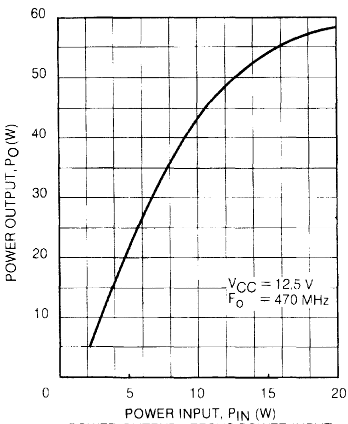
STATIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CES}	I_C = 20mA	V_{BE} = 0		36.0			V
BV_{CEO}	I_E = 50mA	I_B = 0		16.0			V
BV_{EBO}	I_E = 5mA	I_C = 0		4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0				5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1.0A		20.0			

DYNAMIC

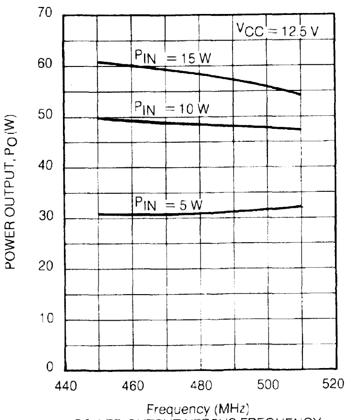
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		45.0			W
G_P	f = 470MHz	V_{CE} = 12.5V		5.0	5.5		dB
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0		13.30		pF

APPLICATION INFORMATION (typical curves)



POWER OUTPUT VERSUS POWER INPUT

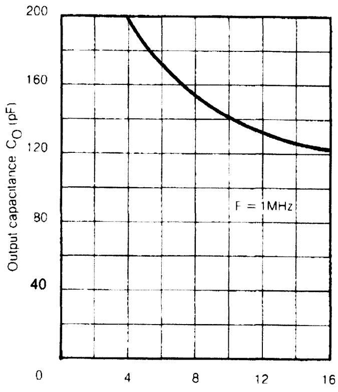
S88SD1434-02



POWER OUTPUT VERSUS FREQUENCY

S88SD1434-03

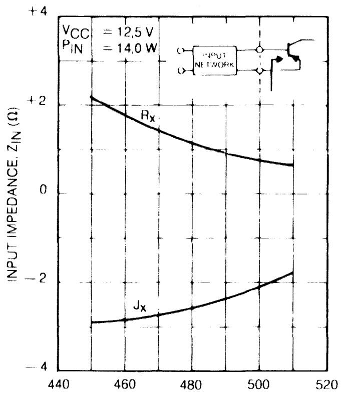
APPLICATION INFORMATION (typical curves) (continued)



OUTPUT CAPACITANCE VERSUS COLLECTOR - BASE VOLTAGE

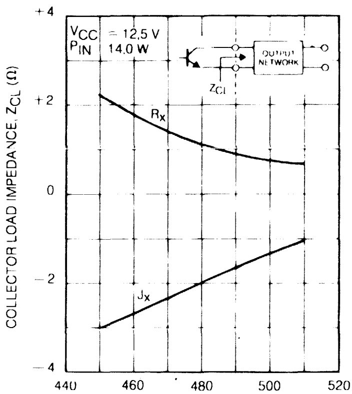
S88SD1434-04

IMPEDANCE DATA (typical)



TYPICAL INPUT IMPEDANCE VERSUS FREQUENCY

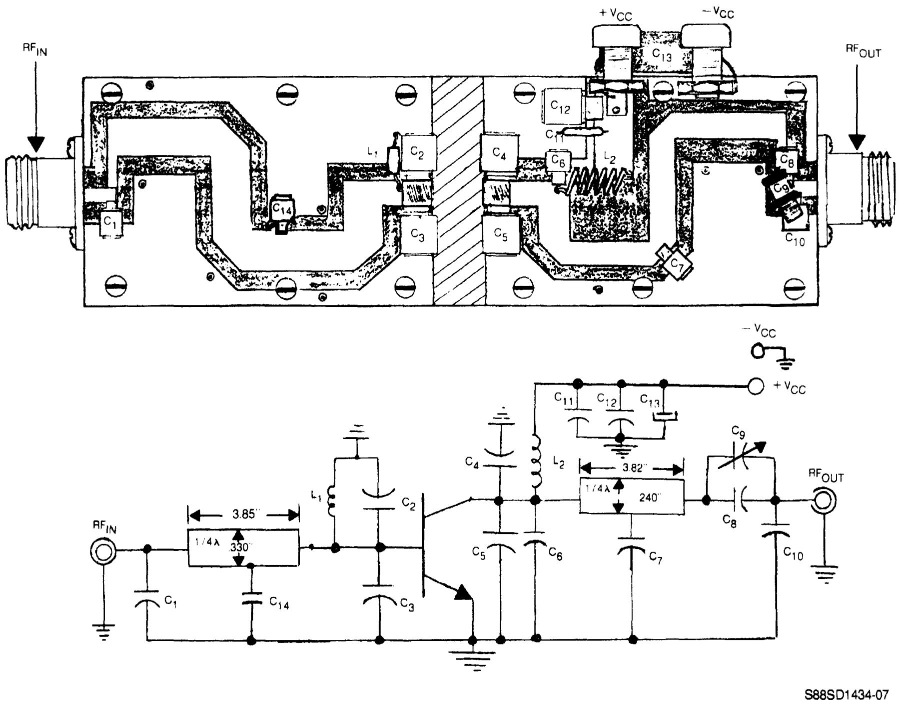
S88SD1434-05



TYPICAL COLLECTOR LOAD IMPEDANCE VERSUS FREQUENCY

S88SD1434-06

TEST CIRCUIT

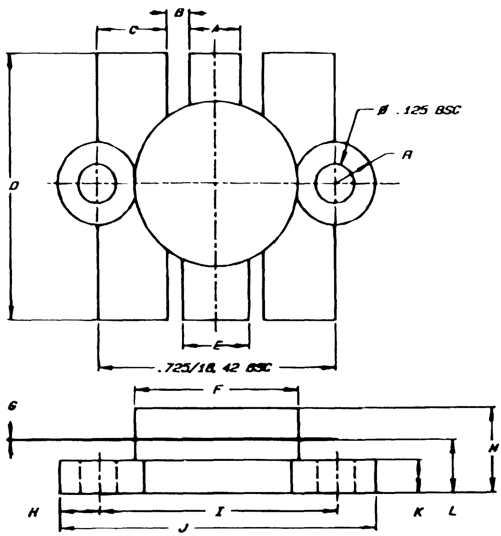


COMPONENTS LIST
C1 - 10pF UNELCO, 200milSQ
C2 - 36pF UNELCO, 400milSQ
C3 - 34pF UNELCO, 400milSQ
C4 - 36pF UNELCO, 400milSQ
C5 - 38pF UNELCO, 400milSQ
C6 - 16pF UNELCO, 200milSQ
C7 - 10pF UNELCO, 200milSQ
C8 - 25pF UNELCO, 200milSQ
C9 - 1-12pF, ATC variable
C10-6pF UNELCO, 200milSQ
C11-01µF 50V, ERIE DISC
C12 - 1000pF UNELCO, 400milSQ
C13 - 47µF 63V, SPRAGUE ELECTROLYTIC
L1 - 27µH MOLDED
L2 - 6TURNS#18AWG, 175"I.D.
C14 - 10pF UNELCO, 200milSQ

MATERIAL
PC BOARD, DOUBLED SIDED COPPER
1/32" THICK TEFLON - GLASS, 3M-K-6098

PACKAGE MECHANICAL DATA

.500 6LFL



S88SD1434-08

	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

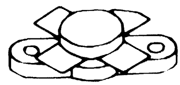
	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SGS-THOMSON
MICROELECTRONICS

SD1438-2

RF & MICROWAVE TRANSISTORS
108...152MHz APPLICATIONS

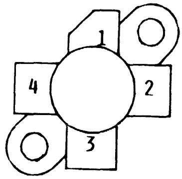
- CLASS C TRANSISTOR
- FREQUENCY 136MHz
- VOLTAGE 28V
- POWER OUT 100W
- POWER GAIN 7.0dB
- GOLD METALLIZATION
- COMMON EMITTER



.380 4LFL (M113)
epoxy sealed

ORDER CODE	**BRANDING**
SD1438-02	SD1438-2

PIN CONNECTION



S88SD1438-2-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1438-2 is a 28V epitaxial silicon NPN planar transistor designed primarily for VHF avionics communications. This device utilizes diffused emitter resistors to achieve infinite VSWR at rated operations conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	36.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	9.0	A
P_{tot}	Total Power Dissipation	103.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.7	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

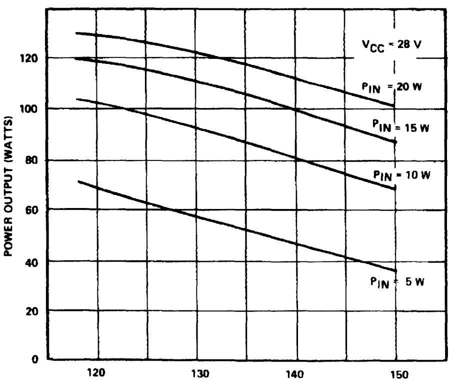
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 200mA	V_{BE} = 0	65.0			V
BV_{CEO}	I_C = 200mA	I_B = 0	36.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CES}	V_{CB} = 30.0V	I_E = 0			10.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 500mA	5.0			

DYNAMIC

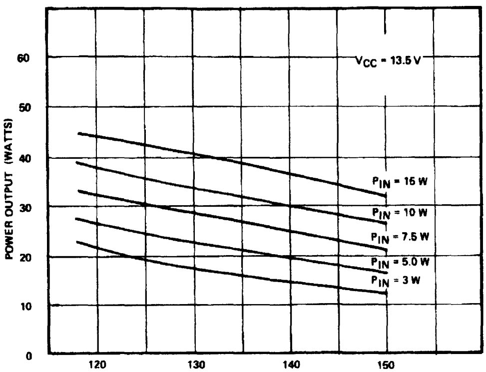
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 136MHz	V_{CE} = 28.0V		100.0			W
G_P	f = 136MHz	V_{CE} = 28.0V		7.0			dB
C_{OB}	f = 1MHz	V_{CB} = 30.0V	I_E = 0			130.0	pF
C_{IB}	f = 1MHz	V_{EB} = 0.5V	I_C = 0			1250.0	pF

APPLICATION INFORMATION (typical curves)



FREQUENCY (MHz)
POWER OUTPUT VS. FREQUENCY

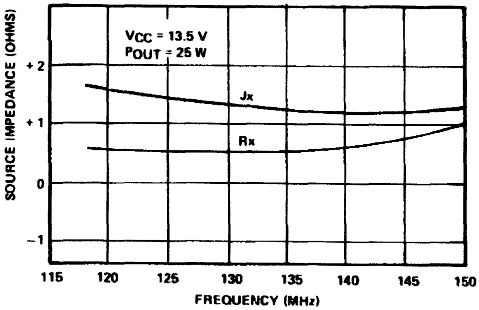
S88SD1438-2-02



FREQUENCY (MHz)
POWER OUTPUT VS. FREQUENCY

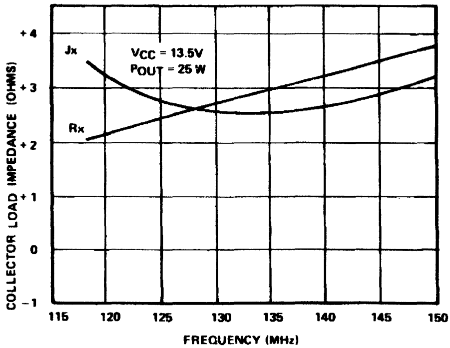
S88S1438-2-03

IMPEDANCE DATA (typical curves)



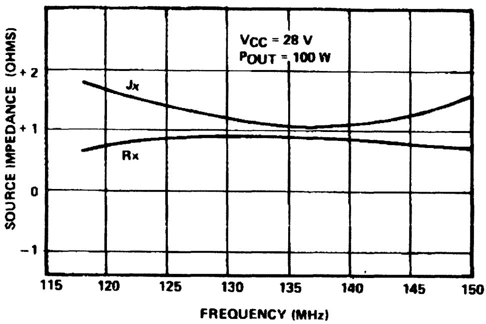
SERIES SOURCE IMPEDANCE VS. FREQUENCY

S88SD1438-2-04



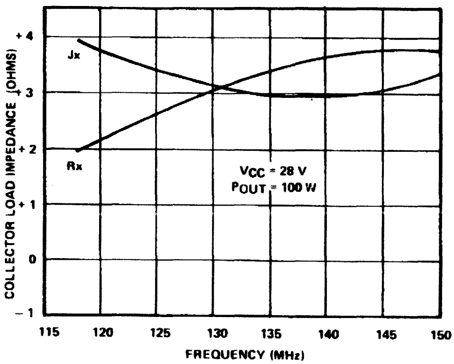
SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY

S88S1438-2-05



SERIES SOURCE IMPEDANCE VS. FREQUENCY

S88SD1438-2-06



SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY

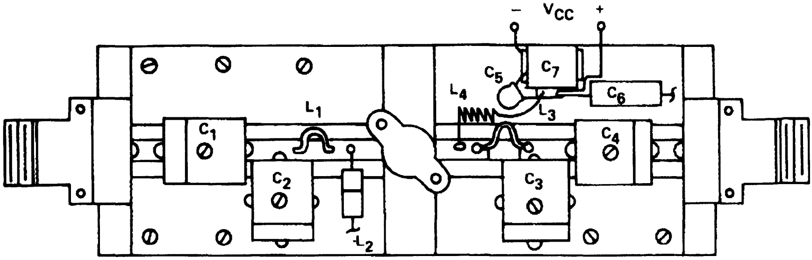
S88SD1438-2-07

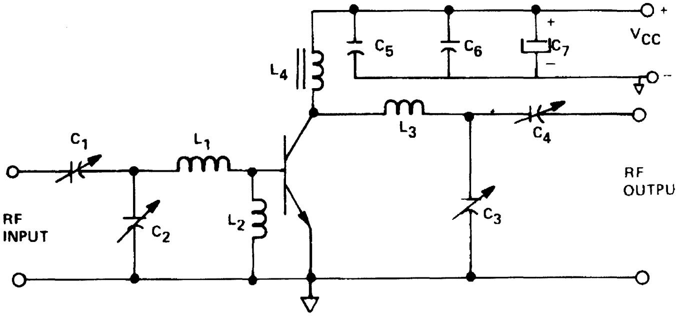
IMPEDANCE DATA (typical)

$Z_S = 0.09 + j\,1.1\Omega$
$Z_{CL} = 3.4 + j\,2.9\Omega$

$V_{CE} = 28V$
$P_O = 100W$
$F = 136MHz$

TEST CIRCUIT

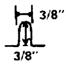




S88SD1438-2-08

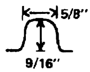
PARTS LIST

C_1	ARCO 462
C_2	ARCO 463
C_3	ARCO 464
C_4	ARCO 465
C_5	.01 mF ERIE
C_6	EECTROLYTIC 10µF, 35V
C_7	1000pF UNELCO



L_1 1/2 TURN, # 14 AWG

L_2 1.5µH MOLDED

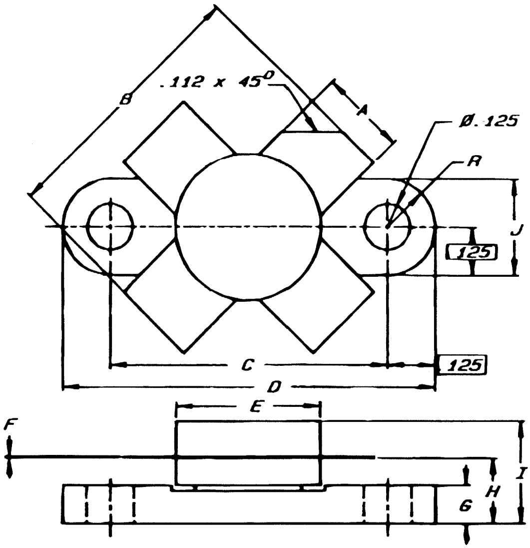


L_3 1/2 TURN, # 14 AWG

L_4 71/2 TURNS, # 16 AWG, ENAMELED, 1/4" ID

PACKAGE MECHANICAL DATA

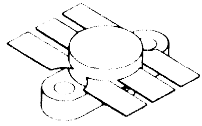
.380 4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

RF & MICROWAVE TRANSISTORS
130...230MHz FM MOBILE APPLICATIONS

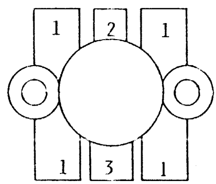
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 150W
- POWER GAIN 5.0dB
- COMMON EMITTER



.500 6LFL (M111)
epoxy sealed

ORDER CODE SD1441
BRANDING SD1441

PIN CONNECTION



1 emitter
2 collector
3 base

DESCRIPTION

The SD1441 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. This device utilizes improved metallization systems to achieve extreme ruggedness under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	22.0	A
P_{tot}	Total Power Dissipation	350.0	W
T_{stg}	Storage Temperature	− 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

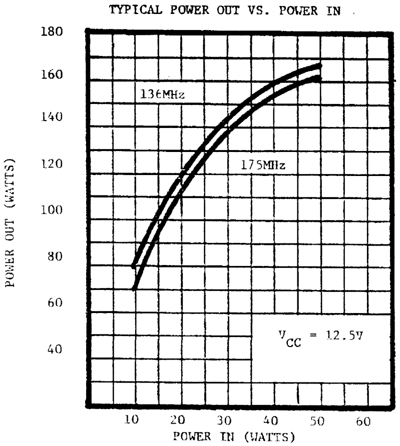
STATIC

Symbol	Test Conditions			Value		Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 100mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 5A	10.0			

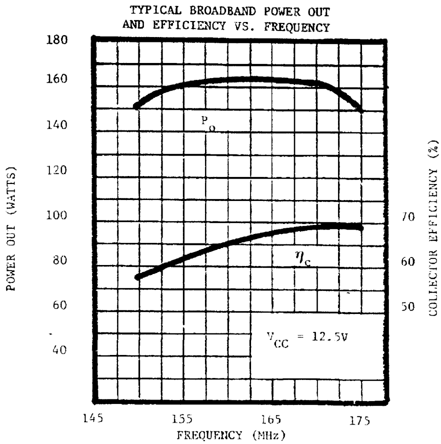
DYNAMIC

Symbol	Test Conditions				Value		Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		150.0	5.0		W
G_P	f = 175MHz	V_{CE} = 12.5V		5.0	5.5		dB
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0		430.0		pF

APPLICATION INFORMATION (typical curves)



S88SD1441 02



S88SD1441 03

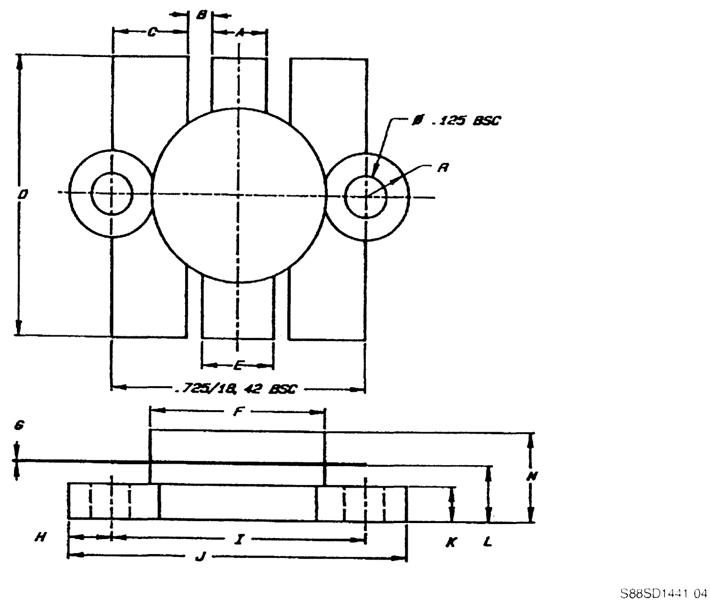
IMPEDANCE DATA (typical values)

Z_S = .7 - j 1.0Ω
Z_{cl} = .7 - j 0.6Ω

V_{CE} = 12.5V
P_O = 150W
F = 175MHz

PACKAGE MECHANICAL DATA

.500 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

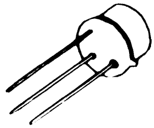
	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SGS-THOMSON MICROELECTRONICS

SD1444

RF & MICROWAVE TRANSISTORS
450-512MHz CLASS C MOBILE APPLICATIONS

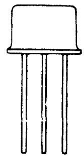
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 2W
- POWER GAIN 8.0dB
- COMMON EMITTER



TO-39 (M133)

ORDER CODE	BRANDING
SD1444	SD1444

PIN CONNECTION



1 2 3

S88SD1444-01

1 collector
2 emitter
3 base

DESCRIPTION

The SD1444 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device is packaged in a grounded emitter TO-39 package for increased power gain and optimum heat dissipation.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	.40	A
P_{tot}	Total Power Dissipation	5.0	W
T_{stg}	Storage Temperature	– 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	35.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

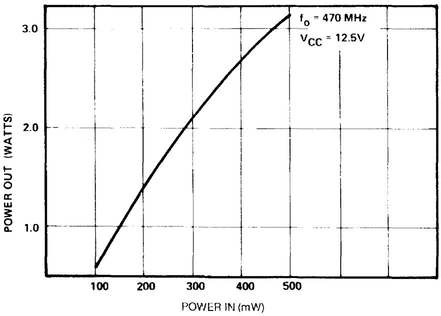
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 1mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 50mA	20.0		200.0	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		2.0			W
G_P	f = 470MHz	V_{CE} = 12.5V		8.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0			15.0	pF

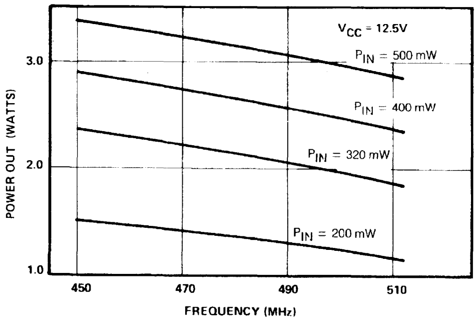
APPLICATION INFORMATION (typical curves)

POWER OUT VS. POWER IN



S88SD1444-02

POWER OUT VS. FREQUENCY



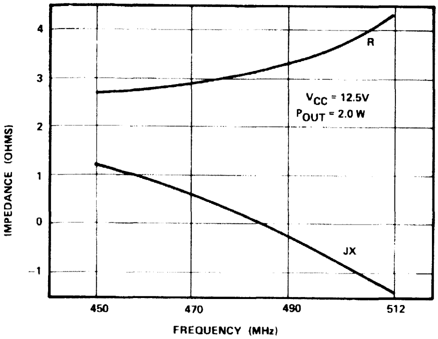
S88S1444-03

IMPEDANCE DATA (typical)

$Z_S = 2.9 + j\ 0.6\Omega$
$Z_{CL} = 15.6 + j\ 10.2\Omega$

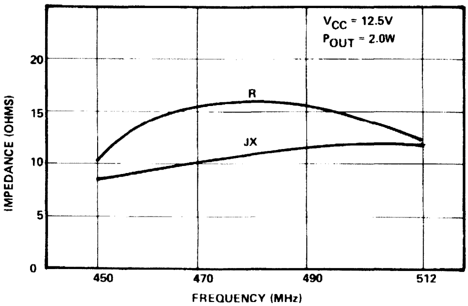
F = 470MHz
$V_{CE} = 12.5V$
$P_O = 2W$

SOURCE IMPEDANCE VS. FREQUENCY



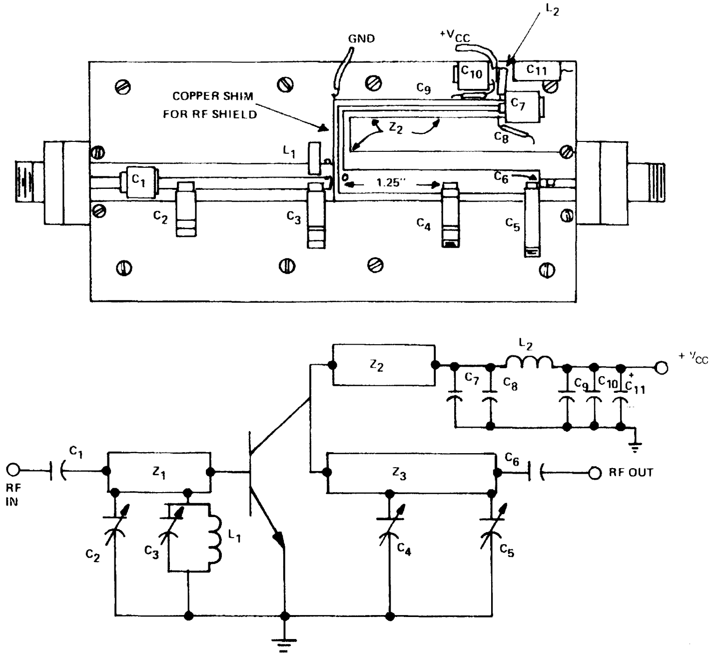
S88SD1444-04

COLLECTOR LOAD IMPEDANCE VS. FREQUENCY



S88S1444-05

TEST CIRCUIT



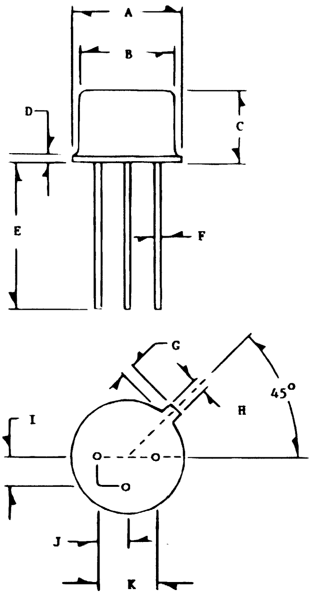
S88SD1444-06

COMPONENT LIST

C_1, C_7, C_{10}	1000pf UNELCO	L_1	0.47μh MOLDED CHOKE
C_2	0.8 – 10pf, VOLTRONICS AJ10	L_2	2.2μh MOLDED CHOKE
C_3, C_4	1.0 – 20pf, JOHANSON 5500	Z_1	2.25" x 0.185"
C_5	1.0 – 30pf, JOHANSON 5600	Z_2	2.50" x 0.0625"
C_6	1000pf CHIP CAPACITOR	Z_3	2.25" x 0.185"
C_8, C_9	0.01μf DISC-CERAMIC	BOARD MATERIAL – 3M–K6098,	
C_{11}	10μf, 35V ELECTROLYTIC	1/16" THK	

PACKAGE MECHANICAL DATA

TO-39



S88SD1444-07

	Minimum Inches	Maximum Inches
A	.350	.370
B	.315	.335
C	.240	.260
D	.015	.045
E	.500	
F	.016	.019

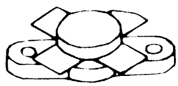
	Minimum Inches	Maximum Inches
G	.029	.040
H	.028	.034
I	.095	.105
J	.095	.105
K	.190	.210

SGS-THOMSON
MICROELECTRONICS

SD1446

RF & MICROWAVE TRANSISTORS
27-88MHz FM APPLICATIONS

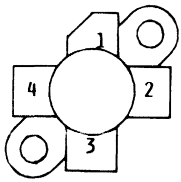
- FM CLASS C TRANSISTOR
- FREQUENCY 50MHz
- VOLTAGE 12.5V
- POWER OUT 70W
- POWER GAIN 10dB
- EFFICIENCY 55%TYP
- GOLD METALLIZATION
- COMMON EMITTER



.380 4LFL (M113)
epoxy sealed

ORDER CODE	**BRANDING**
SD1446	SD1446

PIN CONNECTION



S88SD1446-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1446 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for land mobile transmitter applications. This device utilizes emitter ballasting and is extremely stable and capable of withstanding extremely high VSWR under rated conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current	12.0	A
P_{tot}	Total Power Dissipation	183.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.05	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	18.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 15V	V_{BE} = 0			10	mA
h_{FE}	V_{CE} = 5V	I_C = 5A	10.0	50.0		

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 50MHz	V_{CC} = 12.5V		70.0			W
G_P	f = 50MHz	V_{CC} = 12.5V		10.0			dB
C_{ob}	f = 1MHz	V_{CB} = 12.5V	I_E = 0		230.0		pF

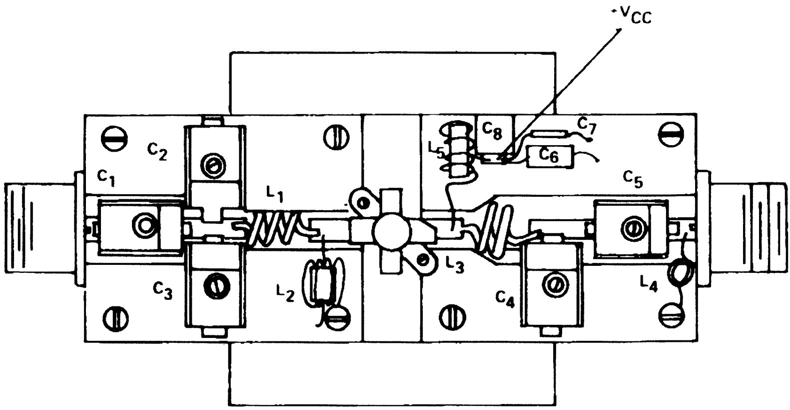
IMPEDANCES DATAS (typical)

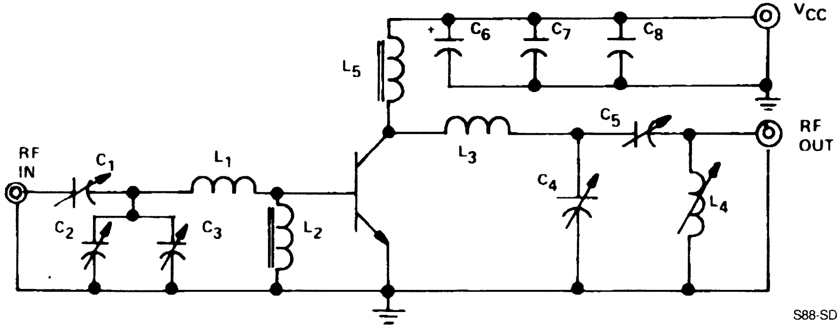
Z_L : 1.2 + j0.6Ω

Z_i : 0.8 – j0.9Ω

at f = 50MHz
V_{CE} = 12.5V
P_{out} = 70W

TEST FIXTURE





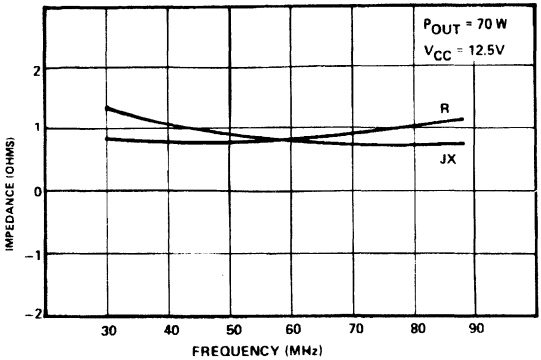
S88-SD1446-02

COMPONENT LIST

C_1, C_4	50 – 380pf ARCO 465
C_2	110 – 580pf ARCO 467
C_3	140 – 680pf ARCO 468
C_5	9 – 180pf ARCO 463
C_6	10µf, 35 VDC, ELECTROLYTIC
C_7	.01µf ERIE
C_8	1000pf UNELCO
L_1	2 1/2 TURNS #14 AWG, TINNED, 1/4" I.D. LOOSE WOUND
L_2	10 TURNS #28AWG. ENAMELED ON FERROXCUBE SLEEVE #3b
L_3	1 1/2 TURNS #12AWG, TINNED, 3/8" ID LOOSE WOUND
L_4	8 TURNS #18 AWG ON 1/4" ID COIL FORM 1/2" LENGTH WITH FERRITE SLUG
L_5	11 TURNS #16 AWG, ENAMELED ON TORROID, MICROMETALS, T50-2

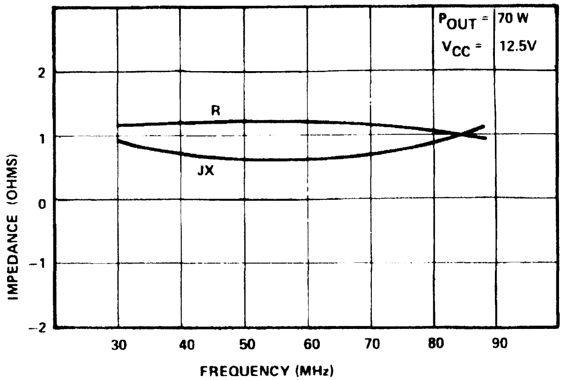
BOARD MATERIAL - DOUBLE-SIDED COPPER 1/16" THK.

APPLICATION INFORMATION (typical curves)



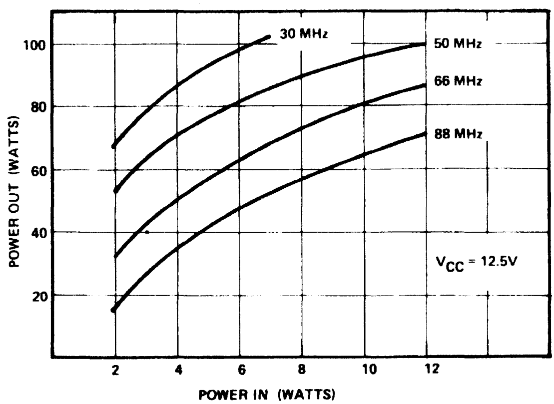
SERIES SOURCE IMPEDANCE

S88-SD1446-03



SERIES COLLECTOR LOAD IMPEDANCE

S88-SD1446-04

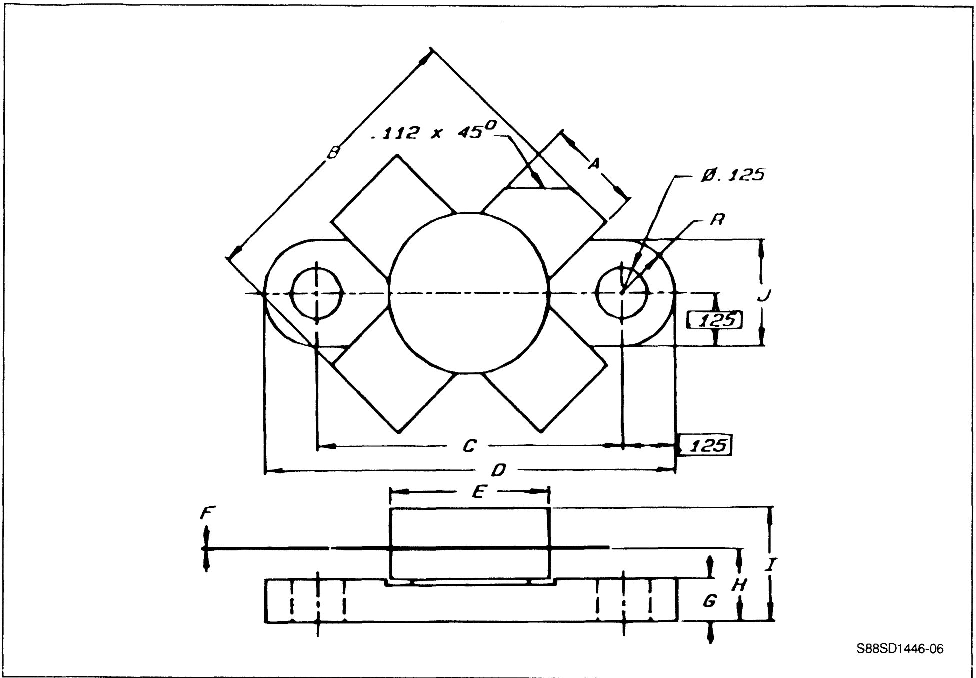


POWER OUT VS. POWER IN

S88-SD1446-05

PACKAGE MECHANICAL DATA

.380 4LFL



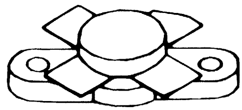
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON
MICROELECTRONICS

SD1451

RF & MICROWAVE TRANSISTORS
SSB APPLICATIONS

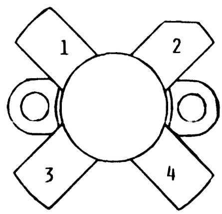
- SEMI LINEAR TRANSISTOR
- OPTIMIZED FOR SSB
- FREQUENCY 30MHz
- VOLTAGE 12.5 V
- POWER OUT 60 W
- POWER GAIN 15dB
- IMD – 26dB
- GOLD METALLIZATION
- COMMON EMITTER



.500 4LFL (M174)
epoxy sealed

ORDER CODE	BRANDING
SD1451	SD1451

PIN CONNECTION



1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1451 is a 12.5 V epitaxial silicon NPN planar transistor designed primarily for SSB communications. This device utilizes emitter ballasting to achieve extreme ruggedness under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36	V
V_{CEO}	Collector - Emitter Voltage	18	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	10	A
P_{tot}	Total Power Dissipation	175	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

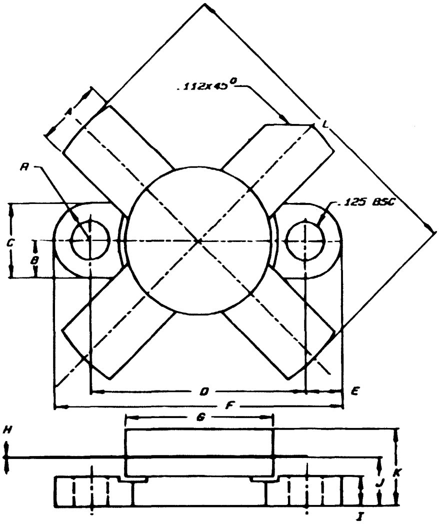
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100 mA	V_{BE} = 0	36			V
BV_{CEO}	I_C = 100 mA	I_B = 0	18			V
BV_{EBO}	I_E = 10 mA	I_C = 0	4			V
I_{CES}	V_{CE} = 15 V	V_{BE} = 0			10	mA
h_{FE}	V_{CE} = 5 V	I_C = 5 A	20	75		

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 30 MHz	V_{CE} = 12.5 V	I_{cq} = 100 mA	60			W
G_P	f = 30 MHz	V_{CE} = 12.5 V	I_{cq} = 100 mA	15	16		dB
IMD	f = 30 MHz	V_{CE} = 12.5 V	I_{cq} = 100 mA		– 30	– 26	dB
C_{ob}	f = 1 MHz	V_{CB} = 12.5 V	I_E = 0		200		pF

PACKAGE MECHANICAL DATA

. 500 4LFL



S88 SD1451 02

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

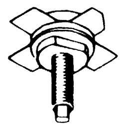
	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

SGS-THOMSON
MICROELECTRONICS

SD1455

RF & MICROWAVE TRANSISTORS
TV BAND III APPLICATIONS

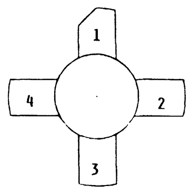
- FREQUENCY 170-230MHz
- POWER OUT 14W
- VOLTAGE 28V
- POWER GAIN 9.0dB
- IMD – 55dB
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION



.500 4 LSTUD (M130)
epoxy sealed

ORDER CODE	BRANDING
SD1455	SD1455

PIN CONNECTION



S88SD1455-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1455 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class A operation in VHF and band III television transmitters and transposers.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	30.0	V
V_{CES}	Collector - Emitter Voltage	60.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current (max.)	8.0	A
P_{tot}	Total Device Dissipation at + 25°C	140.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}*	I_C = 50mA	I_B = 0	30.0			V
BV_{CES}*	I_C = 50mA	V_{BE} = 0	60.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CES}	V_{CB} = 50V	V_{BE} = 0			5.0	
h_{FE}	V_{CE} = 5V	I_C = 2A	10.0		80.0	

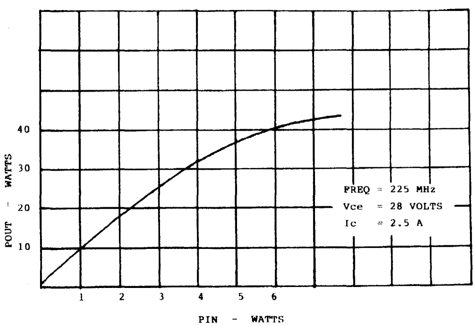
* Pulsed through 25MH Inductor.

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 225MHz	V_{CE} = 28V	I_C = 2.5A	14.0	15.0		W
P_G	f = 225MHz	V_{CE} = 28V	I_C = 2.5A	9.0			dB
IMD**	f = 225MHz	V_{CE} = 28V	I_C = 2.5A		– 55.0		dB
C_{OB}	f = 1MHz	V_{CB} = 28V	I_C = 0		65.0	80.0	pF

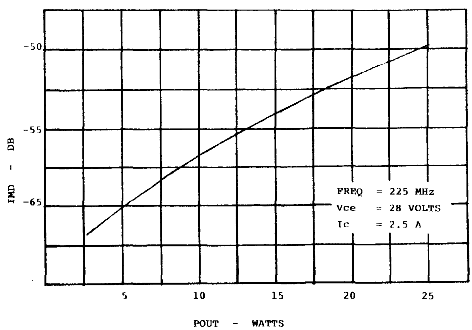
** IMD -- 3 tone
Vision Carrier = Reference -- 8.0dB
Sound Carrier = Reference -- 7.0dB
Sideband = Reference -- 16.0dB

POWER OUT VS POWER IM



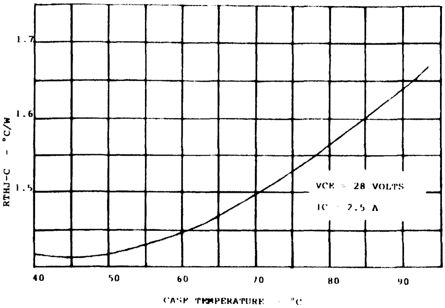
S88SD1455-02

IMD VS POUT



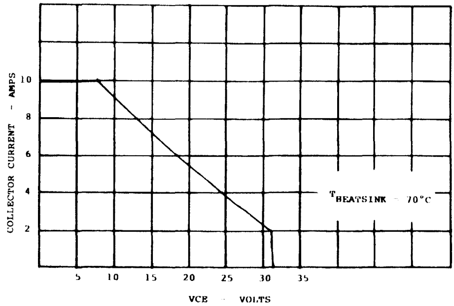
S88SD1455-03

IN SCAN HOT θJC VS CASE TEMPERATURE



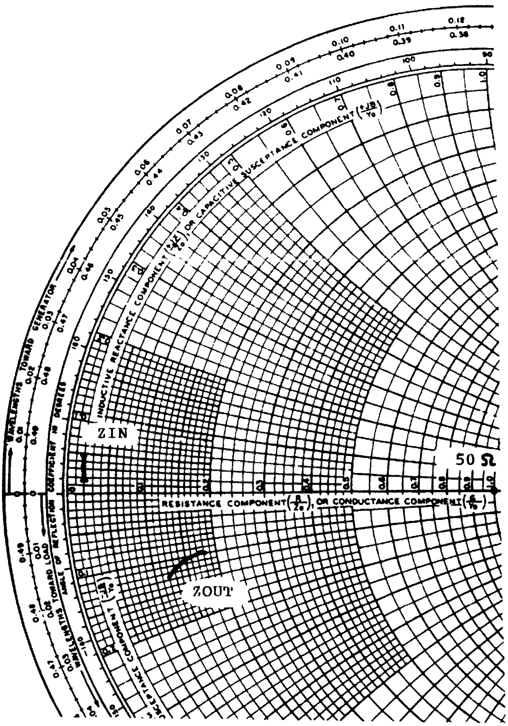
S88SD1455-04

SAPE OPERATING AREA



S88SD1455-05

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



S88-SD1455-06

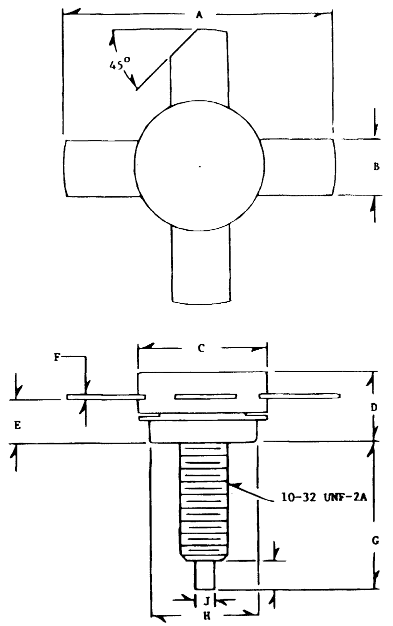
F MHZ	Z IN	Z OUT
250	1 + 2j	6 – 6j
150	1 + 1j	9 – 5j

Z_{OUT} = conjugate of the optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

V_{CE} = 28V
I_C – 2.5A

PACKAGE MECHANICAL DATA

.500 4LSTUD

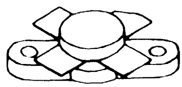


	Minimum Inches	Maximum Inches
A		1.030
B	.220	.230
C	.490	.510
D	.250	.290
E	.160	.180
F	.004	.006
G	.550	.600
H	.415	.425
I	.100	.130
J	.065	.075

SD1457

RF & MICROWAVE TRANSISTORS FM BROADCAST APPLICATIONS

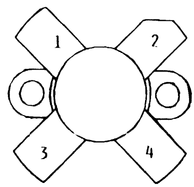
- FM CLASS C TRANSISTOR
- FREQUENCY 108MHz
- VOLTAGE 28V
- POWER OUT 75W
- POWER GAIN 10dB
- EFFICIENCY 75 %
- GOLD METALLIZATION
- COMMON EMITTER



.500 4LFL (M174)
epoxy sealed

ORDER CODE	BRANDING
SD1457	SD1457

PIN CONNECTION



1 emitter
2 collector
3 base
4 emitter

DESCRIPTION

The SD1457 is a 28V gold metallized epitaxial silicon NPN planar transistor designed for VHF, FM broadcasting transmitters.
This device utilizes diffused emitter resistors to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CEO}	Collector - Emitter Voltage	30	V
V_{CES}	Collector - Emitter Voltage	60	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	10	A
P_{tot}	Total Power Dissipation	100	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

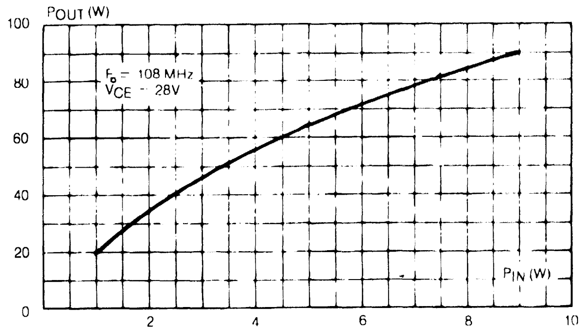
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 50mA	I_E = 0	65			V
BV_{CES}	I_C = 50mA	V_{BE} = 0	60			V
BV_{CEO}	I_C = 50mA	I_B = 0	30			V
BV_{EBO}	I_E = 10mA	I_C = 0	4			V
h_{FE}	V_{CE} = 5V	I_C = 1A	20		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 108MHz	V_{CC} = 28V		75			W
G_P	f = 108MHz	V_{CC} = 28V		10			dB
η_c	f = 108MHz	V_{CC} = 28V		70	75		%
C_{ob}	f = 1MHz	V_{CB} = 30V	I_E = 0			85	pF

APPLICATION INFORMATION (typical curves)



Output power versus input power (typical values)

S88-SD1457-01

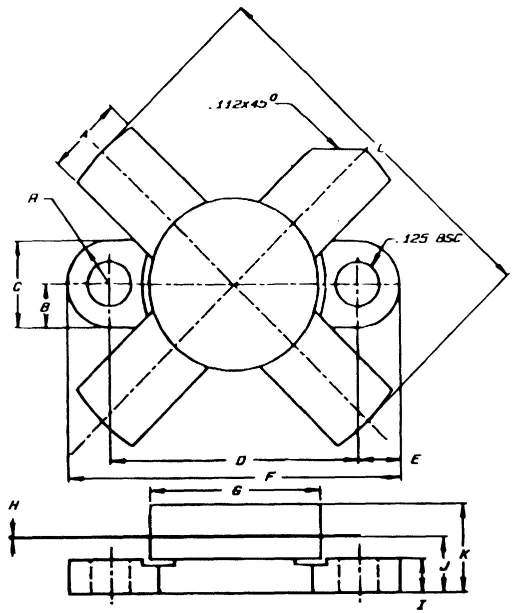
IMPEDANCE DATA (typical)

$Z_L = 5.5 + j\,0.7\Omega$
$Z_S = 1.4 - j\,0.1\Omega$
f = 88MHz V_{CE} = 28V
P_{out} = 70W

$Z_L = 5.7 + j\,1.6\Omega$
$Z_S = 1.0 - j\,0.5\Omega$
f = 108MHz V_{CE} = 28V
P_{out} = 70W

PACKAGE MECHANICAL DATA

.500 4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

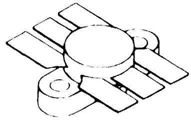
	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

SGS-THOMSON
MICROELECTRONICS

SD1458

RF & MICROWAVE TRANSISTORS TV BAND III APPLICATIONS

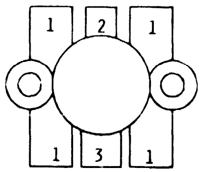
- FREQUENCY 170-230MHz
- POWER OUT 14W
- VOLTAGE 28V
- POWER GAIN 14.0dB
- IMD – 53dB
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION
- INTERNAL INPUT MATCHING



.500 6LFL (M111)
epoxy sealed

ORDER CODE	BRANDING
SD1458	SD1458

PIN CONNECTION



S88SD1458-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1458 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class A operation in VHF and band III television transmitters and transposers.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	60	V
V_{CEO}	Collector - Emitter Voltage	35	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current (max.)	10	A
P_{tot}	Total Device Dissipation at + 25°C	140	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

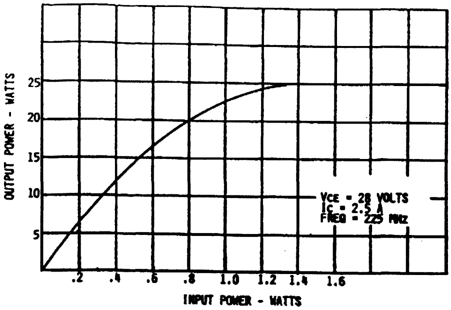
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 50mA		30			V
BV_{CES}	I_C = 50mA		60			V
BV_{EBO}	I_E = 10mA		4			V
I_{CES}	V_{CB} = 50V				5	mA
h_{FE}	V_{CE} = 5V	I_C = 1A	10		100	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 225MHz	V_{CB} = 28V	I_C = 2.5A	14	15		W
P_G	f = 225MHz	V_{CB} = 28V	I_C = 2.5A	14			dB
IMD	f = 225MHz	V_{CB} = 28V	I_C = 2.5A			– 55	DB
V_{SWR}	f = 225MHz	V_{CB} = 28V	P_O = 14W	∞			
C_{OB}	f = 1MHz	V_{CB} = 28V			65	80	pF

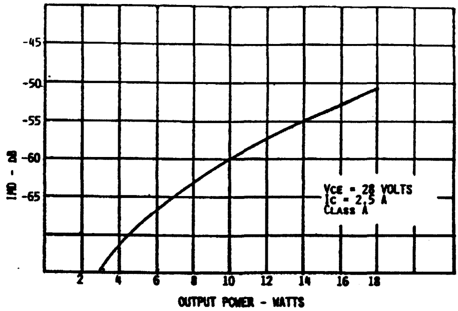
APPLICATION INFORMATION (typical curves)

OUTPUT POWER VS INPUT POWER



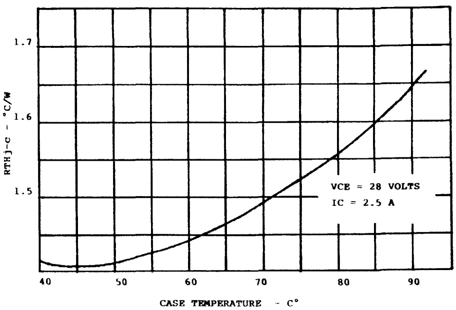
S88SD1458-02

IMD VS OUTPUT POWER



S88SD1458-03

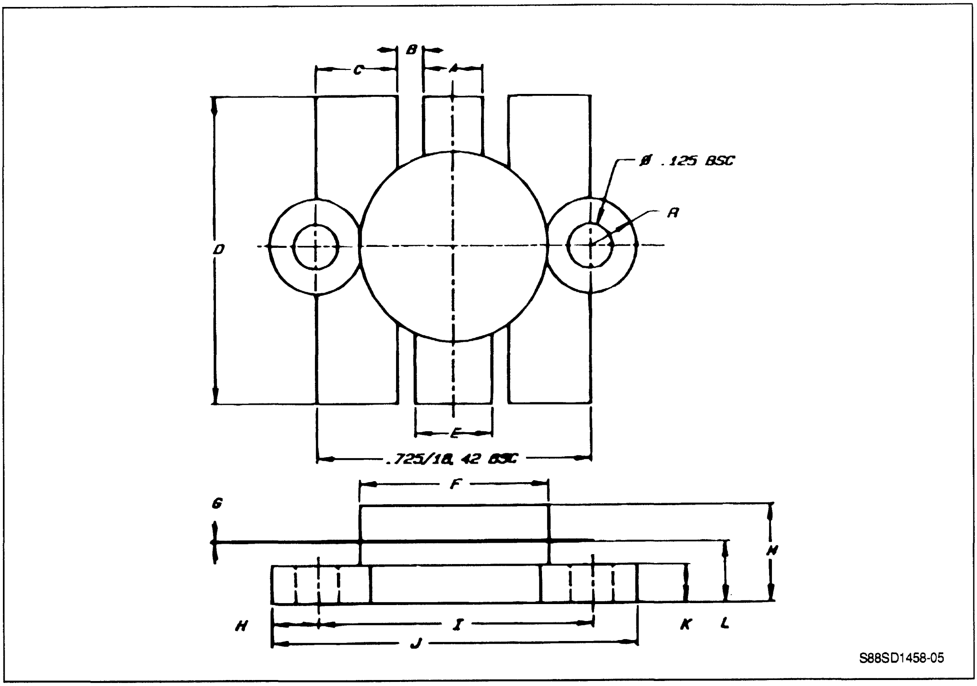
IR SCAN HOT SPOT θ_{JC} VS CASE TEMPERATURE



S88SD1458-04

PACKAGE MECHANICAL DATA

.500 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

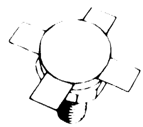
	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SGS-THOMSON MICROELECTRONICS

SD1459

RF POWER TRANSISTORS TV BAND III APPLICATIONS

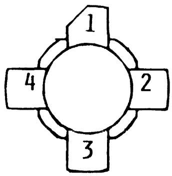
- FREQUENCY 170-230MHz
- POWER OUT 30W
- VOLTAGE 28V
- POWER GAIN 7.5dB
- IMD –53dB
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION



.550 4 LSTUD (M164)
epoxy sealed

ORDER CODE	BRANDING
SD1459	SD1459

PIN CONNECTION



S88SD1459-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1459 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class A operation in VHF and band III television transmitters and transposers.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector – Base Voltage	60	V
V_{CEO}	Collector – Emitter Voltage	30	V
V_{EBO}	Emitter – Base Voltage	4	V
I_C	Collector Current (max.)	16	A
P_{tot}	Total Device Dissipation at + 25°C	150	W
T_{stg}	Storage and Junction Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

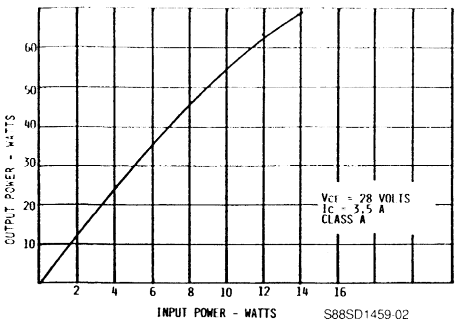
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 100mA		30			V
BV_{CBO}	I_C = 100mA		60			V
BV_{EBO}	I_E = 20mA		4			V
h_{FE}	V_{CE} = 5V	I_C = 1A	10		120	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 225MHz	V_{CE} = 28V	I_C = 3.5A	30			W
P_G	f = 225MHz	V_{CE} = 28V	P_O = 20W	7.5	8.0		dB
IMD	f = 225MHz	V_{CE} = 28V	P_{REF} = 30W			– 53	DB
V_{SWR}	f = 225MHz	V_{CE} = 28V	P_O = 20W	∞			
C_{ob}	f = 1MHz	V_{CB} = 30V				150	pF

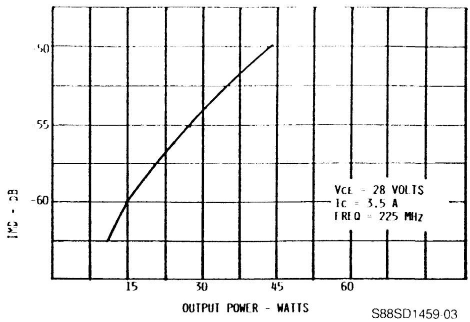
APPLICATION INFORMATION

OUTPUT POWER VS INPUT POWER



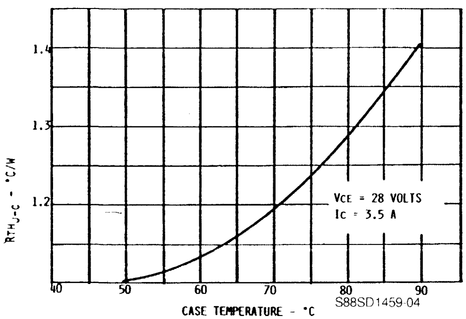
S88SD1459-02

IMD VS OUTPUT POWER



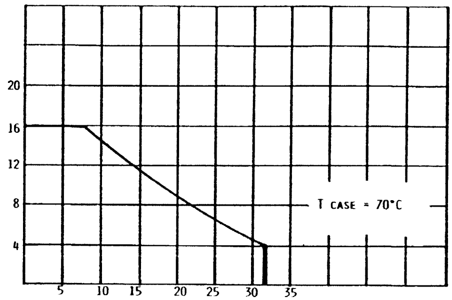
S88SD1459-03

IR SCAN HOT SPOT θJC VS CASE TEMPERATURE



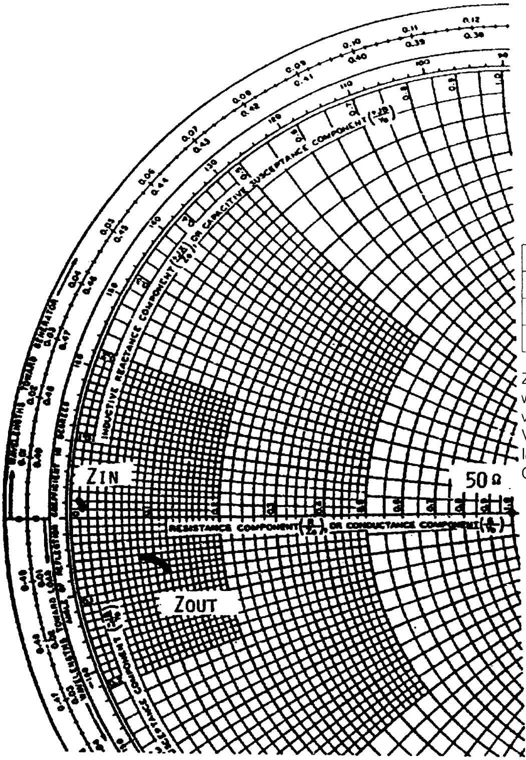
S88SD1459-04

SAFE OPERATING AREA



S88SD1459-05

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE

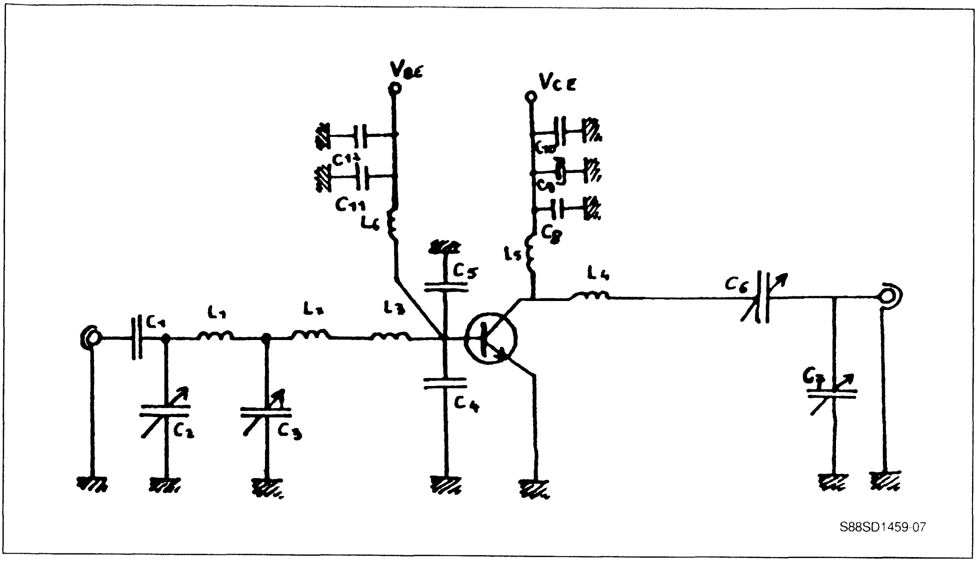


F_{MHZ}	Z_{IN} (Ω)	Z_{OUT} (Ω)
170	.6 + .7j	5.9 − 3.5j
200	.55 + .8j	5 − 3j
230	.5 + .9j	4.2 − 2.8j

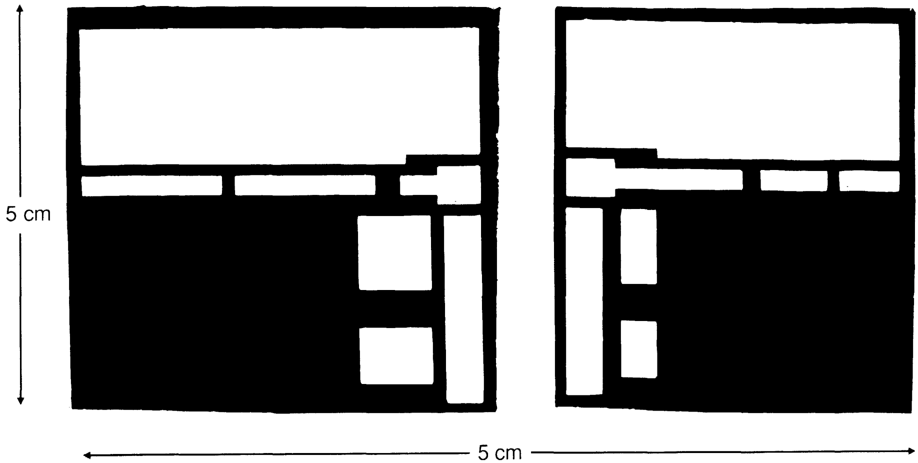
Z_{OUT} = conjugate of the optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.
V_{CE} = 28V
I_C = 3.5A
CLASS A.

S88SD1459-06

TEST CIRCUIT FOR 225MHz CLASS A



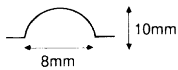
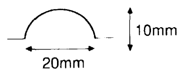
TEST CIRCUIT



S88SD1459-08

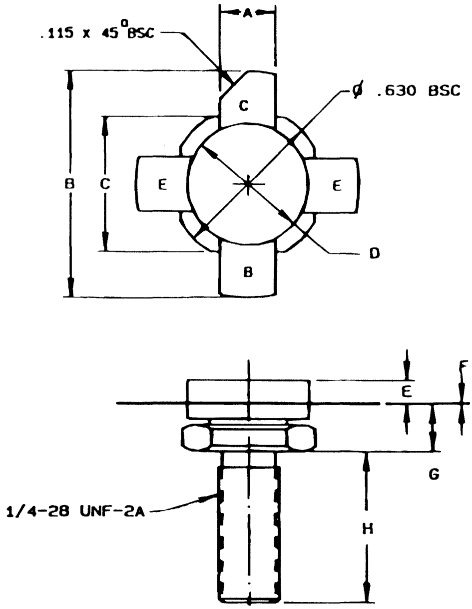
Components List SD1459

C1, C10	:	Chip Capacitor 470pF ATC 100B
C2	:	Trimmer Capacitor ARCO 403 4–40pF
C3	:	Trimmer Capacitor ARCO 404 4–60pF
C4, C5	:	Chip Capacitor 82pF ATC 100 B
C6	:	Trimmer Capacitor ARCO 425 24–200pF
C7	:	Trimmer Capacitor ARCO 405 10–80pF
C8, C11	:	Chip Capacitor 1µF LCC
C9	:	Electrolytic Capacitor 100µF 63V
C12	:	10mF LCC CPM13B

L1	:	1.5 Turns 0.7mm Enameled Wire 4.5mm I.D
L2	:	21mm 50Ω line
L3	:	Lenght of the base lead
L4	:	Enameled wire 1.6mm φ 
L5	:	Enameled wire 1.6mm φ 
L6	:	9 turns 0.7mm Enameled wire 4.5mm I.D
Materiel	:	Epoxy 63 MILS Er = 2.55

PACKAGE MECHANICAL DATA

.550 4LSTUD



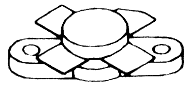
S88-SD1459-06

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.800/20.32	1.020/25.91
C	.545/13.84	.551/14.00
D	.495/12.57	.505/12.83
E	.085/2.16	.100/2.54
F	.003/0.08	.007/0.18
G	.185/4.70	.198/5.03
H	.497/12.62	.530/13.46

SD1460

RF & MICROWAVE TRANSISTORS FM BROADCAST APPLICATIONS

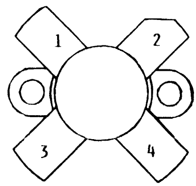
- FM CLASS C TRANSISTOR
- FREQUENCY 108MHz
- VOLTAGE 28V
- POWER OUT 160W
- POWER GAIN 9dB
- EFFICIENCY 75%
- GOLD METALLIZATION
- COMMON EMITTER



.500 4LFL (M174)
epoxy sealed

ORDER CODE	BRANDING
SD1460	SD1460

PIN CONNECTION



S88SD1460-01

1 emitter
2 collector
3 base
4 emitter

DESCRIPTION

The SD1460 is a 28V gold metallized epitaxial silicon NPN planar transistor designed for VHF, FM broadcasting transmitters.
This device utilizes diffused emitter resistors to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	60	V
V_{CEO}	Collector - Emitter Voltage	25	V
V_{CES}	Collector - Emitter Voltage	60	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	16	A
P_{tot}	Total Power Dissipation	230	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.75	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

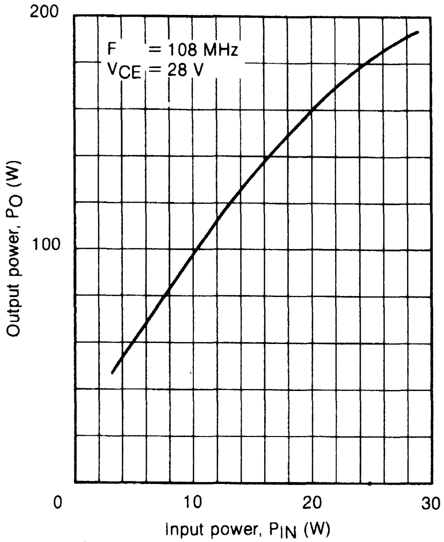
STATIC

Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CBO}	I_C = 100mA	I_E = 0	60			V
BV_{CES}	I_C = 100mA	V_{BE} = 0	60			V
BV_{CEO}	I_C = 100mA	I_B = 0	25			V
BV_{EBO}	I_E = 20mA	I_C = 0	4			V
h_{FE}	V_{CE} = 5V	I_C = 1A	20		150	

DYNAMIC

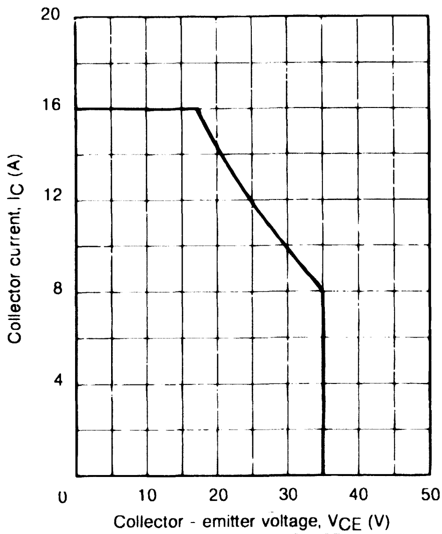
Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	f = 108MHz	V_{CC} = 28V	P_{IN} = 18W	150			W
G_P	f = 108MHz	V_{CC} = 28V	P_{IN} = 18W	9.2			dB
η_c	f = 108MHz	V_{CC} = 28V	P_{IN} = 18W	70	75		%
C_{ob}	f = 1MHz	V_{CB} = 28V	I_E = 0			150	pF

APPLICATION INFORMATION (typical curves)



OUTPUT POWER VERSUS INPUT POWER

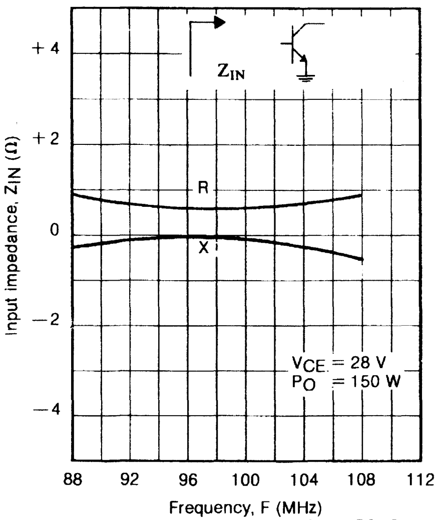
S88-SD1460-02



SAFE OPERATING AREA

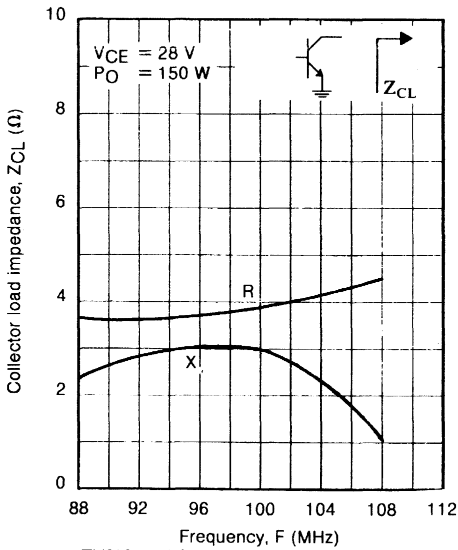
S88-SD1460-03

IMPEDANCES DATA (typical)



TYPICAL INPUT IMPEDANCE VERSUS FREQUENCY

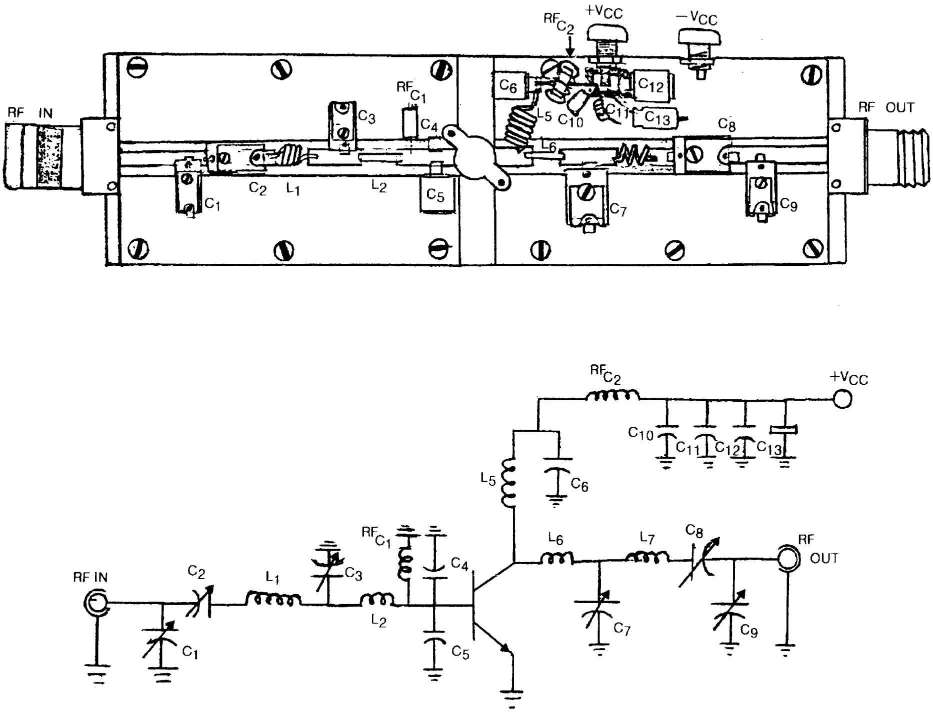
S88-SD1460-04



TYPICAL COLLECTOR LOAD IMPEDANCE VERSUS FREQUENCY

S88-SD1460-05

TEST FIXTURE



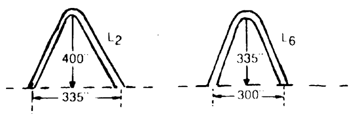
S88-SD1460-06

COMPONENTS LIST

C_1, C_2, C_3, C_9	-	24-200pF variable, ARCO 425
C_8	-	25-280pF variable, ARCO 464
C_7	-	50-380pF variable, ARCO 465
C_4	-	470pF, ATC 125 mil. SQ. Chip
C_5	-	470pF UNELCO, 400 mil. SQ
C_6	-	1000pF UNELCO, 400 mil. SQ
C_{10}	-	.1μF 50V, ERIE DISC
C_{11}	-	.01μF 50V, ERIE DISC
C_{12}	-	1000pF UNELCO, 400 mil. SQ
C_{13}	-	100μF 35V, Sprague Electrolytic

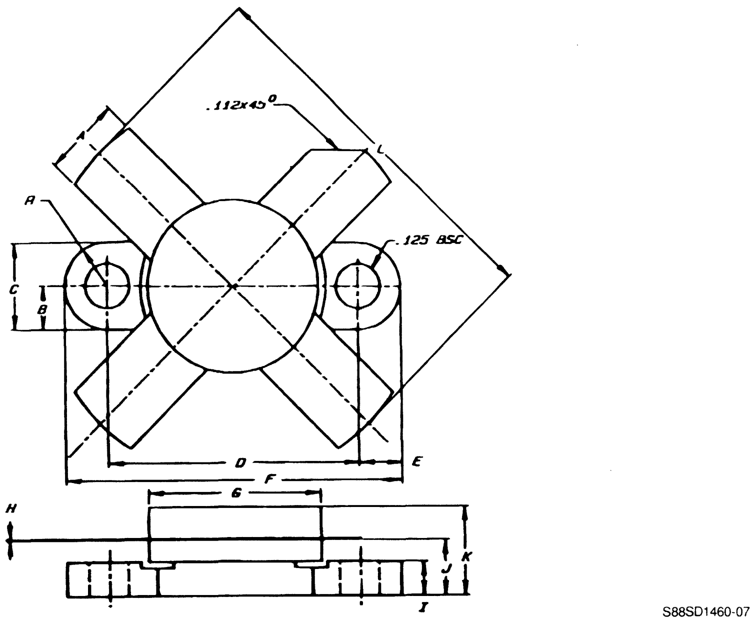
BOARD MATERIAL - 3mK 6098 1/16" THK

L_1	-	3 turns, #16 AWG, 225" I.D.
L_2	-	# 14 AWG, l.335", H.400"
RF C_1	-	VK 200 19/4B (1winding) Ferrox cube choke
L_5	-	5 1/2 turns, # 16 AWG ENAMELED .270" I.D.
L_6	-	# 14 AWG, L .300", H .335"
L_7	-	3 turns, # 16AWG, L .300", H .335"
RF C_2	-	6 turns, # 16 AWG ENAMEL on T50-2 TOROID



PACKAGE MECHANICAL DATA

.500 4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

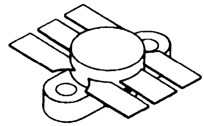
	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

SGS-THOMSON
MICROELECTRONICS

SD1462

RF & MICROWAVE TRANSISTORS
WIDEBAND VHF-UHF CLASS C

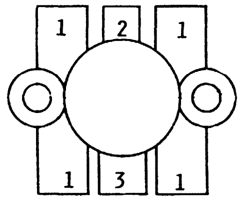
- CLASS C TRANSISTOR
- FREQUENCY 400MHz
- VOLTAGE 28V
- POWER OUT 70W
- POLWER GAIN 9.0dB
- EFFICIENCY 60%
- COMMON EMITTER
- GOLD METALLIZATION



.500 6L F (M111)
epoxy sealed

ORDER CODE	**BRANDING**
SD1462	SD1462

PIN CONNECTION



1 emitter
2 collector
3 base

DESCRIPTION

The SD1462 is a 28.0V epitaxial silicon NPN planar transistor designed primiarily for UHF communications. This device utilizes diffused emitter resistors to achieve VSWR of 10:1 under operating conditions, and is internally input matched to optimize power gain and efficiency over the band.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	60	V
V_{CEO}	Collector - Emitter Voltage	33	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	8	A
P_{tot}	Total Power Dissipation	220	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.8	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

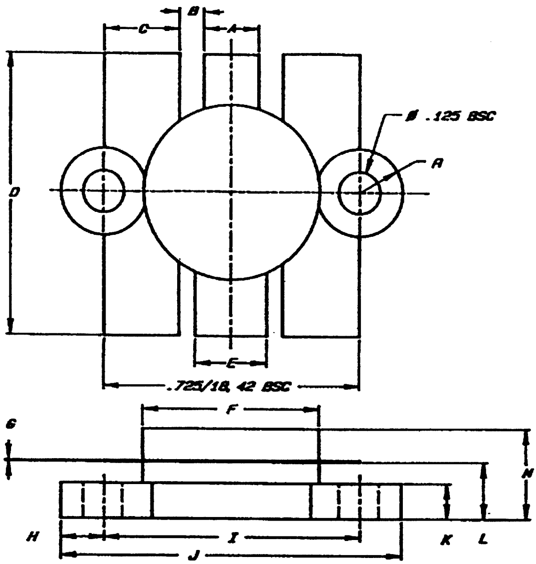
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 50mA	I_E = 0	60			V
BV_{CEO}	I_C = 50mA	I_C = 0	33			V
BV_{EBO}	I_E = 10mA	I_C = 0	4			V
I_{CBO}	V_{CB} = 30V	I_E = 0			5	mA
h_{FE}	V_{CE} = 5V	I_C = 1A	20		120	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 400MHz	V_{CE} = 28V		70			W
G_P	f = 400MHz	V_{CE} = 28V		9			dB
η_c	f = 400MHZ	V_{CC} = 28V			60		%
C_{OB}	f = 1MHz	V_{CB} = 30V	I_E = 0		65		pF

PACKAGE MECHANICAL DATA

.500 6LFL



S88SD1462–02

	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

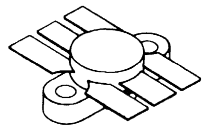
	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SGS-THOMSON
MICROELECTRONICS

SD1468

RF AND MICROWAVE TRANSISTORS
WIDE BAND UHF–VHF CLASS C

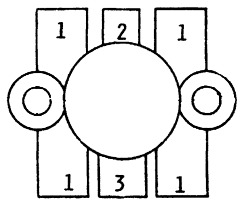
- CLASS C TRANSISTOR
- FREQUENCY 400MHz
- VOLTAGE 28V
- POWER OUT 70W
- POWER GAIN 8.4dB
- INPUT MATCHED
- GOLD METALLIZATION
- COMMON EMITTER



.500 6LFL (M111)
epoxy sealed

ORDER CODE	BRANDING
SD1468	SD1468

PIN CONNECTION



1 emitter
2 collector
3 base

DESCRIPTION

The SD1468 is a 28V gold metallized, epitaxial silicon NPN planar transistor designed for UHF military and commercial equipment. The SD1468 is an internally matched, broadband device optimized for operation within the 200-500MHz frequency range. This device utilizes diffused emitter resistors to achieve a VSWR of 20:1 at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	60.0	V
V_{CEO}	Collector - Emitter Voltage	30.0	V
V_{CES}	Collector - Emitter Voltage	60.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	8.0	A
P_{tot}	Total Power Dissipation	140.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.25	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

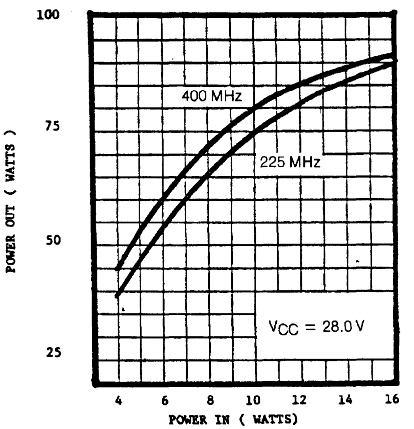
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	60.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	30.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CES}	V_{CE} = 30V	V_{BE} = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 2A	10.0		80.0	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 400MHz	V_{CE} = 28V		70.0			W
G_P	f = 400MHz	V_{CE} = 28V		8.4			dB
C_{OB}	f = 1MHz	V_{CB} = 28V	I_E = 0		65.0	80.0	pF

APPLICATION INFORMATION (typical curves)

TYPICAL POWER OUT VS. POWER IN



S88SD1468-02

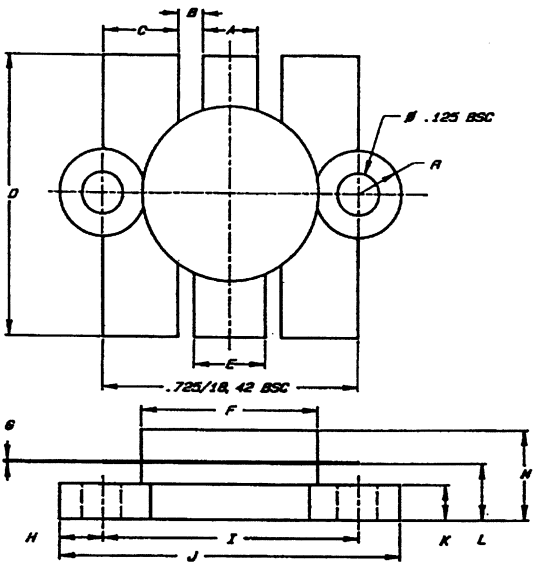
IMPEDANCE DATA

	F = 225MHz	F = 400MHz
Z_S	1.44 – j0.87Ω	1.29 + j0.87Ω
Z_{CL}	1.70 – j2.6Ω	3.0 + j0.87Ω

V_{CE} = 28 P_O = 70W

PACKAGE MECHANICAL DATA

.500 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

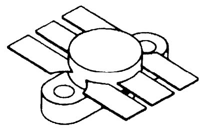
	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SGS-THOMSON
MICROELECTRONICS

SD1470

RF & MICROWAVE TRANSISTORS
WIDEBAND VHF-UHF CLASS C

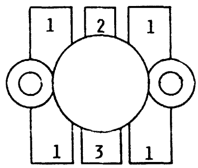
- CLASS C TRANSISTOR
- FREQUENCY 400MHz
- VOLTAGE 28V
- POWER OUT 100W
- POWER GAIN 7.0dB
- EFFICIENCY 60%
- GOLD METALLIZATION
- COMMON EMITTER
- INPUT MATCHED



.500 6LFL (M111)
epoxy sealed

ORDER CODE	BRANDING
SD1470	SD1470

PIN CONNECTION



1 emitter
2 collector
3 base

DESCRIPTION

The SD1470 is a 28.0V epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device utilizes diffused emitter resistors to achieve infinite VSWR under operating conditions, and is internally input matched to optimize power gain and efficiency over the band.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	60	V
V_{CEO}	Collector - Emitter Voltage	33	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	4	A
P_{tot}	Total Power Dissipation	250	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 20	0

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.7	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

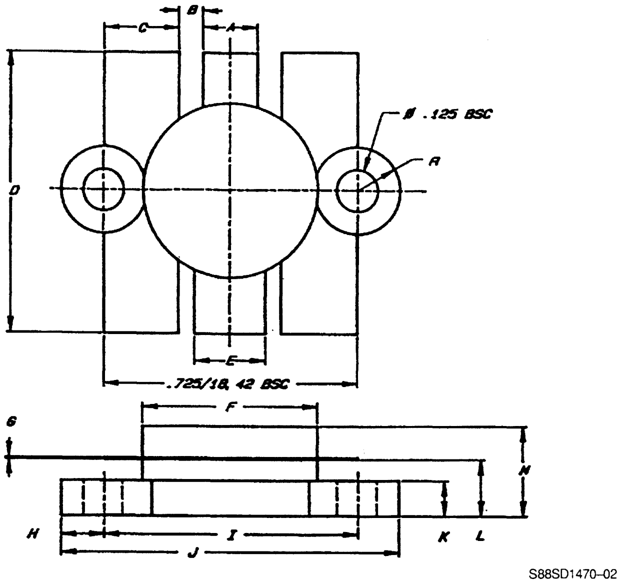
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 100mA	I_E = 0	60			V
BV_{CEO}	I_E = 50mA	I_B = 0	33			V
BV_{EBO}	I_E = 20mA	I_C = 0	4			V
h_{FE}	V_{CE} = 5V	I_C = 1A	20			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 400MHz	V_{CE} = 28V		100			W
G_P	f = 400MHz	V_{CE} = 28V		7			dB
η_c	f = 400MHZ	V_{CC} = 28V			60		%
C_{OB}	f = 1MHz	V_{CB} = 28V	I_E = 0		100		pF

PACKAGE MECHANICAL DATA

.500 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

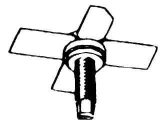
	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SGS-THOMSON
MICROELECTRONICS

SD1475

RF AND MICROWAVE TRANSISTORS WIDE BAND VHF–UHF CLASS C

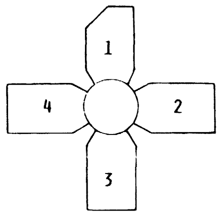
- CLASS C TRANSISTOR
- FREQUENCY 400MHz
- VOLTAGE 28V
- POWER OUT 10W
- POWER GAIN 10.5dB
- EFFICIENCY 50%
- COMMON EMITTER



. 280 4LSTUD (M122)
epoxy sealed

ORDER CODE	**BRANDING**
SD1475	SD1475

PIN CONNECTION



S88SD1475–01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1475 is a 28V epitaxial silicon NPN planar transistor designed primarily for UHF communications. It withstands infinite VSWR under operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	60	V
V_{CEO}	Collector - Emitter Voltage	33	V
V_{CES}	Collector - Emitter Voltage	60	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	1.1	A
P_{tot}	Total Power Dissipation	27	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	6.4	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

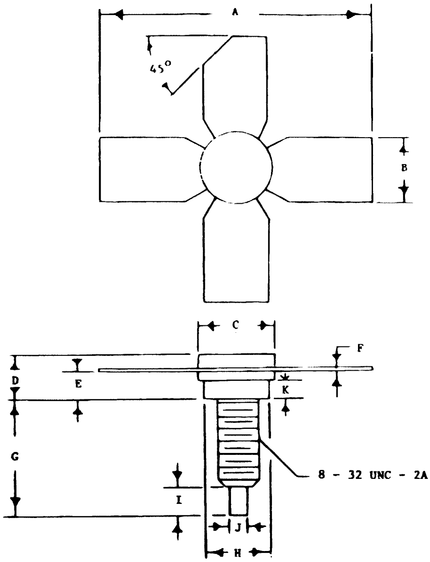
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 20mA	V_{BE} = 0	60			V
BV_{CEO}	I_E = 20mA	I_B = 0	33			V
BV_{EBO}	I_E = 2mA	I_C = 0	4			V
I_{CBO}	V_{CE} = 30V	I_E = 0			1	mA
h_{FE}	V_{CE} = 5V	I_C = 0.5A	20			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 400MHz	V_{CE} = 28V		10			W
G_P	f = 400MHz	V_{CE} = 28V		10.5			dB
η_C	f = 400MHz	V_{CC} = 28V		50	60		%
C_{OB}	f = 1MHz	V_{CB} = 28V	I_E = 0		11	15	pF

PACKAGE MECHANICAL DATA

.280 4LSTUD



S88SD1475–02

	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

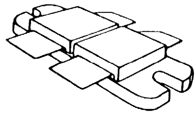
	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SGS-THOMSON
MICROELECTRONICS

SD1476

RF & MICROWAVE TRANSISTORS
TV BAND I APPLICATIONS

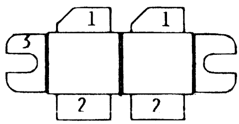
- FREQUENCY 55-88MHz
- POWER OUT 240W
- VOLTAGE 32V
- POWER GAIN 12dB
- CLASS AB PUSH PULL
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION
- INTERNAL INPUT MATCHING



.437 x .450 4 LFL (M165)
epoxy sealed

ORDER CODE	**BRANDING**
SD1476	SD1476

PIN CONNECTION



S88-SD1476-01

1 collector
2 base
3 emitter

DESCRIPTION

The SD1476 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class AB operation in VHF and band I television transmitters and transposers.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector – Base Voltage	70	V
V_{CEO}	Collector – Emitter Voltage	40	V
V_{EBO}	Emitter – Base Voltage	4	V
I_C	Collector Current (max.)	25	A
P_{tot}	Total Device Dissipation at + 25°C	430	W
T_{stg} T_j	Storage and Junction Temperatures	– 50 to 150 200	°C °C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance T_{CASE} = 60°C	.4	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 100mA		40			V
BV_{CBO}	I_C = 50mA		70			V
BV_{EBO}	I_E = 20mA		4			V
I_{CES}	V_{CB} = 30V				5	mA
h_{FE}	V_{CE} = 5V	I_C = 7A	10		50	

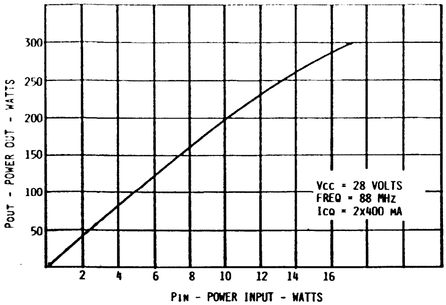
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O*	f = 88MHz	V_{CE} = 32V	I_{CQ} = 800mA	240			W
P_G	f = 88MHz	V_{CE} = 32V	I_{CQ} = 800mA	12			dB
ηc	f = 88MHz	V_{CE} = 32V	I_{CQ} = 800mA	50			%
V_{SWR}	f = 88MHz	V_{CE} = 32V	P_O = 240W	3:1			
C_{ob}	f = 1MHz	V_{CB} = 28V			220		pF

* 1 DB compression.

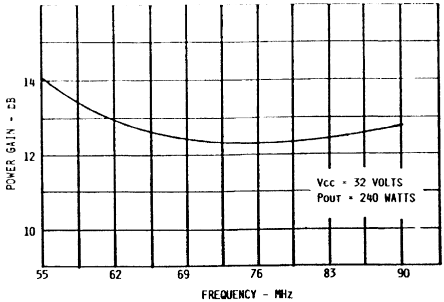
APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS POWER INPUT



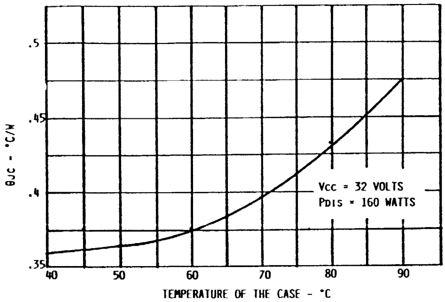
S88-SD1476-02

BROADBAND POWER GAIN VS FREQUENCY



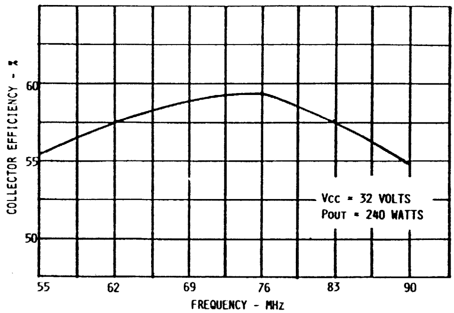
S88-SD1476-03

IR SCAN HOT SPOT θJC VS CASE TEMPERATURE



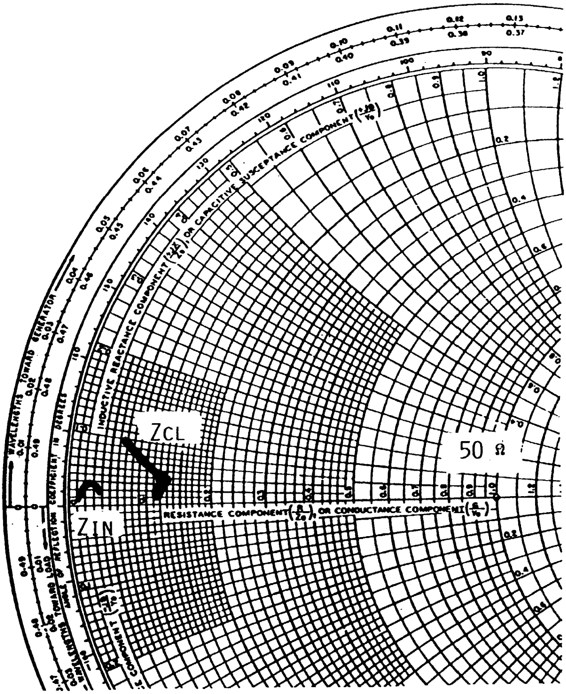
S88-SD1476-04

EFFICIENCY VS FREQUENCY



S88-SD1476-05

SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE

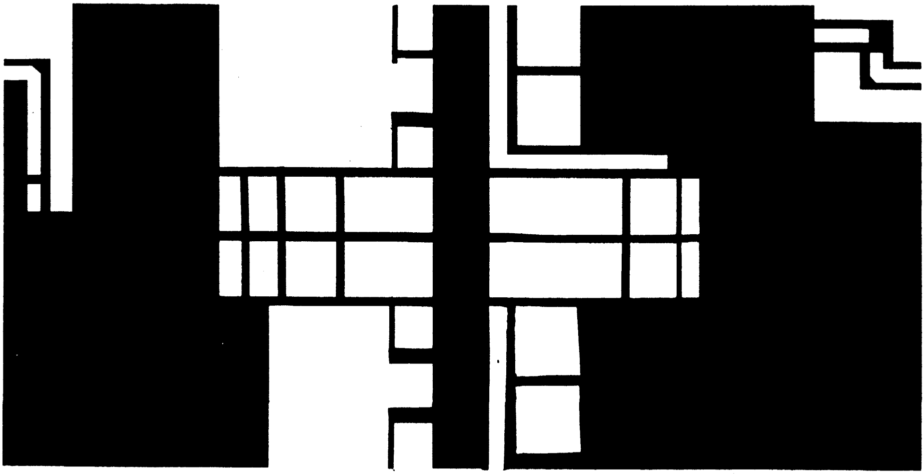


f MHz	Z_{IN} (Ω) Base to Base	Z_{LOAD} (Ω) Collector to Collector
55	1.7 +1j	6.1 + 1j
65	1.5 + 1.3j	7 + 2.1j
75	1 + 1.1j	6.2 + 2j
90	.8 + .4j	3.4 + 4.4j

Z_{LOAD} = optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.
55-88MHz braodband amplifier :
P_{OUT} = 240W
V_{CC} = 32V
CLASS AB

S88SD1476-06

PART LIST AND PRINTED CIRCUIT BOARD LAYOUT

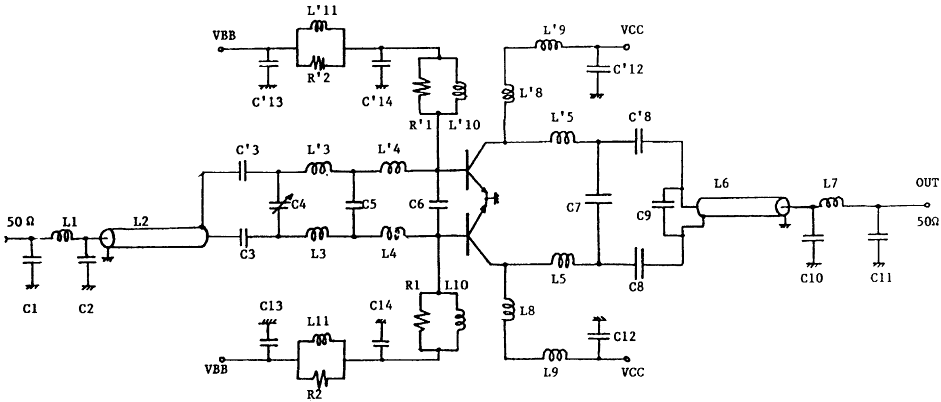


S88SD1476-07

L1, L7	:	4 TURNS ϕ 7mm, WIRE ϕ 1.5mm
L2	:	7 TURNS ϕ 25mm, COAXIAL CABLE Zc = 25Ω
L3, L'3	:	2 TURNS ϕ 2.5mm, WIRE ϕ 0.8mm
L4, L'4	:	L = 15mm, WIRE ϕ = 1.5mm
L5, L'5	:	L = 30mm, WIRE ϕ = 1.5mm
L6	:	6 TURNS ϕ 25mm, COAXIAL CABLE Zc = 25Ω
L8, L'8	:	16 TURNS ϕ 6mm, WIRE ϕ = 1.5mm
L9, L'9	:	1 TURN, WIRE ϕ = 1.5mm IN FERRITE (stackpole 57 3312)
L10, L'10 L11, L'11	:	14 TURNS WIRE ϕ = 0.6mm AROUND RESISTOR 1W
R1, R2 R'1, R'2	:	180Ω – 1W
C1	:	10pF + 33pF – ATC 100B
C2	:	47pF – ATC 100B
C3, C'3	:	1.5nf + 2.2nf – ATC 100B
C4	:	4 – 60pF – ARCO 404
C5	:	2x100pF + 47pF – ATC 100B
C6	:	2x330pF + 3x180pF + 270pF – ATC 100B
C7	:	150pF + 10pF – ATC 100B
C8, C'8	:	4.7nF – ATC 100B
C9	:	4–40pF – ARCO 403
C10	:	10pF – ATC 100B
C11	:	43pF – ATC 100B
C12, C'12	:	1µF – 63V – LCC CPM13B
C13, C'13	:	82nF – 100V – LCC 745
C14, C'14	:	270nF – 63V – LCC 7950
Material	:	Epoxy 63 MIL Er = 2.55

TEST CIRCUIT

SD1476 : 55 – 88MHz Broadband Amplifier

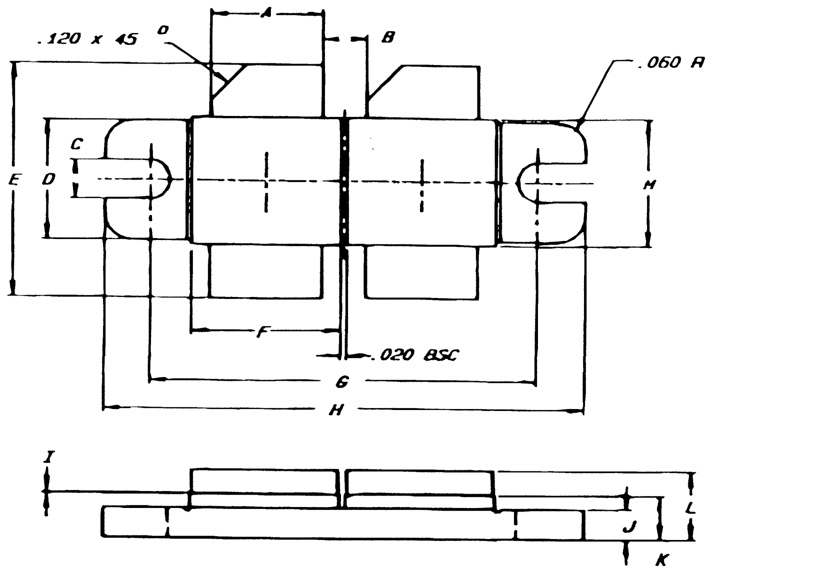


Pout ≥ 240W
Vcc = 32V
Icq = 800mA

S88SD1476- 08

PACKAGE MECHANICAL DATA

.437 x .450 4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.373/9.47	.385/9.78
B	.122/3.10 BSC	
C	.125/3.18 BSC	
D	.411/10.44	.421/10.69
E	.825/20.96	.865/21.97
F	.495/12.57	.505/12.83
G	1.255/31.88	1.265/32.13

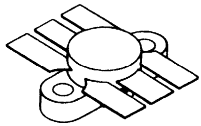
	Minimum Inches/mm	Maximum Inches/mm
H	1.675/42.55	1.685/42.80
I	.002/0.05	.006/0.15
J	.095/2.41	.105/2.67
K	.142/3.61	.150/3.81
L		.250/6.35
N	.425/10.80	.435/11.05

SGS-THOMSON MICROELECTRONICS

SD1477

RF & MICROWAVE TRANSISTORS 130...230MHz FM MOBILE APPLICATIONS

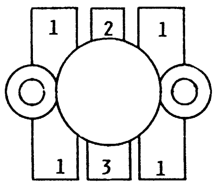
- FM CLASS C TRANSISTOR
- FREQUENCY 175MHz
- VOLTAGE 12.5V
- POWER OUT 100W
- POWER GAIN 6.0dB
- COMMON EMITTER



.500 6LFL(M111)
epoxy sealed

ORDER CODE	BRANDING
SD1477	SD1477

PIN CONNECTION



1 emitter
2 collector
3 base

DESCRIPTION

The SD1477 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for VHF communications. This device utilizes diffused emitter resistors to achieve extremely high VSWR under operating conditions, and is internally input matched to optimize power gain and efficiency over the band.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	18.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	20.0	A
P_{tot}	Total Power Dissipation	270.0	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	.65	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

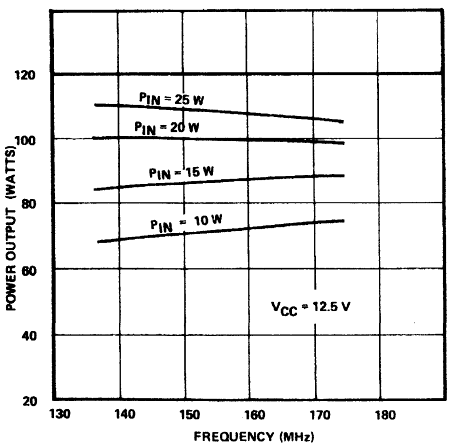
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CES}	I_C = 100mA	V_{BE} = 0		36.0			V
BV_{CEO}	I_C = 100mA	I_B = 0		18.0			V
BV_{EBO}	I_E = 10mA	I_C = 0		4.0			V
h_{FE}	V_{CE} = 5.0V	I_C = 5.0A		10.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 175MHz	V_{CE} = 12.5V		100.0			W
G_P	f = 175MHz	V_{CE} = 12.5V		6.0	7.0		dB
C_{OB}	f = 1MHz	V_{CB} = 12.0V	I_E = 0		354.0		pF

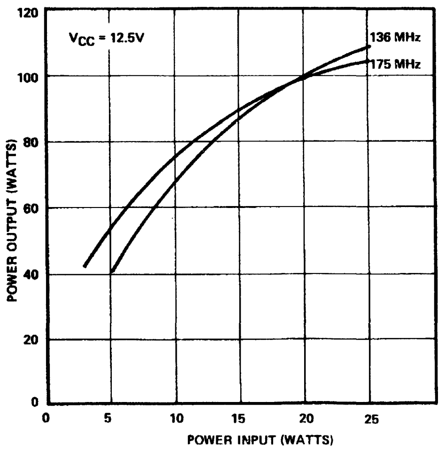
APPLICATION INFORMATION (typical curves)

POWER OUTPUT vs. FREQUENCY



S88SD1477-02

POWER OUTPUT vs. POWER INPUT



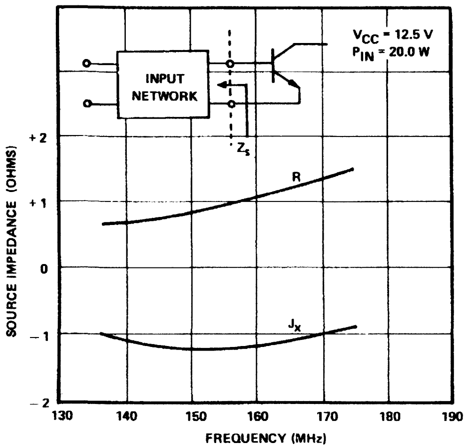
S88S1477-03

IMPEDANCE DATA (typical)

$Z_s = 1.5 - j\,0.9\Omega$ F = 175MHz P_{IN} = 20W

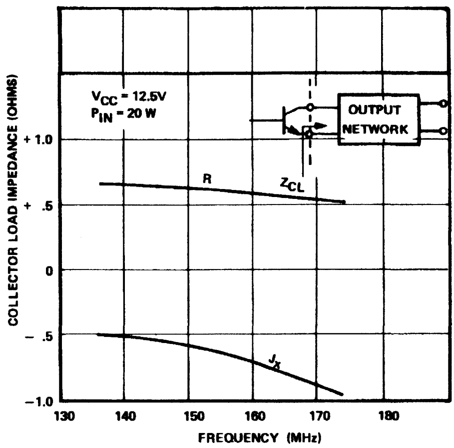
$Z_{cl} = 0.5 - j\,1.0\Omega$ V_{CE} = 12.5V

SERIES SOURCE IMPEDANCE vs. FREQUENCY



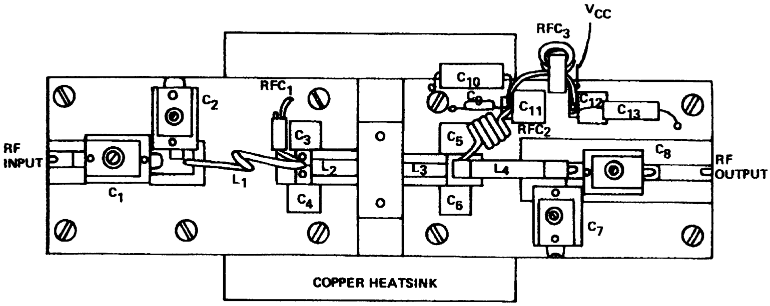
S88SD1477-04

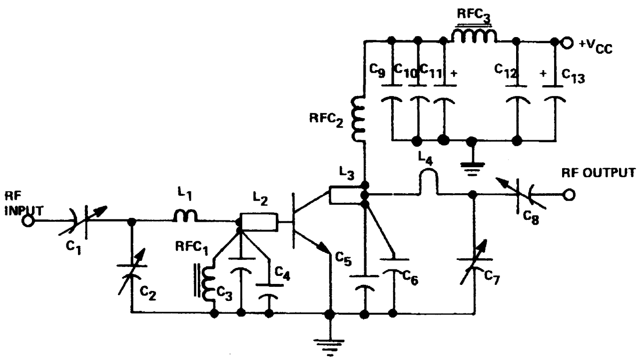
SERIES COLLECTOR IMPEDANCE vs. FREQUENCY



S88S1477-05

TEST CIRCUIT



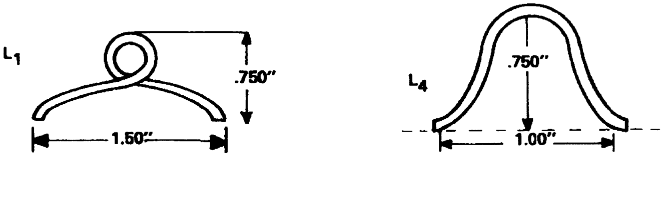


S88S1477-06

COMPONENT LIST

C_1	ARCO 462 5-80pf
C_2	ARCO 462 5-80pf
C_3, 4	UNELCO 100pf/350V
C_5, 6	UNELCO 120pf/350V
C_7	ARCO 463 9-180pf
C_8	ARCO 463 9-180pf
C_9, 12	UNELCO 1000pf/350V
C_{10}	ERIE .15μf/200V "REDCAP"
C_{11}	25μf/25V ELECTROLYTIC
C_{13}	10μf/25V ELECTROLYTIC
L_1	1t # ID 1/4" I.D. *
L_2, 3	1/2" 50Ω STRIPLINE (.180" WIDE)
L_4	1/8" THICK COPPER STRAP 1/4" WIDE **
RFC_1	1-1/2 t ON FERROXCUBE VK200/19 - 4B
RFC_2	4 t. # 16 ENAMEL, 3/8" I.D. - 3/8" LONG
RFC_3	4 t. # 16 ENAMEL ON T50-2 TOROID

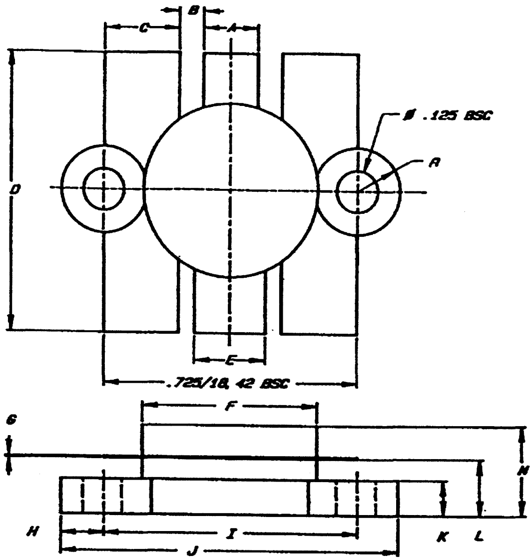
BOARD MATERIAL - 3M-K6098, 1/16" THK



S88SD1477-07

PACKAGE MECHANICAL DATA

.500 6LFL



S88SD1477-08

	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

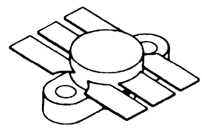
	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SGS-THOMSON
MICROELECTRONICS

SD1480

RF & MICROWAVE TRANSISTORS
108...152MHz APPLICATIONS

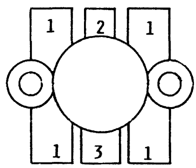
- CLASS C TRANSISTOR
- FREQUENCY 136-175MHz
- VOLTAGE 28V
- POWER OUT 125W
- POWER GAIN 9.2dB
- EFFICIENCY 55%
- GOLD METALLIZATION
- COMMON EMITTER
- INTERNAL INPUT MATCHING



.500 6LFL (M111)
epoxy sealed

ORDER CODE	**BRANDING**
SD1480	SD1480

PIN CONNECTION



S88SD1480-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1480 is a common emitter 28.0V epitaxial silicon NPN planar transistor designed primarily for VHF communications applications. This internally matched device incorporates diffused emitter ballasting resistors and provides high gain and stable operation across the entire 138-175MHz VHF communications band.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	36.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	20.0	A
P_{tot}	Total Power Dissipation	270.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.65	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

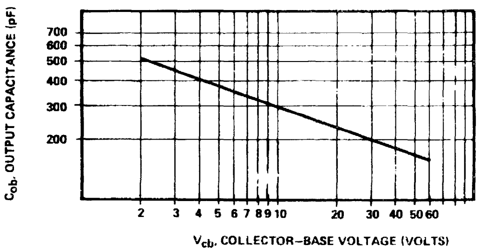
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 100mA	I_E = 0	65.0			V
BV_{CES}	I_C = 100mA	V_{BE} = 0	65.0			V
BV_{CEO}	I_C = 100mA	I_B = 0	36.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 30.0V	I_E = 0			15.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 5.0A	20.0	50.0		

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 138/175MHz	V_{CE} = 28.0V		125.0	135.0		W
G_P	f = 138/175MHz	V_{CE} = 28.0V		9.2	9.5		dB
η_C	f = 138/175MHz	V_{CE} = 28.0V		55.0	60.0		%
VSWR**	f = 138/175MHz	V_{CE} = 28.0V	P_i = 15W	20.1			
C_{OB}	f = 1MHz	V_{CB} = 30.0V	I_E = 0		200.0	250.0	pF

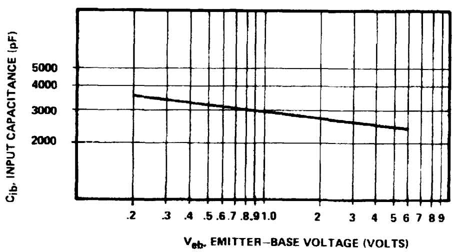
APPLICATION INFORMATION (typical curves)

OUTPUT CAPACITANCE VS. COLLECTOR BASE VOLTAGE



S88SD1480-02

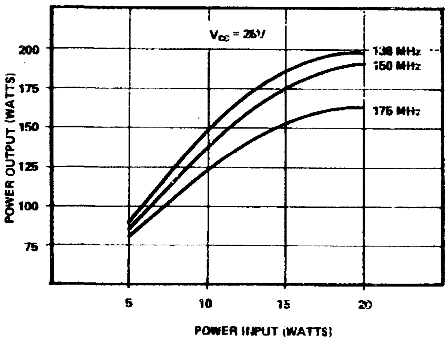
INPUT CAPACITY VS. EMITTER BASE VOLTAGE



S88S1480-03

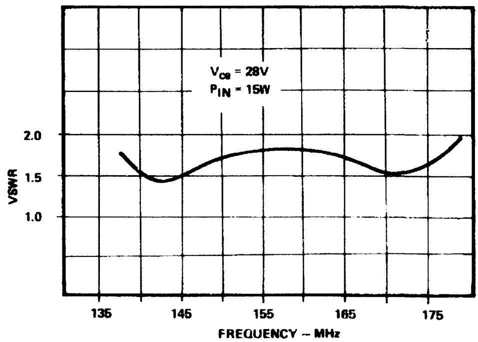
APPLICATION INFORMATION (typical curves) (continued)

POWER OUTPUT VS. POWER INPUT



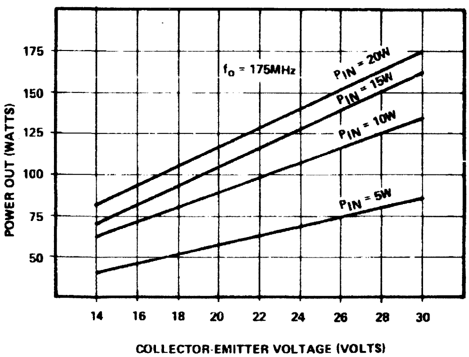
S88SD1480-04

INPUT VSWR VS. FREQUENCY



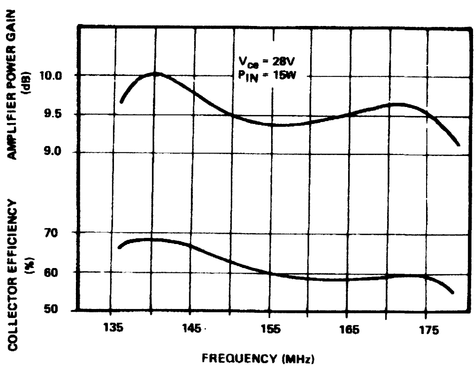
S88S1480-05

POWER OUTPUT VS. Vce



S88SD1274-1-06

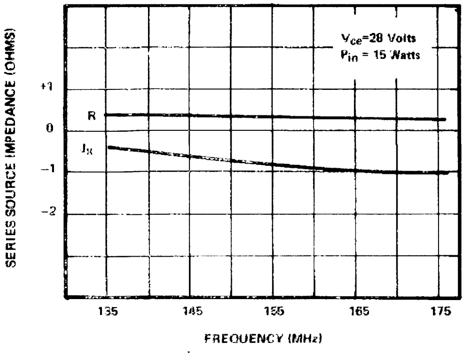
AMPLIFIER POWER GAIN & EFFICIENCY VS. FREQUENCY



S88SD1274-1-07

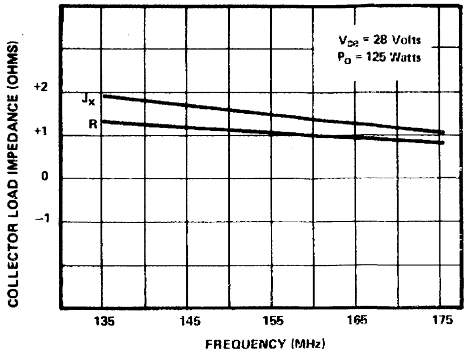
IMPEDANCE DATA (typical)

SERIES SOURCE IMPEDANCE VS. FREQUENCY



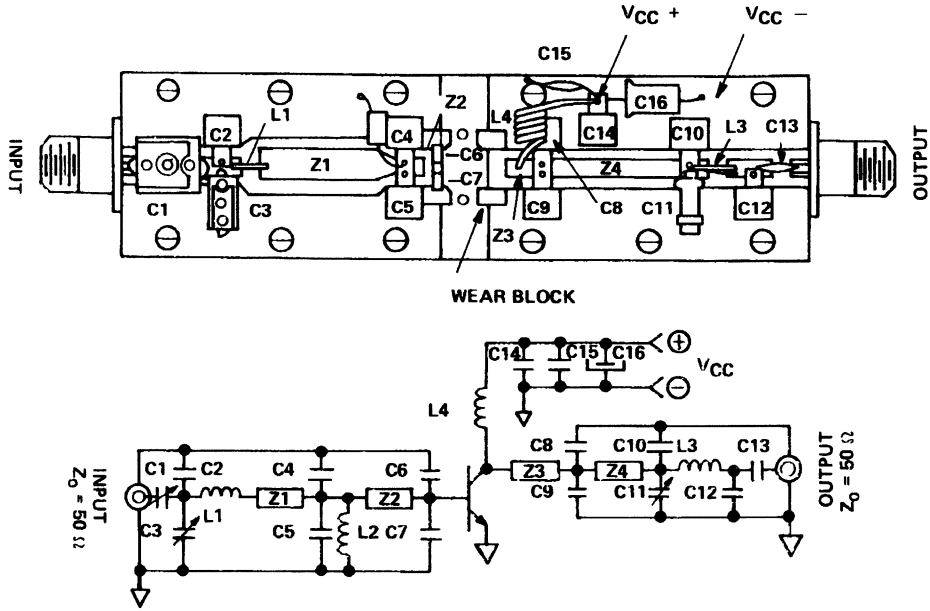
S88SD1480-08

SERIES COLLECTOR LOAD IMPEDANCE VS. FREQUENCY



S88SD1480-09

TEST CIRCUIT



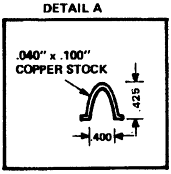
S88SD1480-10

PARTS LIST

C1 5	.080 pF ARCO462
C2	25mF UNDERWOOD
C3	2.020pF ARCO 402
C4, C5	15pF UNDERWOOD
C6	240pF CHIP CAP. ATC
C7	270pF CHIP CAP. ATC
C8	150pF UNDERWOOD
C9	180pF UNDERWOOD
C10	100pF UNDERWOOD
C11	8.20pF JOHANSON JMC5501
C12	33pF UNDERWOOD
C13, C15	.15µF DISCAP
C14	1000pF UNDERWOOD
C16	10µF ELECTROLYTIC

L1	SEE DETAIL A
L2	FERROXCUBE VK.200 19/4B
L3	1T# 16AWG... 250 I.D. CLOSEWOUND
L4	5T #16AWG., 250 I.D., CLOSEWOUND
Z1	MICROSTRIP, 330" W X 1.600"L
Z2	MICROSTRIP, 200" W X 400"L
Z3	MICROSTRIP, 200" W X 600"L
Z4	MICROSTRIP, 200" W X 1.600"L
PCB	3M 1 OZ DOUBLED SIDED 1/16" TEFLON-GLASS, ER = 2.5

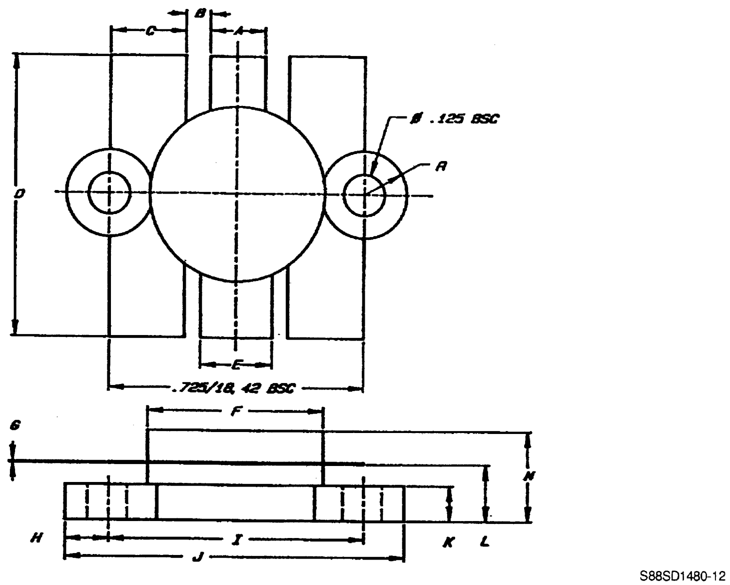
DETAIL A



S88SD1480-11

PACKAGE MECHANICAL DATA

.500 6LFL



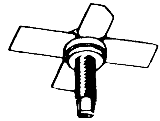
	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SD1482

RF & MICROWAVE TRANSISTORS 450–512MHz CLASS C, MOBILE APPLICATIONS

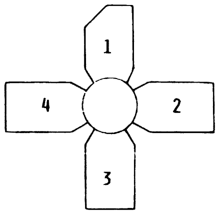
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 7.5V
- POWER OUT 3.0W
- POWER GAIN 8.0dB
- COMMON EMITTER



.280 4LSTUD (M122)
epoxy sealed

ORDER CODE	**BRANDING**
SD1482	SD1482

PIN CONNECTION



S88SD1482–01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION

The SD1482 is a 7.5V epitaxial silicon NPN planar transistor designed primarily for UHF communications.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	28.0	V
V_{CEO}	Collector - Emitter Voltage	12.0	V
V_{CES}	Collector - Emitter Voltage	28.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	1.0	A
P_{tot}	Total Power Dissipation	15.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	11.6	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100mA	V_{BE} = 0	28.0			V
BV_{CEO}	I_C = 100mA	I_B = 0	12.0			V
BV_{EBO}	I_E = 2mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 100mA	5			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CC} = 7.5V		3.0			W
G_P	f = 470MHz	V_{CC} = 7.5V		8.0			dB
C_{OB}	f = 1MHz	V_{CB} = 12.5V	I_E = 0			25.0	pF

IMPEDANCE DATA (typical)

Z_s = 1.5 - j0.5Ω

Z_{cl} = 2.75 + j2.75Ω

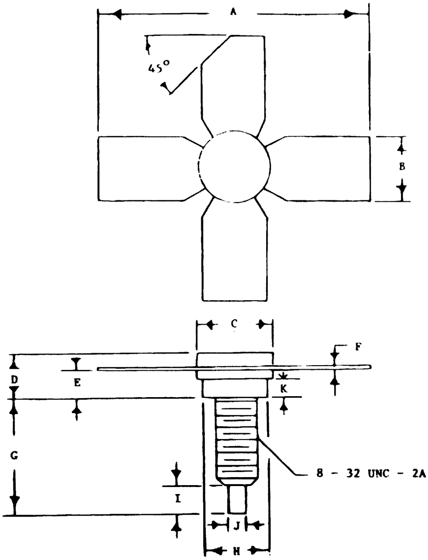
F = 470MHz

V_{CE} = 7.5V

P_o = 3W

PACKAGE MECHANICAL DATA

.280 4LSTUD



S88SD1482-02

	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

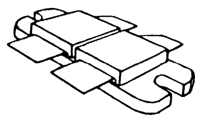
	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SGS-THOMSON
MICROELECTRONICS

SD1483

RF & MICROWAVE TRANSISTORS
FM BROADCAST APPLICATIONS

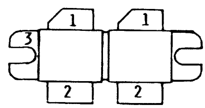
- FM CLASS C TRANSISTOR
- FREQUENCY 88-108MHz
- VOLTAGE 28V
- POWER OUT 300W BROADBAND
- POWER GAIN 10dB
- EFFICIENCY 60%
- GOLD METALLIZATION
- COMMON EMITTER



2 x .450 SQ4LFL (M175)
epoxy sealed

ORDER CODE	BRANDING
SD1483	SD1483

PIN CONNECTION



S88SD1483-01

1 collector
2 base
3 emitter

DESCRIPTION

The SD1483 is a 28V gold metallized epitaxial silicon NPN planar transistor designed for VHF, FM broadcasting transmitters.
This device utilizes diffused emitter resistors to achieve infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	60	V
V_{CEO}	Collector - Emitter Voltage	30	V
V_{CES}	Collector - Emitter Voltage	60	V
V_{EBO}	Emitter - Base Voltage	3	V
I_C	Collector Current	25	A
P_{tot}	Total Power Dissipation	380	W
T_{stg}	Storage Temperature	– 50 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.45	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

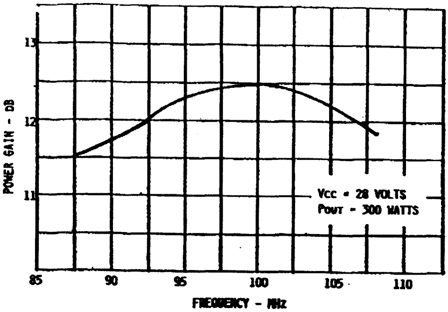
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 100mA	I_E = 0	60			V
BV_{CES}	I_C = 100mA	V_{BE} = 0	60			V
BV_{CEO}	I_C = 100mA	I_B = 0	30			V
BV_{EBO}	I_E = 20mA	I_C = 0	3			V
I_{CBO}	V_{CB} = 30V	I_E = 0			10	mA
h_{FE}	V_{CE} = 5V	I_C = 1A	15		120	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 88-108MHz	V_{CC} = 28V		300			W
G_P	f = 88-108MHz	V_{CC} = 28V		10	11		dB
η_c	f = 88-108MHz	V_{CC} = 28V		60			%
C_{ob}	f = 1MHz	V_{CB} = 28V	I_E = 0		130		pF

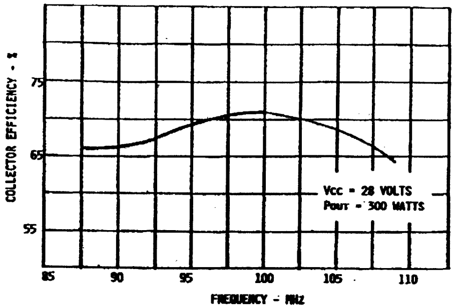
APPLICATION INFORMATION (typical curves)

BROADBAND POWER GAIN VS FREQUENCY



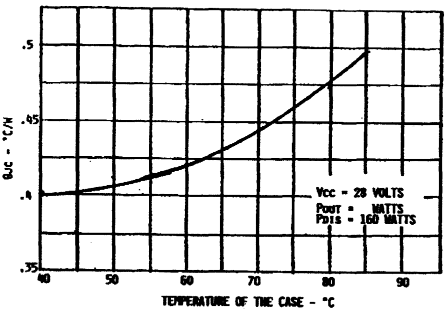
S88SD1483-02

EFFICIENCY VS FREQUENCY



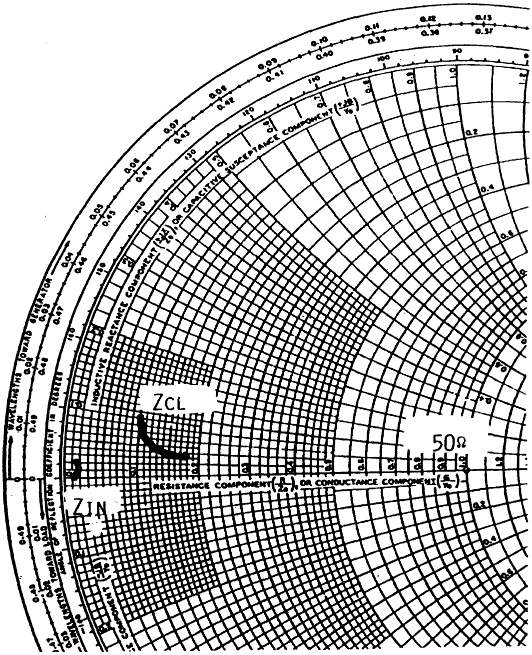
S88SD1483-03

IR SCAN HOT θ_{JC} VS CASE TEMPERATURE



S88SD1483-04

SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



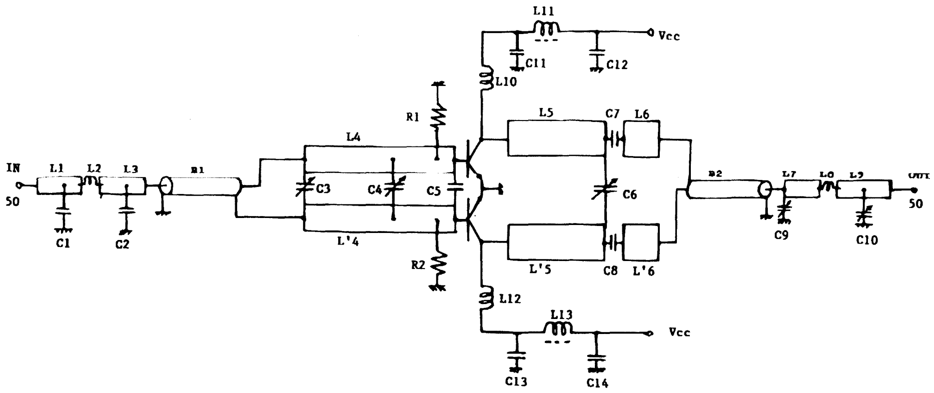
f MHz	Z_{IN} Base to Base	Z_{LOAD} Collector to Collector
85	.82 – 0J	8.7 + 1.37J
90	.93 – .16J	7.1 + 1.5J
100	.98 – .33J	5.8 + 2.7J
110	.93 – .79J	5.7 + 3.6J

Z_{LOAD} = optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

88-108MHz broadband amplifier :
P_{OUT} = 300W
V_{CC} = 28V
CLASS C

S88SD1483-05

SD1483 : 88-108MHz BROADBAND AMPLIFIER



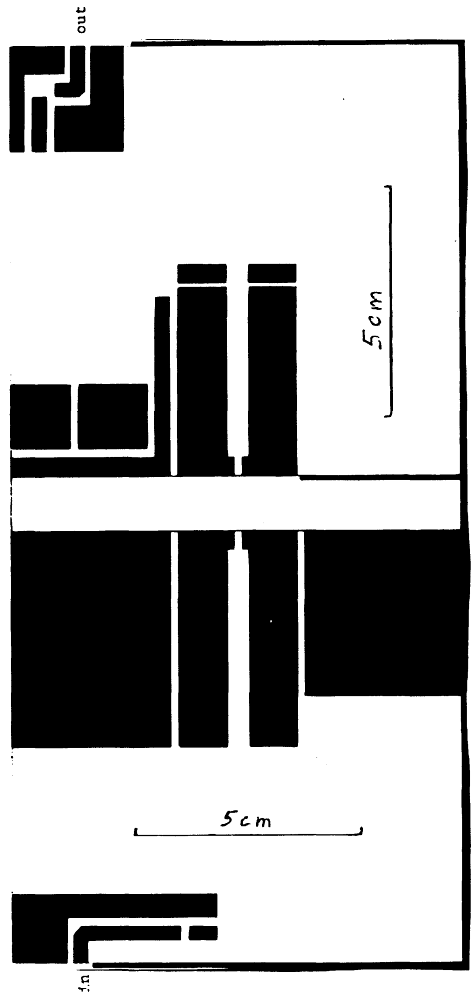
S88SD1483-06

Parts List : SD1483

Material	–	Epoxy 63 MILS ER = 2.55
L1, L3, L7, L9	–	Printed line Zc = 50Ω
L4, L'4	–	Printed line W = 11mm L = 47mm
L5, L'5	–	Printed line W = 11mm L = 40mm
L6, L'6	–	Printed line W = 11mm L = 4mm
L2	–	Inductor L = 32ηH
L8	–	Inductor L = 50ηH
L10, L12	–	wire ϕ = 1.5mm, L = 75ηH
L11, L13	–	Choke
C1	–	Trimmer 4–60pF
C2	–	33pF ATC 100 B

C3	–	Trimmer 24–200pF
C4	–	270pF + 380pF + 24–200pF Trimmer
C5	–	560pF ATC 100 B
C6	–	24–200pF Trimmer
C7, C8	–	4.7ηF ATC 100 B
C9	–	2x22pF– ATC 100 B + 1–10pF Trimmer
C10	–	27pF ATC 100 B + 1–14pF Trimmer
C11, C12, C13, C14	–	1ηF + 100ηF + 47μF–63V
R1, R2	–	6.2Ω SFERNICE
B1, B2	–	Zc = 25Ω coaxial cable = $\lambda_g/4$

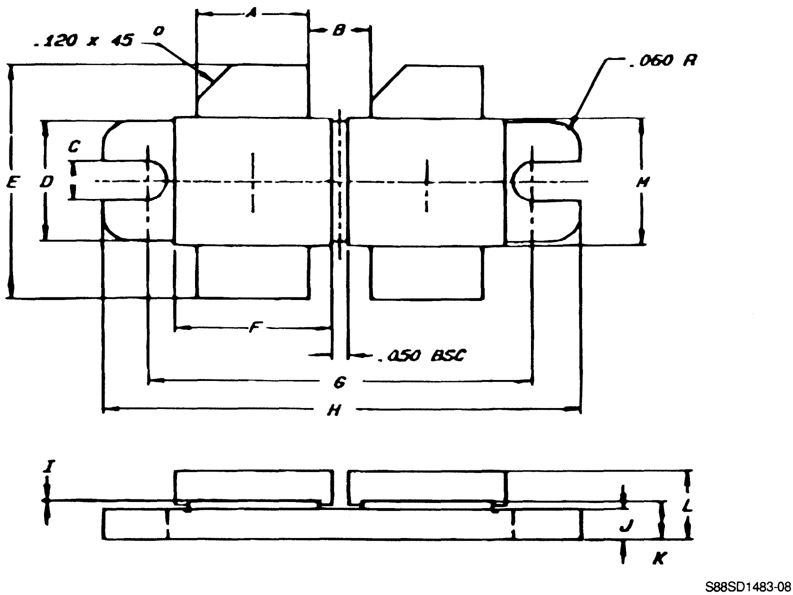
PRINTED CIRCUIT BOARD LAYOUT



S88SD1483-07

PACKAGE MECHANICAL DATA

.2 x .450 SQ4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.373/9.47	.385/9.78
B	.190/4.83 BSC	
C	.125/3.18 BSC	
D	.411/10.44	.421/10.69
E	.825/20.96	.865/21.97
F	.525/13.34	.535/13.59
G	1.255/31.88	1.265/32.13

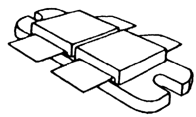
	Minimum Inches/mm	Maximum Inches/mm
H	1.675/42.55	1.685/42.80
I	.002/0.05	.006/0.15
J	.095/2.41	.105/2.67
K	.115/2.92	.135/3.43
L		.250/6.35
M	.445/11.30	.455/11.56

SGS-THOMSON
MICROELECTRONICS

SD1485

RF & MICROWAVE TRANSISTORS
TV BAND III APPLICATIONS

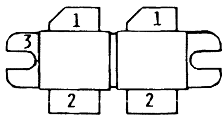
- FREQUENCY 170 – 230MHz
- POWER OUT 200 W
- VOLTAGE 32V
- POWER GAIN 11dB
- CLASS AB PUSH PULL
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION
- INTERNAL INPUT MATCHING



.437 x .450 4 LFL (M175)
epoxy sealed

ORDER CODE	**BRANDING**
SD1485	SD1485

PIN CONNECTION



S88SD1485-01

1 collector
2 base
3 emitter

DESCRIPTION

The SD1485 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class AB operation in VHF and band III television transmitters and transposers.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CEO}	Collector - Emitter Voltage	35	V
V_{EBO}	Emitter - Base Voltage	3	V
I_C	Collector Current (max.)	25	A
P_{tot}	Total Device Dissipation at + 25°C	385	W
T_{stg}	Storage Temperature	– 50 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance T_C = 60°C	.45	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

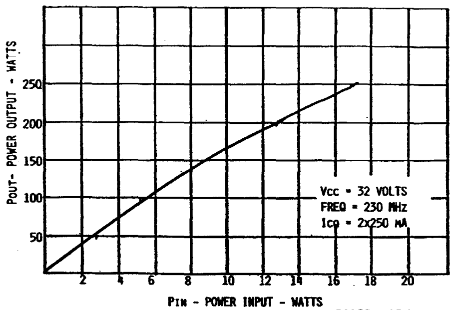
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 100mA	I_B = 0	35			V
BV_{CBO}	I_C = 100mA		65			V
BV_{EBO}	I_E = 20mA		3			V
I_{CES}	V_{CB} = 32V				10	mA
h_{FE}	V_{CE} = 5V	I_C = 4A	20		70	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O*	f = 230MHz	V_{CE} = 32V	I_{CQ} = 1A	200			W
P_G	f = 230MHz	V_{CE} = 32V	I_{CQ} = 1A	11			dB
nc	f = 230MHz	V_{CE} = 32V	I_{CQ} = 1A	50			%
V_{SWR}	f = 230MHz	V_{CE} = 32V	P_O = 200W	3 : 1			
C_{OB}	f = 1MHz	V_{CB} = 28V			130		pF

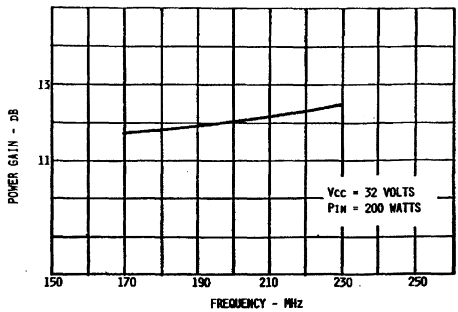
* 1 DB compression

POWER OUTPUT VS POWER INPUT



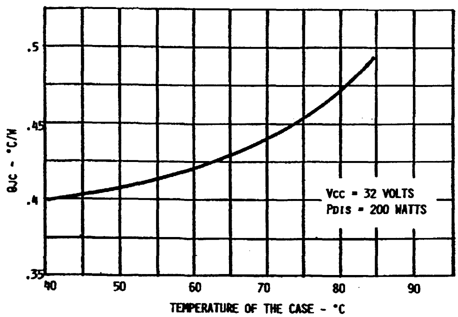
S88SD1485-02

BROADBAND POWER GAIN VS FREQUENCY



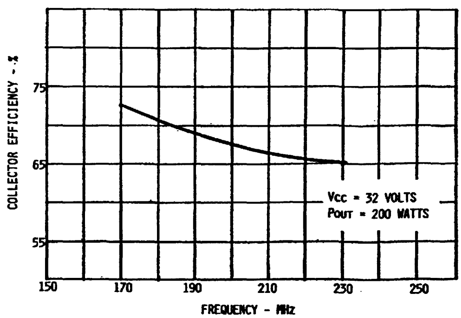
S88SD1485-03

IR SCAN HOT SPOT θ_{JC} VS CASE TEMPERATURE



S88SD1485-04

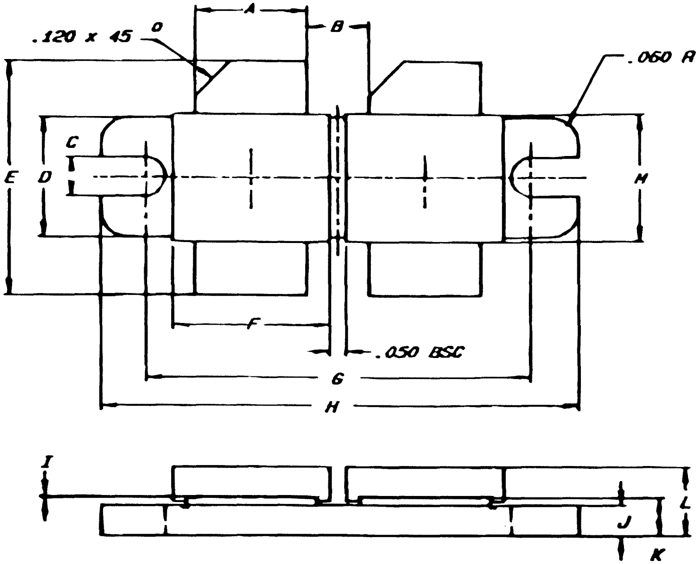
EFFICIENCY VS FREQUENCY



S88SD1485-05

PACKAGE MECHANICAL DATA

.437 x .450 4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.373/9.47	.385/9.78
B	.190/4.83 BSC	
C	.125/3.18 BSC	
D	.411/10.44	.421/10.69
E	.825/20.96	.865/21.97
F	.525/13.34	.535/13.59
G	1.255/31.88	1.265/32.13

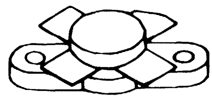
	Minimum Inches/mm	Maximum Inches/mm
H	1.675/42.55	1.685/42.80
I	.002/0.05	.006/0.15
J	.095/2.41	.105/2.67
K	.115/2.92	.135/3.43
L		.250/6.35
M	.445/11.30	.455/11.56

SGS-THOMSON
MICROELECTRONICS

SD1487

RF & MICROWAVE TRANSISTORS
SSB APPLICATIONS

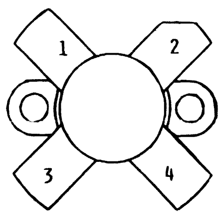
- SEMI LINEAR TRANSISTOR
- OPTIMIZED FOR SSB
- FREQUENCY 30MHz
- VOLTAGE 12.5 V
- POWER OUT 100 W
- POWER GAIN 12dB
- IMD 30dB
- GOLD METALLIZATION
- COMMON EMITTER



.500 4LFL (M174)
epoxy sealed

ORDER CODE	**BRANDING**
SD1487	SD1487

PIN CONNECTION



1 emitter
2 collector
3 base
4 emitter

DESCRIPTION

The SD1487 is a 12.5 V epitaxial silicon NPN planar transistor designed primarily for HF communications. This device utilizes an aluminum metallization system with state-of-the-art diffused emitter ballasting to achieve extreme ruggedness under severe operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36	V
V_{CEO}	Collector - Emitter Voltage	18	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	20	A
P_{tot}	Total Power Dissipation	290	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.6	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100 mA	V_{BE} = 0	36			V
BV_{CEO}	I_C = 100 mA	I_B = 0	18			V
BV_{EBO}	I_E = 20 mA	I_C = 0	4			V
I_{CES}	V_{CE} = 15 V	V_{BE} = 0			20	mA
h_{FE}	V_{CE} = 5 V	I_C = 5 A	10			

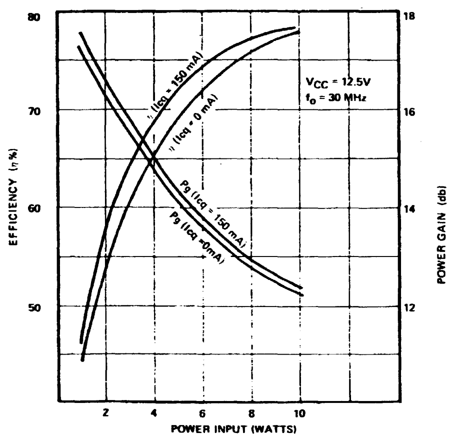
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 30 MHz	V_{CE} = 12.5 V	I_{cq} = 150 mA	100			W
G_P	f = 30 MHz	V_{CE} = 12.5 V	I_{cq} = 150 mA	11	13		dB
IMD*	f = 30 MHz	V_{CE} = 12.5 V	I_{cq} = 150 mA		– 32	– 30	dB
C_{ob}	f = 1 MHz	V_{CB} = 12.5 V	I_E = 0		400		pF

* at P_O = 100 W.

APPLICATION INFORMATION

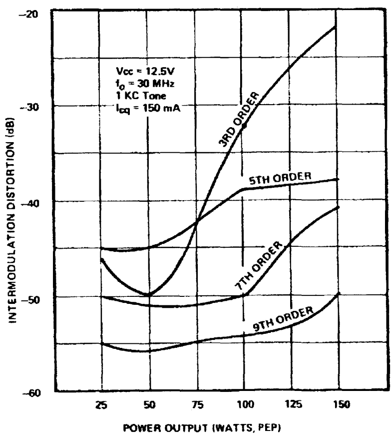
POWER GAIN AND EFFICIENCY vs POWER IN



S88SD1487-02

TYPICAL CURVES

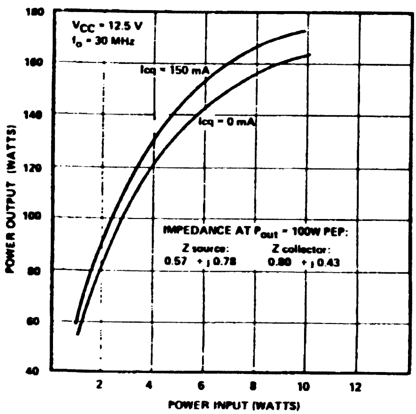
IMD vs P_O OUT



S88SD1487-03

APPLICATION INFORMATION

POWER OUT vs POWER IN

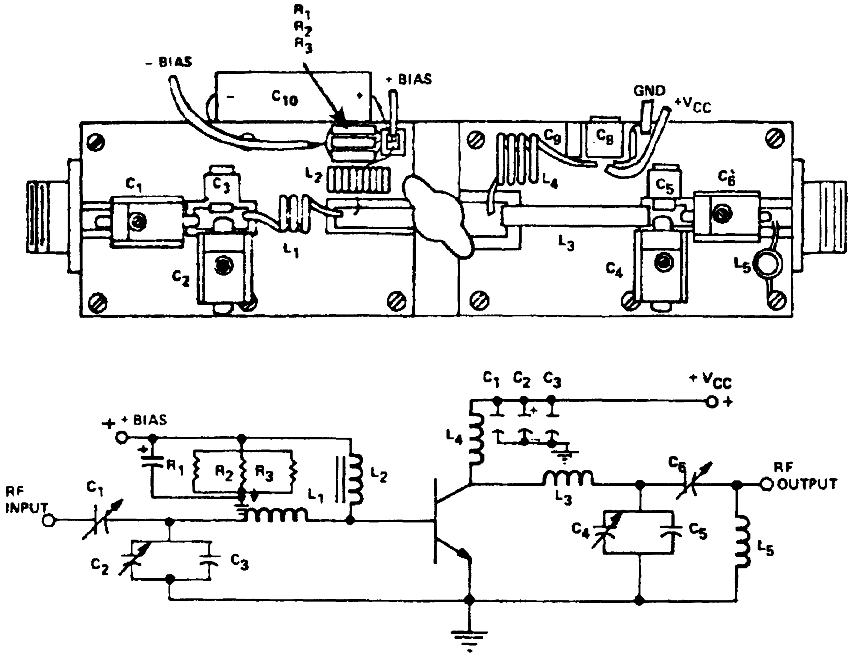


S88SD1487-04

IMPEDANCE INFORMATION (typical value)

$Z_S = 0.57 + j\ 0.78\ \Omega$	$F = 30$ MHz	$I_{CQ} = 150$ mA
$Z_{Cl} = 0.80 + j\ 0.43\ \Omega$	$V_{CE} = 12.5$ V	$P_O = 100$ W PEP.

TEST FIXTURE DRAWING



S88SD1487-05

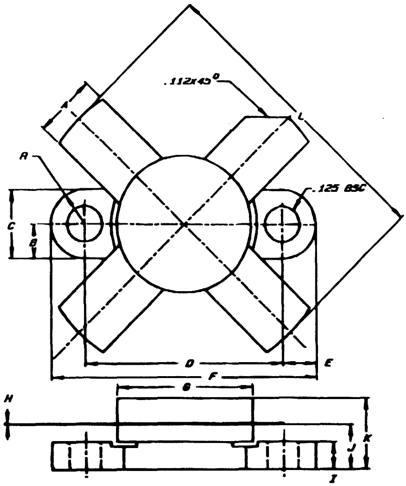
PARTS LIST

C_1 = 9-180 pf, ARCO 463
C_2 = 5-380 pf, ARCO 465
C_3 = 200 pf, UNELCO
C_4, C_6 = 170 pf, ARCO 469
C_7 = 0.1µf CERAMIC DISK
C_5, C_8 = 1000 pf, UNELCO
C_9 = 10µf, ELECTROLYTIC, 35 V DC
C_{10} = 1000µf, ELECTROLYTIC, 35 V DC
R_1, R_2, R_3 = 1.5 OHM, 1 WATT CARBON

L_1 = 2 1/2 TURNS, #14 AWG, " ID LOOSE WOUND
L_2 = 16 TURNS, #16 AWG, ENAMELED WIRE ON MICROMETALS TORROID #T-94
L_3 = COPPERSTRAP, 1/4" WIDTH, L= 1 1/2", H = 1/2"
L_4 = 4 TURNS #16 AWG, ENAMELED WIRE, 3/8" ID
L_5 = 5 TURNS #18 AWG ON 1/4 ID COIL FORM, 1/2" LENGTH, FERRITE SLUG

PACKAGE MECHANICAL DATA

. 500 4LFL



S88 SD1487-06

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

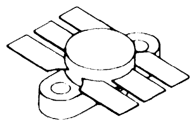
	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

SGS-THOMSON
MICROELECTRONICS

SD1488

RF & MICROWAVE TRANSISTORS 450-512MHz CLASS C, MOBILE APPLICATIONS

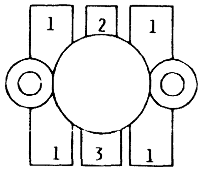
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 38.0W
- POWER GAIN 5.8dB
- EFFICIENCY 55%
- COMMON EMITTER



.500 6LFL (M111)
epoxy sealed

ORDER CODE	**BRANDING**
SD1488	SD1488

PIN CONNECTION



S88SD1488-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1488 is a 12.5V epitaxial silicon NPN common emitter transistor designed for broadband applications in the 450 to 512MHz land mobile radio band. This device utilizes diffused emitter resistors to withstand infinite VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	8.0	A
P_{tot}	Total Power Dissipation	117	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

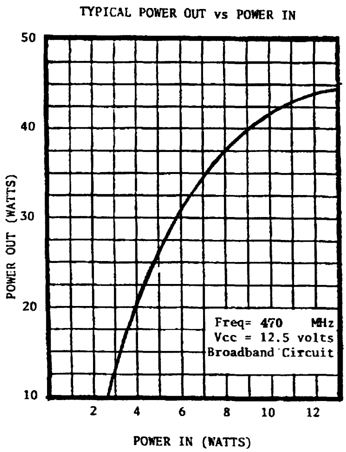
STATIC

Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CES}	I_C = 15mA	V_{BE} = 0V	36.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
h_{FE}	V_{CE} = 5.0V	I_C = 1.0A	20.0			–

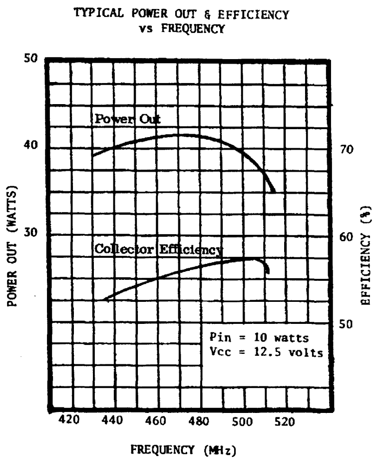
DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	f = 470MHz	V_{CE} = 12.5V		38.0	40.0		W
G_P	f = 470MHz	V_{CE} = 12.5V		5.8			dB
C_{OB}	f = 1MHz	V_{EB} = 12.5V	I_E = 0		95.0		pF

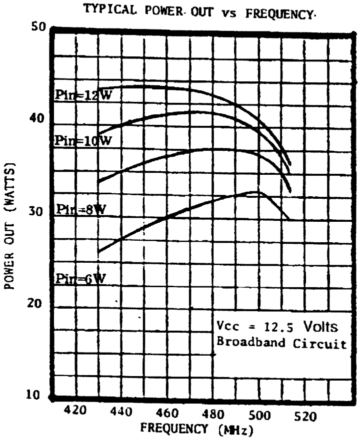
APPLICATION INFORMATION (typical curves)



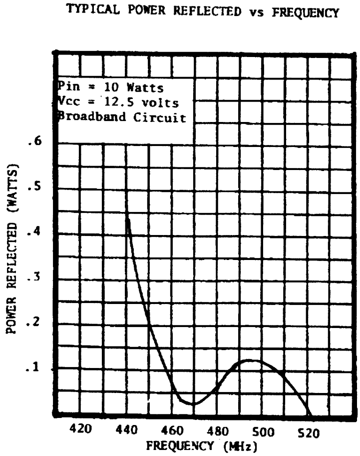
S88SD1488-02



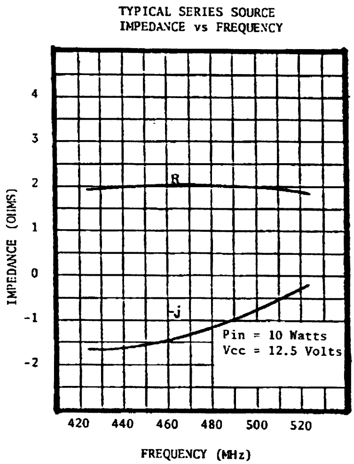
S88SD1488-03



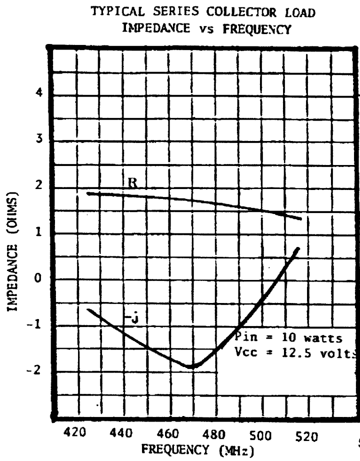
S88SD1488-04



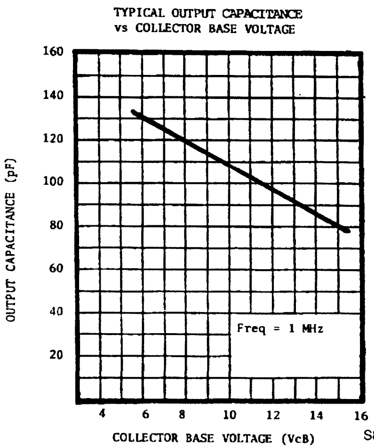
S88SD1488-05



S88SD1488-06



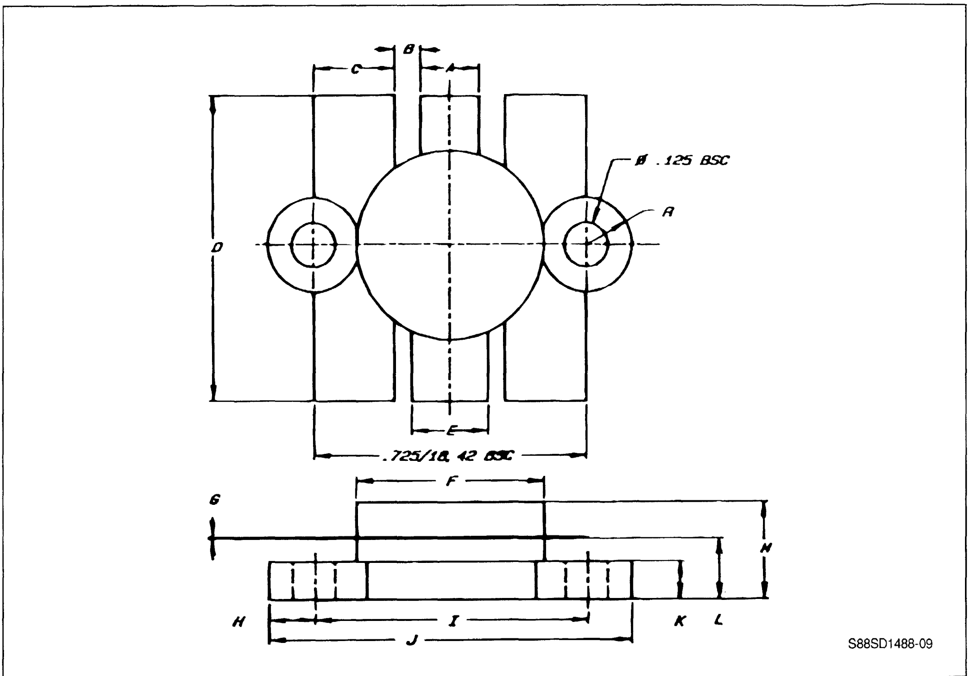
S88SD1488-07



S88SD1488-08

PACKAGE MECHANICAL DATA

.500 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

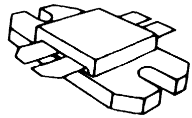
	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SGS-THOMSON
MICROELECTRONICS

SD1489

RF POWER TRANSISTORS
TV BAND IV AND V APPLICATIONS

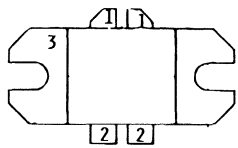
- FREQUENCY 470-860MHz
- POWER OUT 50W
- VOLTAGE 28V
- POWER GAIN 6.5dB
- CLASS AB PUSH PULL
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION
- INTERNAL INPUT MATCHING



.438 x .450 2LFL (M173)
epoxy sealed

ORDER CODE	**BRANDING**
SD1489	SD1489

PIN CONNECTION



S88-SD1489-01

1 collector
2 base
3 emitter

DESCRIPTION

The SD1489 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class AB operation in UHF and band IV, V television transmitters and transposers.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45	V
V_{CEO}	Collector - Emitter Voltage	30	V
V_{EBO}	Emitter - Base Voltage	3	V
I_C	Collector Current (max.)	8	A
P_{tot}	Total Device Dissipation at + 25°C	175	W
T_{stg}	Storage Temperature	– 50 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance T_C = 60°C	1	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

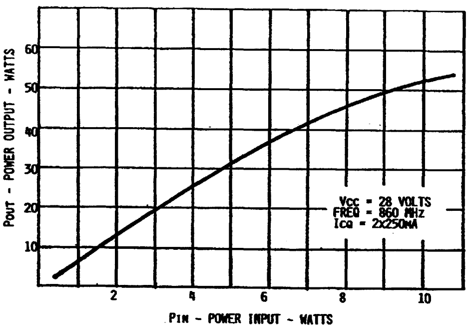
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 200mA		30			V
BV_{CBO}	I_C = 50mA		45			V
BV_{EBO}	I_E = 10mA		3			V
I_{CEO}	V_{CB} = 28V				5	mA
h_{FE}	V_{CE} = 5V	I_C = 3A	10		80	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 860MHz	V_{CE} = 28V	I_{CQ} = 500mA	50			W
P_G	f = 860MHz	V_{CE} = 28V	I_{CQ} = 500mA	6.8			dB
ηc	f = 860MHz	V_{CE} = 28V	I_{CQ} = 500mA	45			%
V_{SWR}	f = 860MHz	V_{CE} = 28V	P_O = 50W	3 : 1			
C_{ob}	f = 1MHz	V_{CB} = 28V			70		pF

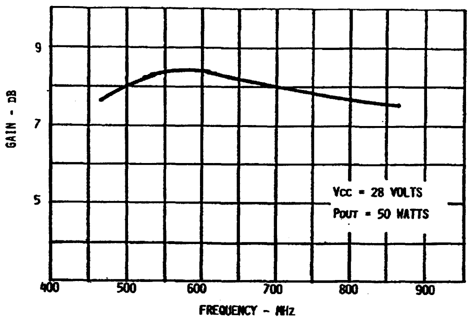
APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS POWER INPUT



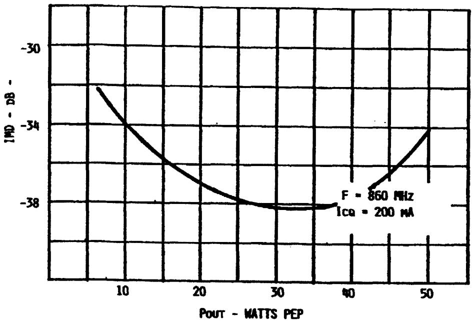
S88-SD1489-02

BROADBAND POWER GAIN VS FREQUENCY



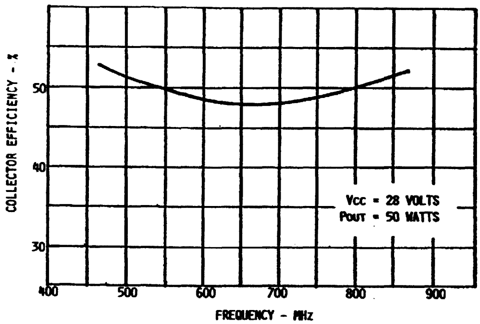
S88-SD1489-03

IMD VS P_{OUT}



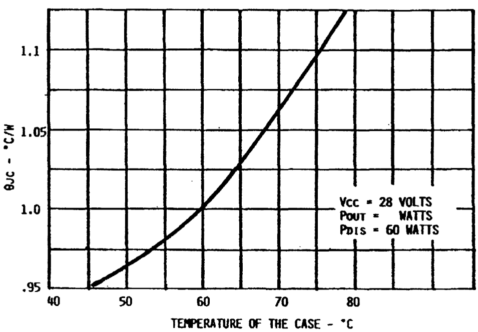
S88-SD1489-04

FREQUENCY VS FREQUENCY



S88-SD1489-05

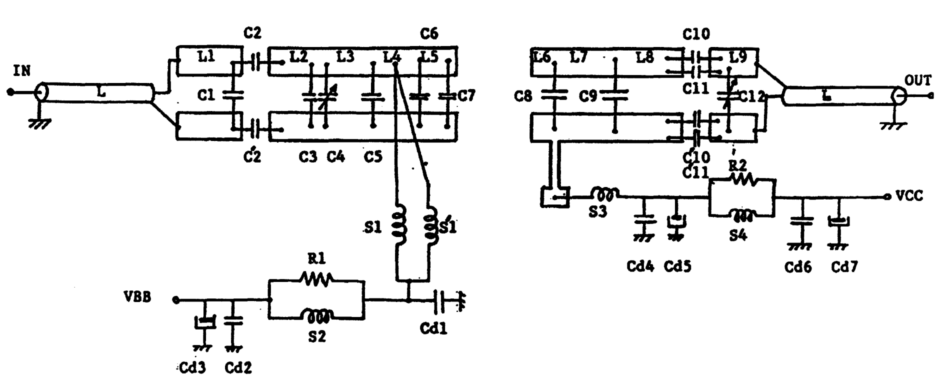
IR SCAN HOT θ_{JC} VS CASE TEMPERATURE



S88-SD1489-06

LAYOUT

470 – 860MHz Amplifier



S88-SD1489-07

L = COAXIAL CABLE Z_O = 50Ω 1 = G/4 AT 680MHz
L_1 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 12mm
L_2 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 12mm
L_3 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 10mm
L_4 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 9mm
L_5 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 5.5mm
L_6 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 6mm
L_7 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 14.5mm
L_8 = PRINTED TRANSMISSION LINE Z_O = 25Ω
L_9 = PRINTED TRANSMISSION LINE Z_O = 25Ω

C_1 = 1.5pF ATC 100A
$C_2 = C'_2$ = 100pF ATC 100A
$C_3 = C_{12}$ = AIRTONIC ADJUSTABLE .5 TO 4.5pF
C_4 = 2.7pF ATC 100A
C_5 = 2.7pF ATC 100A
C_6 = 10pF ATC 100A
C_7 = 18pF ATC 100A
C_8 = 6.8pF ATC 100A
C_9 = 1.5pF ATC 100A + 1.8 ATC 100A
$C_{10} = C'_{10}$ = 100pF ATC 100A
$C_{11} = C'_{11}$ = 120pF ATC 100A

DECOUPLING CAPACITORS

CD_1 = 100pF ATC 100A
CD_2 = 47pF ATC 100-B = 1000pPF ATC 100B
CD_3 = 500uF 25V
CD_4 = 100pF ATC 100A
CD_5 = 22uF 35V
CD_6 = 1000pF ATC 100B
CD_7 = 47uF 63V

CHOKE INDUCTANCES

S_1 = S'_1 = 10 TURNS OF WIRE 35/100MM ON Ø = 2MM
S_2 = = 9 TURNS OF WIRE 35/100MM ON R1
S_3 = = 2 TURNS OF WIRE 80/100MM ON Ø = 4MM
S_4 = = 5 TURNS OF WIRE 80/100MM ON R2

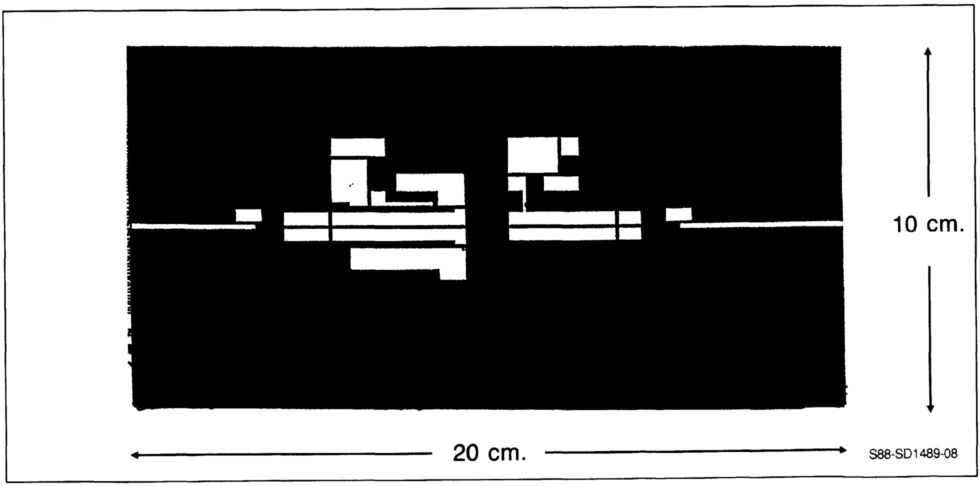
RESISTORS

R_1 = 150W 1/4 WATT
R_2 = 51W 1/4 WATT

PC BOARD MATERIAL

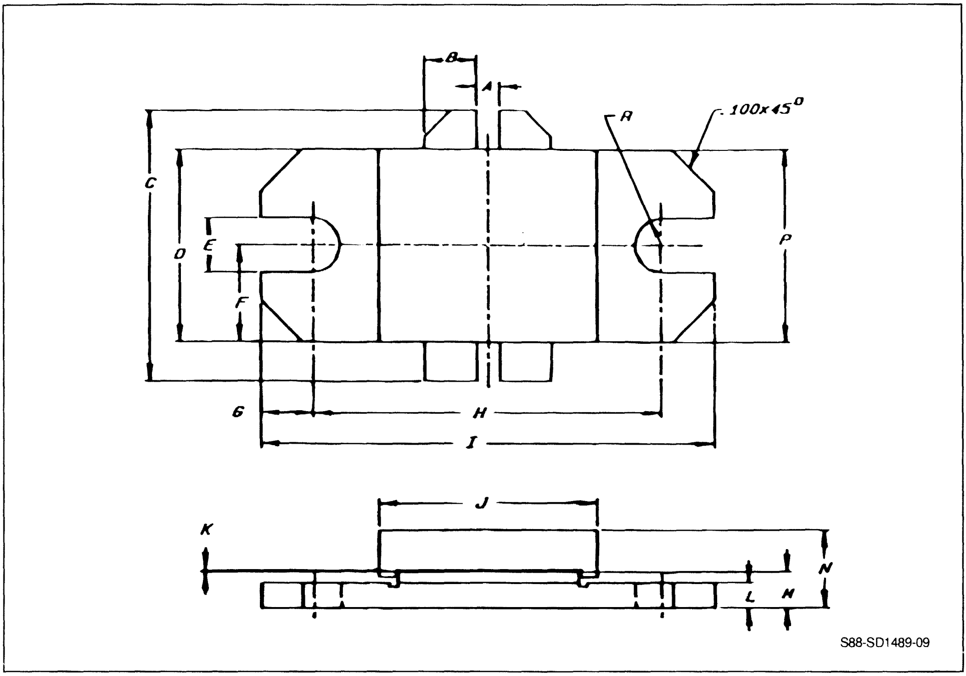
ε_r = 2.55 .020" Thick

PRINTED CIRCUIT BOARD



PACKAGE MECHANICAL DATA

.438 x .450 2 LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.055/1.40 BSC	
B	.120/3.05	.130/3.30
C		.785/19.94
D	.455/11.56	.465/11.81
E	.125/3.18 BSC	
F	.230/5.84 BSC	
G	.128/3.25 BSC	
H	.838/21.28	.850/21.59

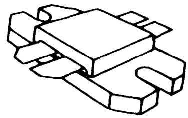
	Minimum Inches/mm	Maximum Inches/mm
I	1.095/27.81	1.105/28.07
J	.525/13.34	.535/13.59
K	.002/0.05	.006/0.15
L	.055/1.40	.065/1.65
M	.080/2.03	.088/2.24
N		.195/4.95
P	.455/11.56	.465/11.81

SGS-THOMSON MICROELECTRONICS

SD1490

RF & MICROWAVE TRANSISTORS TV BAND IV AND V APPLICATIONS

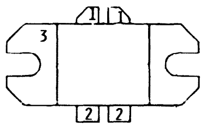
- FREQUENCY 470-860MHz
- POWER OUT 25W
- VOLTAGE 28V
- POWER GAIN 9dB
- CLASS A PUSH PULL
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION
- INTERNAL INPUT MATCHING



.438 x .450 2 LFL (M173)
epoxy sealed

ORDER CODE	BRANDING
SD1490	SD1490

PIN CONNECTION



S88-SD1490-01

1 collector
2 base
3 emitter

DESCRIPTION

The SD1490 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class A operation in UHF and band IV, V television transmitters and transposers.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector – Base Voltage	45	V
V_{CEO}	Collector – Emitter Voltage	30	V
V_{EBO}	Emitter – Base Voltage	3	V
I_C	Collector Current (max.)	8	A
P_{tot}	Total Device Dissipation at + 25°C	135	W
T_{stg}	Storage Temperature	– 50 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance T_C = 60°C	1.3	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

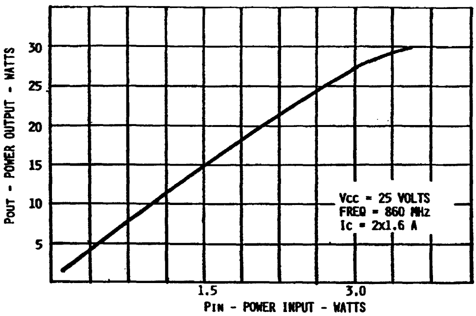
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 200mA		30			V
BV_{CBO}	I_C = 50mA		45			V
BV_{EBO}	I_E = 10mA		3			V
I_{CEO}	V_{CB} = 25V				5	mA
h_{FE}	V_{CE} = 5V	I_C = 3A	10		80	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 860MHz	V_{CE} = 25V	I_C = 3.2A	25			W
P_G	f = 860MHz	V_{CE} = 25V	I_C = 3.2A	8			dB
CMOD	f = 860MHz	V_{CE} = 25V	P_{REF} = 25W			20	%
IMD	f = 860MHz	V_{CE} = 25V	P_{REF} = 25W			– 45	dB
C_{ob}	f = 1MHz	V_{CB} = 28V			70		pF

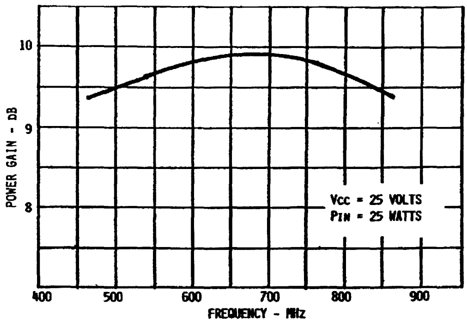
APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS POWER INPUT



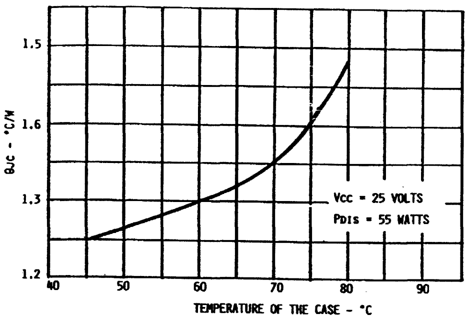
S88-SD1490-02

BROADBAND POWER GAIN VS FREQUENCY



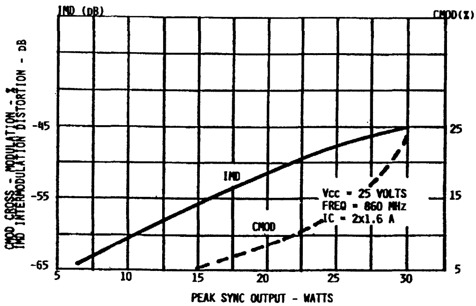
S88-SD1490-03

IR SCAN HOT SPOT θJC VS CASE TEMPERATURE



S88-SD1490-04

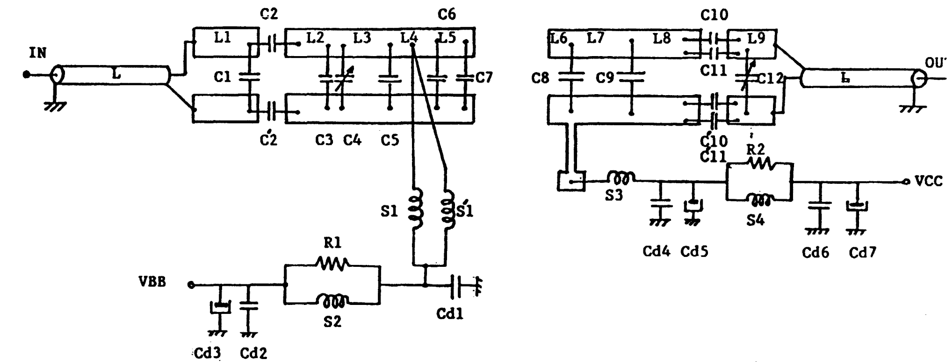
CMOD & IMD VS PEAK SYNC OUTPUT



S88-SD1490-05

TEST CIRCUIT

470 – 860MHz Amplifier



S88-SD1490-06

CIRCUIT COMPONENTS AND VALUES

L = COAXIAL CABLE Z_O = 50Ω 1 = G/4 AT 680MHz
L_1 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 12mm
L_2 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 12mm
L_3 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 10mm
L_4 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 9mm
L_5 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 5.5mm
L_6 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 6mm
L_7 = PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 14.5mm
L_8 = PRINTED TRANSMISSION LINE Z_O = 25Ω
L_9 = PRINTED TRANSMISSION LINE Z_O = 25Ω

C_1 = 1.5pF ATC 100A
$C_2 = C'_2$ = 100pF ATC 100A
$C_3 = C_{12}$ = AIRTONIC ADJUSTABLE .5 TO 4.5pF
C_4 = 2.7pF ATC 100A
C_5 = 2.7pF ATC 100A
C_6 = 10pF ATC 100A
C_7 = 18pF ATC 100A
C_8 = 6.8pF ATC 100A
C_9 = 1.5pF ATC 100A + 1.8 ATC 100A
$C_{10} = C'_{10}$ = 100pF ATC 100A
$C_{11} = C'_{11}$ = 120pF ATC 100A

DECOUPLING CAPACITORS

CD_1 = 100pF ATC 100A
CD_2 = 47pF ATC 100-B = 1000pPF ATC 100B
CD_3 = 500uF 25V
CD_4 = 100pF ATC 100A
CD_5 = 22uF 35V
CD_6 = 1000pF ATC 100B
CD_7 = 47uF 63V

CHOKE INDUCTANCES

S_1 = S'_1 = 10 TURNS OF WIRE 35/100MM ON Ø = 2MM
S_2 = 9 TURNS OF WIRE 35/100MM ON R1
S_3 = 2 TURNS OF WIRE 80/100MM ON Ø = 4MM
S_4 = 5 TURNS OF WIRE 80/100MM ON R2

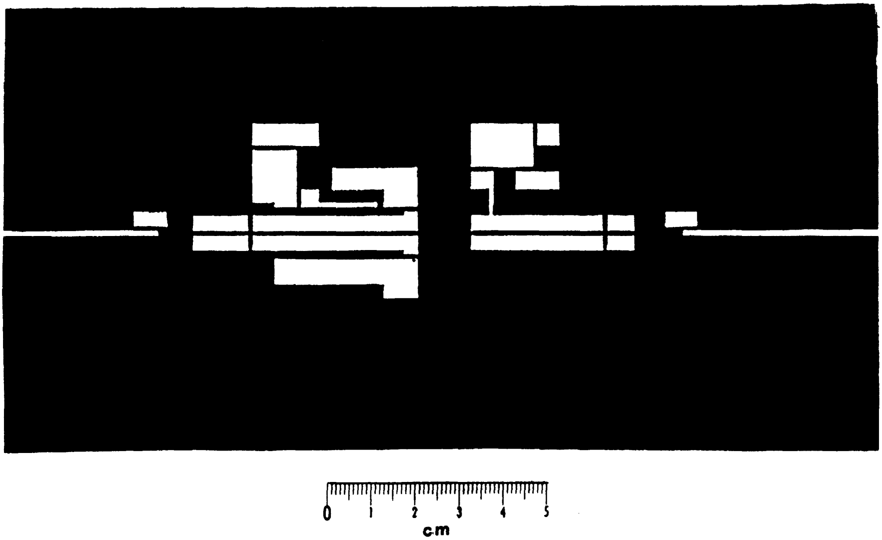
RESISTORS

R_1 = 150W 1/4 WATT
R_2 = 51W 1/4 WATT

CIRCUIT BOARD MATERIAL

εr = 2.55 .020" Thick

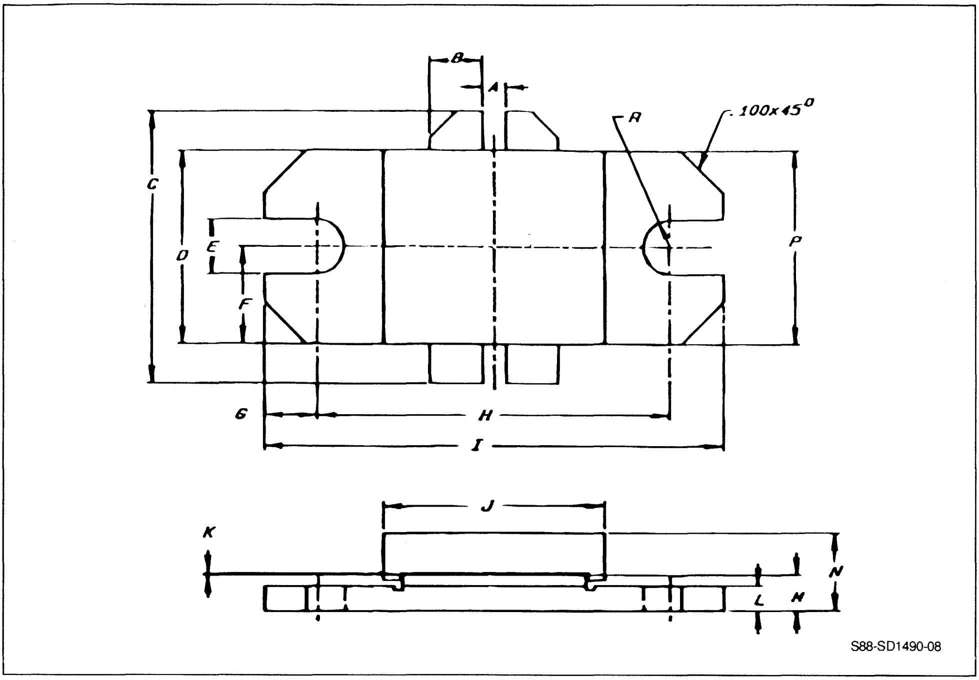
PRINTED CIRCUIT BOARD



S88-SD1490-07

PACKAGE MECHANICAL DATA

.438 x .450 2LFL



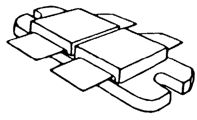
	Minimum Inches/mm	Maximum Inches/mm
A	.055/1.40 BSC	
B	.120/3.05	.130/3.30
C		.785/19.94
D	.455/11.56	.465/11.81
E	.125/3.18 BSC	
F	.230/5.84 BSC	
G	.128/3.25 BSC	
H	.838/21.28	.850/21.59

	Minimum Inches/mm	Maximum Inches/mm
I	1.095/27.81	1.105/28.07
J	.525/13.34	.535/13.59
K	.002/0.05	.006/0.15
L	.055/1.40	.065/1.65
M	.080/2.03	.088/2.24
N		.195/4.95
P	.455/11.56	.465/11.81

SD1492

RF & MICROWAVE TRANSISTORS
TV BAND IV AND V APPLICATIONS

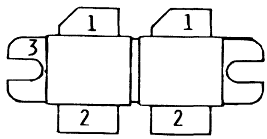
- FREQUENCY 470-860MHz
- POWER OUT 150W
- VOLTAGE 28V
- POWER GAIN 6.5dB
- CLASS AB PUSH PULL
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION
- INTERNAL INPUT MATCHING



2 (.437 x .450 2L)FL (M175)
epoxy sealed

ORDER CODE	**BRANDING**
SD1492	SD1492

PIN CONNECTION



S88SD1492-01

1 collector
2 base
3 emitter

DESCRIPTION

The SD1492 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class AB operation in UHF and band IV, V television transmitters and transposers.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	60	V
V_{CEO}	Collector - Emitter Voltage	30	V
V_{EBO}	Emitter - Base Voltage	3	V
I_C	Collector Current (max.)	25	A
P_{tot}	Total Device Dissipation at + 25°C	310	W
T_{stg}	Storage Temperature	– 50 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance T_C = 70°C	.55	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 100mA		30			V
BV_{CBO}	I_C = 100mA		60			V
BV_{EBO}	I_E = 50mA		3			V
I_{CES}	V_{CB} = 28V				10	mA
h_{FE}	V_{CE} = 5V	I_C = 3A	15		70	

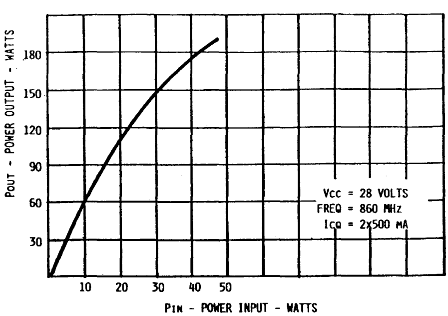
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O*	f = 860MHz	V_{CE} = 28V	I_{CQ} = 2 x 800mA	150	170		W
P_G	f = 860MHz	V_{CE} = 28V	I_{CQ} = 2 x 800mA	6.5			dB
ηc	f = 860MHz	V_{CE} = 28V		45			%
V_{SWR}	f = 860MHz	V_{CE} = 28V	P_O = 150W	3 : 1			
C_{OB}	f = 1MHz	V_{CB} = 28V				100	pF

* 1 DB COMPRESSION.

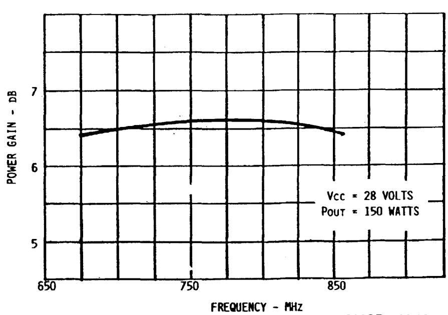
APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS POWER INPUT



S88SD1492-02

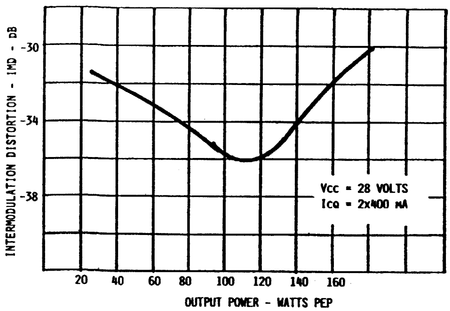
BROADBAND POWER GAIN VS FREQUENCY



S88SD1492-03

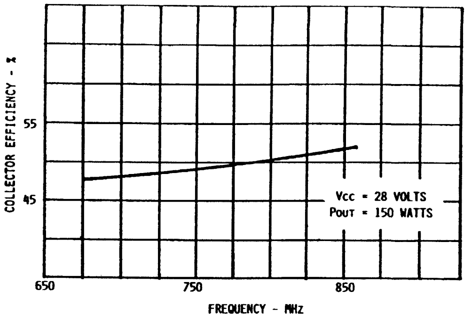
APPLICATION INFORMATION (typical curves) (continued)

INTERMODULATION VS OUTPUT POWER



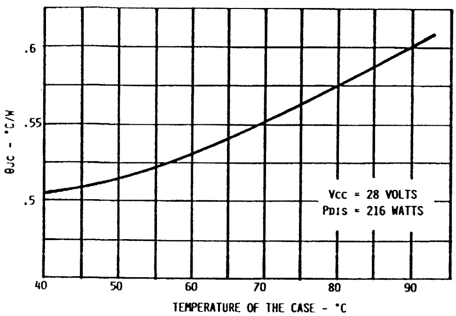
S88SD1492-04

EFFICIENCY VS FREQUENCY



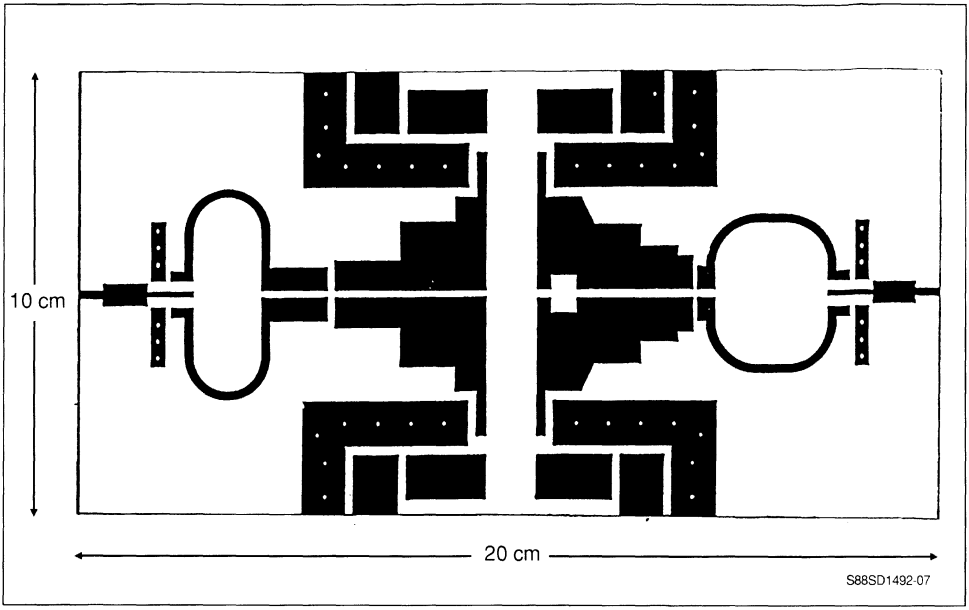
S88SD1492-05

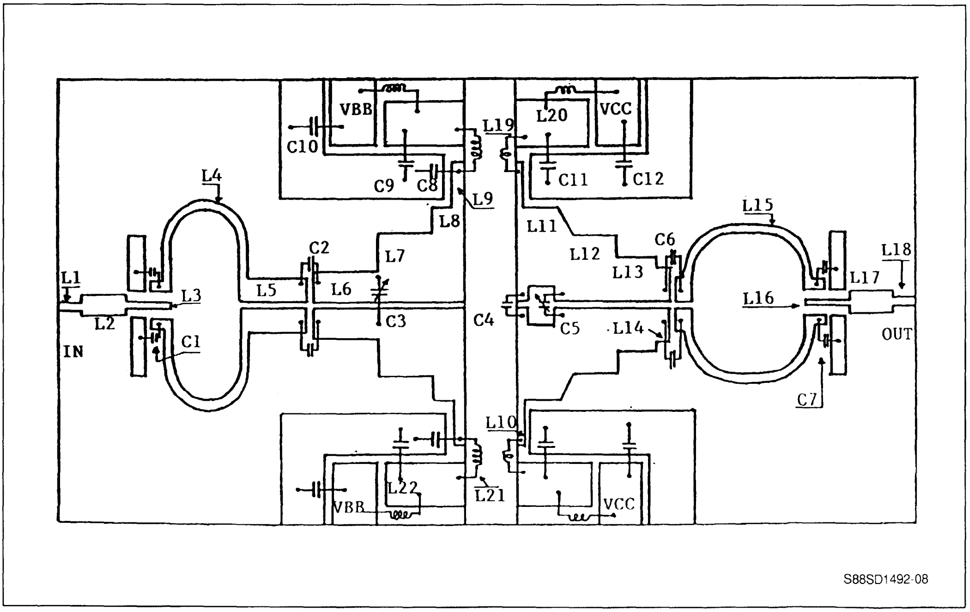
IR SCAN HOT SPOT θJc VS CASE TEMPERATURE



S88SD1492-06

TEST CIRCUIT BOARD AND SCHEMATIC



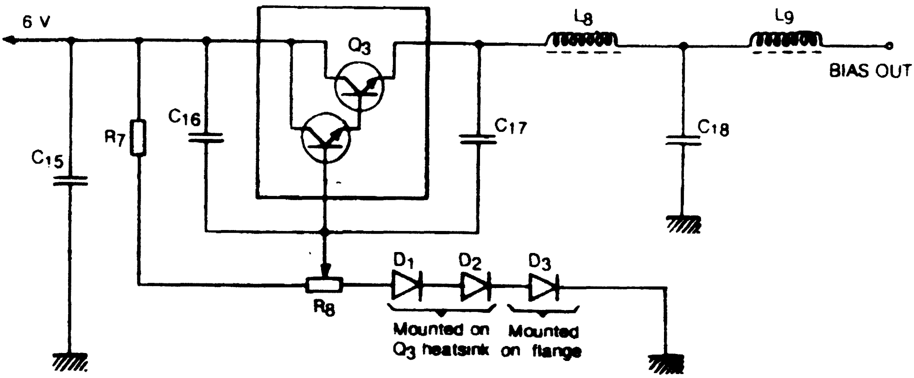


PARTS LIST :

L_1 - L_{18}	: PRINTED LINE 50Ω
L_2 - L_{17}	: PRINTED LINE 26.7Ω . 10mm
L_3 - L_{16}	: PRINTED LINE 60Ω . 10.5mm
L_4 - L_{15}	: PRINTED LINE 50Ω . 43mm
L_5	: PRINTED LINE 25Ω . 13.5mm
L_6	: PRINTED LINE 21Ω 15mm
L_7	: PRINTED LINE 10.5Ω . 12.5mm
L_8	: PRINTED LINE 8Ω . 7.5mm
L_9 -L_{10}	: PRINTED LINE 50Ω . 10mm
L_{11}	: PRINTED LINE 9.5Ω 10.5mm
L_{12}	: PRINTED LINE 11Ω . 14.5mm
L_{13}	: PRINTED LINE 15.5Ω . 8.5mm
L_{14}	: PRINTED LINE 19Ω . 3.5mm
L_{19}	: 2 TURNS - 16 AWG
L_{20}	: 8 TURNS - 16 AWG
L_{21} - L_{22}	: 12 TURNS - 22 AWG.

C_1 - C_2	: 330pF - ATC 100B
C_3	: JOHANSON GIGA - TRIM -8 TO 8pF
C_4	: 4.7 + 3.9pF - ATC 100B
C_5	: 3.9 + 1.7pF - ATC 100B
	: + JOHANSON GIGA - TRIM -8 TO 8pF
C_6 - C_7	: 330pF - ATC 100B
C_8	: 120pF - ATC 100B
C_9	: 1.5nF - ATC 100B
C_{10}	: 10nF + 47μF - 63V
C_{11}	: 1.5nF - ATC 100B + 10nF
C_{12}	: 470pF + 1.5nF - ATC 100B
	+ 100μF - 63V.

B1 - B2	: COAXIAL CABLE 25 . 43mm
SUBSTRATE	: TEFLON GLASS Er = 2.55 . 30MILS.



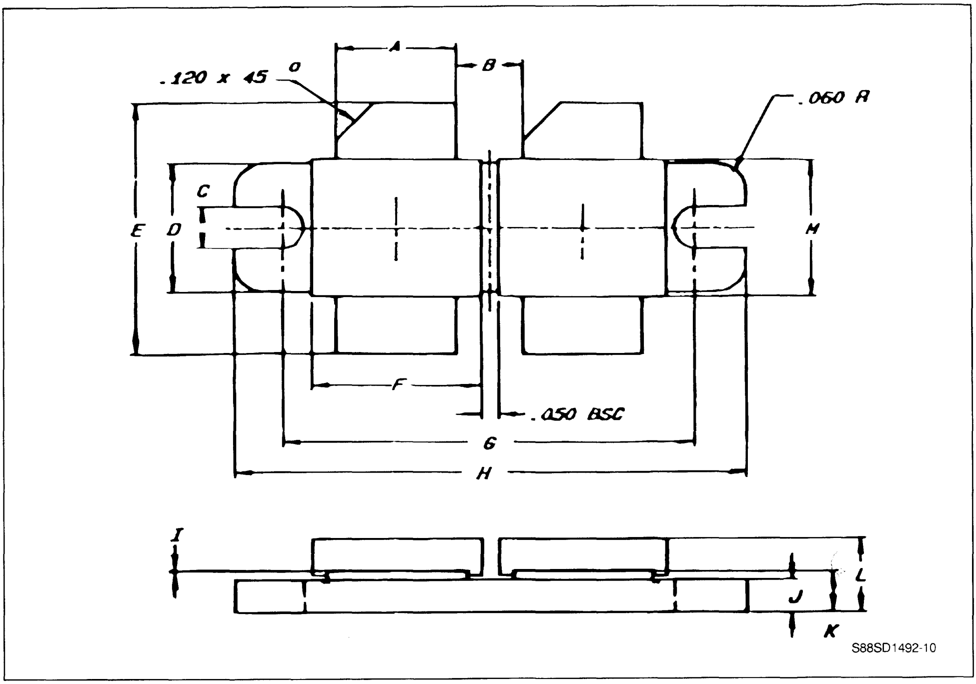
S88SD1492-09

PARTS LIST (BIAS VOLTAGE SOURCE)

R_7	: 470Ω -1/2W
R_6	: 100Ω TRIMPOT
C_{15}	: 10nF + 100nF + 10μF
C_{16}	: 10nF
C_{17}	: 1μF
C_{18}	: 1.2nF + 27nF + 10μF
Q_3	: BOX 63B
D_1	: AAY 49 -Ge diode thermally connected with Q_3 heatsink
D_2	: 1N 400S - Si diode thermally connected with Q_3 heatsink
D_3	: 1N 400S - Si diode thermally connected with SD1492 (RF transistors) flange
L_6 -L_9	: Ferrite choice.

PACKAGE MECHANICAL DATA

2 x (.437 x .450 2L)FL



	Minimum Inches/mm	Maximum Inches/mm
A	.373/9.47	.385/9.78
B	.190/4.83 BSC	
C	.125/3.18 BSC	
D	.411/10.44	.421/10.69
E	.825/20.96	.865/21.97
F	.525/13.34	.535/13.59
G	1.255/31.88	1.265/32.13

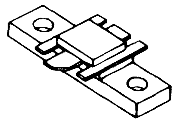
	Minimum Inches/mm	Maximum Inches/mm
H	1.675/42.55	1.685/42.80
I	.002/0.05	.006/0.15
J	.095/2.41	.105/2.67
K	.115/2.92	.135/3.43
L		.250/6.35
M	.445/11.30	.455/11.56

SGS-THOMSON
MICROELECTRONICS

SD1495

RF & MICROWAVE TRANSISTORS
850-890MHz CLASS C, BASE STATIONS

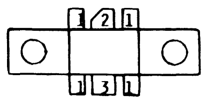
- CLASS C TRANSISTOR
- FREQUENCY 870MHz
- VOLTAGE 24V
- POWER OUT 35.0W
- POWER GAIN 7.3dB
- EFFICIENCY 45%
- COMMON BASE



.230 6LFL(M142)
epoxy sealed

ORDER CODE	BRANDING
SD1495	SD1495

PIN CONNECTION



S88SD1495-01

1 base
2 collector
3 emitter

DESCRIPTION

The SD1495 is a 24V epitaxial silicon planar transistor designed for base station applications in cellular telephone systems. The SD1495 uses matched input technology tuned Q to increase band width and power gain over the 850 to 890MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	50	V
V_{CEO}	Collector - Emitter Voltage	30	V
V_{CES}	Collector - Emitter Voltage	50	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	9	A
P_{tot}	Total Power Dissipation	100	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

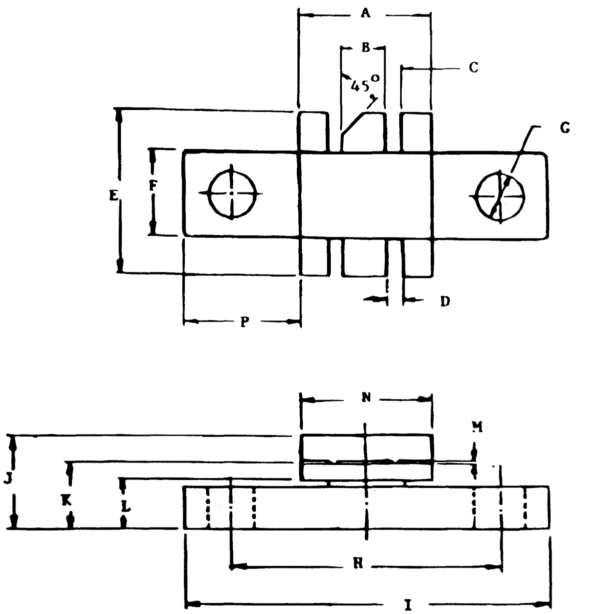
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	50			V
BV_{CEO}	I_C = 50mA	I_B = 0	30			V
BV_{EBO}	I_E = 10mA	I_C = 0	4			V
I_{CBO}	V_{CB} = 15V	I_E = 0			5	mA
h_{FE}	V_{CE} = 5V	I_C = 1A	10			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 850MHz	V_{CE} = 24V	PIN = 6.5W	35			W
	f = 870MHz	V_{CE} = 24V	PIN = 6.5W	35			W
	f = 890MHz	V_{CE} = 24V	PIN = 6.5W	32			W
G_P	f = 870MHz	V_{CE} = 24V	PIN = 6.5W	7.3			dB
η_C	f = 890MHz	V_{CC} = 24V	POUT = 32W	45			%
C_{ob}	f = 1MHz	V_{CB} = 25V			50		pF

PACKAGE MECHANICAL DATA

.230 6LFL



S88SD1495-02

	Minimum Inch/mm	Maximum Inch/mm
A	.355/9.01	.365/9.27
B	.115/2.92	.125/3.18
C	.075/1.91	.085/2.16
D	.035/0.89	.045/1.14
E	.425/10.80	.435/11.05
F	.225/5.72	.235/5.97
G	.115/2.92	.130/3.30
H	.720/18.29	.730/18.54

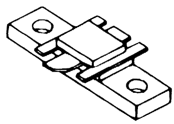
	Minimum Inch/mm	Maximum Inch/mm
I	.970/24.64	.980/24.89
J	.230/5.84	.260/6.60
K	.155/3.94	.175/4.45w
L	.120/3.05	.130/3.30
M	.004/0.10	.006/0.15
N	.345/8.76	.360/9.14
P	.300/7.62	.314/7.98

SGS-THOMSON
MICROELECTRONICS

SD1495-3

RF & MICROWAVE TRANSISTORS
900-960MHz CLASS C, BASE STATIONS

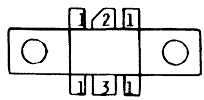
- CLASS C TRANSISTOR
- FREQUENCY 960MHz
- VOLTAGE 24V
- POWER OUT 30.0W
- POWER GAIN 7.0dB
- EFFICIENCY 50%
- COMMON BASE



.230 6LFL (M142)
epoxy sealed

ORDER CODE	BRANDING
SD1495-03	SD1495-3

PIN CONNECTION



S88SD1495-3-01

1 base
2 collector
3 emitter

DESCRIPTION

The SD1495-3 is a 24V epitaxial silicon NPN planar transistor designed primarily for amplifier applications in the 900-960MHz frequency range. Internal input matching and common base configuration assure optimum gain and efficiency across the entire frequency band.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	50	V
V_{CEO}	Collector - Emitter Voltage	30	V
V_{CES}	Collector - Emitter Voltage	50	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	9	A
P_{tot}	Total Power Dissipation	100	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

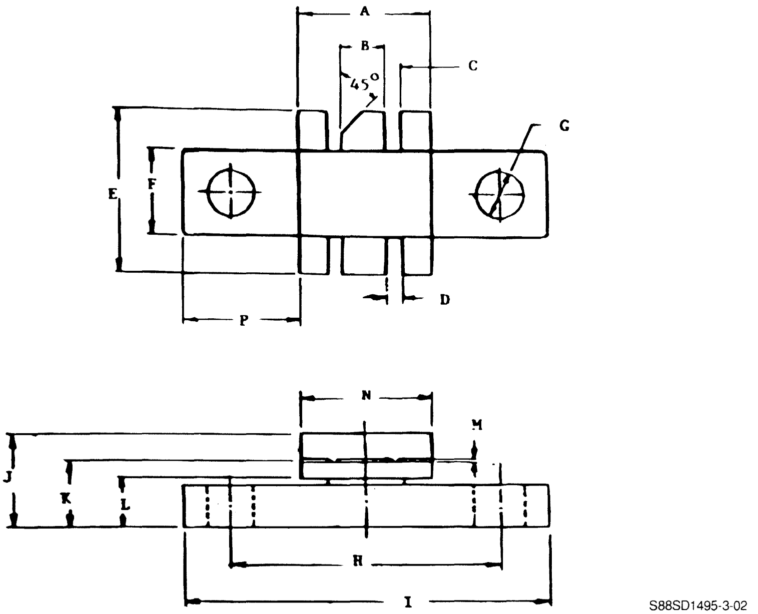
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0V	50			V
BV_{CEO}	I_C = 50mA	I_B = 0	30			V
BV_{EBO}	I_E = 10mA	I_C = 0	4			V
I_{CBO}	V_{CB} = 15V	I_E = 0			5	mA
h_{FE}	V_{CE} = 5V	I_C = 1A	10		120	

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O	f = 960MHz	V_{CE} = 24V	30			W
G_P	f = 960MHz	V_{CE} = 24V	7			dB
ηc	f = 960MHz	V_{CE} = 24V		50		%
C_{ob}	f = 1MHz	V_{CE} = 24V		55		pF

PACKAGE MECHANICAL DATA

.230 6LFL



	Minimum Inch/mm	Maximum Inch/mm
A	.355/9.01	.365/9.27
B	.115/2.92	.125/3.18
C	.075/1.91	.085/2.16
D	.035/0.89	.045/1.14
E	.425/10.80	.435/11.05
F	.225/5.72	.235/5.97
G	.115/2.92	.130/3.30
H	.720/18.29	.730/18.54

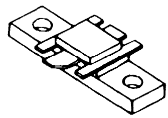
	Minimum Inch/mm	Maximum Inch/mm
I	.970/24.64	.980/24.89
J	.230/5.84	.260/6.60
K	.155/3.94	.175/4.45w
L	.120/3.05	.130/3.30
M	.004/0.10	.006/0.15
N	.345/8.76	.360/9.14
P	.300/7.62	.314/7.98

SGS-THOMSON
MICROELECTRONICS

SD1496

RF & MICROWAVE TRANSISTORS
860-900MHz CLASS C, BASE STATIONS

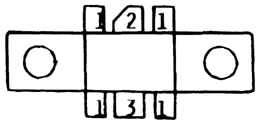
- CLASS C TRANSISTOR
- FREQUENCY 900MHz
- VOLTAGE 24V
- POWER OUT 60W
- POWER GAIN 7.5dB
- EFFICIENCY 50%
- COMMON BASE



.230 6 LFL (M142)
epoxy sealed

ORDER CODE	**BRANDING**
SD1496	SD1496

PIN CONNECTION



S88SD1496-01

1 base
2 collector
3 emitter

DESCRIPTION

The SD1496 is an NPN silicon epitaxial planar transistor designed for base station applications in the 860-900MHz frequency range.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	50.0	V
V_{CEO}	Collector - Emitter Voltage	26	V
V_{CES}	Collector - Emitter Voltage	50.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	9	A
P_{tot}	Total Power Dissipation	190	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.9	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50.0mA	V_{BE} = 0	50.0			V
BV_{CEO}	I_E = 50.0mA	I_B = 0	26.0			V
BV_{EBO}	I_E = 10.0mA	I_C = 0	3.0			V
I_{CBO}	V_{CB} = .0V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1.0A	20			

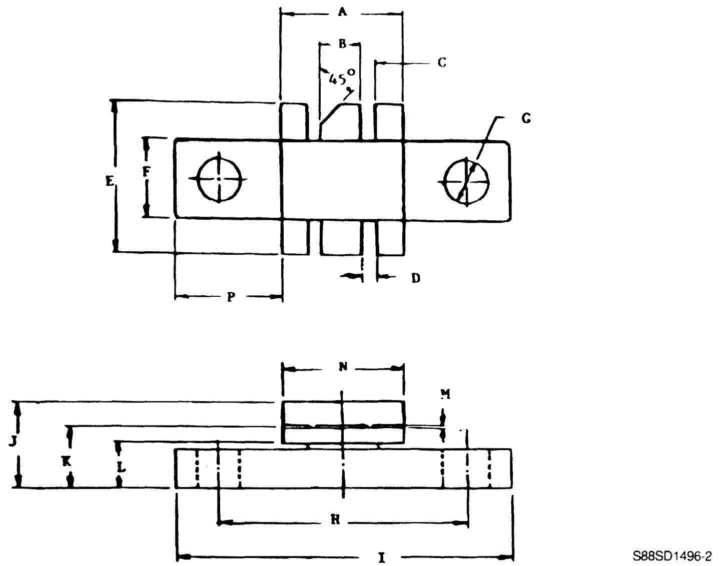
* Pulsed through 25MH Inductor.

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O	f = 860 – 900MHz	V_{CC} = 24V	60			W
G_P	f = 860 – 900MHz	V_{CC} = 24V	7.5			dB
η_C	f = 860 – 900MHz	V_{CC} = 24V		50.0		%
C_{OB}	V_{CE} = 24V	V_{CC} = 24V		55.0		pF

PACKAGE MECHANICAL DATA

.230 6LFL



	Minimum Inch/mm	Maximum Inch/mm
A	.355/9.01	.365/9.27
B	.115/2.92	.125/3.18
C	.075/1.91	.085/2.16
D	.035/0.89	.045/1.14
E	.425/10.80	.435/11.05
F	.225/5.72	.235/5.97
G	.115/2.92	.130/3.30
H	.720/18.29	.730/18.54

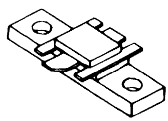
	Minimum Inch/mm	Maximum Inch/mm
I	.970/24.64	.980/24.89
J	.230/5.84	.260/6.60
K	.155/3.94	.175/4.45
L	.120/3.05	.130/3.30
M	.004/0.10	.006/0.15
N	.345/8.76	.360/9.14
P	.300/7.62	.314/7.98

SGS-THOMSON
MICROELECTRONICS

SD1496-3

RF & MICROWAVE TRANSISTORS
900-960MHz CLASS C, BASE STATIONS

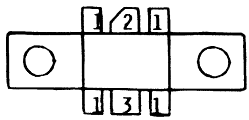
- CLASS C TRANSISTOR
- FREQUENCY 960MHz
- VOLTAGE 24V
- POWER OUT 55W
- POWER GAIN 7.4dB
- EFFICIENCY 50%
- COMMON BASE



.230 6LFL (M142)
epoxy sealed

ORDER CODE	**BRANDING**
SD1496-3	SD1496-3

PIN CONNECTION



S88SD1496-3-01

1 base
2 collector
3 emitter

DESCRIPTION

The SD1496-3 is a 24V epitaxial silicon NPN planar transistor designed primarily for amplifier applications in the 900-960MHz frequency range. In the 900-960MHz frequency range. Internal input matching and common base configuration assure optimum gain and efficiency across the entire frequency band.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	50	V
V_{CEO}	Collector – Emiiter Voltage	26	V
V_{CES}	Collector - Emitter Voltage	50	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	9	A
P_{tot}	Total Power Dissipation	190	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.9	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

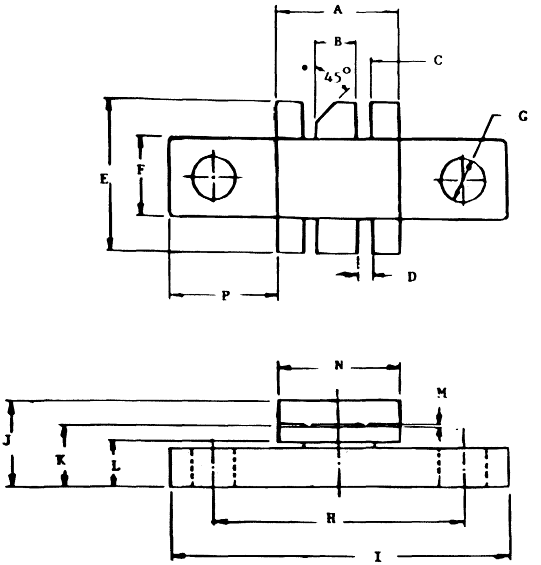
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 50mA	V_{BE} = 0	50			V
BV_{CEO}	I_E = 50mA	I_B = 0	26			V
BV_{EBO}	I_E = 10mA	I_C = 0	3			V
I_{CBO}	V_{CB} = 30V	I_E = 0			5	mA
h_{FE}	V_{CE} = 5V	I_C = 1A	20			

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O	f = 960MHz	V_{CE} = 24V	55			W
G_P	f = 960MHz	V_{CE} = 24V	7.4			dB
η_C	f = 960MHz	V_{CC} = 24V		50		%

PACKAGE MECHANICAL DATA

. 230 6LFL



	Minimum Inch/mm	Maximum Inch/mm
A	.355/9.01	.365/9.27
B	.115/2.92	.125/3.18
C	.075/1.91	.085/2.16
D	.035/0.89	.045/1.14
E	.425/10.80	.435/11.05
F	.225/5.72	.235/5.97
G	.115/2.92	.130/3.30
H	.720/18.29	.730/18.54

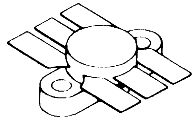
	Minimum Inch/mm	Maximum Inch/mm
I	.970/24.64	.980/24.89
J	.230/5.84	.260/6.60
K	.155/3.94	.175/4.45w
L	.120/3.05	.130/3.30
M	.004/0.10	.006/0.15
N	.345/8.76	.360/9.14
P	.300/7.62	.314/7.98

SGS-THOMSON
MICROELECTRONICS

SD1499-1

RF & MICROWAVE TRANSISTORS
450-512MHz CLASS C, MOBILE APPLICATIONS

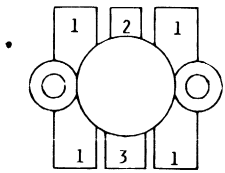
- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 60.0W
- POWER GAIN 4.7dB
- COMMON EMITTER



.500 6LFL (M111)
epoxy sealed

ORDER CODE	BRANDING
SD1499-01	SD1499-1

PIN CONNECTION



S88SD1499-1-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1499-1 is a 12.5 Volt epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device utilizes diffused emitter resistors to achieve 20:1 VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	36.0	V
V_{CEO}	Collector - Emitter Voltage	16.0	V
V_{CES}	Collector - Emitter Voltage	36.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	13.0	A
P_{tot}	Total Power Dissipation	218.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.8	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

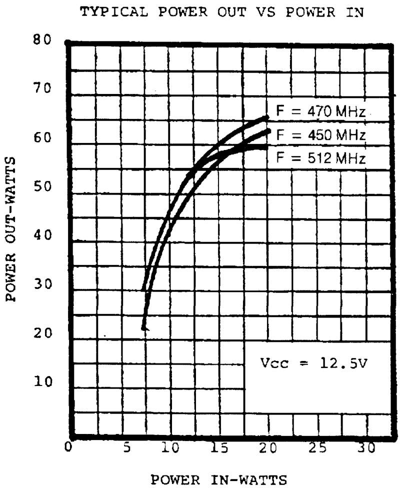
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 30mA	V_{BE} = 0	36.0			V
BV_{CEO}	I_E = 50mA	I_B = 0	16.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 15.0V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 0.5V	I_C = 1.0A	20.0			

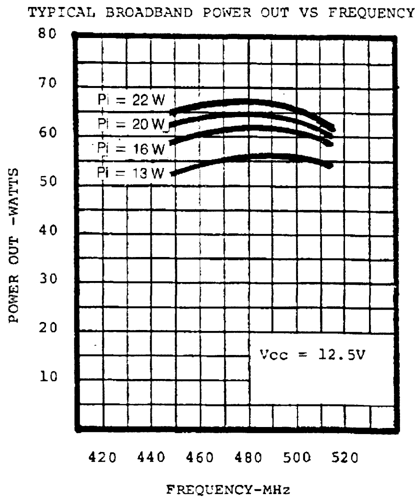
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 470MHz	V_{CE} = 12.5V		60.0			W
G_P	f = 470MHz	V_{CE} = 12.5V		4.7			dB
C_{Ob}	f = 1MHz	V_{CB} = 12.5V	I_E = 0	180.0			pF

APPLICATION INFORMATION (typical curves)



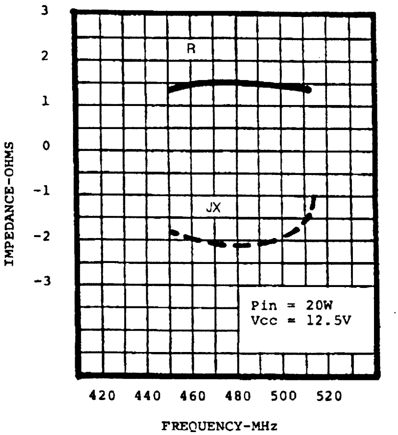
S88SD1499-1-02



S88SD1499-1-03

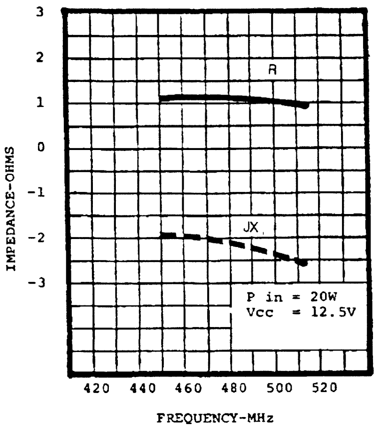
IMPEDANCE DATA

TYPICAL SERIES SOURCE IMPEDANCE VS FREQUENCY



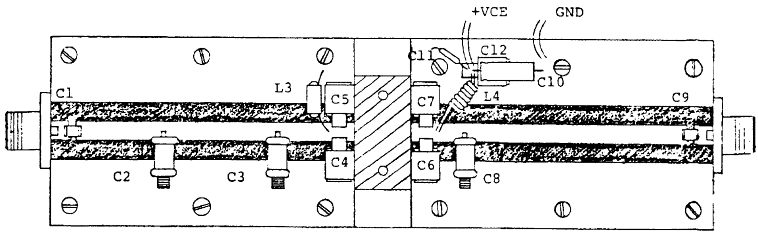
S88SD1499-1-04

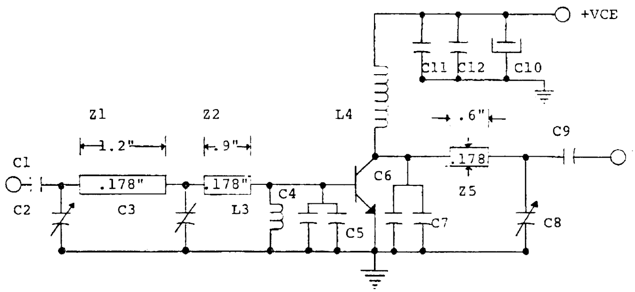
TYPICAL SERIES COLLECTOR LOAD VS FREQUENCY



S88SD1499-1-05

TEST CIRCUIT





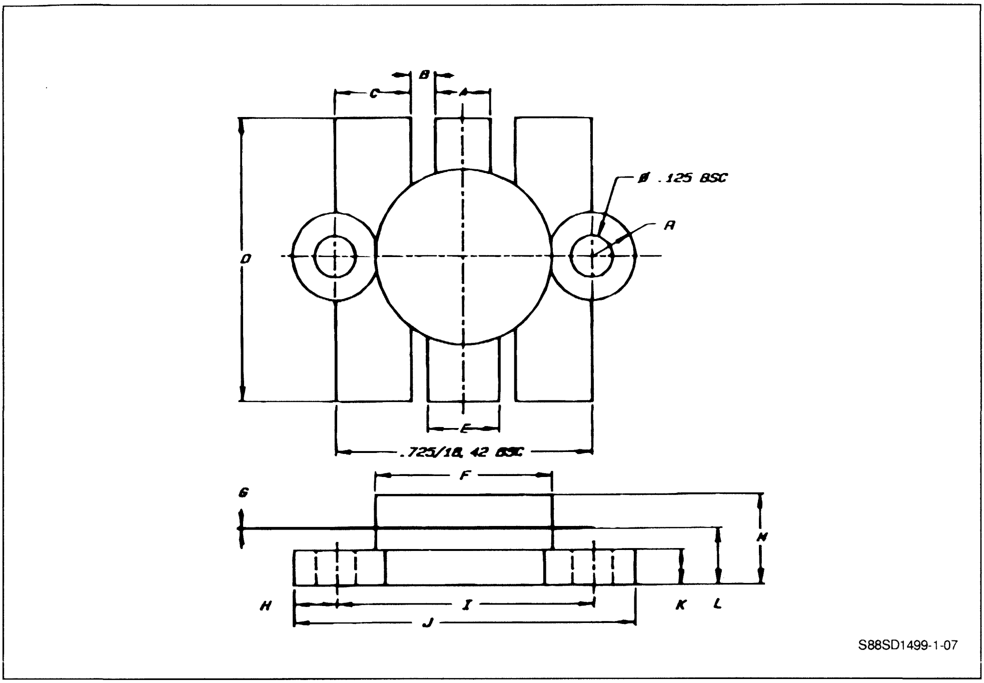
S88SD1499-1-06

C2, C3, C8 Voltronics Air Variable 1-14pF
C4, C5 Unelco 30pF
C6, C7 Unelco 22pF
C1, C9 ATC 100mil Chip Capacitor 750pF
C11 Eric Disk Capacitor .0.1mF@ 25VDC
C12 Unelco 1000pF
C10 Electrolytic Capacitor 8.2mF @25VDC

Z1 50Ω Microstrip .1783x1.23
Z2 50Ω Microstrip .1783x.93
L3 VK200 21.4B Ferracbe 1 1/2 Turn
L4 7 Turn # 18AWG .23I.D. with Wiring Spacing
Z5 50Ω Microstrip .1783x.63
BOARD MATERIAL 3M-K 6098 1/16" Thick

PACKAGE MECHANICAL DATA

.500 6LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.150/3.43	.160/4.06
B	.045/1.14 BSC	
C	.210/5.33	.220/5.59
D	.835/21.21	.865/21.97
E	.200/5.08	.210/5.33
F	.490/12.45	.510/12.95
G	.002/0.05	.007/0.18

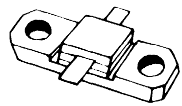
	Minimum Inches/mm	Maximum Inches/mm
H	.125/3.18 BSC	
I	.720/18.29	.730/18.54
J	.970/24.64	.980/24.89
K	.095/2.41	.105/2.67
L	.150/3.81	.170/4.32
M		.280/7.11

SGS-THOMSON MICROELECTRONICS

SD1500

RF & MICROWAVE TRANSISTORS L BAND RADAR APPLICATIONS

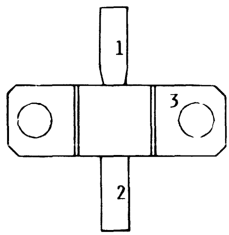
- DESIGNED FOR USE IN LONG PULSE L-BAND APPLICATIONS LIKE RADAR, JTIDS, ETC.
- EXTREMELY RUGGED
- THERMALLY STABLE
- GOLD METALLIZATION
- CAPABLE OF OPERATION AT GREATER THAN 500µs AND 20%
- STRIPLINE FLANGE PACKAGE



.250 x 250 2LFL (M124)
epoxy sealed

ORDER CODE	**BRANDING**
SD1500	SD1500

PIN CONNECTION



1 collector
2 emitter
3 base

DESCRIPTION

The SD1500 is a gold metallized silicon NPN Planar Pulsed Transistor that has been designed for use in extended pulse width and duty cycle applications from 1200 to 1400MHz. This device is extremely rugged, thermally stable, and is capable of operation at pulse widths in excess of 500µs and duty cycles greater than 20%.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	30.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current (max.)	2.0	A
P_{TOT}	Total Device Dissipation at + 25°C	53.0	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	3.3	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

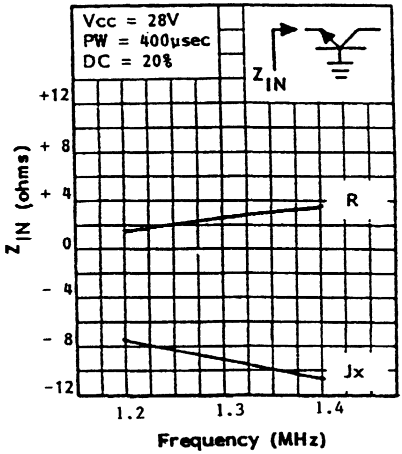
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 10mA	I_B = 0	30.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CEO}	V_{CB} = 28.0V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 100.0mA	20.0			

DYNAMIC

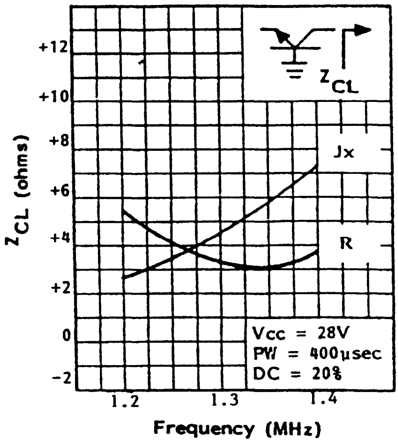
Symbol	Test Conditions				Value			Unit
					Min.	Typ.	Max.	
P_O	f = 1400MHz	V_{CE} = 28V	PW = 400μs	DC = 20%	5.0			W
P_G	f = 1400MHz	V_{CE} = 28V	PW = 400μs	DC = 20%	7.0			dB
Zin	f = 1400MHz	V_{CE} = 28V	Pin = 1.0W			3.7–j10.6		Ω
Zcl	f = 1400MHz	V_{CE} = 28.0V	Pin = 1.0W			3.5+j7.3		Ω

TYPICAL INPUT IMPEDANCE vs. FREQUENCY



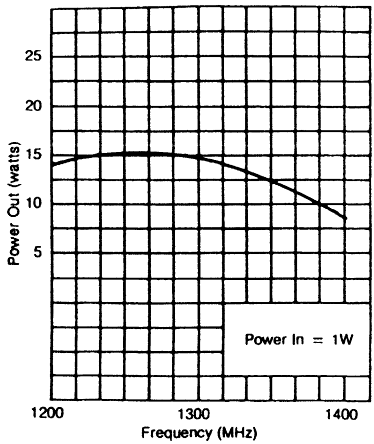
S88SD1500-02

TYPICAL COLLECTOR LOAD IMPEDANCE vs. FREQUENCY



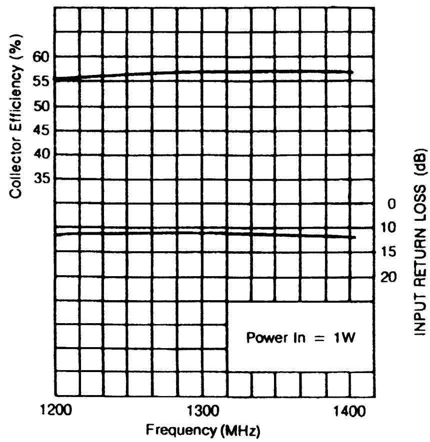
S88SD1500-03

TYPICAL POWER OUTPUT vs. FREQUENCY



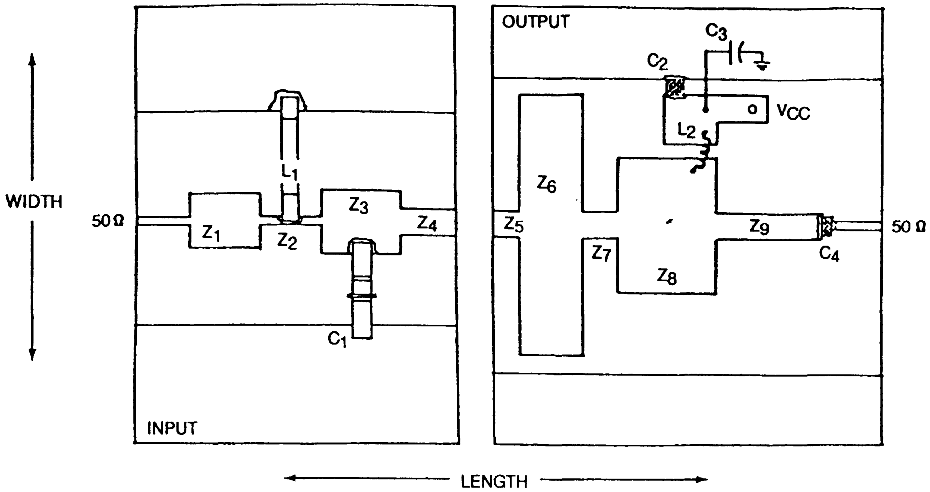
S88SD1500-04

TYPICAL COLLECTOR EFFICIENCY INPUT RETURN LOSS vs. FREQUENCY



S88SD1500-05

TEST FIXTURE

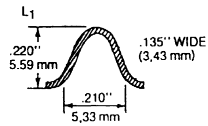


S88SD1500-06

BOARD MATERIAL : 3-M E_6 $E_r = 6$
THK : 0.030" (0.762 mm)

Line	Length		Width	
	Inches	mm	Inches	mm
Z_1	0.514	13,06	0.270	6,86
Z_2	0.399	10,14	0.038	0,97
Z_3	0.504	12,80	0.320	8,13
Z_4	0.525	13,34	0.120	3,05
Z_5	0.194	4,93	0.153	3,89
Z_6	0.500	12,70	1.168	29,67
Z_7	0.200	5,08	0.153	3,89
Z_8	0.500	12,70	0.490	12,45
Z_9	0.680	17,27	0.153	3,89

C_1 = 0.8 - 8pF GIGA-TRIM
C_2 = 820pF AJC
C_3 = 1000µF
C_4 = 120pF AJC

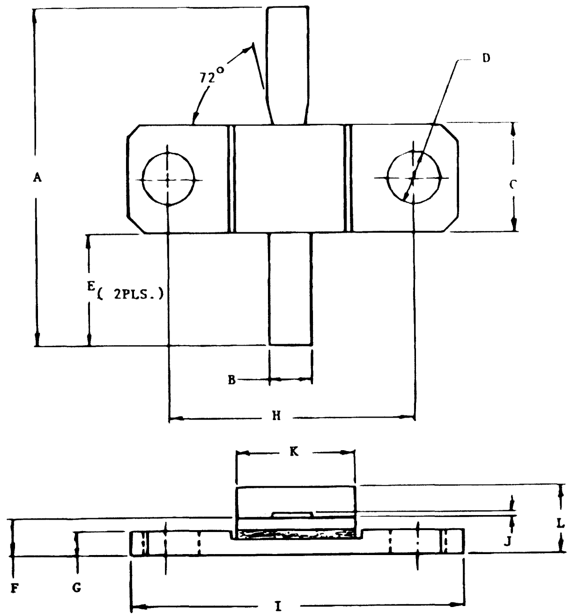


L_2 4 1/2 turns # 24 WIRE

S88SD1500-07

PACKAGE MECHANICAL DATA

.250 x .250 2LFL



S88SD1500-08

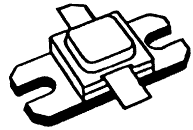
	Minimum Inches/mm	Maximum Inches/mm
A	.750/19.05	
B	.095/2.41	.105/2.67
C	.245/6.22	.255/6.48
D	.120/3.05	.130/3.30
E	.350/8.89	
F	.075/1.91	.100/2.54

	Minimum Inches/mm	Maximum Inches/mm
G	.058/1.47	.064/1.63
H	.555/14.10	.570/14.48
I	.795/20.19	.805/20.45
J	.003/0.08	.006/0.15
K	.245/6.22	.255/6.48
L	.150/3.81	.160/4.06

SD1501

RF & MICROWAVE TRANSISTORS
L BAND RADAR APPLICATIONS

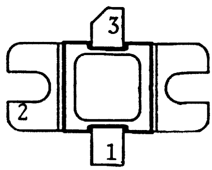
- FREQUENCY 1.2-1.4GHz
- POWER OUT 30W
- POWER GAIN 7.0dB
- VOLTAGE 35V
- PULSE WIDTH 400μs
- DUTY CYCLE 20%
- DESIGNED FOR USE IN LONG PULSE L-BAND APPLICATIONS LIKE RADAR, JTIDS, ETC.
- EXTREMELY RUGGED
- THERMALLY STABLE
- GOLD METALLIZATION
- STRIPLINE, HERMETIC FLANGE PACKAGE



.400 x .400 2LFL (M138)
hermetic sealed

ORDER CODE	BRANDING
SD1501	SD1501

PIN CONNECTION



S88SD1501-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1501 is a gold metallized silicon NPN Planar Pulsed Transistor that has been designed for use in extended pulse width and duty cycle applications from 1200 to 1400MHz. This device is extremely rugged, thermally stable, and operates at 400μs pulse width and 20% duty cycle.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	5.5	A
P_{TOT}	Total Device Dissipation at + 25°C	105.0	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-Case Thermal Resistance	.74	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

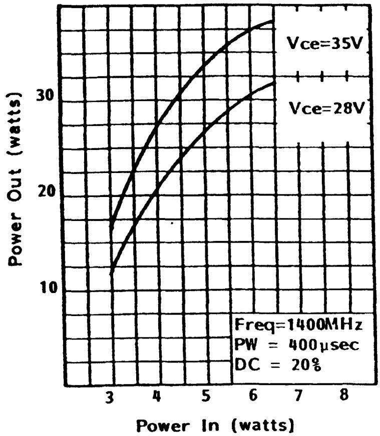
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 50mA	I_E = 0	65.0			V
BV_{CES}	I_C = 50mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 5.0mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			10.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 250.0mA	20.0			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 1400MHz	V_{CE} = 35.0V	PW = 400μsec DC = 20%	30.0			W
P_G	f = 1400MHz	V_{CE} = 35.0V	PW = 400μsec DC = 20%	7.0			dB
Z_{in}	f = 1300MHz	V_{CE} = 35.0V	P_{in} = 5.0W		1.6+j3.1		Ω
Z_{cl}	f = 1300MHz	V_{CE} = 35.0V	P_{in} = 5.0W		1.5+j2.2		Ω

POWER OUT vs. POWER IN

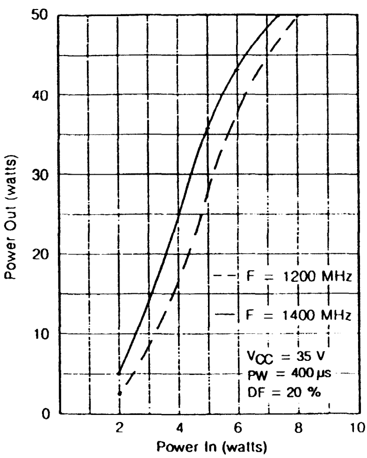


S88SD1501-02

Frequency = 1.3GHz
Pulse Width = 400µs at 20%
V_{CC} = 28V

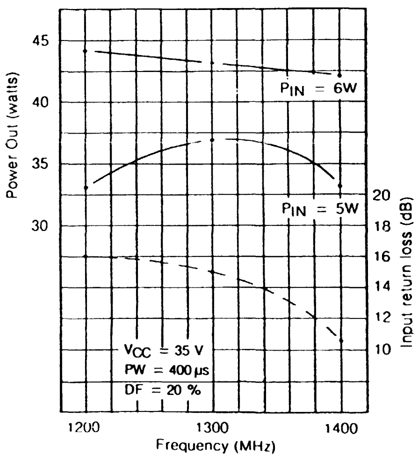
Z_{IN} = 1.6 + j3.1Ω
Z_{CL} = 1.5 + j2.2Ω

TYPICAL OUTPUT POWER VERSUS INPUT POWER



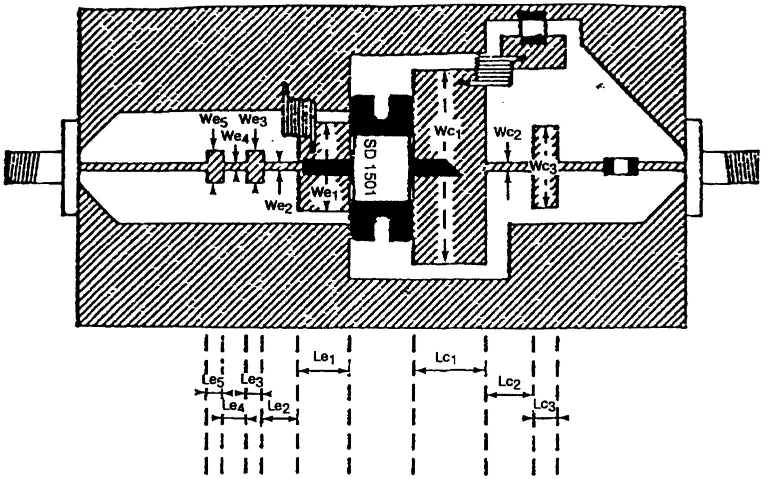
S88SD1501-03

TYPICAL OUTPUT POWER AND IMPUT RETURN LOSS VERSUS FREQUENCY



S88S1501-04

TEST FIXTURE DRAWING



S88SD1501-05

INPUT CIRCUIT

We_1 = .535" = 13.6mm
We_2 = .040" = 1.0mm
We_3 = .205" = 5.2mm
We_4 = .040" = 1.0mm
We_5 = .200" = 5.1mm

Le_1 = .320" = 8.1mm
Le_2 = .215" = 5.5mm
Le_3 = .110" = 2.8mm
Le_4 = .160" = 4.1mm
Le_5 = .105" = 2.7mm

OUTPUT CIRCUIT

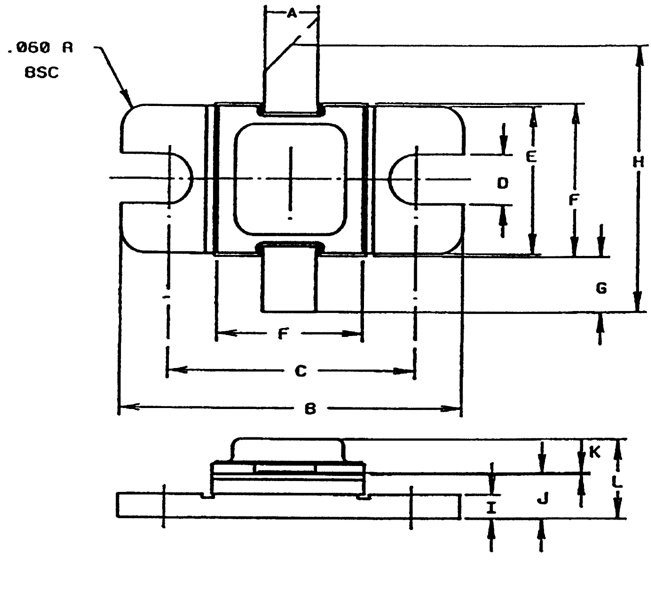
Wc_1 = 1.225" = 31.1mm
Wc_2 = .055" = 1.4mm
Wc_3 = .510" = 13.mm

Lc_1 = .445" = 11.3mm
Lc_2 = .285" = 7.2mm
Lc_3 = .150" = 3.8mm

EPSILAM 6 : Er ≈ 6
THICKNESS : .030" = .762mm

PACKAGE MECHANICAL DATA

.400 x .400 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.090/2.29	.105/2.67
B	.890/22.61	.910/23.11
C	.640/16.26	.660/16.76
D	.120/3.05	.130/3.30
E	.380/9.65	.390/9.91
F	.395/10.03	.405/10.29

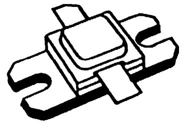
	Minimum Inches/mm	Maximum Inches/mm
G	.240/6.10	.260/6.60
H	.885/22.48	
I	.055/1.40	.065/1.65
J	.110/2.79	.130/3.30
K	.002/0.05	.006/0.15
L		.230/5.84

SGS-THOMSON
MICROELECTRONICS

SD1504

RF & MICROWAVE TRANSISTORS
L BAND RADAR APPLICATIONS

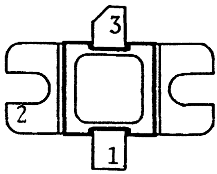
- FREQUENCY 1.2-1.4GHz
- POWER OUT 50.0W
- POWER GAIN 7.8dB
- VOLTAGE 45.0V
- PULSE WIDTH 300μs
- DUTY CYCLE 10%
- DESIGNED FOR HIGH POWER PULSE AT L-BAND
- ALL GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- COMMON BASE CONFIGURATION



.400 x .400 2LFL (M138)
hermetic sealed

ORDER CODE	**BRANDING**
SD1504	SD1504

PIN CONNECTION



S88SD1504-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1504 is a NPN gold metallized silicon transistor designed for long pulse applications from 1200-1400MHz. The SD1504 features an all gold metallized system, is thermally stable, and is suitable for HI REL and military applications.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CES}	Collector - Emitter Voltage	65	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	4.5	A
P_{TOT}	Total Device Dissipation at + 25°C	150	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.70	°C/W

ELECTRICAL CHARACTERISTICS ($T_{case} = 25°C$)

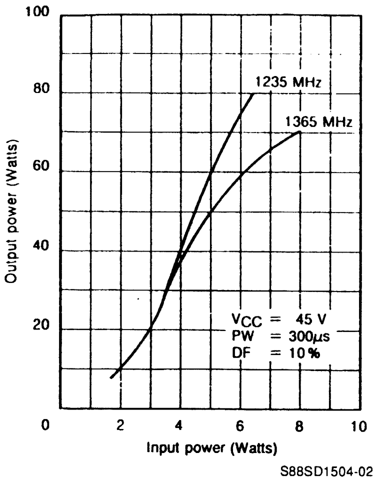
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	$I_C = 50.0mA$	$I_E = 0$	65			V
BV_{CES}	$I_C = 50.0mA$	$I_B = 0$	65			V
BV_{EBO}	$I_E = 5.0mA$	$I_C = 0$	3.5		6.5	V
I_{CES}	$V_{CE} = 50.0V$	$V_{BE} = 0$			10	mA
H_{FE}	$V_{CE} = 50.0V$	$I_C = 250mA$	20			

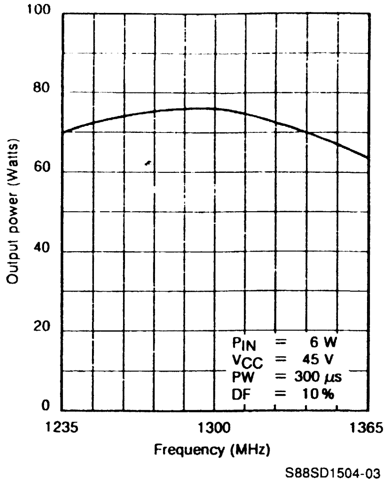
DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O	f = 1400MHz	$V_{CE} = 45.0V$	50			W
P_G	PW = 300μs	DC = 10%	7.8			dB

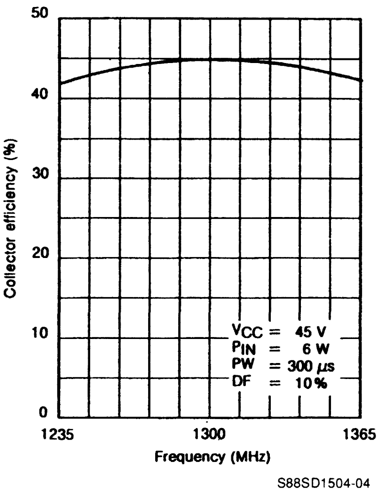
OUTPUT POWER VERSUS INPUT POWER



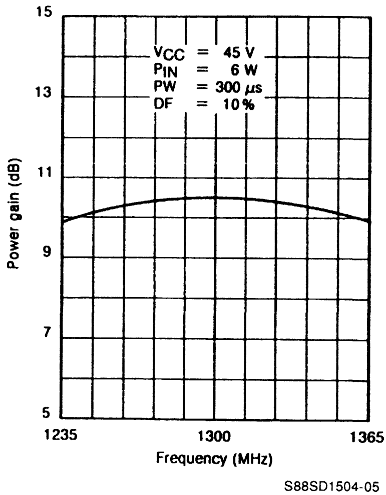
OUTPUT POWER VERSUS FREQUENCY



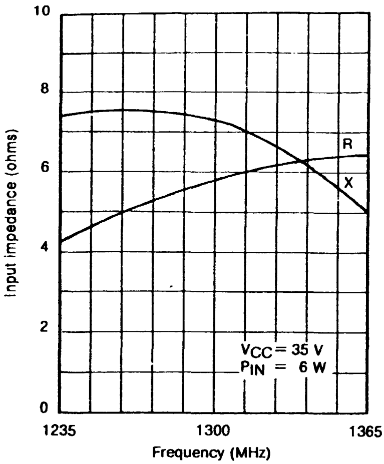
COLLECTOR EFFICIENCY VERSUS FREQUENCY



POWER GAIN VERSUS FREQUENCY

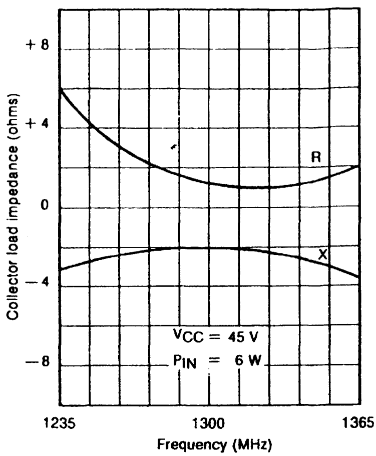


INPUT IMPEDANCE VERSUS FREQUENCY



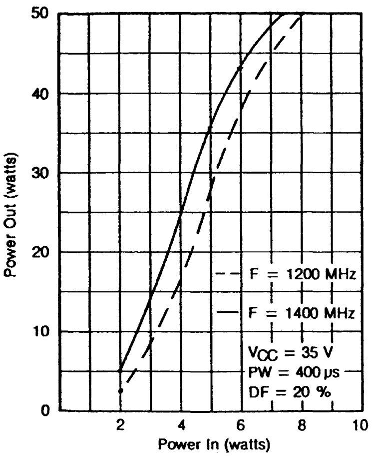
S88SD1504-06

COLLECTOR LOAD IMPEDANCE VERSUS FREQUENCY



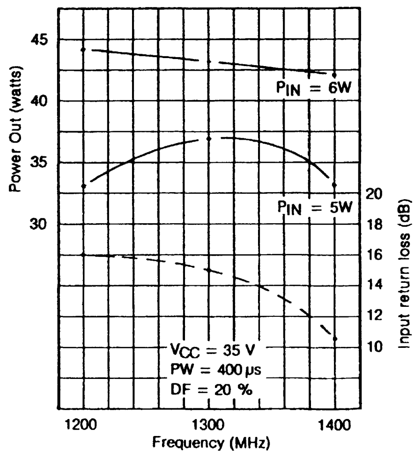
S88SD1504-07

TYPICAL OUTPUT POWER VERSUS INPUT POWER



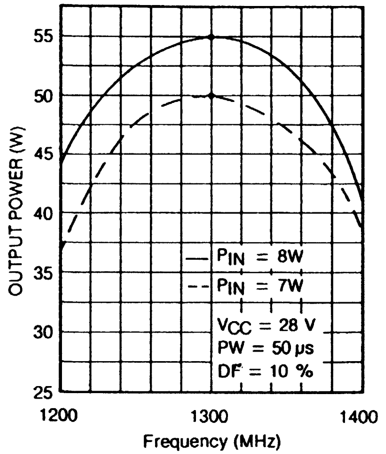
S88SD1504-08

TYPICAL OUTPUT POWER AND INPUT RETURN LOSS VERSUS FREQUENCY

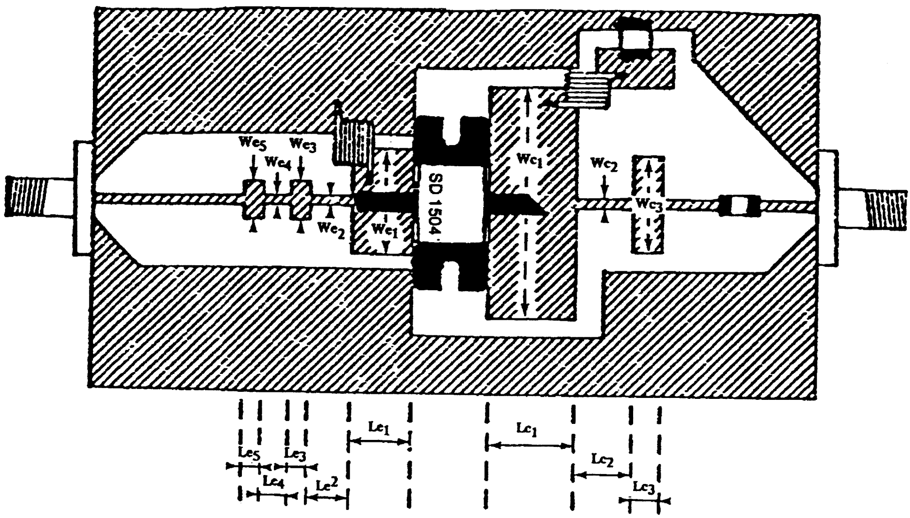


S88SD1504-09

TYPICAL OUTPUT POWER VERSUS FREQUENCY



S88SD1504-10



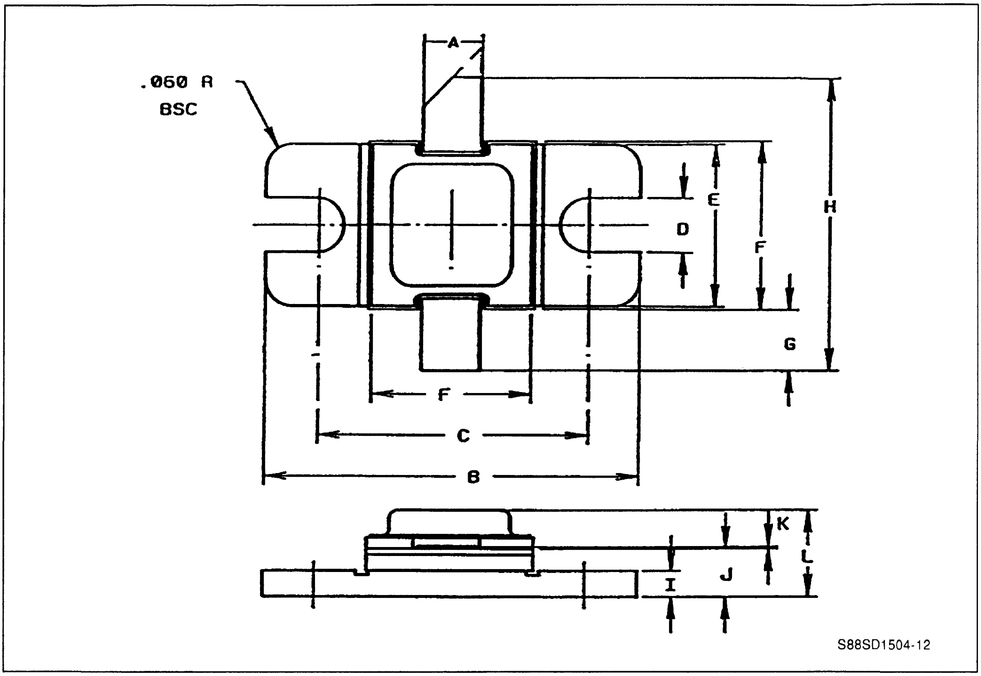
INPUT CIRCUIT	We_1 = .535" = 13.6mm	Le_1 = .320" = 8.1mm
	We_2 = .040" = 1.0mm	Le_2 = .215" = 5.5mm
	We_3 = .205" = 5.2mm	Le_3 = .110" = 2.8mm
	We_4 = .040" = 1.0mm	Le_4 = .160" = 4.1mm
	We_5 = .200" = 5.1mm	Le_5 = .105" = 2.7mm
OUTPUT CIRCUIT	Wc_1 = 1.225" = 31.1mm	Lc_1 = .445" = 11.3mm
	Wc_2 = .055" = 1.4mm	Lc_2 = .285" = 7.2mm
	Wc_3 = .510" = 13.	Lc_3 = .150" = 3.8mm

EPSILAM 6 : Er ≈ 6 **THICKNESS :.030" = .762mm**

S88SD1504-11

PACKAGE MECHANICAL DATA

.400 x .400 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.090/2.29	.105/2.67
B	.890/22.61	.910/23.11
C	.640/16.26	.660/16.76
D	.120/3.05	.130/3.30
E	.380/9.65	.390/9.91
F	.395/10.03	.405/10.29

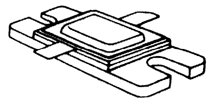
	Minimum Inches/mm	Maximum Inches/mm
G	.240/6.10	.260/6.60
H	.885/22.48	
I	.055/1.40	.065/1.65
J	.110/2.79	.130/3.30
K	.002/0.05	.006/0.15
L		.230/5.84

SGS-THOMSON
MICROELECTRONICS

SD1505

RF & MICROWAVE TRANSISTORS
L BAND RADAR APPLICATIONS

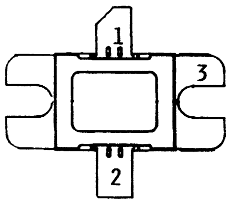
- FREQUENCY 1.2-1.4GHz
- POWER OUT 150.0W
- POWER GAIN 7.0dB
- VOLTAGE 50.0V
- PULSE WIDTH 300µs
- DUTY CYCLE 10%
- DESIGNED FOR HIGH POWER PULSE AT L-BAND
- ALL GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- COMMON BASE CONFIGURATION



.400 x .500 2LFL (M112)
hermetic sealed

ORDER CODE	**BRANDING**
SD1505	SD1505

PIN CONNECTION



S88SD1505-01

1 collector
2 emitter
3 base

DESCRIPTION

The SD1505 is a NPN gold metallized silicon transistor designed for long pulse applications from 1200-1400MHz. The SD1505 features an all gold metallized system, is thermally stable, and is suitable for HI REL and military applications.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CES}	Collector - Emitter Voltage	65	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	9.0	A
P_{TOT}	Total Device Dissipation at + 25°C	300	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.40	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

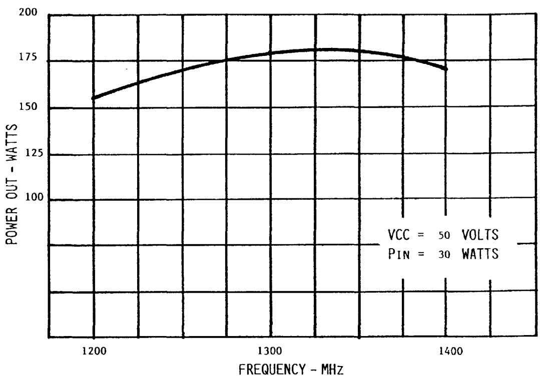
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 100mA	I_E = 0	65			V
BV	I_C = 100mA	I_E = 0	65			V
BV_{EBO}	I_C = 10mA		3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			20	mA
H_{FE}	V_{CE} = 5.0V	I_C = 500mA	20		100	

DYNAMIC

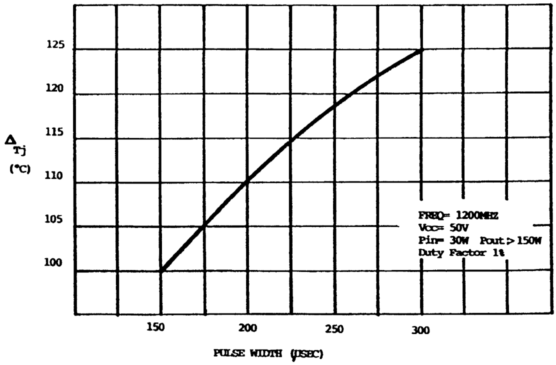
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 1400MHz	V_{CE} = 50.0V		150			W
P_G	PW = 300μs	DC = 10%	PIN = 30W	7.0			dB

TYPICAL BROADBAND POWER OUTPUT

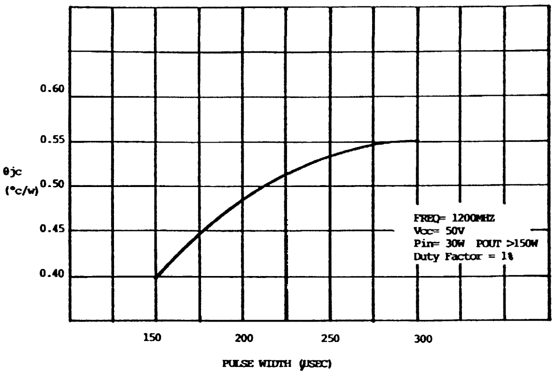


S88SD1505-02

THERMAL CHARACTERISTICS WORSE CASE HOT SPOT-TUNED FOR GAIN FLATNESS



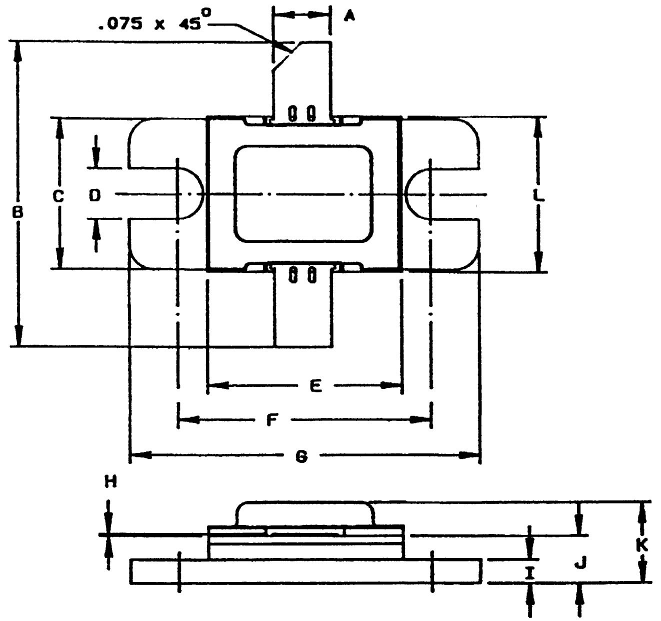
S88SD1505-03



S88SD1505-04

PACKAGE MECHANICAL DATA

.400 x .500 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.145/3.68	.155/3.93
B	.750/19.05	
C	.380/9.65	.390/9.91
D	.130/3.30 BSC	
E	.495/12.57	.505/12.83
F	.640/16.26	.655/16.64

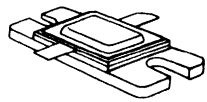
	Minimum Inches/mm	Maximum Inches/mm
G	.890/22.61	.910/23.11
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.115/2.92	.135/3.43
K		.230/5.84
L	.395/10.03	.405/10.29

SGS-THOMSON
MICROELECTRONICS

SD1507

RF & MICROWAVE TRANSISTORS
L BAND RADAR APPLICATIONS

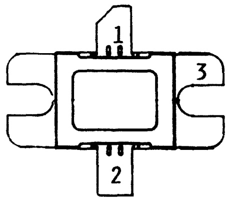
- FREQUENCY 1.2 - 1.4GHz
- POWER OUT 285W
- POWER GAIN 6.4dB
- VOLTAGE 50.0V
- PULSE WIDTH 150μs
- DUTY CYCLE 5%
- DESIGNED FOR HIGH POWER PULSE AT L-BAND
- EMITTER SITE BALLASTING
- INPUT AND OUTPUT MATCHING
- GOLD METALLIZATION
- HERMETICALLY SEALED PACKAGE
- COMMON BASE CONFIGURATION



.400 X .500 2LFL (M112)
hermetic sealed

ORDER CODE	**BRANDING**
SD1507	SD1507

PIN CONNECTION



S88SD1507-01

1 collector
2 emitter
3 base

DESCRIPTION

The SD1507 is a single ended 300W power transistor designed primarily for use in short and medium pulse radar applications in the L-band frequency range.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	17	A
P_{TOT}	Total Device Dissipation at + 25°C	750	W
T_{STG}	Storage Temperature	− 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

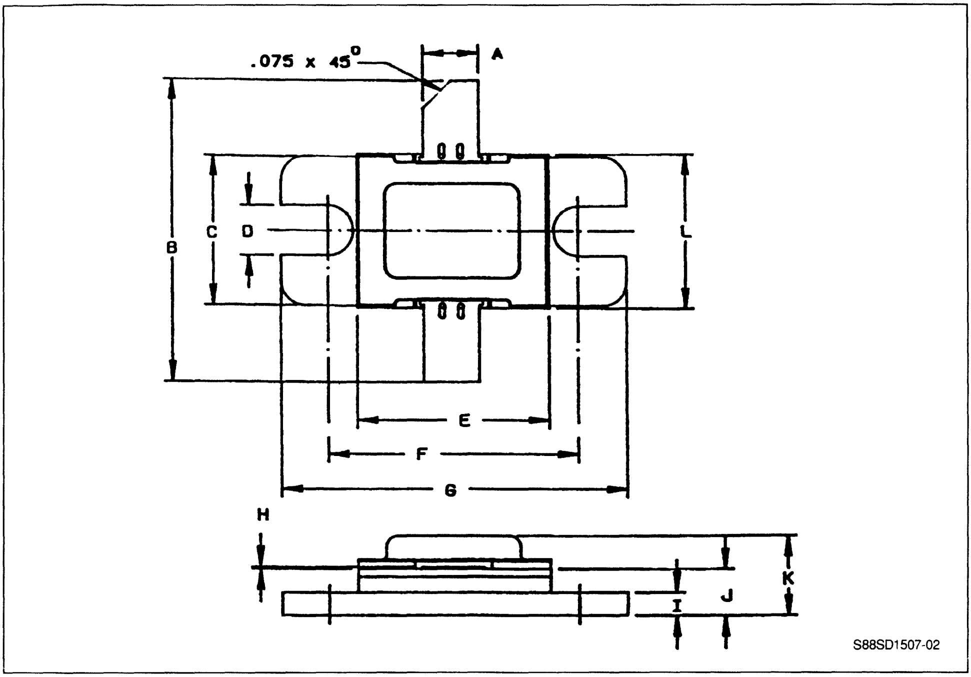
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 35mA	I_E = 0	65	80		V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50V	V_{BE} = 0			25	mA
h_{FE}	V_{CE} = 5V	I_C = ?A	15		200	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 1200 - 1400MHz	PW = 150μs	DC = 5%	285	300		W
P_G	V_{CC} = 50V	PW = 150μs	DC = 5%	6.4			dB
η_C	P_{IN} = 65W			40			%

PACKAGE MECHANICAL DATA

.400 X .500 2LFL



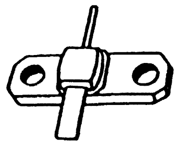
	Minimum Inches/mm	Maximum Inches/mm
A	.145/3.68	.155/3.93
B	.750/19.05	
C	.380/9.65	.390/9.91
D	.130/3.30 BSC	
E	.495/12.57	.505/12.83
F	.640/16.26	.655/16.64
G	.890/22.61	.910/23.11
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.115/2.92	.135/3.43
K		.230/5.84
L	.395/10.03	.405/10.29

SGS-THOMSON
MICROELECTRONICS

SD1511-8

RF & MICROWAVE TRANSISTORS
UHF PULSE POWER

- COMMON EMITTER
- 12W TYPICAL CW
- 15W TYPICAL PULSED
- GOLD METALLIZATION
- EMITTER BALLAST
- 30:1 LOAD VSWR CAPABILITY

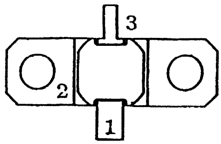


.250 x .250 2LFL (M105)
hermetic sealed

ORDER CODE SD1511-08

BRANDING SD11511-8

PIN CONNECTION



S88SD1511-8-01

1 emitter
2 base
3 collector

DESCRIPTION

- Gold Metallized Silicon NPN
- For 28V CW and Pulsed Radar Application

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	65	V
V_{CES}	Collector-Emitter Voltage	65	V
V_{EBO}	Emitter-Base Voltage	4	V
I_C	Collector Current (max.)	2	A
P_{TOT}	Total Device Dissipation at + 25°C	58.3	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	JunctionTemperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-Case Thermal Resistance	3	°C/W

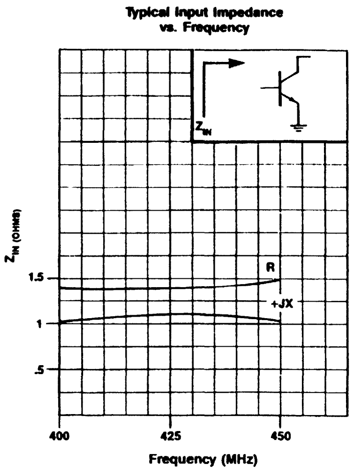
ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

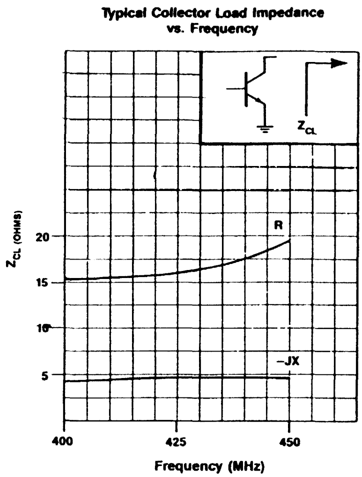
Symbol	Test Conditions	Value Min.	Value Typ.	Value Max.	Unit
BV_{CBO}	I_C = 10mA	65			V
BV_{EBO}	I_E =1mA	4			V
I_{CBO}	V_{CB} = 30V			1	mA
h_{FE}	V_{CE} = 5V I_C = 1A	10		100	

DYNAMIC

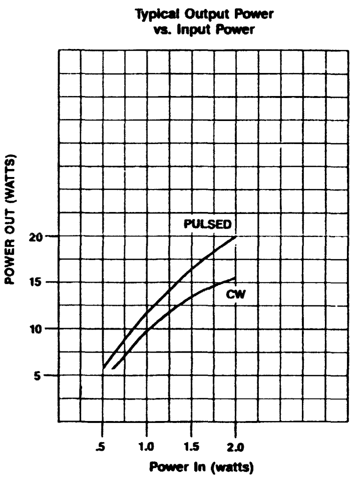
Symbol	Test Conditions	Value Min.	Value Typ.	Value Max.	Unit
P_{out}	f = 425MHz V_{CC} = 28V P_{in} = 1.2W	10	12		W
P_{GAIN}	f = 425MHz V_{CC} = 28V P_{in} = 1.2W	9.2	10		dB
ηc	f = 425MHz V_{CC} = 28V P_{out} = 10W	50	55		%



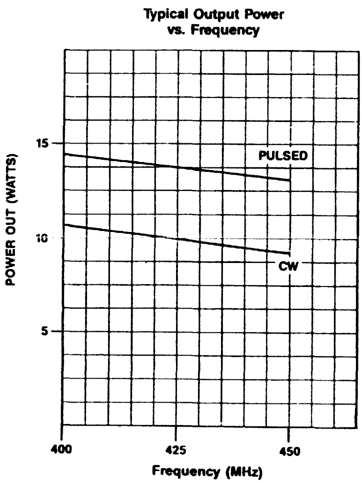
S88SD1511-8-02



S88SD1511-8-03



S88SD1511-8-04

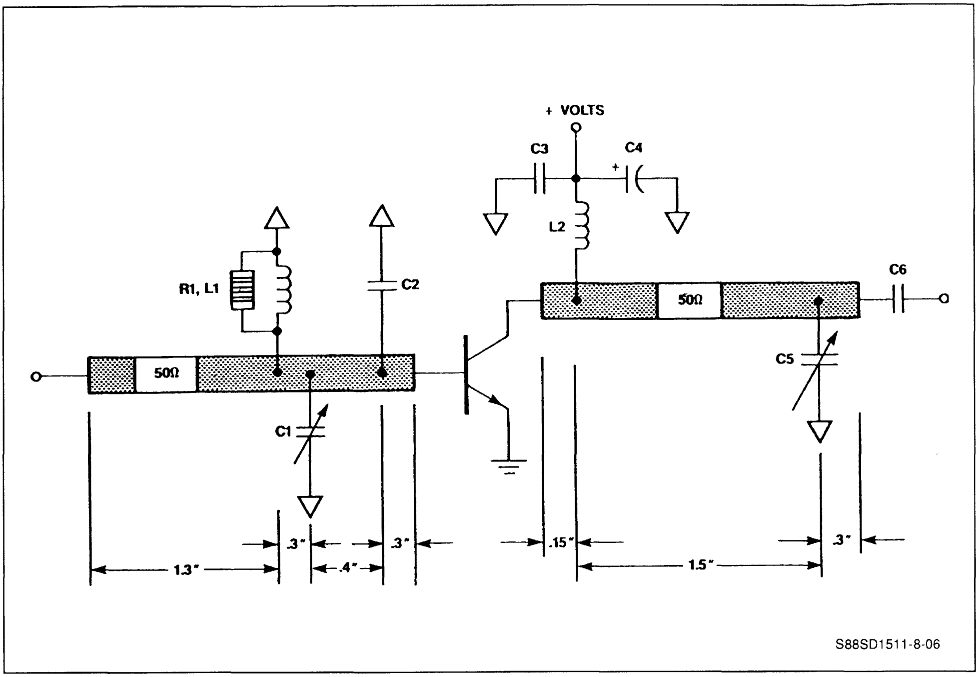


S88SD1511-8-05

Pulse Conditions
Pulse width = 250μs
Duty Factor = 10%

TEST CIRCUIT 425MHz WIDEBAND

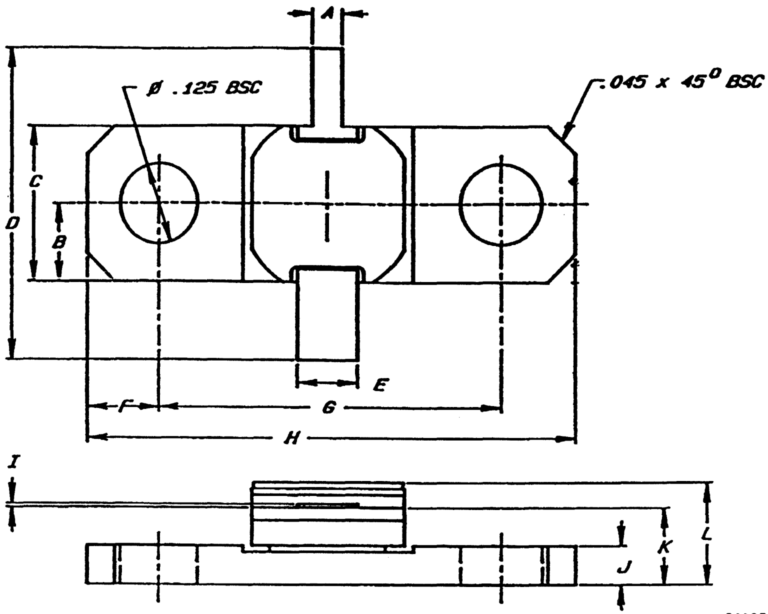
.030 " 3M EPSILAM 6 SUBSTRATE



Component	L1	L2	R1	C1, C5	C2	C3, C6	C4
Value	12.5 Turns AWG # 24	AWG # 18 Hairpin L = 1"	1000	6-12	33	470	1000
Units			Ω	pF	pF	pF	µF

PACKAGE MECHANICAL DATA

.250 x .250 2LFL



S88SD1511-8-07

	Minimum Inches/mm	Maximum Inches/mm
A	.045/1.14	.055/1.40
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	1.235/31.37	
E	.095/2.41	.105/2.67
F	.119/3.02 BSC	

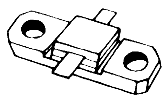
	Minimum Inches/mm	Maximum Inches/mm
G	.557/14.15	.567/14.40
H	.795/20.19	.805/20.45
I	.002/0.05	.006/0.15
J	.057/1.45	.067/1.70
K	.112/2.84	.132/3.35
L		.175/4.45

SGS-THOMSON
MICROELECTRONICS

SD1512

RF & MICROWAVE TRANSISTORS
MODE-S/JTIDS APPLICATIONS

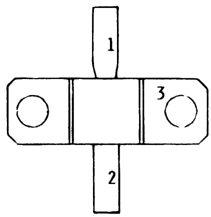
- DESIGNED FOR USE IN LONG PULSE L-BAND APPLICATIONS LIKE RADAR, JTIDS, ETC.
- EXTREMELY RUGGED
- THERMALLY STABLE
- GOLD METALLIZATION
- CAPABLE OF OPERATION AT400µs AND 20%
- STRIPLINE FLANGE PACKAGE



.250 x .250 2LFL (M124)
epoxy sealed

ORDER CODE	**BRANDING**
SD1512	SD1512

PIN CONNECTION



S88SD1512-01

1 collector
2 emitter
3 base

DESCRIPTION

The SD1512 is a gold metallized silicon NPN Planar Pulsed Transistor that has been designed for use in extended pulse width and duty cycle applications from 960 to 1220MHz. This device is extremely rugged, thermally stable, and is capable of operation at pulse widths of 400µs and a duty cycle of 20%.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	30.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current (max.)	2.0	A
P_{TOT}	Total Device Dissipation at + 25°C	53.0	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	3.3	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

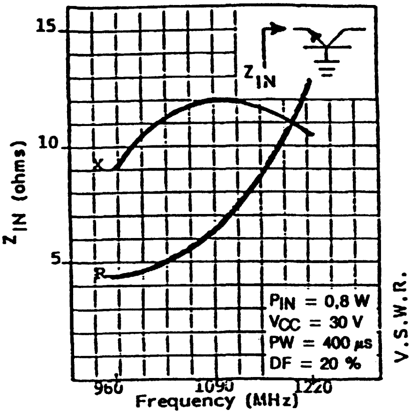
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 10mA	I_B = 0	30.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 28.0V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 100.0mA	20.0			

DYNAMIC

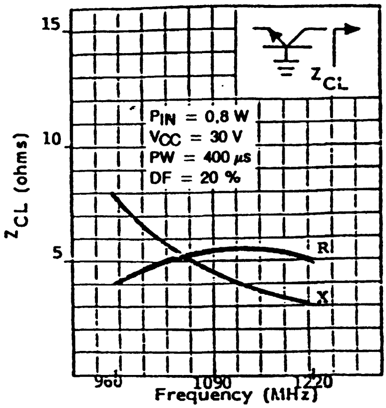
Symbol	Test Conditions				Value			Unit
					Min.	Typ.	Max.	
P_O	f = 960 to 1220MHz	V_{CE} = 30.0V	PW = 400μs	DC = 20%	5.0			W
P_G	f = 960 to 1220MHz	V_{CE} = 30.0V	PW = 400μs	DC = 20%	7.0			dB

Typical Input Impedance vs. Frequency



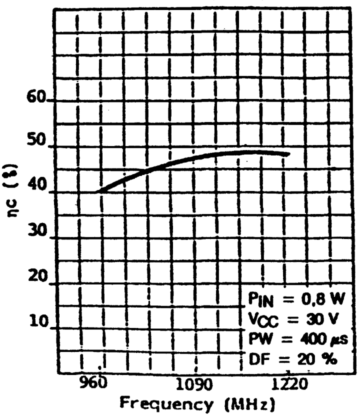
S88SD1512-02

Typical Collector Load Impedance vs. Frequency



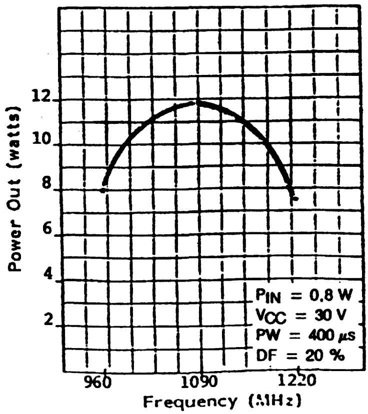
S88SD1512-03

Typical Collector Efficiency vs. Frequency

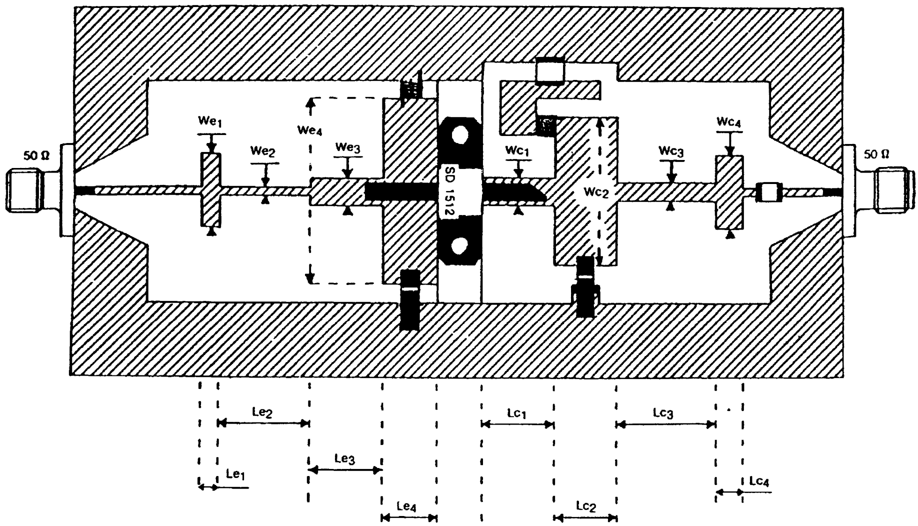


S88SD1512-04

Typical Output Power vs. Frequency



S88SD1512-05



Bandwith : 960 – 1220MHz
Pulse width : 400μs
Duty factor : 20%

Power In : 1W
Power Out : 5W
Collector voltage : 30V

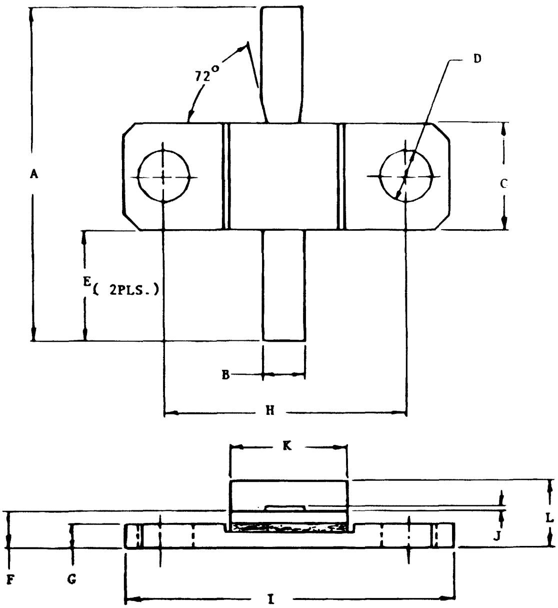
S88SD1512-06

Substrate : Dielectric constant : 6 Dielectric thickness : 30mils (762μm)	Dielectric constant : 10.2 Dielectric thickness : 25mils (635μm)

	Line	Width		Length		Line	Width		Length	
		Mils	mm	Mils	mm		Mils	mm	Mils	mm
Input Circuit	L_1	395	10	100	2.5	L_1	245	6.2	80	2
	L_2	40	1	490	12.5	L_2	20	0.5	395	10
	L_3	120	3	395	10	L_3	70	1.8	315	8
	L_4	1 "	25.5	205	5.2	L_4	640	16.2	160	4
Output Circuit	L_1	155	4	415	10.5	L_1	100	2.5	330	8.5
	L_2	790	20	355	9	L_2	500	12.7	275	7
	L_3	80	2	550	14	L_3	45	1.1	435	11
	L_4	395	10	140	3.5	L_4	245	6.2	110	2.7

PACKAGE MECHANICAL DATA

.250 x .250 2LFL



S88SD1512-07

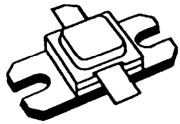
	Minimum Inches/mm	Maximum Inches/mm
A	.750/19.05	
B	.095/2.41	.105/2.67
C	.245/6.22	.255/6.48
D	.120/3.05	.130/3.30
E	.350/8.89	
F	.075/1.91	.100/2.54

	Minimum Inches/mm	Maximum Inches/mm
G	.058/1.47	.064/1.63
H	.555/14.10	.570/14.48
I	.795/20.19	.805/20.45
J	.003/0.08	.006/0.15
K	.245/6.22	.255/6.48
L	.150/3.81	.160/4.06

SD1513

RF & MICROWAVE TRANSISTORS MODE-S/JTIDS APPLICATIONS

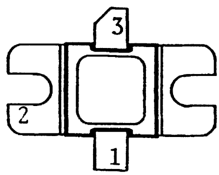
- DESIGNED FOR USE IN LONG PULSE L-BAND APPLICATIONS LIKE RADAR, JTIDS, ETC.
- EXTREMELY RUGGED
- THERMALLY STABLE
- GOLD METALLIZATION
- CAPABLE OF OPERATION AT 400µs AND 20%
- STRIPLINE, HERMETIC FLANGE PACKAGE



.400 x .400 2LFL (M138)
hermetic sealed

ORDER CODE	**BRANDING**
SD1513	SD1513

PIN CONNECTION



S88SD1513-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1513 is a gold metallized silicon NPN Planar Pulsed Transistor that has been designed for use in extended pulse width and duty cycle applications from 960 to 1220MHz. This device is extremely rugged, thermally stable, and is capable of operation at pulse width 400µs and a duty cycle of 20%.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	5.5	A
P_{TOT}	Total Device Dissipation at + 25°C	105.5	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.74	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

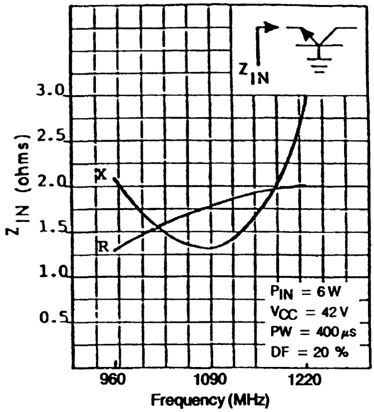
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 50mA	I_E = 0	65.0			V
BV_{CES}	I_C = 50mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 5.0mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			10.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 250.0mA	20.0			

DYNAMIC

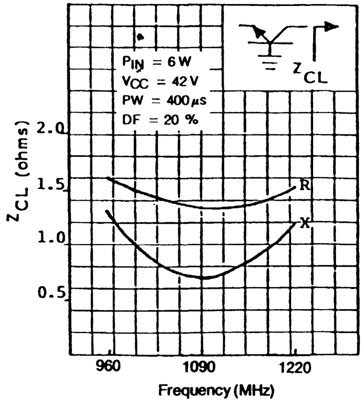
Symbol	Test Conditions				Value			Unit
					Min.	Typ.	Max.	
P_O	f = 960 to 1220MHz	V_{CE} = 42.0V	PW = 400μs	DC = 20%	30.0			W
P_G	f = 960 to 1220MHz	V_{CE} = 42.0V	PW = 400μs	DC = 20%	6.6			dB

Typical Input Impedance vs. Frequency



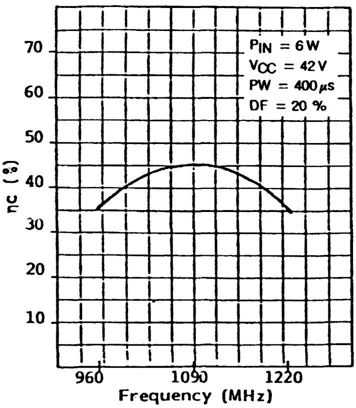
S88SD1513-02

Typical Collector Load Impedance vs. Frequency



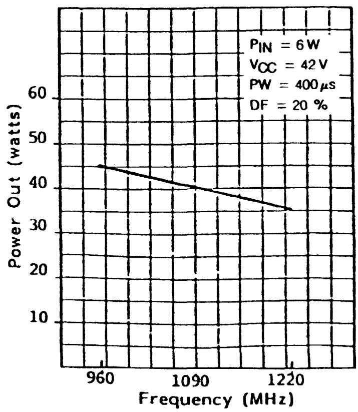
S88SD1513-03

Typical Collector Efficiency vs. Frequency



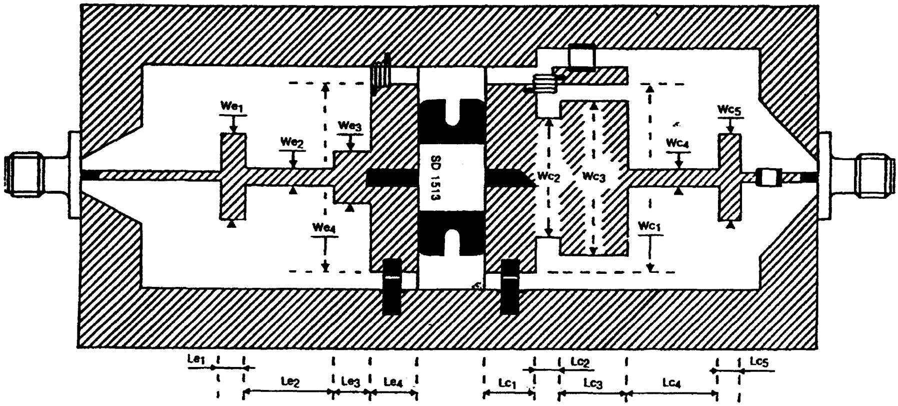
S88SD1513-04

Typical Output Power vs. Frequency



S88SD1513-05

TEST PICTURE DRAWING



BANDWIDTH : 960-1220MHz
PULSE WIDTH : 400µs
DUTY FACTOR : 20%
COLLECTOR VOLTAGE : 42V

S88SD1513-06

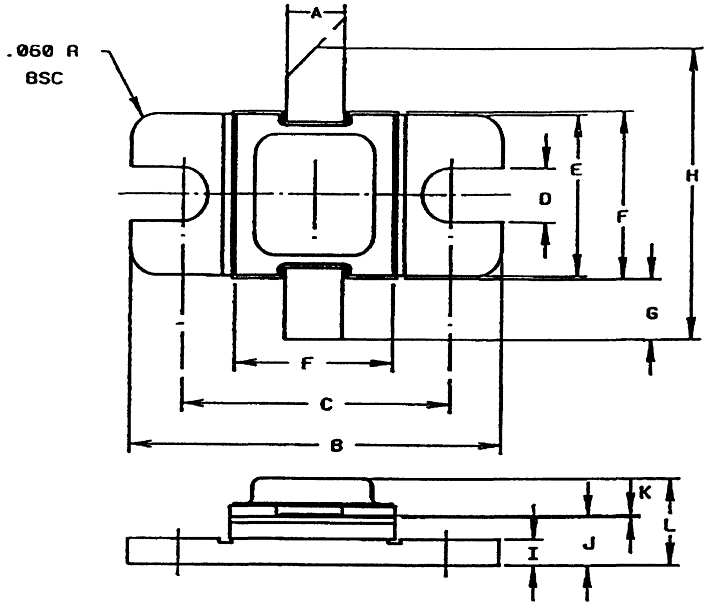
Substrate : Dielectric constant : 6
Dielectric thickness : 30 mils (762µm)

Dielectric constant : 10,2
Dielectric thickness : 25 mils (635µm)

	Line	Width		Length		Line	Width		Length	
		Mils	**mm**	**Mils**	**mm**		**Mils**	**mm**	**Mils**	**mm**
Input Circuit	L_1	470	12	140	3.5	L_1	295	7.5	110	2.7
	L_2	100	2.5	530	13.5	L_2	55	1.4	420	10.7
	L_3	275	7	225	5.7	L_3	170	4.3	175	4.5
	L_4	1.1 "	27.5	270	6.8	L_4	690	17.5	205	5.3
Output Circuit	L_1	1.1 "	28	295	7.5	L_1	700	17.8	230	5.8
	L_2	710	18	155	4	L_2	450	11.4	120	3.1
	L_3	865	22	405	10.3	L_3	550	14	315	8
	L_4	80	2	540	13.7	L_4	45	1.1	430	10.9
	L_5	490	12.5	120	3	L_5	309	7.8	90	2.3

PACKAGE MECHANICAL DATA

.400 x .400 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.090/2.29	.105/2.67
B	.890/22.61	.910/23.11
C	.640/16.26	.660/16.76
D	.120/3.05	.130/3.30
E	.380/9.65	.390/9.91
F	.395/10.03	.405/10.29

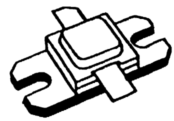
	Minimum Inches/mm	Maximum Inches/mm
G	.240/6.10	.260/6.60
H	.885/22.48	
I	.055/1.40	.065/1.65
J	.110/2.79	.130/3.30
K	.002/0.05	.006/0.15
L		.230/5.84

SGS-THOMSON
MICROELECTRONICS

SD1514

RF & MICROWAVE TRANSISTORS
MODE-S/JTIDS APPLICATIONS

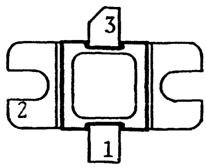
- DESIGNED FOR USE IN LONG PULSE L-BAND APPLICATIONS LIKE RADAR, JTIDS, ETC.
- EXTREMELY RUGGED
- THERMALLY STABLE
- GOLD METALLIZATION
- CAPABLE OF OPERATION AT 400µs, 20%
- STRIPLINE, HERMETIC FLANGE PACKAGE



.400 x .400 2LFL (M138)
hermetic sealed

ORDER CODE	**BRANDING**
SD1514	SD1514

PIN CONNECTION



S88SD1514-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1514 is a gold metallized silicon NPN Planar Pulsed Transistor that has been designed for use in extended pulse width and duty cycle applications from 960 to 1220MHz. This device is extremely rugged, thermally stable, and is capable of operation at pulse widths of 400µs and a duty cycle of 20%.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	9.0	A
P_{TOT}	Total Device Dissipation at + 25°C	175.0	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.44	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

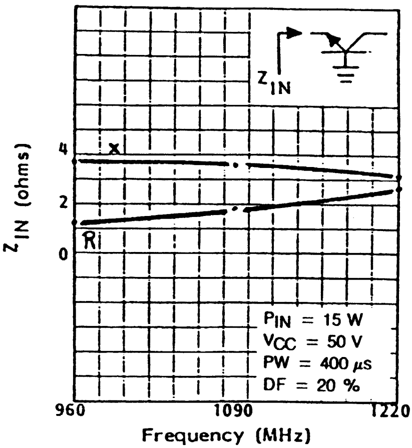
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 50mA	I_E = 0	65.0			V
BV_{CES}	I_C = 50mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 10.0mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			20.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 500.0mA	20.0			

DYNAMIC

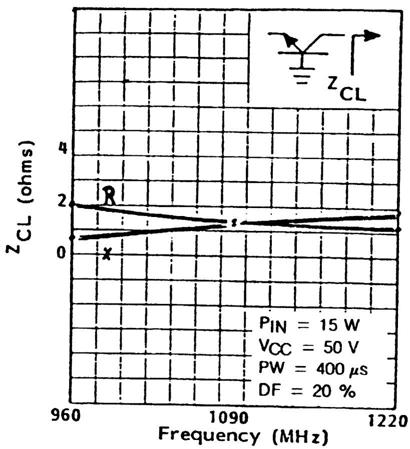
Symbol	Test Conditions				Value			Unit
					Min.	Typ.	Max.	
P_O	f = 960 to 1220MHz	V_{CE} = 50.0V	PW = 400µs	DC = 20%	100.0			W
P_G	f = 960 to 1220MHz	V_{CE} = 50.0V	PW = 400µs	DC = 20%	6.0			dB

TYPICAL INPUT IMPEDANCE vs. FREQUENCY



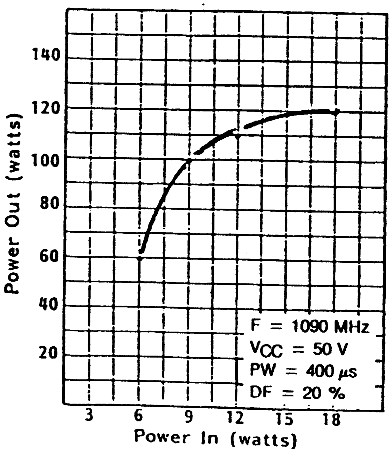
S88SD1514-02

TYPICAL COLLECTOR LOAD IMPEDANCE vs. FREQUENCY



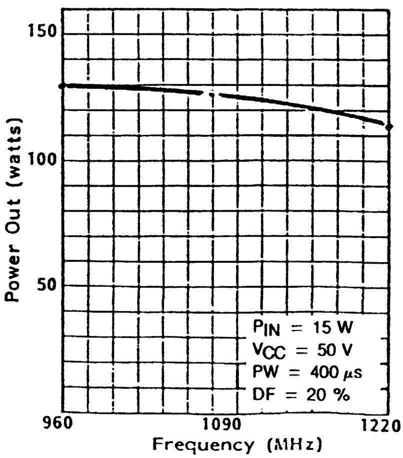
S88SD1514-03

TYPICAL OUTPUT POWER vs. INPUT POWER



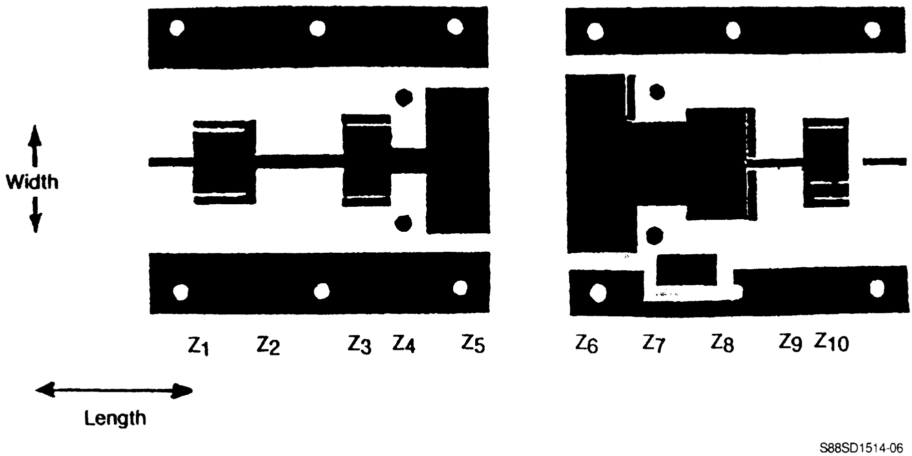
S88SD1514-04

TYPICAL OUTPUT POWER vs. FREQUENCY



S88SD1514-05

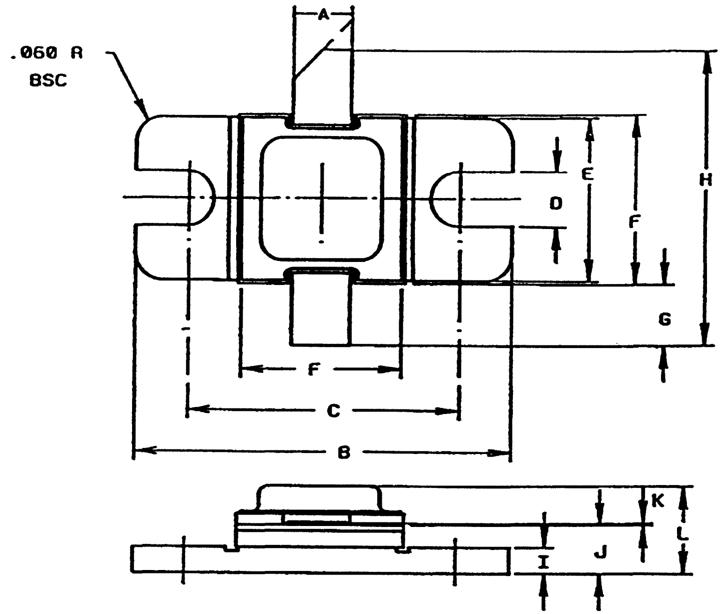
TEST CIRCUIT P.C BOARD



Line	Length		Width	
	Inches	mm	Inches	mm
Z_1	0.325	8,26	0.400	10,16
Z_2	0.650	16,51	0.083	2,11
Z_3	0.318	8,08	0.460	11,68
Z_4	0.230	5,84	0.160	4,06
Z_5	0.412	10,47	0.962	24,43
Z_6	0.400	10,16	1.165	29,59
Z_7	0.400	10,16	0.550	13,97
Z_8	0.400	10,16	0.728	18,49
Z_9	0.385	9,78	0.055	1,40
Z_{10}	0.300	7,62	0.350	8,89

PACKAGE MECHANICAL DATA

.400 x .400 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.090/2.29	.105/2.67
B	.890/22.61	.910/23.11
C	.640/16.26	.660/16.76
D	.120/3.05	.130/3.30
E	.380/9.65	.390/9.91
F	.395/10.03	.405/10.29

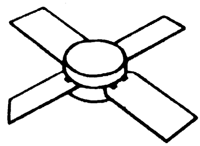
	Minimum Inches/mm	Maximum Inches/mm
G	.240/6.10	.260/6.60
H	.885/22.48	
I	.055/1.40	.065/1.65
J	.110/2.79	.130/3.30
K	.002/0.05	.006/0.15
L		.230/5.84

SGS-THOMSON MICROELECTRONICS

SD1520-3

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

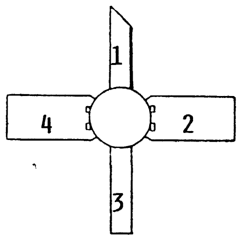
- DESIGNED FOR PULSE POWER IFF, DME, TACAN
- 1.0W (typ.) IFF1030-1090MHz
- 1.0W (min.) DME 1025-1150MHz
- 0.75W (typ) TACAN 960-1215MHz
- GREATER THAN 10.5dB GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INFINITE LOAD — VSWR CAPABILITY AT SPECIFIC OPERATING CONDITIONS
- INPUT MATCHED, COMMON EMITTER



.280 4LSL (M115)
epoxy sealed

ORDER CODE	**BRANDING**
SD1520-03	SD1520-3

PIN CONNECTION



S88SD1520-3-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1520-3 is a gold metallized, silicon NPN pulsed power transistor. The SD1520-3 is designed for Class A operation at IFF, DME, and TACAN frequencies. The SD1520-3 is packaged in the .280" input matched stripline package resulting in improved broadband performance and low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	50.0	V
V_{CEO}	Collector - Emitter Voltage	20.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.25	A
P_{TOT}	Total Device Dissipation at + 25°C	5.8	W
T_{STG}	Storage Temperature	− 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	30.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 5mA	I_B = 0	20.0			V
BV_{CBO}	I_C = 1mA	I_E = 0	50.0			V
BV_{EBO}	I_E = 1mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 28.0V	V_{BE} = 0			0.5	mA
h_{FE}	V_{CE} = 5.0V	I_C = 100mA		55.0		

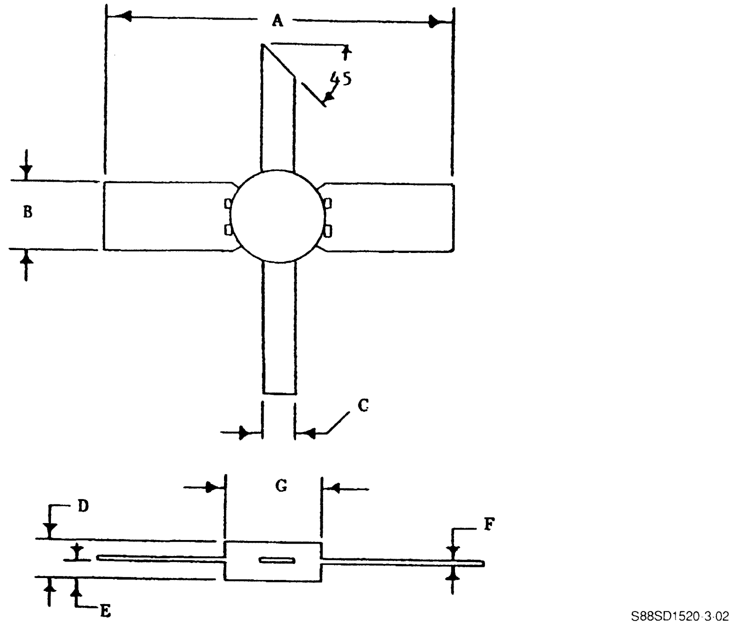
DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CE} = 28.0V		1.0		W
P_G	f = 1090MHz	V_{CE} = 28.0V		10.5		dB
P_o**	f = 1025/1150MHz	V_{CE} = 28.0V	1.0			W
P_g	f = 1025/1150MHz	V_{CE} = 28.0V	10.0			dB
P_o***	f = 960/1215MHz	V_{CE} = 28.0V		0.75		W
P_g	f = 960/1215MHz	V_{CE} = 28.0V		8.5		dB

** Pulse width 10µs, duty cycle 1%.
*** Pulse width 10µs, duty cycle 10%.

PACKAGE MECHANICAL DATA

.280 4LSL



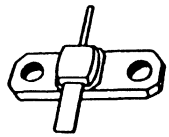
	Minimum Inches	Maximum Inches
A	1.000	
B	.195	.205
C	.095	.105
D	.120	.135
E	.050	.065
F	.004	.007
G	.275	.285

SGS-THOMSON
MICROELECTRONICS

SD1520-8

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

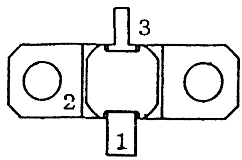
- DESIGNED FOR PULSE POWER IFF, DME, TACAN
- 0.25 WATT (typ) IFF 1030-1090MHz
- 0.20 WATT (min.) DME 1025-1150MHz
- 0.15 WATT (typ) TACAN 960-1215MHz
- GREATER THAN 9.5dB GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INFINITE LOAD — VSWR CAPABILITY AT SPECIFIC OPERATING CONDITIONS
- INPUT MATCHED, COMMON EMITTER



.250 x .250 4LFL (M105)
hermetic sealed

ORDER CODE	BRANDING
SD1520-08	SD1520-8

PIN CONNECTION



S88SD1520-8-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1520-8 is a gold metallized, silicon NPN pulsed power transistor. The SD1520-8 is designed for Class A operation at IFF, DME, and TACAN frequencies. The SD1520-8 is packaged in the .250" input matched hermetic stripline flange package resulting in improved broadband performance and low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	50.0	V
V_{CEO}	Collector - Emitter Voltage	20.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.25	A
P_{TOT}	Total Device Dissipation at + 25°C	5.8	W
T_{STG}	Storage Temperature	− 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	30.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 5mA	I_B = 0	20.0			V
BV_{CBO}	I_C = 1mA	V_{BE} = 0	50.0			V
BV_{EBO}	I_E = 1mA	I_C = 0	3.5			V
I_{CES}	V_{CB} = 28.0V	V_{BE} = 0			1.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 100mA		55.0		

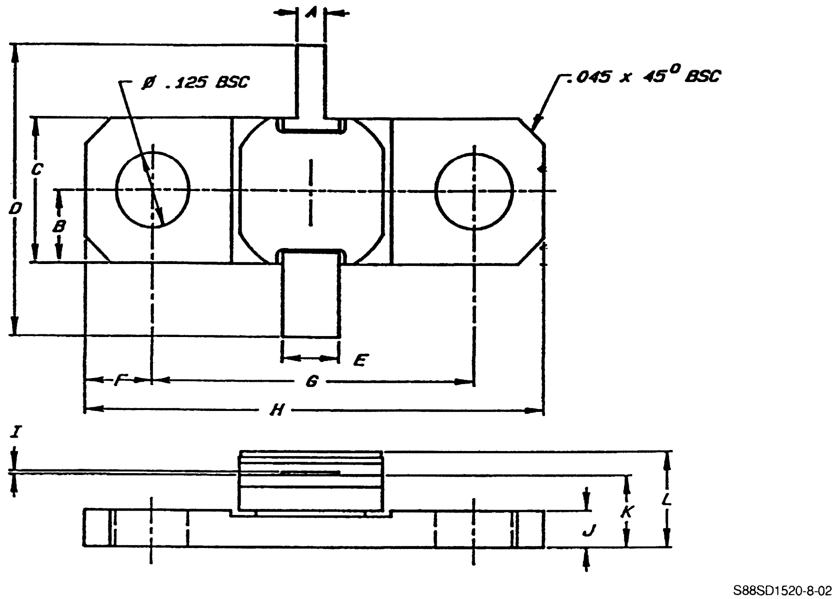
DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CE} = 28.0V		0.25		W
P_G	f = 1090MHz	V_{CE} = 28.0V		9.5		dB
P_o**	f = 1025/1150MHz	V_{CE} = 28.0V	0.20			W
P_g	f = 1025/1150MHz	V_{CE} = 28.0V	9.0			dB
P_o***	f = 960/1215MHz	V_{CE} = 28.0V		0.15		W
P_g	f = 960/1215MHz	V_{CE} = 28.0V		8.5		dB

** Pulse width 10µs, duty cycle 1%
*** Pulse width 10µs, duty cycle 10%.

PACKAGE MECHANICAL DATA

.250 x .250 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.045/1.14	.055/1.40
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	1.235/31.37	
E	.095/2.41	.105/2.67
F	.119/3.02 BSC	

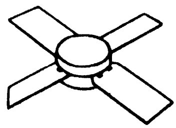
	Minimum Inches/mm	Maximum Inches/mm
G	.557/14.15	.567/14.40
H	.795/20.19	.805/20.45
I	.002/0.05	.006/0.15
J	.057/1.45	.067/1.70
K	.112/2.84	.132/3.35
L		.175/4.45

SGS-THOMSON MICROELECTRONICS

SD1522-3

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATION

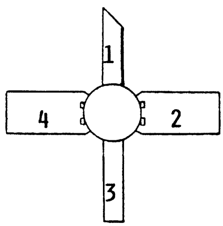
- DESIGNED FOR PULSE POWER IFF, DME, TACAN
- 1.7 WATT (typ) IFF 1030-1090MHz
- 1.5 WATT (min) DME 1025-1150MHz
- 1.25 WATT (typ) TACAN 960-1215MHz
- GREATER THAN 9.3dB @IFF
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INFINITE LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.280 4LSL (M115)
epoxy sealed

ORDER CODE	BRANDING
SD1522-03	SD1522-3

PIN CONNECTION



S88SD1522-3-01

1 collector
2 base
3 emitter
4 base

DESCRIPTION

The SD1522-3 is a gold metallized, silicon NPN power transistor. The SD1522-3 is designed for applications requiring peak power and low duty cycles such as IFF, DME, TACAN. The SD1522-3 is packaged in the .280 input matched stripline package resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45.0	V
V_{CES}	Collector - Emitter Voltage	45.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.5	A
P_{TOT}	Total Device Dissipation at + 25°C	8.0	W
T_{STG}	Storage Temperature	− 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	21.9	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_B = 0	45.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	45.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V

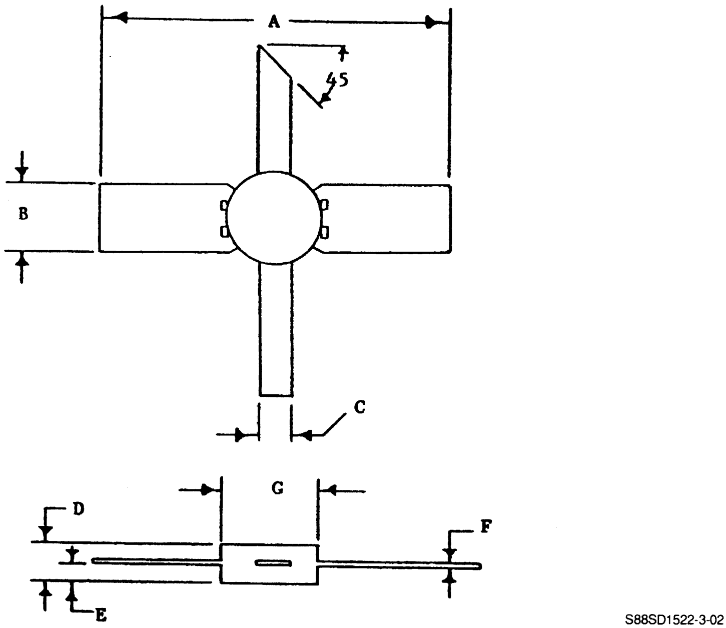
DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CE} = 35.0V		1.7		W
P_G	f = 1090MHz	V_{CE} = 35.0V		9.3		dB
P_o***	f = 1025/1150MHz	V_{CE} = 35.0V	1.5			W
P_g	f = 1025/1150MHz	V_{CE} = 35.0V	8.75			dB
P_o***	f = 960/1215MHz	V_{CE} = 35.0V		1.25		W
P_g	f = 960/1215MHz	V_{CE} = 35.0V		8.25		dB

** Pulse width 10µs, duty cycle 1%.
*** Pulse width 10µs, duty cycle 10%.

PACKAGE MECHANICAL DATA

.280 4LSL



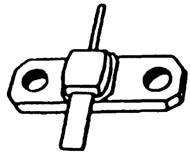
	Minimum Inches	Maximum Inches
A	1.000	
B	.195	.205
C	.095	.105
D	.120	.135
E	.050	.065
F	.004	.007
G	.275	.285

SGS-THOMSON MICROELECTRONICS

SD1522-9

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

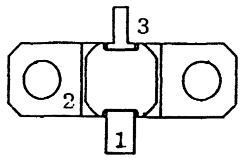
- DESIGNATED FOR PULSE POWER IFF, DME, TACAN
- 1.7 WATTS (typ) IFF 1030-1090MHz
- 1.5 WATTS (min) DME 1025-1150MHz
- 1.2 WATTS (typ) TACAN 960-1215MHz
- GREATER THAN 6.2dB GAIN @ IFF
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INFINITE LOAD — VSWR CAPABILITY AT SPECIFIED OPERATION CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.280 4LSL (M105)
hermetic sealed

ORDER CODE	BRANDING
SD1522-09	SD1522-9

PIN CONNECTION



S88SD1522-9-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1522-9 is a gold metallized silicon NPN power transistor. The SD1522-9 is designed for applications requiring peak power and low duty cycles such as IFF, DM TACAN. The SD1522-9 is packaged in the .250" input matched hermetic stripline flange package resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45.0	V
V_{CES}	Collector - Emitter Voltage	45.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.5	A
P_{TOT}	Total Device Dissipation at + 25°C	5.8	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	30.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

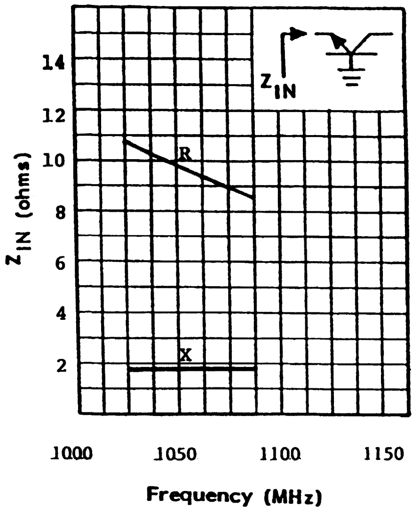
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_B = 0	45.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	45.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CE} = 35.0V		1.7		W
P_G	f = 1090MHz	V_{CE} = 35.0V		6.2		dB
P_o**	f = 1025/1150MHz	V_{CE} = 35.0V	1.5			W
P_g	f = 1025/1150MHz	V_{CE} = 35.0V	6.0			dB
P_o***	f = 960/1215MHz	V_{CE} = 35.0V		1.2		W
P_g	f = 960/1215MHz	V_{CE} = 35.0V		5.0		dB

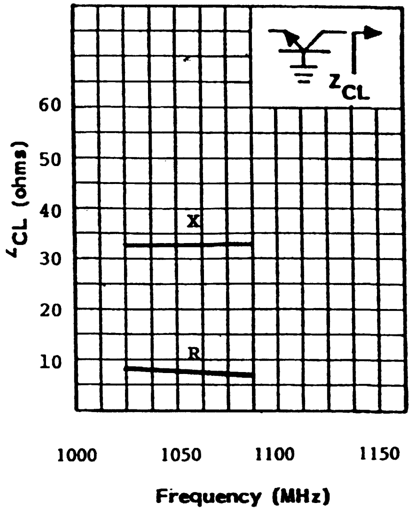
** Pulse width 10μs, duty cycle 1%.
*** Pulse width 10μs, duty cycle 10%.

TYPICAL INPUT IMPEDANCE vs. FREQUENCY



S88SD1522-9-02

TYPICAL COLLECTOR LOAD IMPEDANCE vs. FREQUENCY

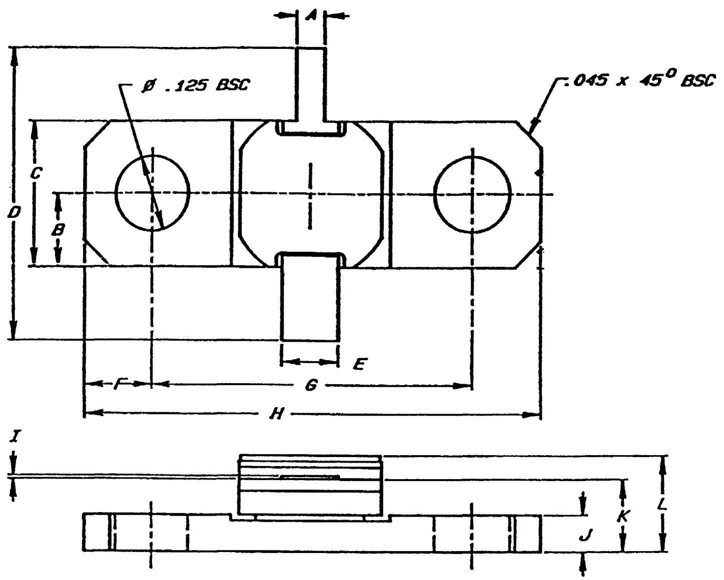


S88SD1522-9-03

P_{IN} = 0.2W
V_{CE} = 28V
P.W. = 10µs
D.F. = 1%

PACKAGE MECHANICAL DATA

.280 4LSL



	Minimum Inches/mm	Maximum Inches/mm
A	.045/1.14	.055/1.40
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	1.235/31.37	
E	.095/2.41	.105/2.67
F	.119/3.02 BSC	

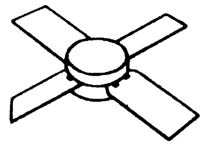
	Minimum Inches/mm	Maximum Inches/mm
G	.557/14.15	.567/14.40
H	.795/20.19	.805/20.45
I	.002/0.05	.006/0.15
J	.057/1.45	.067/1.70
K	.112/2.84	.132/3.35
L		.175/4.45

SGS-THOMSON
MICROELECTRONICS

SD1524-1

RF & MICROWAVE TRANSISTORS
IFF/DME APPLICATIONS

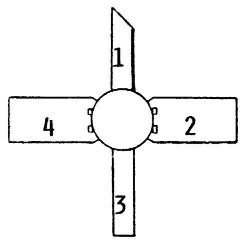
- DESIGNED FOR HIGH POWER PULSE IFF, DME, TACAN
- 3.0W (typ) IFF 1030-1090MHz
- 2.7W (min) DME 1025-1150MHz
- 2.3W (typ) TACAN 960-1215MHz
- GREATER THAN 10.0dB GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INFINITE LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.280 4LSL (M115)
epoxy sealed

ORDER CODE	BRANDING
SD1524-01	SD1524-1

PIN CONNECTION



S88SD1524-1-01

1 collector	3 emitter
2 base	4 base

DESCRIPTION

The SD1524-1 is a gold metallized, silicon NPN power transistor. The SD1524-1 is designed for applications requiring peak power and low duty cycles such as IFF, DME, TACAN. The SD1524-1 is packaged in the .280 input matched stripline package resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45.0	V
V_{CES}	Collector - Emitter Voltage	45.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.5	A
P_{TOT}	Total Device Dissipation at + 25°C	11.7	W
T_{STG}	Storage Temperature	− 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	15.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

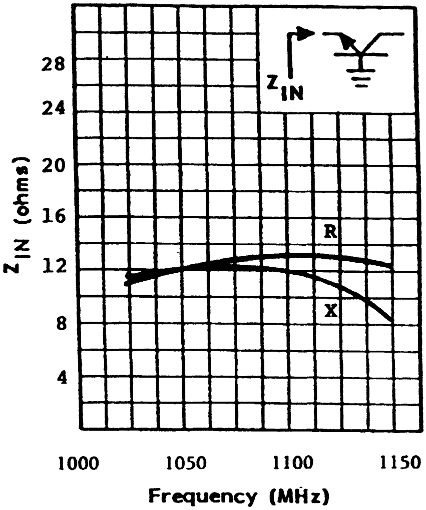
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_B = 0	45.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	45.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CB} = 28.	V_{BE} = 0			1.0	mA

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CE} = 28.0V		3.0		W
P_G	f = 1090MHz	V_{CE} = 28.0V		10.0		dB
P_o**	f = 1025/1150MHz	V_{CE} = 28.0V	2.7			W
P_g	f = 1025/1150MHz	V_{CE} = 28.0V	9.5			dB
P_o***	f = 960/1215MHz	V_{CE} = 28.0V		2.3		W
P_g	f = 960/1215MHz	V_{CE} = 28.0V		9.0		dB

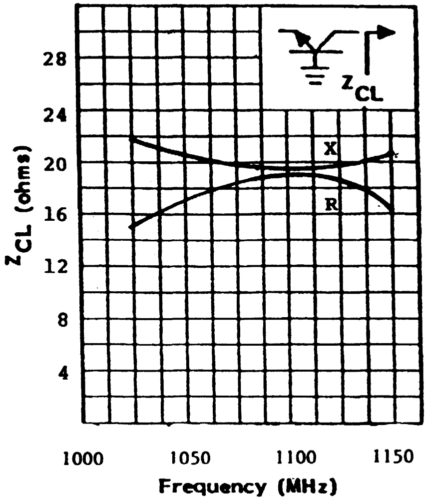
** Pulse width 10µs, duty cycle 1%.
*** Pulse width 10µs, duty cycle 10%.

TYPICAL INPUT IMPEDANCE vs. FREQUENCY



S88SD1524-1-02

TYPICAL COLLECTOR LOAD IMPEDANCE vs. FREQUENCY

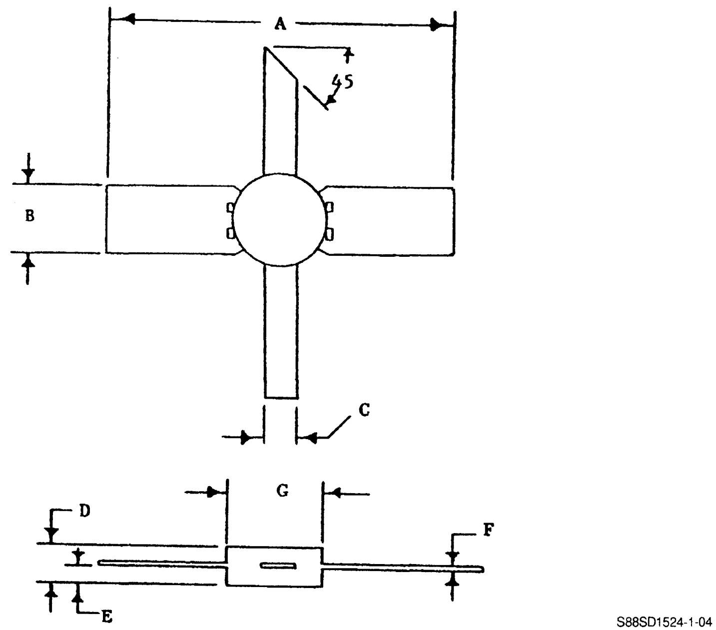


S88SD1524-1-03

P_{in} = 0.5W
V_{CE} = 28V
P.W. = 10μs
D.F. = 1%

PACKAGE MECHANICAL DATA

.280 4LSL



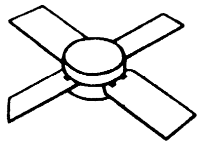
	Minimum Inches	Maximum Inches
A	1.000	
B	.195	.205
C	.095	.105
D	.120	.135
E	.050	.065
F	.004	.007
G	.275	.285

SGS-THOMSON
MICROELECTRONICS

SD1526-1

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

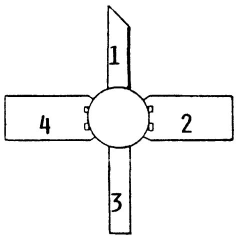
- DESIGNED FOR HIGH POWER PULSE IFF, DME, TACAN
- 6.0W (typ) IFF 1030-1090MHz
- 5.0W (min) DME 1025-1150MHz
- 4.0W (typ) TACAN 960-1215MHz
- GREATER THAN 9.5dB GAIN
- REFRACTORY BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INFINITE LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.280 4LSL (M115)
epoxy sealed

ORDER CODE	BRANDING
SD1526-01	SD1526-1

PIN CONNECTION



1 collector
2 base
3 emitter
4 base

DESCRIPTION

The SD1526-1 is a gold metallized, silicon NPN power transistor. The SD1526-1 is designed for applications requiring peak power and low duty cycles such as IFF, DME TACAN. The SD1526-1 is packaged in the .280" input matched stripline package resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45.0	V
V_{CES}	Collector - Emitter Voltage	45.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	1.0	A
P_{TOT}	Total Device Dissipation at + 25°C	21.9	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	8.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

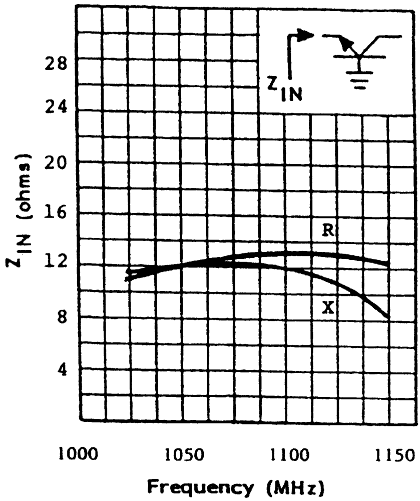
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_B = 0	45.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	45.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CB} = 28.0V	V_{BE} = 0			1.0	mA

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CE} = 28.0V		6.0		W
P_G	f = 1090MHz	V_{CE} = 28.0V		9.5		dB
P_o**	f = 1025/1150MHz	V_{CE} = 28.0V	5.0			W
P_g	f = 1025/1150MHz	V_{CE} = 28.0V	9.5			dB
P_o***	f = 960/1215MHz	V_{CE} = 28.0V		4.0		W
P_g	f = 960/1215MHz	V_{CE} = 28.0V		9.0		dB

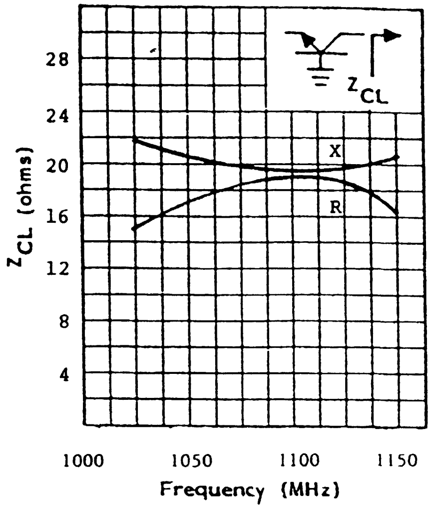
** Pulse width 10μs, duty cycle 1%.
*** Pulse width 10μs, duty cycle 10%.

TYPICAL INPUT IMPEDANCE vs. FREQUENCY



S88SD1526-1-02

TYPICAL COLLECTOR LOAD IMPEDANCE vs. FREQUENCY

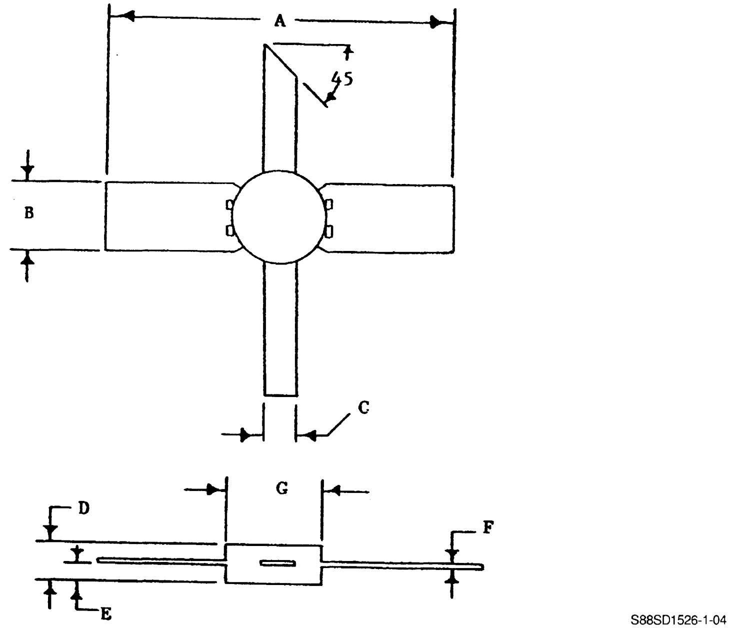


S88SD1526-1-03

Pin = 0.5W
V_{CE} = 28V
P.W. = 10µs
D.F. = 1%

PACKAGE MECHANICAL DATA

.280 4LSL



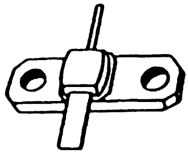
	Minimum Inches	Maximum Inches
A	1.000	
B	.195	.205
C	.095	.105
D	.120	.135
E	.050	.065
F	.004	.007
G	.275	.285

SGS-THOMSON MICROELECTRONICS

SD1527-8

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

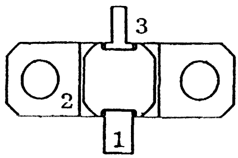
- DESIGNATED FOR HIGH POWER PULSE IFF AND TACAN
- 5.0 WATTS (min.) IFF 1030-1090MHz
- 4.0 WATTS (typ.) TACAN 960-1215MHz
- GREATER THAN 11.5dB GAIN
- REFRACTORY BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INFINITE LOAD - VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.250 x .250 2LFL (M105)
hermetic sealed

ORDER CODE	**BRANDING**
SD1527-08	SD1527-8

PIN CONNECTION



S88SD1527-8-01

1 emitter
2 base4
3 collector

DESCRIPTION

The SD1527-8 is a gold metallized, silicon NPN power transistor. The SD1527-8 is designed for applications requiring peak power and low duty cycles such as IFF, DME, TACAN. The SD1527-8 is packaged in the .250" input matched hermetic stripline flange package resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	80.0	V
V_{CES}	Collector - Emitter Voltage	80.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	1.0	A
P_{TOT}	Total Device Dissipation at + 25°C	21.9	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	8.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

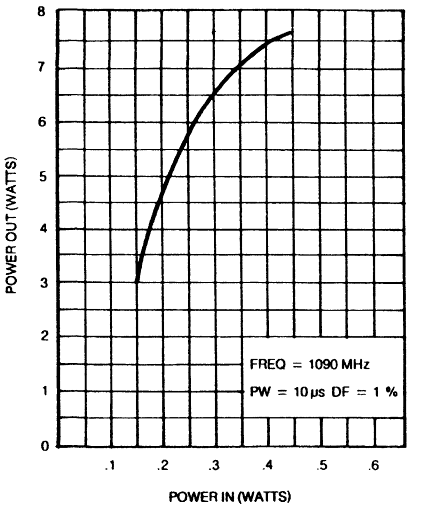
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 10mA	I_B = 0	80.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	80.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CB} = 50.0V	V_{BE} = 0			1.0	mA

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CE} = 50.0V		5.0			W
P_G	f = 1090MHz	V_{CE} = 50.0V		11.5			dB
P_o**	f = 1090MHz	V_{CE} = 28.0V			4.0		W
P_g	f = 1090MHz	V_{CE} = 28.0V			9.0		dB
P_o***	f = 960/1215MHz	V_{CE} = 28.0V			4.0		W
P_g	f = 960/1215MHz	V_{CE} = 28.0V			8.0		dB
Z_{in}	f = 1090MHz	V_{CE} = 50.0V	P_i = .5W		3.6–j2.9		Ω
Z_{cl}	f = 1090MHz	V_{CE} = 50.0V	P_i = .5W		4.7+j17.5		Ω

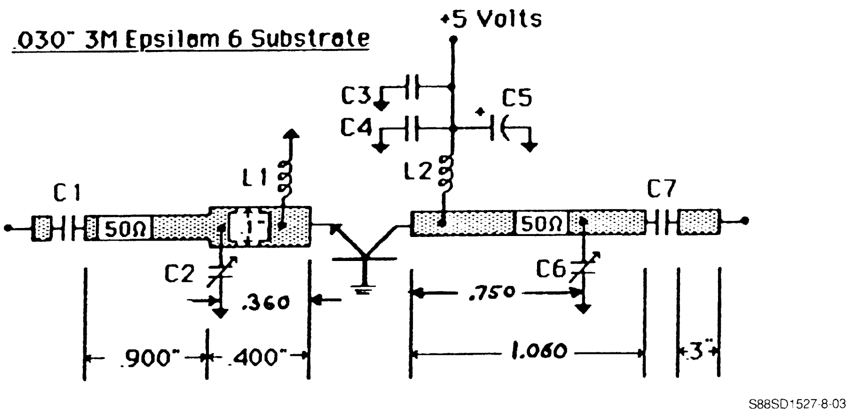
** Pulse width 10μs, duty cycle 1%.
*** Pulse width 10μs, duty cycle 10%.

TYPICAL POWER OUT vs. POWER IN



CIRCUIT DIAGRAM

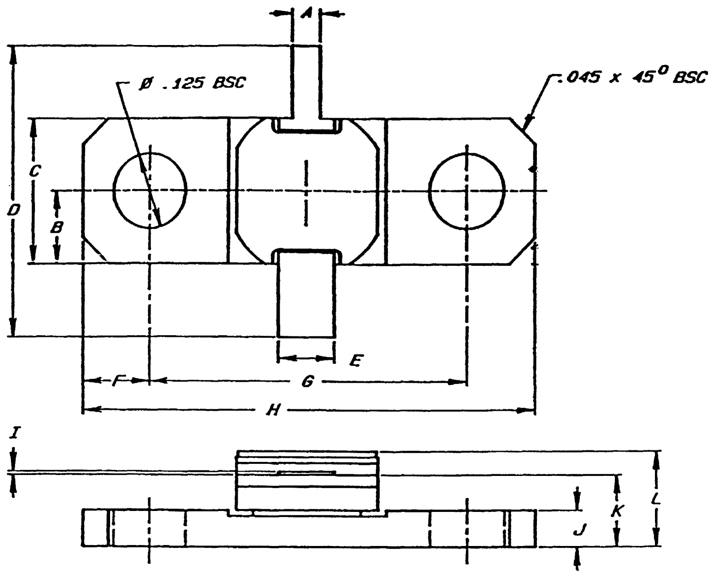
1025 – 1150 WIDE BAND



Component	L1	L2	C2, C6	C1, C3, C4, C7	C5
Value	4.5 Turns AWG *22	8.5 Turns AWG *24	.6 - 4.5	470	2200
Units			pF	pF	μF

PACKAGE MECHANICAL DATA

.250 x .250 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.045/1.14	.055/1.40
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	1.235/31.37	
E	.095/2.41	.105/2.67
F	.119/3.02 BSC	

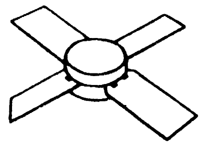
	Minimum Inches/mm	Maximum Inches/mm
G	.557/14.15	.567/14.40
H	.795/20.19	.805/20.45
I	.002/0.05	.006/0.15
J	.057/1.45	.067/1.70
K	.112/2.84	.132/3.35
L		.175/4.45

SGS-THOMSON MICROELECTRONICS

SD1528-6

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

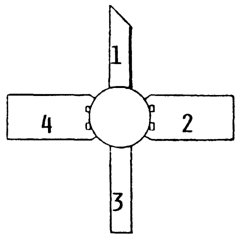
- DESIGNED FOR HIGH POWER PULSE IFF, DME, TACAN
- 20.0W (typ.) IFF 1030-1090MHz
- 15.0W (min.) DME 1025-1150MHz
- 15.0W (typ.) TACAN 960-1215MHz
- GREATER THAN 11.2dB GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 20:1 LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.280 4LSL (M115)
epoxy sealed

ORDER CODE	BRANDING
SD1528-06	SD1528-6

PIN CONNECTION



S88SD1528-6-01

1 collector
2 base
3 emitter
4 base

DESCRIPTION

The SD1528-6 is a gold metallized, silicon NPN power transistor. The SD1528-6 is designed for applications requiring high peak power and low duty cycles such as IFF, DME and TACAN. The SD1528-6 is packaged in the .280" input matched stripline package, resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	1.5	A
P_{TOT}	Total Device Dissipation at + 25°C	87.5	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	2.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

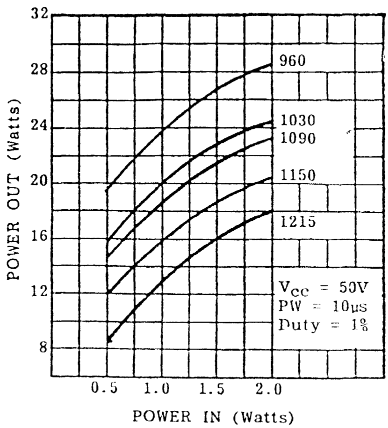
Symbol	Test Conditions		Value Min.	Typ.	Max.	Unit
BV_{CBO}	I_C = 10mA	I_B = 0	65.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CB} = 50.0V	V_{BE} = 0			2.5	mA

DYNAMIC

Symbol	Test Conditions		Value Min.	Typ.	Max.	Unit
P_O**	f = 1090MHz	V_{CE} = 50.0V		20.0		W
P_G	f = 1090MHz	V_{CE} = 50.0V		11.2		dB
P_o**	f = 1025/1150MHz	V_{CE} = 50.0V	15.0	18.0		W
P_g	f = 1025/1150MHz	V_{CE} = 50.0V	10.0	10.8		dB
P_o***	f = 960/1215MHz	V_{CE} = 50.0V		15.0		W
P_g	f = 960/1215MHz	V_{CE} = 50.0		10.0		dB

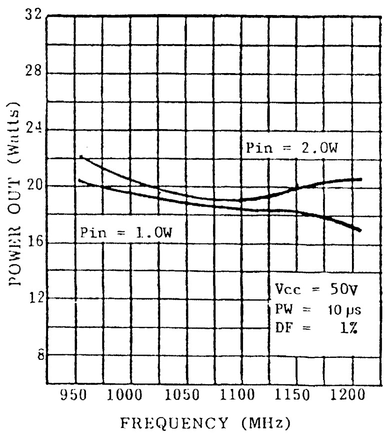
** Pulse width 10µs, duty cycle 1%.
*** Pulse width 10µs, duty cycle 10%.

TYPICAL POWER OUT vs. POWER IN



S88SD1528-6-02

TYPICAL POWER OUT vs. FREQUENCY



S88SD1528-6-03

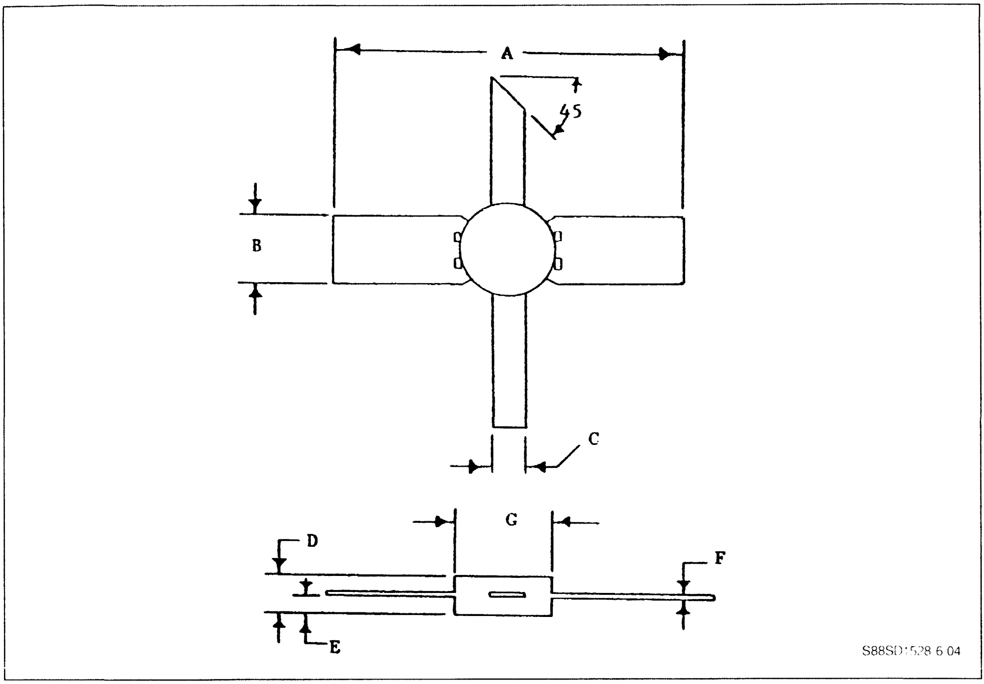
TYPICAL IMPEDANCES

Frequency (MHz)	Z_{IN} (ohms)	Z_{CL} (ohms)
960	2.5 + j12.5	17.0 + j15.5
1030	3.5 + j12.5	17.0 + j14.5
1090	3.0 + j13.5	19.5 + j12.0
1150	3.5 + j14.0	18.0 + j12.0
1215	5.0 + j17.0	16.0 + j12.0

Conditions : Power In = 1.5W Vcc = 50V Pulse width = 10µs Duty = 1%.

PACKAGE MECHANICAL DATA

.280 4LSL



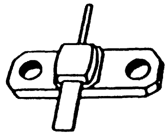
	Minimum Inches	Maximum Inches
A	1.000	
B	.195	.205
C	.095	.105
D	.120	.135
E	.050	.065
F	.004	.007
G	.275	.285

SGS-THOMSON MICROELECTRONICS

SD1528-8

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

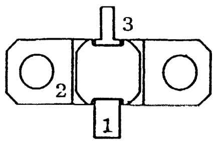
- DESIGNATED FOR HIGH POWER PULSE IFF, DME TACAN
- 20.0W (typ.) IFF 1030-1090MHz
- 15.0W (min.) DME 1025-1150MHz
- 15.0W (typ.) TACAN 960-1215MHz
- GREATER THAN 11.2dB GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 20:1 LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.250 x .250 2LFL (M105)
hermetic sealed

ORDER CODE	**BRANDING**
SD1528-08	SD1528-8

PIN CONNECTION



S88SD1528-8-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1528-8 is a gold metallized, silicon NPN power transistor. The SD1528-8 is designed for applications requiring high peak power and low duty cycles such as IFF, DME and TACAN. The SD1528–8 is packaged in the .250" input matched hermetic stripling flange package resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	1.5	A
P_{TOT}	Total Device Dissipation at + 25°C	87.5	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-Case Thermal Resistance	2.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

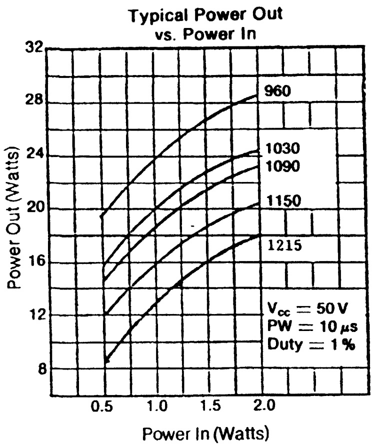
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_B = 0	65.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			2.5	mA

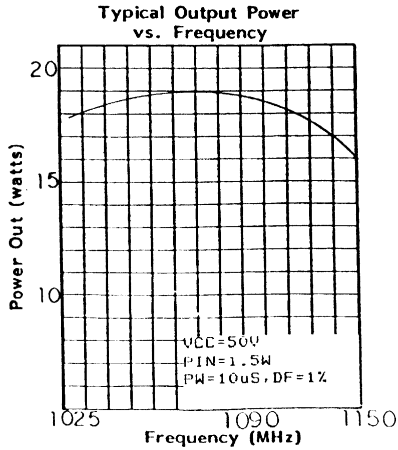
DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CE} = 50.0V		20.0		W
P_G	f = 1090MHz	V_{CE} = 50.0V		11.2		dB
P_o**	f = 1025/1150MHz	V_{CE} = 50.0V	15.0	18.0		W
P_g	f = 1025/1150MHz	V_{CE} = 50.0V	10.0	10.8		dB
P_o***	f = 960/1215MHz	V_{CE} = 50.0V		15.0		W
P_g	f = 960/1215MHz	V_{CE} = 50.0V		10.0		dB

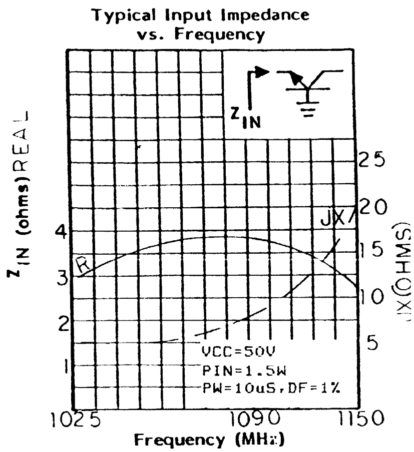
* Pulse width 10µs. duty cycle 1%.
** Pulse width 10µs, duty cycle 10%.



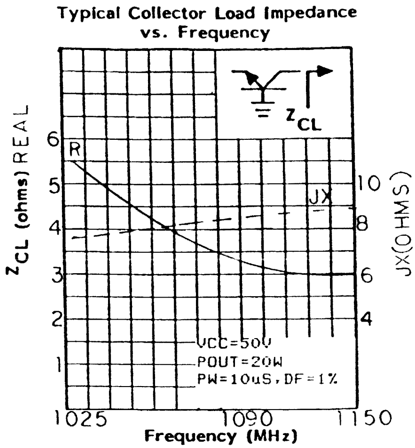
S88SD1528-8-02



S88S1528-8-03

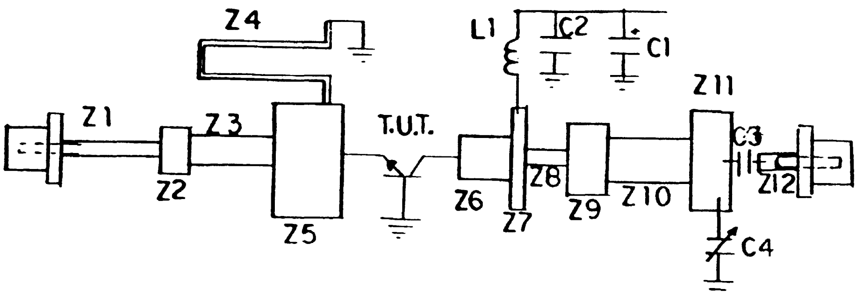


S88SD1528-8-04



S88S1528-8-05

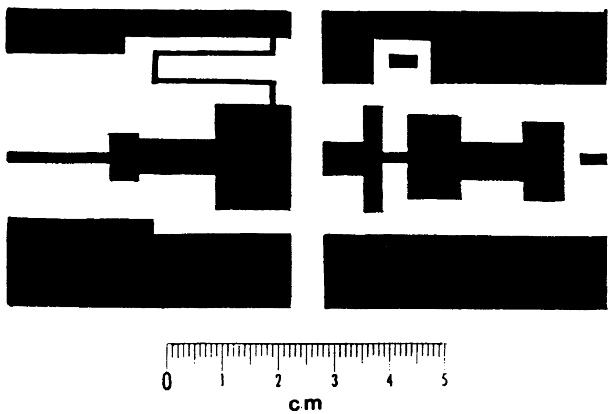
TEST FIXTURE P.C BOARD AND SCHEMATICS



S88SD1528-8-06

C1	1000µF ELECTROLYTIC
C2	.100 x .100 680pF CHIP CAP
C3	.100 x .100 120pF CHIP CAP
C4	.6 – 4.5pF GIGATRIM
Z1	.070 x .680
Z2	.335 x .200
Z3	.260 x .550
Z4	.040 x 1.91
Z5	.700 x .540
Z6	.240 x .280
Z7	.725 x .135
Z8	.080 x .175
Z9	.560 x .380
Z10	.260 x .435
Z11	.500 x .290
Z12	.070 x .200
L1	6.5 TURNS, AWG #22 ON A #30 DRILL BIT

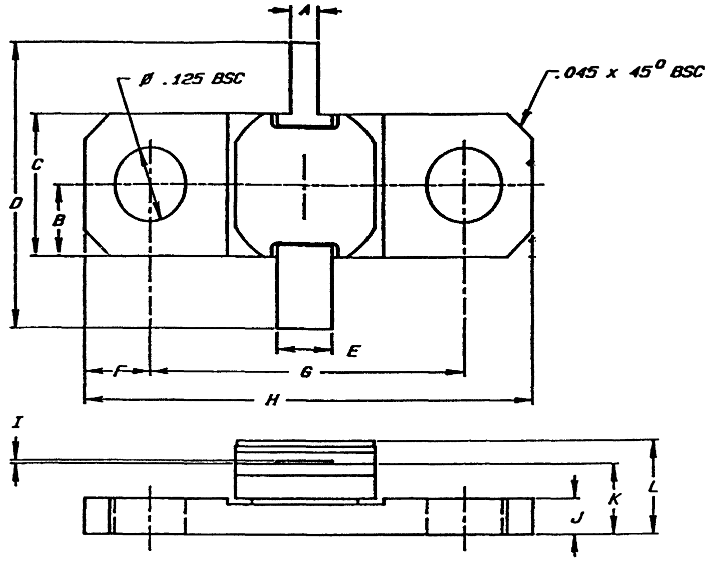
BOARD THICKNESS 0.34, Er = 2.5
NOTE : ALL DIMENSIONS ARE IN INCHS.



S88SD1528-8-07

PACKAGE MECHANICAL DATA

.250 x .250 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.045/1.14	.055/1.40
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	1.235/31.37	
E	.095/2.41	.105/2.67
F	.119/3.02 BSC	

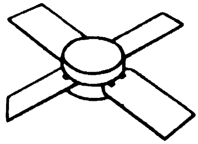
	Minimum Inches/mm	Maximum Inches/mm
G	.557/14.15	.567/14.40
H	.795/20.19	.805/20.45
I	.002/0.05	.006/0.15
J	.057/1.45	.067/1.70
K	.112/2.84	.132/3.35
L		.175/4.45

SGS-THOMSON
MICROELECTRONICS

SD1530-1

RF & MICROWAVE TRANSISTORS
IFF/DME APPLICATIONS

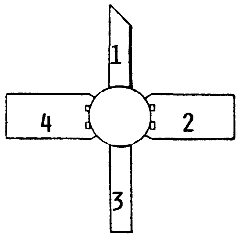
- DESIGNED FOR HIGH POWER PULSE IFF, DME, TACAN
- 40 WATTS (typ.) IFF 1030-1090MHz
- 35 WATTS (min.) DME 1025-1150MHz
- 25 WATTS (typ.) TACAN 960-1215MHz
- GREATER THAN 9.0dB GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INFINITE LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.280 4LSL (M115)
epoxy sealed

ORDER CODE	BRANDING
SD1530-01	SD1530-1

PIN CONNECTION



S88SD1530-1-01

1 collector	3 emitter
2 base	4 base

DESCRIPTION

The SD1530-1 is a gold metallized silicon, NPN power transistor designed for applications requiring high peak power and low duty cycles such as IFF, DME, TACAN. The SD1530-1 is packaged in the .280" input matched stripline package resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	2.6	A
P_{TOT}	Total Device Dissipation at + 25°C	87.5	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	2.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

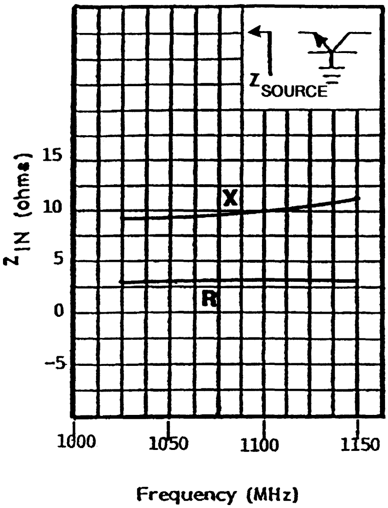
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_B = 0	65.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			5.0	mA

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{ce} = 50.0V		40.0		W
P_G	f = 1090MHz	V_{ce} = 50.0V		9.0		dB
P_o**	f = 1025/1150MHz	V_{ce} = 50.0V	35.0			W
P_g	f = 1025/1150MHz	V_{ce} = 50.0V	8.5			dB
P_o***	f = 960/1215MHz	V_{ce} = 50.0V		25.0		W
P_g	f = 960/1215MHz	V_{ce} = 50.0V		8.5		dB

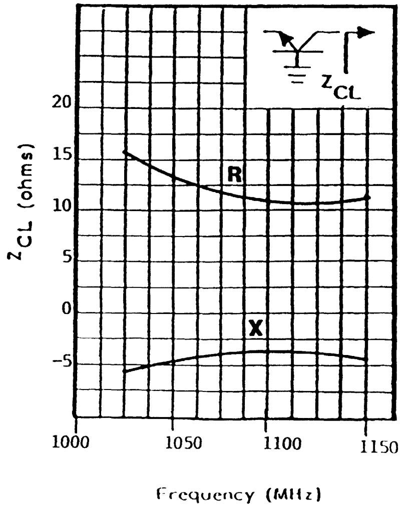
** Pulse width 10µs, duty cycle 1%.
*** Pulse width 10µs, duty cycle 10%.

TYPICAL INPUT IMPEDANCE vs. FREQUENCY



S88SD1530-3-02

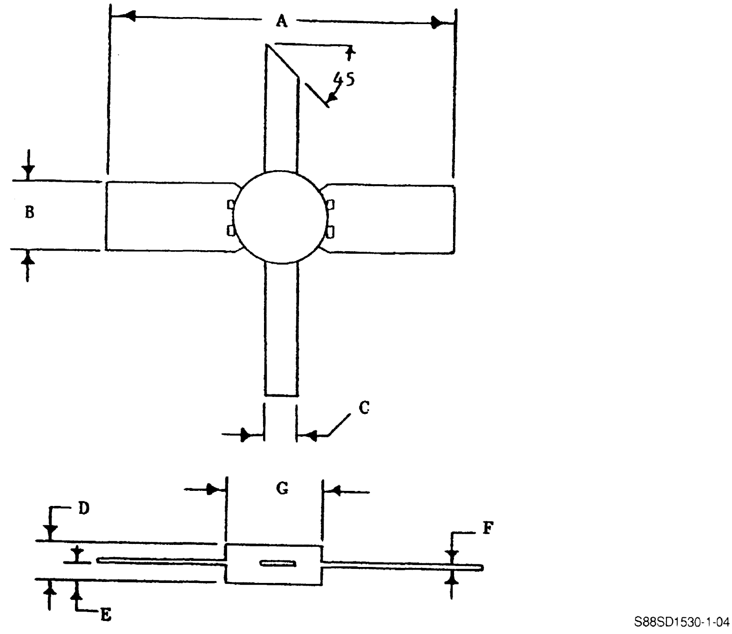
TYPICAL COLLECTOR LOAD IMPEDANCE vs. FREQUENCY



S88SD1530-3-03

PACKAGE MECHANICAL DATA

.280 4 LSL



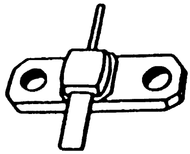
	Minimum Inches	Maximum Inches
A	1.000	
B	.195	.205
C	.095	.105
D	.120	.135
E	.050	.065
F	.004	.007
G	.275	.285

SGS-THOMSON
MICROELECTRONICS

SD1530-8

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

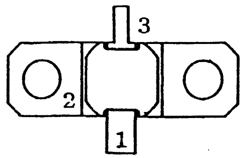
- DESIGNATED FOR HIGH POWER IFF, DME, TACAN
- 40 WATTS (typ.) IFF 1030-1090MHz
- 35 WATTS (min.) DME 1025-1150MHz
- 25 WATTS (typ.) TACAN 960-1215MHz
- GREATER THAN 9.0dB GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INFINITE LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.250 x .250 2LFL (M105)
hermetic sealed

ORDER CODE	BRANDING
SD1530-08	SD1530-8

PIN CONNECTION



S88SD1530-8-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1530-8 is a gold metallized silicon, NPN power transistor designed for applications requiring high peak power and low duty cycles such as IFF, DME, TACAN. The SD1530-8 is packaged in the .250" input matched hermetic stripline flange package resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	2.6	A
P_{TOT}	Total Device Dissipation at + 25°C	87.5	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	2.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

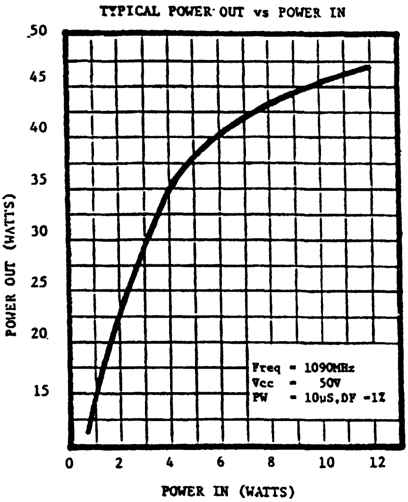
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_B = 0	65.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			5.0	mA

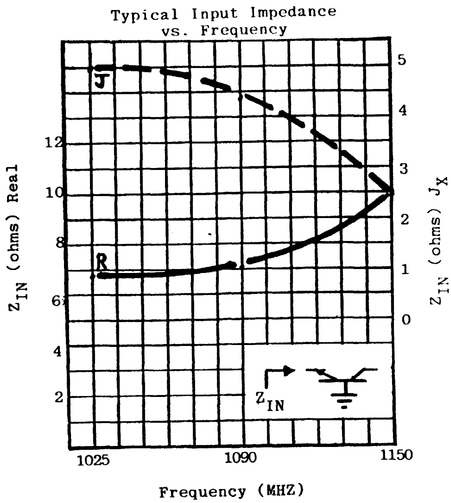
DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O**	f = 1030MHz	V_{CE} = 50.0V		40.0		W
P_G	f = 1030MHz	V_{CE} = 50.0V		9.0		dB
P_o**	f = 1025/1150MHz	V_{CE} = 50.0V	35.0			W
P_g	f = 1025/1150MHz	V_{CE} = 50.0V	8.5			dB
P_o***	f = 960/1215MHz	V_{CE} = 50.0V		25.0		W
P_g	f = 960/1215MHz	V_{CE} = 50.0V		8.5		dB

** Pulse width 10μs, duty cycle 1%.
*** Pulse width 10μs, duty cycle 10%.

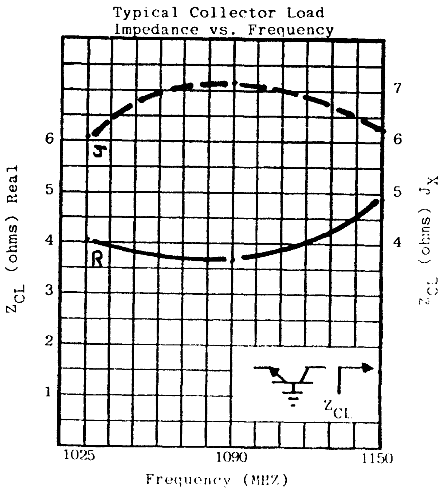


S88SD1530-8-02



S88SD1530-8-03

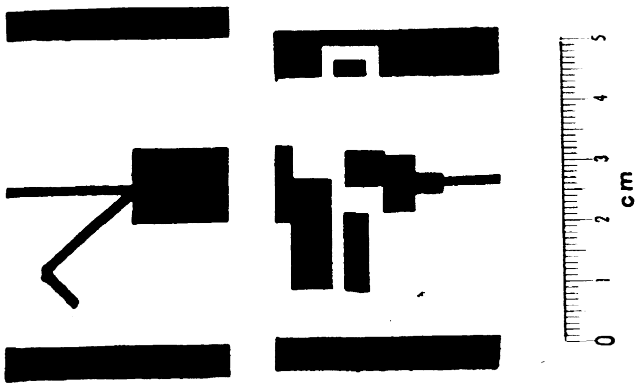
Pwr In	5W	Vcc	50V
Pulse Width	10μs	Duty Factor	1%



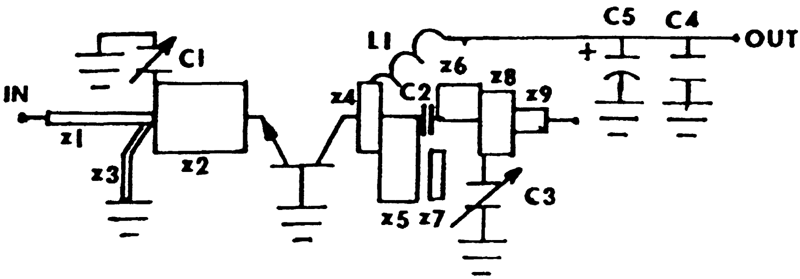
S88SD1530-8-04

TEST FIXTURE P.C. BOARD AND SHEMATICS

3M EPSILAM 6 .03" SUBSTRATE



S88SD1530-8-05



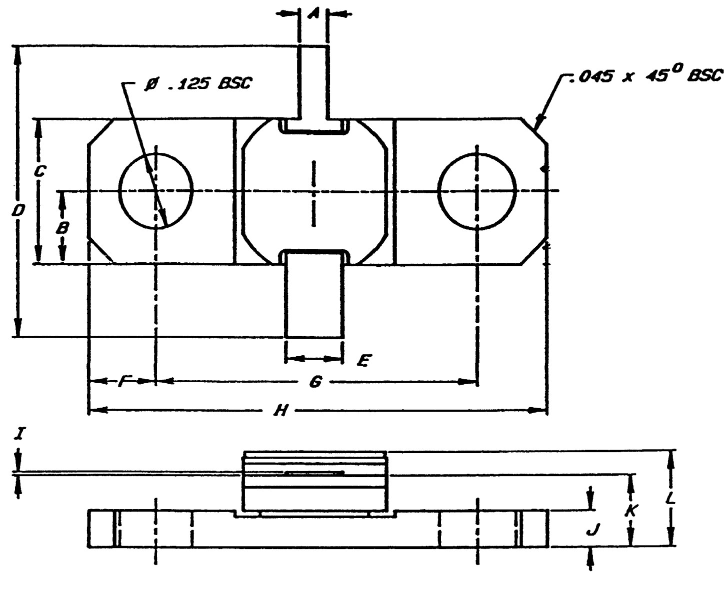
S88SD1530-8-06

C1, C3 – 0.6–4.5pF, Johanson Gisatrim
C2 – 470pF ATC Chip Cap
C4 – 1000pF ATC Chip Cap
C5 – 1000µF, 63V Electrolitic Capacitor
Z1 – 500nm Line
Z2 – .450" Wice Line L = .600"
Z3 – 50Ω Shunt L

Z4 – .110" x .490"
Z5 – .250" x .700"
Z6 – .250" x .225"
Z7 – ground
Z8 – .185" x .360"
Z9 – .180" x .120"
L1 – 4.5 Turns AWG #22 Wire

PACKAGE MECHANICAL DATA

.250 x .250 2LFL

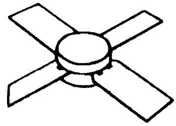


	Minimum Inches/mm	Maximum Inches/mm
A	.045/1.14	.055/1.40
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	1.235/31.37	
E	.095/2.41	.105/2.67
F	.119/3.02 BSC	

	Minimum Inches/mm	Maximum Inches/mm
G	.557/14.15	.567/14.40
H	.795/20.19	.805/20.45
I	.002/0.05	.006/0.15
J	.057/1.45	.067/1.70
K	.112/2.84	.132/3.35
L		.175/4.45

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

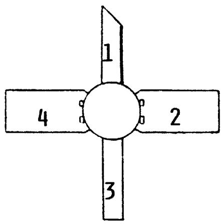
- DESIGNED FOR HIGH POWER PULSE IFF, DME, TACAN
- 80W (typ.) IFF 1030-1090MHz
- 75W (min.) DME 1025-1150MHz
- 50W (typ.) TACAN 960-1215MHz
- GREATER THAN 8.0dB GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INFINITE LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.280 4LSL (A) (M115)
epoxy sealed

ORDER CODE	BRANDING
SD1534-01	SD1534-1

PIN CONNECTION



S88SD1534-1-01

1 collector
2 base
3 emitter
4 base

DESCRIPTION

The SD1534-1 is a gold metallized, silicon NPN power transistor. The SD1534-1 is designed for applications requiring high peak power and low duty cycles such as IFF, DME, TACAN. The SD1534-1 is packaged in the .280" input matched stripline package resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	5.5	A
P_{TOT}	Total Device Dissipation at + 25°C	218.7	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.8	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_B = 0	65.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0mA	V_{BE} = 0			5.0	mA

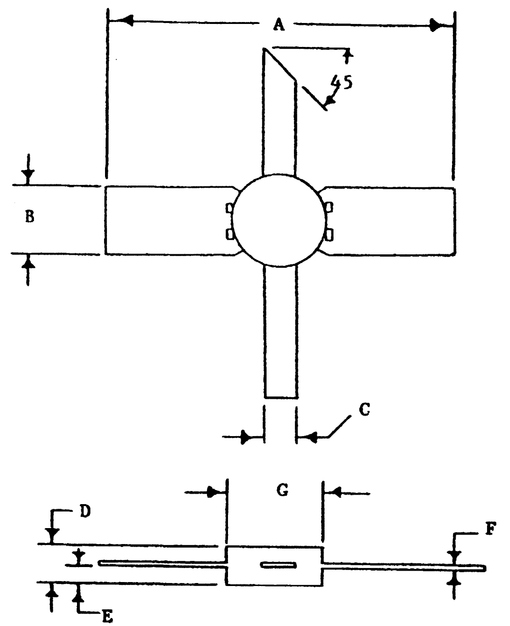
DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CE} = 50.0V		80.0		W
P_G	f = 1090MHz	V_{CE} = 50.0V		8.0		dB
P_o**	f = 1025/1150MHz	V_{CE} = 50.0V	75.0			W
P_g	f = 1025/1150MHz	V_{CE} = 50.0V	7.5			dB
P_o***	f = 960/1215MHz	V_{CE} = 50.0V		50.0		W
P_g	f = 960/1215MHz	V_{CE} = 50.0V		7.0		dB

** Pulse width 10µs, duty cycle 1%
*** Pulse width 10µs, duty cycle 1%.

PACKAGE MECHANICAL DATA

.280 4LSL (A)



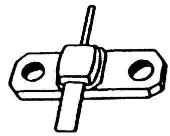
	Minimum Inches	Maximum Inches
A	1.000	
B	.195	.205
C	.095	.105
D	.120	.135
E	.050	.065
F	.004	.007
G	.275	.285

SGS-THOMSON
MICROELECTRONICS

SD1534-8

RF & MICROWAVE TRANSISTORS
IFF/DME APPLICATIONS

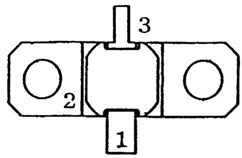
- DESIGNED FOR HIGH POWER PULSE IFF, DME, TACAN
- 80 WATTS (typ.) IFF 1030-1090MHz
- 75 WATTS (min.) DME 1025-1150MHz
- 50 WATTS (typ.) TACAN 960-1215MHz
- GREATER THAN 8.0dB GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INFINITE LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.250 x .250 2LFL (M105)
hermetic sealed

ORDER CODE	**BRANDING**
SD1534-08	SD1534-8

PIN CONNECTION



S88SD1534-8-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1534-8 is a gold metallized, silicon NPN power transistor. The SD1534-8 is designed for applications requiring high peak power and low duty cycles such as IFF, DME, TACAN.
The SD1534-8 is packaged in the .250" input matched hermetical stripline flange package resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	5.5	A
P_{TOT}	Total Device Dissipation at + 25°C	218.7	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.8	°C/W

May 1989

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_B = 0	65.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			5.0	mA

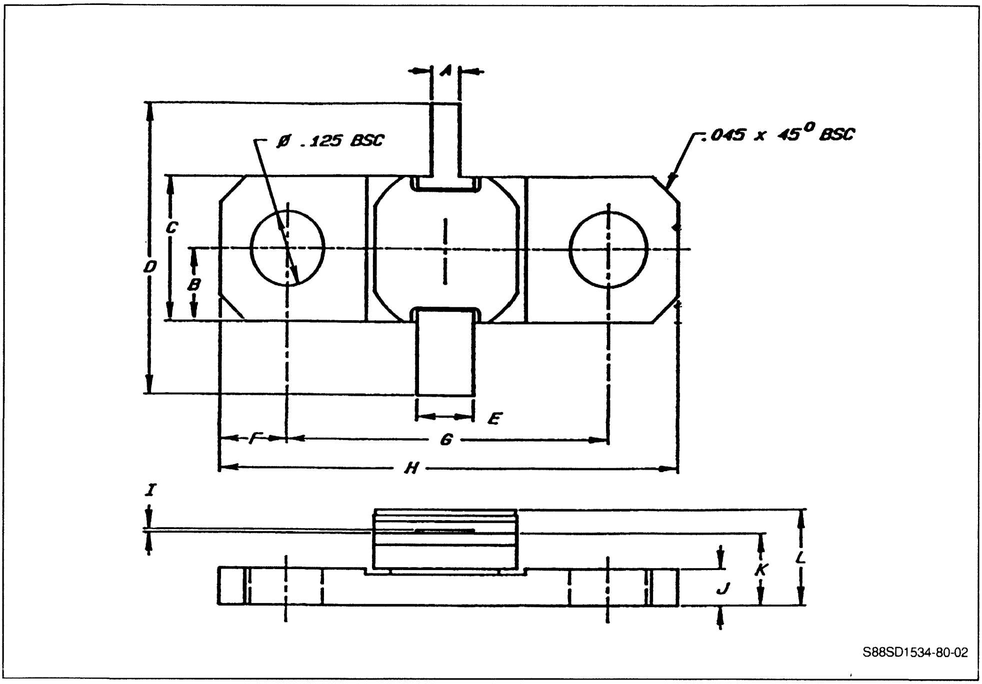
DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CE} = 50.0V		80.0		W
P_G	f = 1090MHz	V_{CE} = 50.0V		8.0		dB
P_o**	f = 1025/1150MHz	V_{CE} = 50.0V	75.0			W
P_g	f = 1025/1150MHz	V_{CE} = 50.0V	7.5			dB
P_o***	f = 960/1215MHz	V_{CE} = 50.0V		50.0		W
P_g	f = 960/1215MHz	V_{CE} = 50.0V		7.0		dB

** Pulse width 10μs, duty cycle 1%
*** Pulse width 10μs, duty cycle 10%.

PACKAGE MECHANICAL DATA

.250 x .250 2LFL



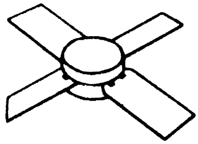
	Minimum Inches/mm	Maximum Inches/mm
A	.045/1.14	.055/1.40
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	1.235/31.37	
E	.095/2.41	.105/2.67
F	.119/3.02 BSC	

	Minimum Inches/mm	Maximum Inches/mm
G	.557/14.15	.567/14.40
H	.795/20.19	.805/20.45
I	.002/0.05	.006/0.15
J	.057/1.45	.067/1.70
K	.112/2.84	.132/3.35
L		.175/4.45

SD1536-3

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

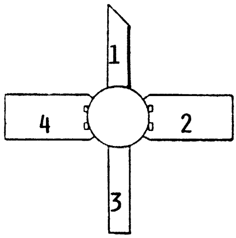
- DESIGNED FOR HIGH POWER PULSE IFF, DME TACAN
- 100 WATTS (typ.) IFF 1030-1090MHz
- 90 WATTS (min.) DME 1025-1150MHz
- 90 WATTS (typ.) TACAN 960-1215MHz
- GREATER THAN 8.8dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 20:1 LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.280 4LSL (M115)
epoxy sealed

ORDER CODE	BRANDING
SD1536-03	SD1536-3

PIN CONNECTION



S88SD1536-3-01

1 collector	3 emitter
2 base	4 base

DESCRIPTION

The SD1536-3 is a gold metallized, silicon NPN power transistor. The SD1536-3 is designed for applications requiring high peak power and low duty cycles such as IFF, DME, and TACAN. The SD1536-3 is packaged in the .280" input matched stripline package, resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	10.0	A
P_{TOT}	Total Device Dissipation at + 25°C	292.0	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	.60	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

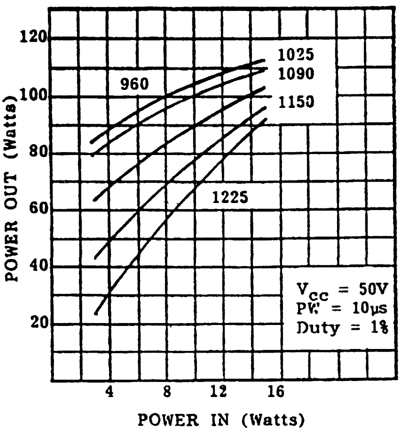
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_B = 0	65.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			10.0	mA

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CC} = 50.0V	P_i = 13W		100.0		W
P_G	f = 1090MHz	V_{CC} = 50.0V	P_i = 13W		8.8		dB
P_o**	f = 1025/1150MHz	V_{CC} = 50.0V	P_i = 13W	90.0	95.0		W
P_g	f = 1025/1150MHz	V_{CC} = 50.0V	P_i = 13W	8.4	8.6		dB
P_o***	f = 960/1215MHz	V_{CC} = 50.0V	P_i = 13W		90.0		W
P_g	f = 960/1215MHz	V_{CC} = 50.0V	P_i = 13W		8.4		dB

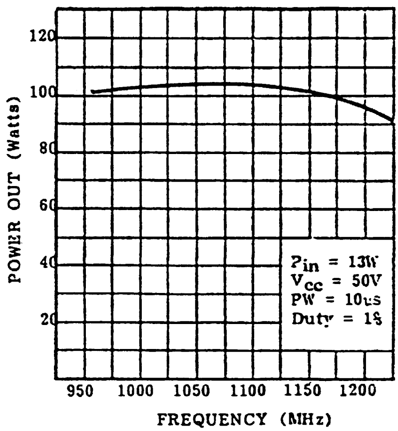
** Pulse width 10μ s, duty cycle 1%.
*** Pulse width 10μ s, duty cycle 10%.

TYPICAL POWER OUT vs. POWER IN



S88SD1536-3-02

TYPICAL POWER OUT vs. FREQUENCY



S88SD1536-3-03

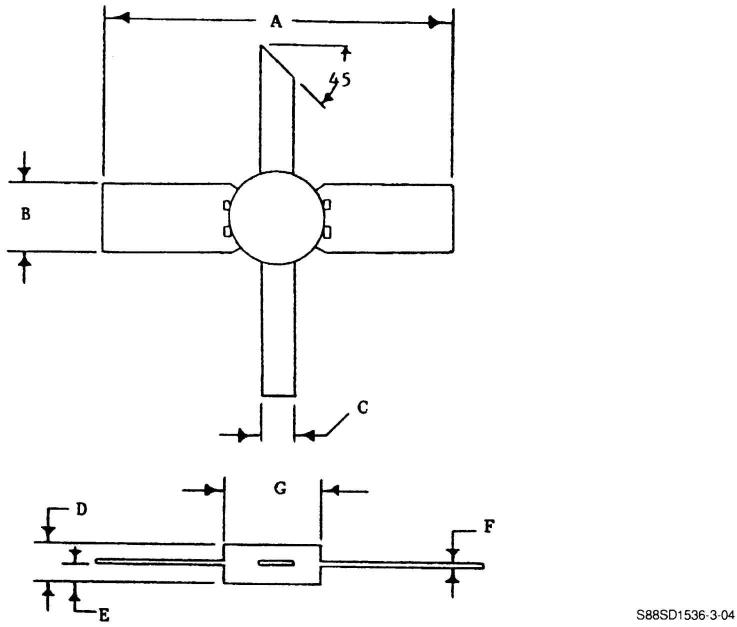
TYPICAL IMPEDANCES

Frequency (MHz)	Z_{IN} (ohms)	Z_{CL} (ohms)
960	2.5 + j13.0	4.6 – j5.5
1030	5.2 + j15.0	5.0 – j5.5
1090	16.3 + j15.0	4.8 – j5.5
1150	14.7 + j2.5	4.7 – j7.0
1215	7.6 + j0.5	4.7 – j5.0

Conditions : Power In = 13W Vcc = 50V Pulse width = 10μ s Duty = 1%.

PACKAGE MECHANICAL DATA

.280 4LSL



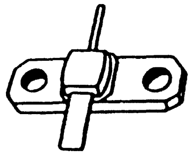
	Minimum Inches	Maximum Inches
A	1.000	
B	.195	.205
C	.095	.105
D	.120	.135
E	.050	.065
F	.004	.007
G	.275	.285

SGS-THOMSON
MICROELECTRONICS

SD1536-8

RF & MICROWAVE TRANSISTORS
IFF/DME APPLICATIONS

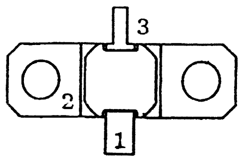
- DESIGNATED FOR HIGH POWER PULSE IFF, DME TACAN
- 100 WATTS (typ.) IFF 1030-1090MHz
- 90 WATTS (min.) DME 1025-1150MHz
- 90 WATTS (typ.) TACAN 960-1215MHz
- GREATER THAN 8.8dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 20:1 LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.250 x .250 2LFL (M105)
hermetic sealed

ORDER CODE	BRANDING
SD1536-08	SD1536-8

PIN CONNECTION



S88SD1536-8-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1536-8 is a gold metallized, silicon NPN power transistor. The SD1536-8 is designed for applications requiring high peak power and low duty cycles such as IFF, DME, and TACAN. The SD1536-8 is packaged in the .250" input matched hermetic stripline flange package resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	10.0	A
P_{TOT}	Total Device Dissipation at + 25°C	292.0	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	.60	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

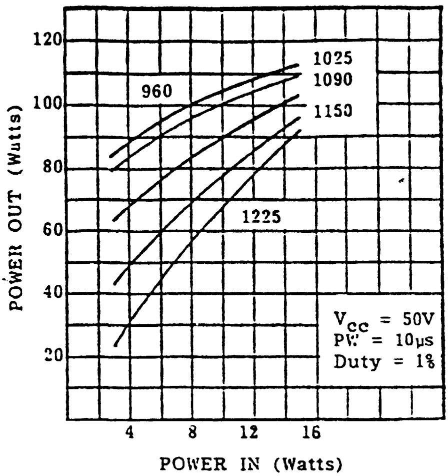
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_B = 0	65.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			10.0	mA

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{cc} = 50.0V	P_i = 13W		100.0		W
P_G	f = 1090MHz	V_{cc} = 50.0V	P_i = 13W		8.8		dB
P_o**	f = 1025/1150MHz	V_{cc} = 50.0V	P_i = 13W	90.0	95.0		W
P_g	f = 1025/1150MHz	V_{cc} = 50.0V	P_i = 13W	8.4	8.6		dB
P_o***	f = 960/1215MHz	V_{cc} = 50.0V	P_i = 13W		90.0		W
P_g	f = 960/1215MHz	V_{cc} = 50.0V	P_i = 13W		8.4		dB

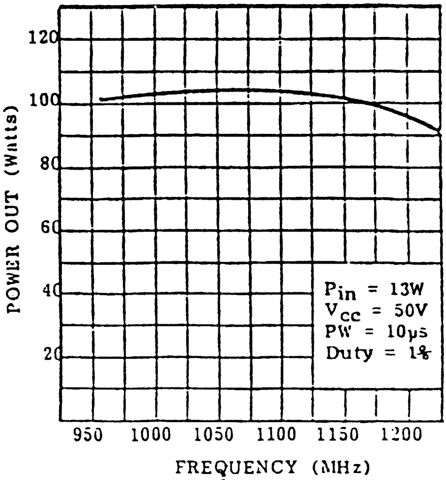
** Pulse width 10µs, duty cycle 1%.
*** Pulse width 10µs, duty cycle 10%.

TYPICAL POWER OUT vs. POWER IN



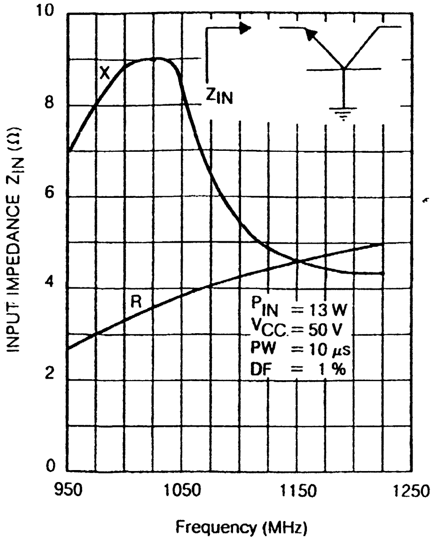
S88SD1536-8-02

TYPICAL POWER OUT vs. FREQUENCY



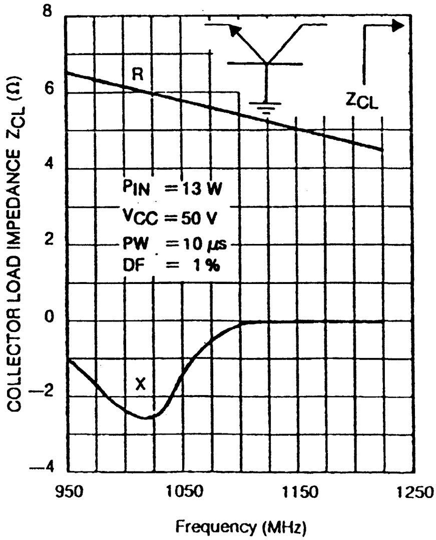
S88SD1536-8-03

TYPICAL INPUT IMPEDANCE VERSUS FREQUENCY



S88SD1536-8-04

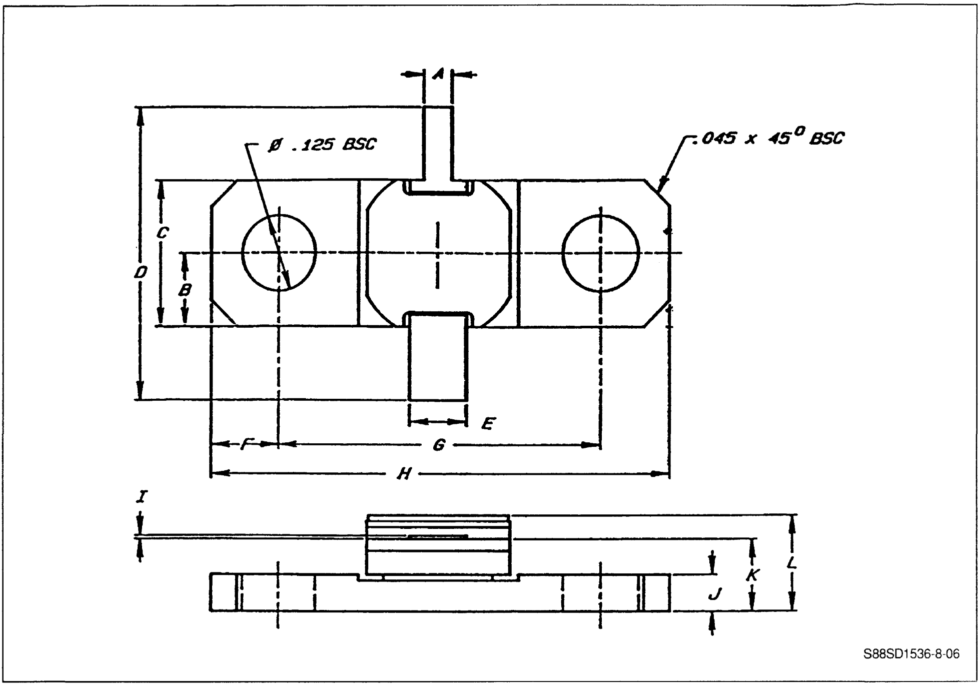
TYPICAL COLLECTOR LOAD IMPEDANCE VERSUS FREQUENCY



S88SD1536-8-05

PACKAGE MECHANICAL DATA

.250 x .250 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.045/1.14	.055/1.40
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	1.235/31.37	
E	.095/2.41	.105/2.67
F	.119/3.02 BSC	

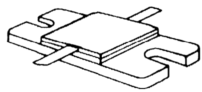
	Minimum Inches/mm	Maximum Inches/mm
G	.557/14.15	.567/14.40
H	.795/20.19	.805/20.45
I	.002/0.05	.006/0.15
J	.057/1.45	.067/1.70
K	.112/2.84	.132/3.35
L		.175/4.45

SGS-THOMSON
MICROELECTRONICS

SD1538-2

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

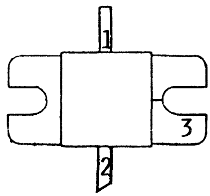
- DESIGNATED FOR HIGH POWER PULSE IFF, DME, AND TACAN
- 200W (typ.) IFF 1030-1090MHz
- 150W (min.) DME 1025-1150MHz
- 140W (typ.) TACAN 960-1215MHz
- GREATER THAN 8.2dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT AND OUTPUT MATCHED, COMMON BASE CONFIGURATION



.400 x .400 2LFL (M103)
epoxy sealed

ORDER CODE	BRANDING
SD1538-02	SD1538-2

PIN CONNECTION



S88SD1538-2-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1538-2 is a gold metallized, silicon NPN power transistor. The SD1538-2 is designed for applications requiring high peak power and low duty cycles such as IFF, DME and TACAN. The SD1538-2 is packaged in a metal/ceramic package with intenral input/output matching, resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	11.0	A
P_{TOT}	Total Device Dissipation at + 25°C	583.0	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	.30	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

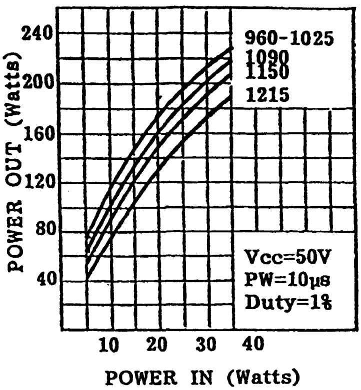
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_B = 0	65.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			10.0	mA

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O*	f = 1090MHz	V_{CE} = 50.0V	P_i = 30W		200.0		W
P_G	f = 1090MHz	V_{CE} = 50.0V	P_i = 30W		8.2		dB
P_o*	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 25W	150.0	175.0		W
P_g	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 25W	7.8	8.4		dB
P_o**	f = 960/1215MHz	V_{CE} = 50.0V	P_i = 25W		140.0		W
P_g	f = 960/1215MHz	V_{CE} = 50.0V	P_i = 25W		7.5		dB

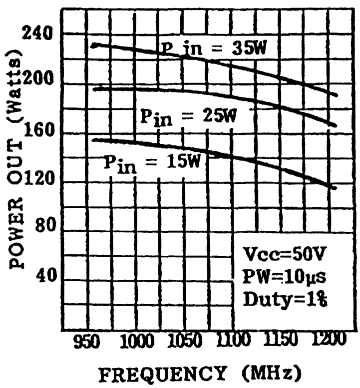
* Pulse width 10μs, duty cycle 1%.
** Pulse width 10μs, duty cycle 10%.

TYPICAL POWER OUT vs. POWER IN

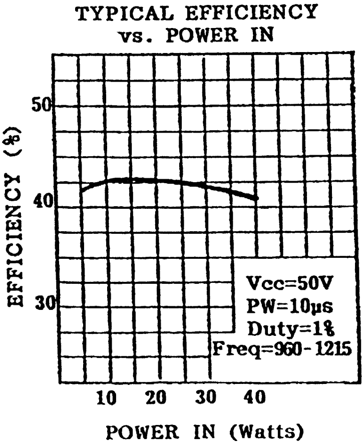


S88SD1538-2-02

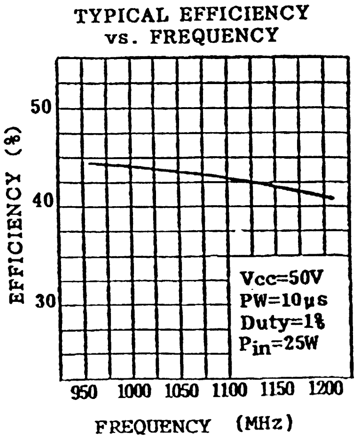
TYPICAL POWER OUT vs. FREQUENCY



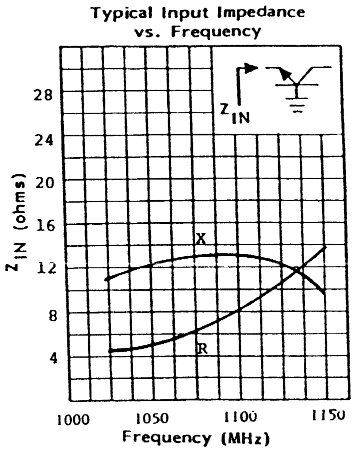
S88S1538-2-03



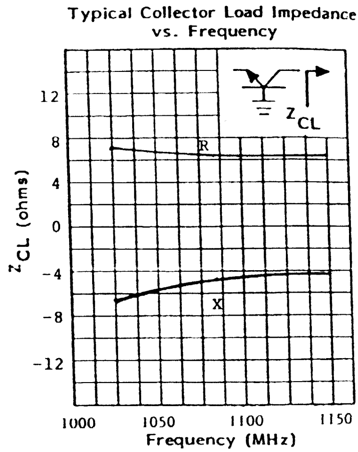
S88SD1538-2-04



S88SD1538-2-05



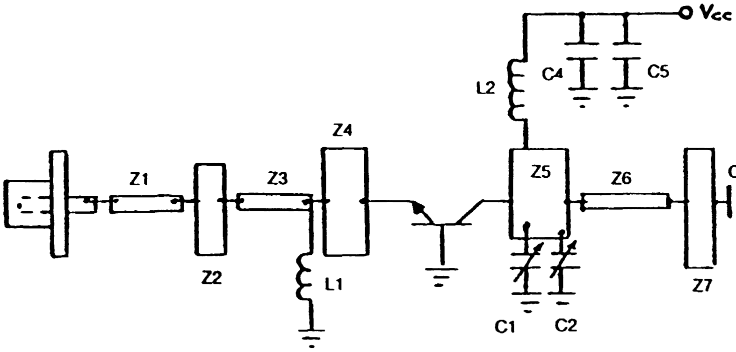
S88SD1538-2-06



S88SD1538-2-07

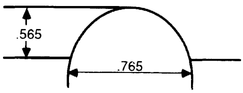
test conditions : P_{IN} = 25W – V_{CE} = 50V – P.W. = 10µs –D.F. = 1%.

TEST FIXTURE P.C BOARD AND SCHEMATIC



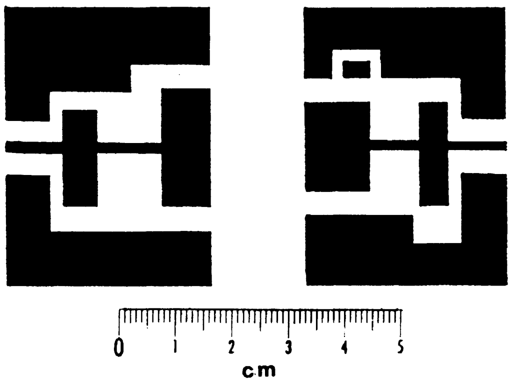
S88SD1538-2-08

C1, C2	.6 – 4.5PF GIGATRIM	Z5	.640 x .470
C3	.100 x .100 120PF CHIP CAP	Z6	.070 x .405
C4	.100 x .100 470PF CHIP CAP	Z7	.740 x .180
C5	100µF ELECTROLYTIC	Z8	.050 x .325
Z1	.195 x .415	L1	#20 AWG
Z2	.685 x .230	L2	3 TURNS, 20 AWG WOUND ON #32 DRILL BIT
Z3	.080 x .105		
Z4	.845 x .345		



S88SD1538-2-09

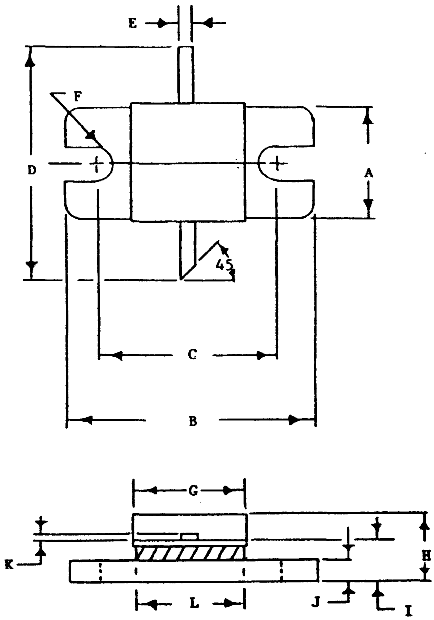
BOARD THICKNESS 31 MILS Er = 2.5



S88SD1538-2-10

PACKAGE MECHANICAL DATA

.400 x .400 2LFL



	Minimum Inches	Maximum Inches
G	.390	.410
H		.230
I	.115	.130
J	.055	.065
K	.004	.007
L	.390	.405

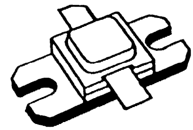
	Minimum Inches	Maximum Inches
G	.390	.410
H		.230
I	.115	.130
J	.055	.065
K	.004	.007
L	.390	.405

SGS-THOMSON MICROELECTRONICS

SD1538-8

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

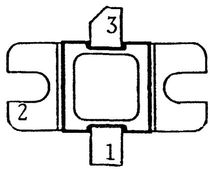
- DESIGNED FOR HIGH POWER PULSE IFF, DME, AND TACAN
- 200W (typ.) IFF 1030-1090MHz
- 150W (min.) DME 1025-1150MHz
- 140W (typ.) TACAN 960-1215MHz
- GREATER THAN 8.2dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT AND OUTPUT MATCHED, COMMON BASE CONFIGURATION



.400 x .400 2LFL (M138)
hermetic sealed

ORDER CODE	BRANDING
SD1538-08	SD1538-8

PIN CONNECTION



S88SD1538-8-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1538-8 is a gold metallized, silicon NPN power transistor. The SD1538-8 is designed for applications requiring high peak power and low duty cycles such as IFF, DME and TACAN. The SD1538-8 is packaged in a metal/hermetic package with internal input/output matching, resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CES}	Collector - Emitter Voltage	65	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	11	A
P_{TOT}	Total Device Dissipation at + 25°C	583	W
T_{STG}	Storage Temperature	− 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.30	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

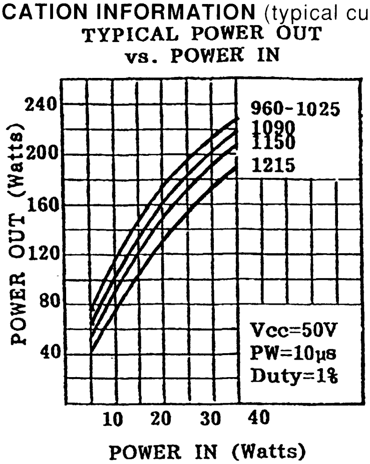
Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CBO}	I_C = 10mA	I_B = 0	65.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			10.0	mA

DYNAMIC

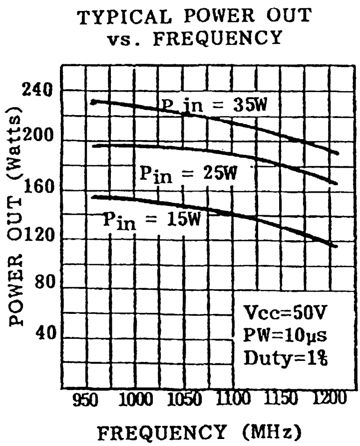
Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O*	f = 1090MHz	V_{CE} = 50.0V	P_i = 30W		200.0		W
P_G	f = 1090MHz	V_{CE} = 50.0V	P_i = 30W		8.2		dB
P_o*	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 25W	150.0	175.0		W
P_g	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 25W	7.8	8.4		dB
P_o**	f = 960/1215MHz	V_{CE} = 50.0V	P_i = 25W		140.0		W
P_g	f = 960/1215MHz	V_{CE} = 50.0V	P_i = 25W		7.5		dB

* Pulse width 10μs, duty cycle 1%.
** Pulse width 10μs, duty cycle 10%.

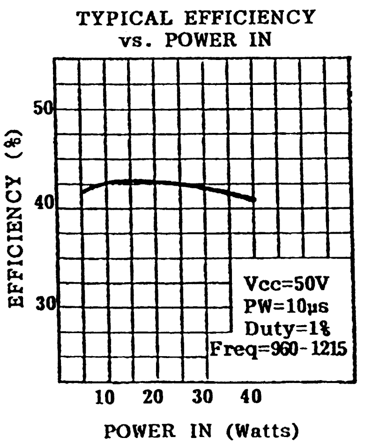
APPLICATION INFORMATION (typical curves)



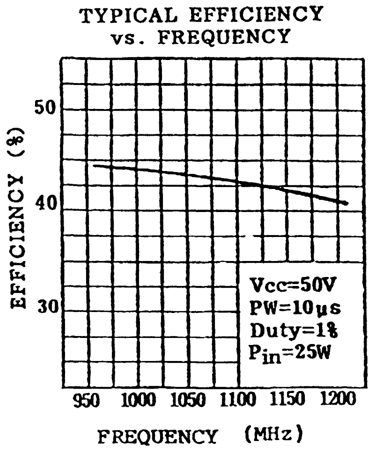
S88SD1538-8-02



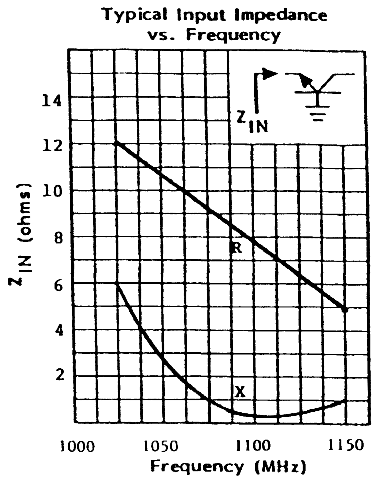
S88S1538-8-03



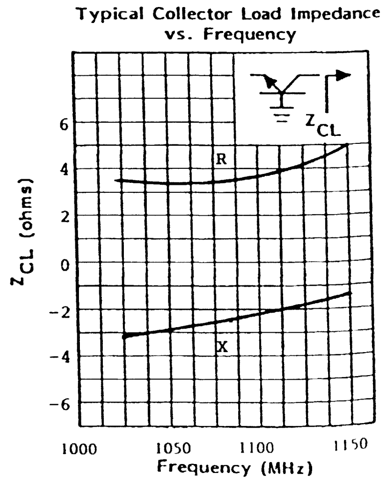
S88SD1538-8-04



S88SD1538-8-05



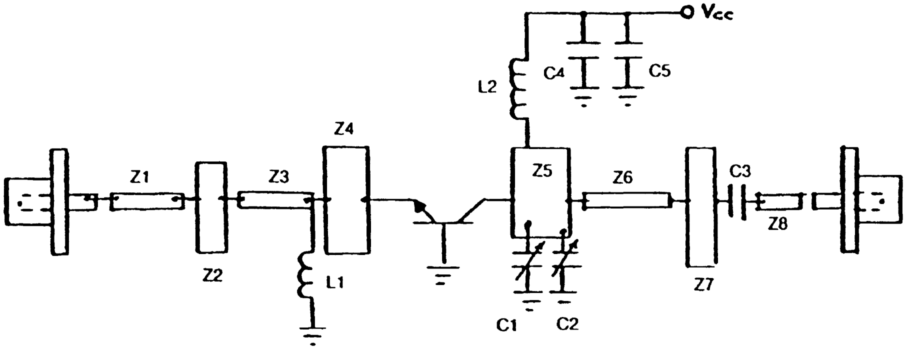
S88SD1538-8-06



S88SD1538-8-07

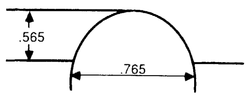
test conditions : P_{IN} = 25W – V_{CE} = 50V – P.W. = 10µs – D.F. = 1%.

TEST FIXTURE P.C BOARD AND SCHEMATIC



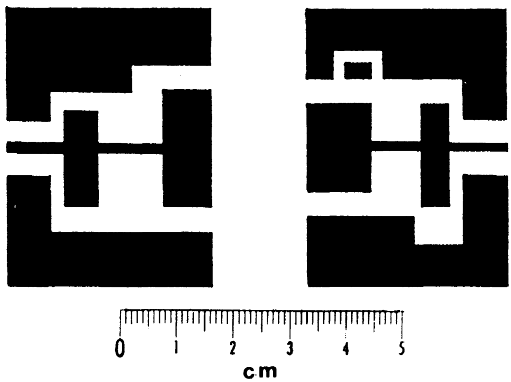
S88SD1538-8-08

C1, C2	.6 – 4.5PF GIGATRIM	Z5	.640 x .470
C3	.100 x .100 120PF CHIP CAP	Z6	.070 x .405
C4	.100 x .100 470PF CHIP CAP	Z7	.740 x .180
C5	100μF ELECTROLYTIC	Z8	.050 x .325
Z1	.195 x .415	L1	#20 AWG
Z2	.685 x .230	L2	3 TURNS, 20 AWG WOUND ON #32 DRILL BIT
Z3	.080 x .105		
Z4	.845 x .345		



S88SD1538-8-09

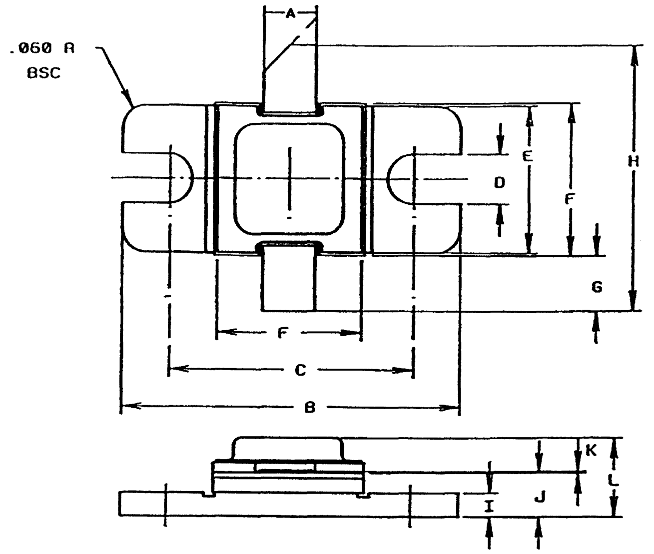
BOARD THICKNESS 31 MILS Er = 2.5



S88SD1538-8-10

PACKAGE MECHANICAL DATA

.400 x .400 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.090/2.29	.105/2.67
B	.890/22.61	.910/23.11
C	.640/16.26	.660/16.76
D	.120/3.05	.130/3.30
E	.380/9.65	.390/9.91
F	.395/10.03	.405/10.29

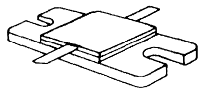
	Minimum Inches/mm	Maximum Inches/mm
G	.240/6.10	.260/6.60
H	.885/22.48	
I	.055/1.40	.065/1.65
J	.110/2.79	.130/3.30
K	.002/0.05	.006/0.15
L		.230/5.84

SGS-THOMSON
MICROELECTRONICS

SD1540

RF & MICROWAVE TRANSISTORS
IFF/DME APPLICATIONS

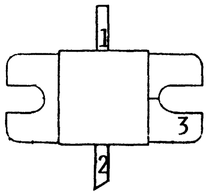
- DESIGNED FOR HIGH POWER PULSE IFF, DME, AND TACAN
- 350 WATTS (typ.) IFF 1030-1090MHz
- 300 WATTS (min.) DME 1025-1150MHz
- 290 WATTS (typ.) TACAN 960-1215MHz
- GREATER THAN 7.0dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD - VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT AND OUTPUT MATCHED, COMMON BASE CONFIGURATION



.400 x .400 2LFL (M103)
epoxy sealed

ORDER CODE	**BRANDING**
SD1540	SD1540

PIN CONNECTION



1 emitter
2 collector
3 base

DESCRIPTION

The SD1540 is a gold metallized, silicon NPN power transistor. The SD1540 is designed for applications requiring high peak power and low duty cycles such as IFF, DME and TACAN. The SD1540 is packaged in a metal/ceramic package with internal input/output matching, resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	22.0	A
P_{TOT}	Total Device Dissipation at + 25°C	875.0	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	.20	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

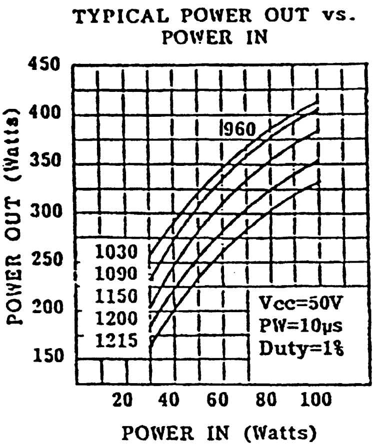
STATIC

Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CBO}	I_C = 10mA	I_B = 0	65.0			V
BV_{EBO}	I_E = 5.0mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			25.0	mA

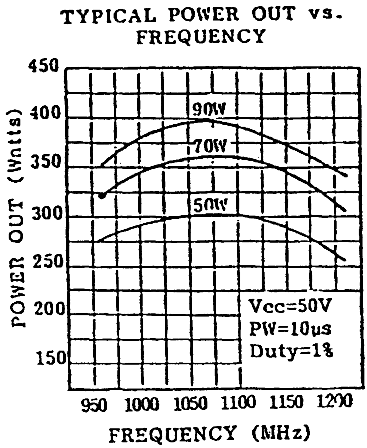
DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O*	f = 1090MHz	V_{CE} = 50.0V	P_i = 70W		350.0		W
P_G	f = 1090MHz	V_{CE} = 50.0V	P_i = 70W		7.0		dB
P_o*	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 70W	300.0	340.0		W
P_g	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 70W	6.3	6.8		dB
P_o**	f = 960/1215MHz	V_{CE} = 50.0V	P_i = 70W		290.0		W
P_g	f = 960/1215MHz	V_{CE} = 50.0V	P_i = 70W		6.1		dB

* Pulse width 10µs, duty cycle 1%.
** Pulse width 10µs, duty cycle 10%.

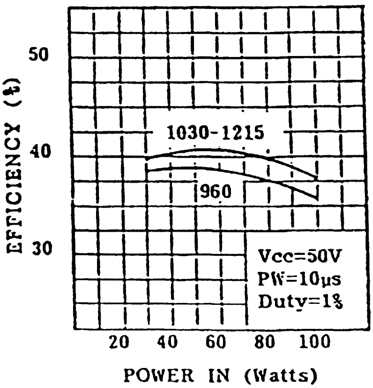


S88SD1540-02



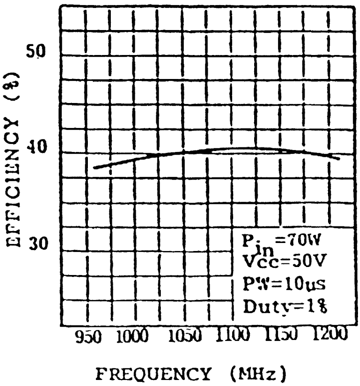
S88S1540-03

TYPICAL EFFICIENCY vs. POWER IN



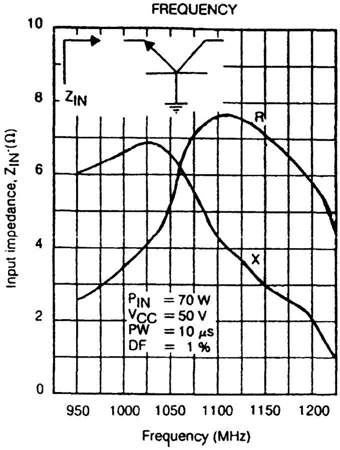
S88SD1540-04

TYPICAL EFFICIENCY vs. FREQUENCY



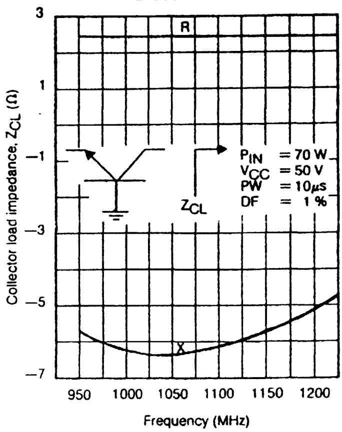
S88SD1540-05

TYPICAL INPUT IMPEDANCE VERSUS FREQUENCY



S88SD1540-06

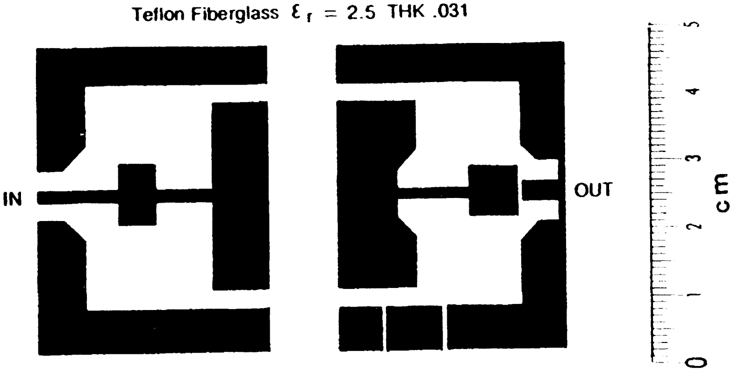
TYPICAL COLLECTOR LOAD IMPEDANCE VERSUS FREQUENCY



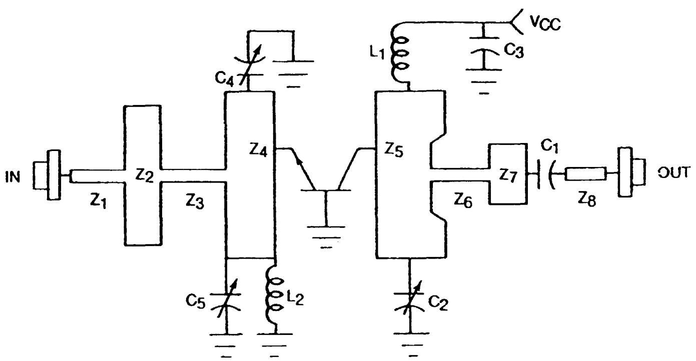
S88SD1540-07

TEST FIXTURE P.C BOARD AND SCHEMATIC

Teflon Fiberglass ε_r = 2.5 THK .031



S88SD1540-08

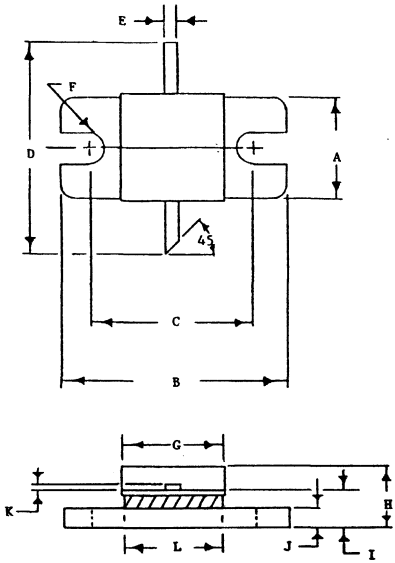


S88SD1540-09

C_1	100pF chip capacitor across .120sq gap	Z_2	.250 x .340	All dimensions in inches
C_2	.6-4.5pF Johanson	Z_3	.495 x .083	
C_3	470pF chip capacitor across .120sq gap	Z_4	.360 x 1.193	
L_1	2 3/4t ϕ 16 tinned .125 i.d. .215 long	Z_5	.485 x 1.2	
C_4 C_5	.35-3.5pF	Z_6	.520 x .035	
L_2	2 3/4t ϕ 20 tinned .090 i.d. .220 long	Z_7	.270 x .330	
Z_1	.395 x .083	Z_8	.270 x .110	

PACKAGE MECHANICAL DATA

.400 x .400 2LFL



S88SD1540-10

	Minimum Inches	Maximum Inches
A	.380	.395
B	.890	.910
C	.650	.670
D	.715	
E	.045	.055
F	.120	.130

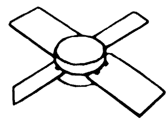
	Minimum Inches	Maximum Inches
G	.390	.410
H		.230
I	.115	.130
J	.055	.065
K	.004	.007
L	.390	.405

SGS-THOMSON
MICROELECTRONICS

SD1540-3

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

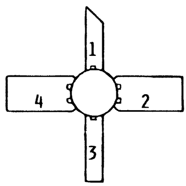
- DESIGNED FOR HIGH POWER PULSE IFF, DME, AND TACAN
- 325W (min.) IFF 1030-1090MHz
- 280W (typ.) DME 1025-1150MHz
- 200W (typ.) TACAN 960-1215MHz
- GREATER THAN 6.6dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT AND OUTPUT MATCHED, COMMON BASE CONFIGURATION



.375 4LSL (M143)
epoxy sealed

ORDER CODE	**BRANDING**
SD1540-03	SD1540-3

PIN CONNECTION



S88SD1540-3-01

1 collector	3 emitter
2 base	4 base

DESCRIPTION

The SD1540-3 is a gold metallized, silicon NPN power transistor. The SD1540-3 is designed for applications requiring high peak power and low duty cycles such as IFF, DME and TACAN.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	22.0	A
P_{TOT}	Total Device Dissipation at + 25°C	875.0	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	.20	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

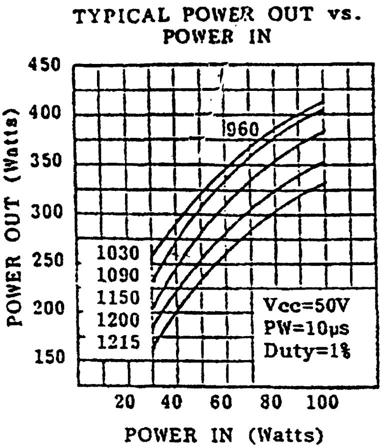
STATIC

Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CBO}	I_C = 10mA	I_B = 0	65.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			25.0	mA

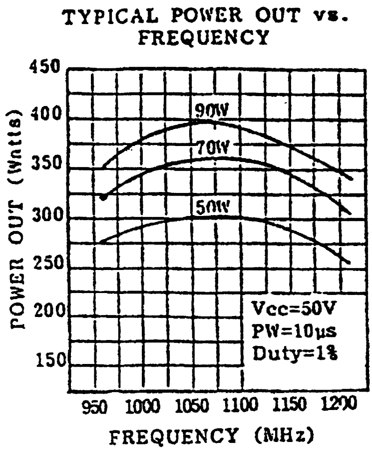
DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O*	f = 1090MHz	V_{CE} = 50.0V	P_i = 70W	325.0			W
P_G	f = 1090MHz	V_{CE} = 50.0V	P_i = 70W	6.6			dB
P_o*	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 70W		280.0		W
P_g	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 70W		6.0		dB
P_o**	f = 960/1215MHz	V_{CE} = 50.0V	P_i = 70W		200.0		W
P_g	f = 960/1215MHz	V_{CE} = 50.0V	P_i = 70W		4.5		dB

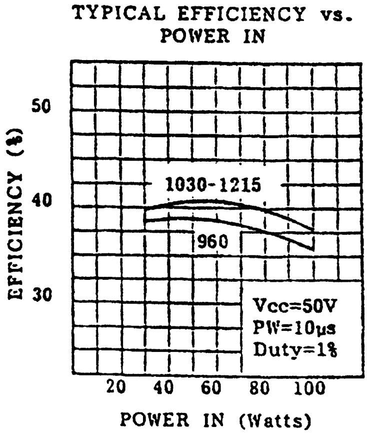
* Pulse width 10μs, duty cycle 1%.
** Pulse width 10μs, duty cycle 10%.



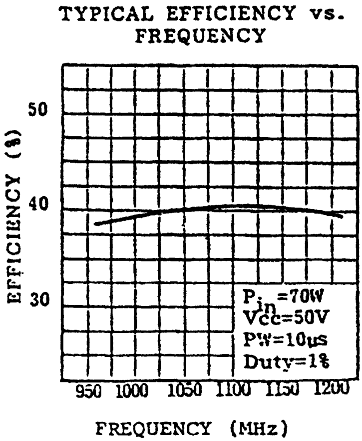
S88SD1540-3-02



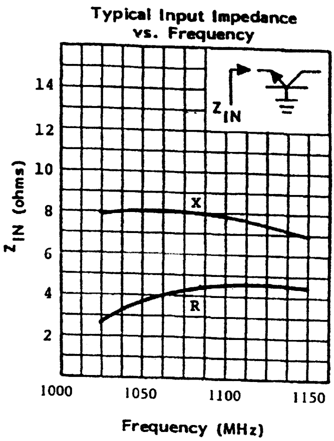
S88S1540-3-03



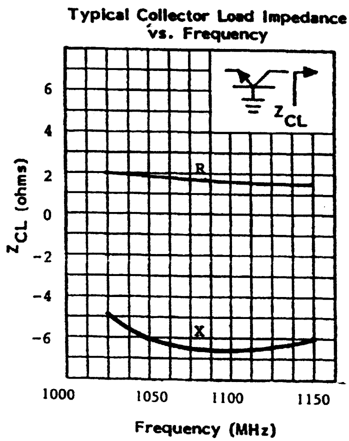
S88SD1540-3-04



S88SD1540-3-05



S88SD1540-3-06

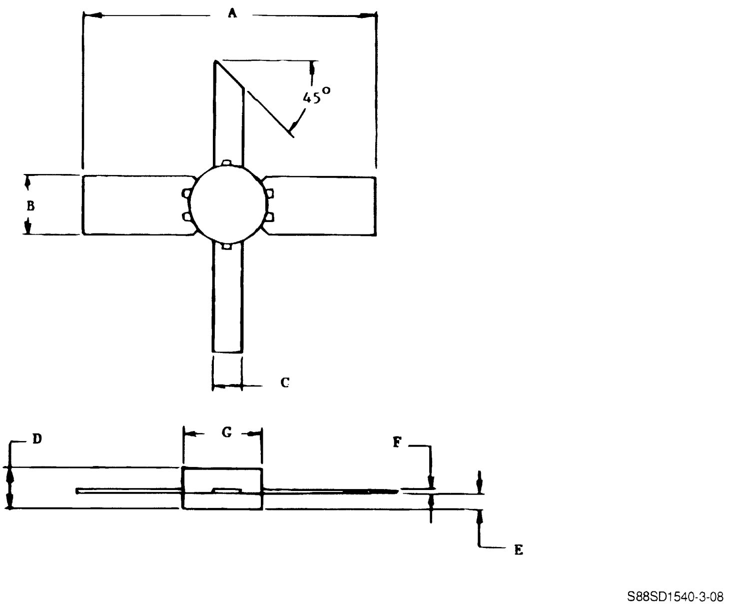


S88SD1540-3-07

P_{IN} = 70W
V_{CE} = 50V
P.W. = 10µs
D.F. = 1%

PACKAGE MECHANICAL DATA

.375 4LSL



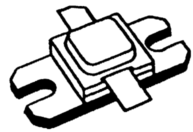
	Minimum Inch/mm	Maximum Inch/mm
A	1.000/25.40	1.090/27.69
B	.235/5.97	.245/6.22
C	.095/2.41	.105/2.67
D	.160/4.06	.180/4.57
E	.065/1.65	.075/1.91
F	.004/0.10	.007/0.18
G	.370/9.40	.390/9.91

SGS-THOMSON MICROELECTRONICS

SD1540-8

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

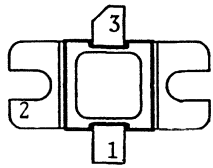
- DESIGNED FOR HIGH POWER PULSE IFF, DME, AND TACAN
- 350 WATTS (typ.) IFF 1030-1090MHz
- 300 WATTS (min.) DME 1025-1150MHz
- 290 WATTS (typ.) TACAN 960-1215MHz
- GREATER THAN 7.0dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT AND OUTPUT MATCHED, COMMON BASE CONFIGURATION



.400 x .400 2LFL (M138)
hermetic sealed

ORDER CODE	BRANDING
SD1540-08	SD1540-8

PIN CONNECTION



S88SD1540-8-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1540-8 is a gold metallized, silicon NPN power transistor. The SD1540-8 is designed for applications requiring high peak power and low duty cycles such as IFF, DME and TCAN. The SD1540-8 is packaged in a metal/ceramic package with internal input/output matching, resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	22.0	A
P_{TOT}	Total Device Dissipation at + 25°C	875.0	W
T_{STG}	Storage Temperature	− 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	.20	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

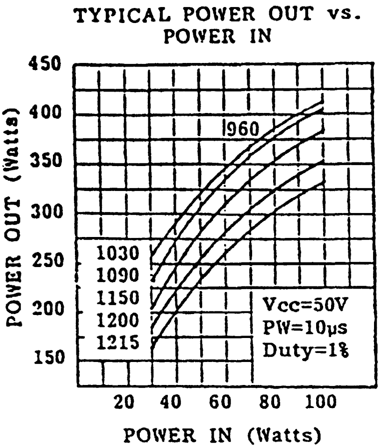
STATIC

Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CBO}	I_C = 10mA	I_B = 0	65.0			V
BV_{EBO}	I_E = 5.0mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			25.0	mA

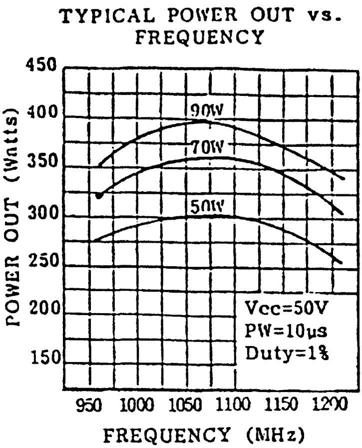
DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O*	f = 1090MHz	V_{CE} = 50.0V	P_i = 70W		350.0		W
P_G	f = 1090MHz	V_{CE} = 50.0V	P_i = 70W		7.0		dB
P_o*	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 70W	300.0	340.0		W
P_g	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 70W	6.3	6.8		dB
P_o**	f = 960/1215MHz	V_{CE} = 50.0V	P_i = 70W		290.0		W
P_g	f = 960/1215MHz	V_{CE} = 50.0V	P_i = 70W		6.1		dB

* Pulse width 10µs, duty cycle 1%.
** Pulse width 10µs, duty cycle 10%.

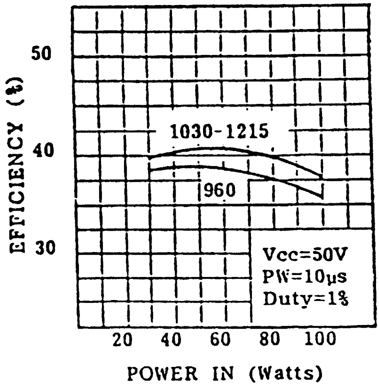


S88SD1540-8-02



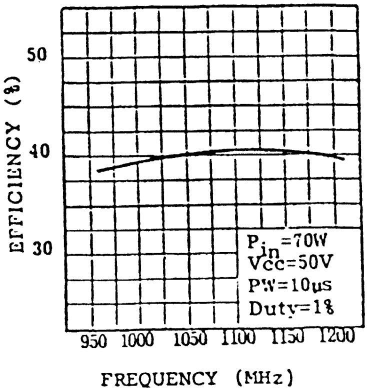
S88S1540-8-03

TYPICAL EFFICIENCY vs. POWER IN

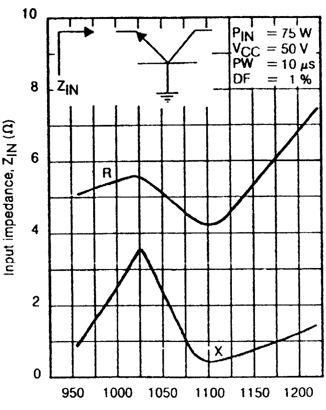


S88SD1540-8-04

TYPICAL EFFICIENCY vs. FREQUENCY

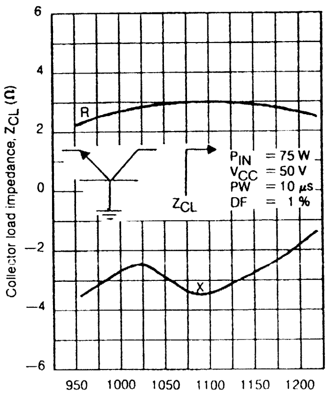


S88SD1540-8-05



TYPICAL INPUT IMPEDANCE VERSUS FREQUENCY

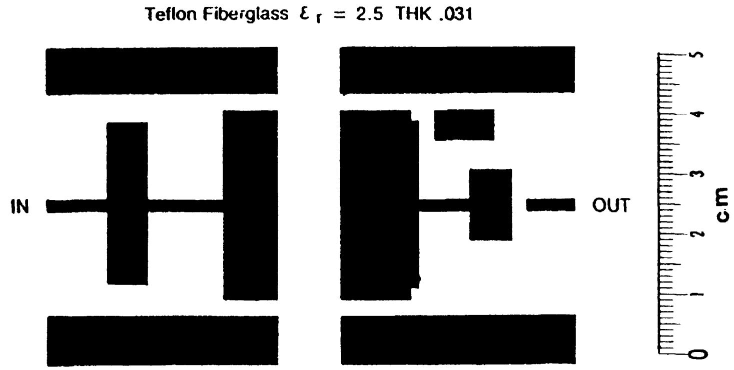
S88SD1540-8-06



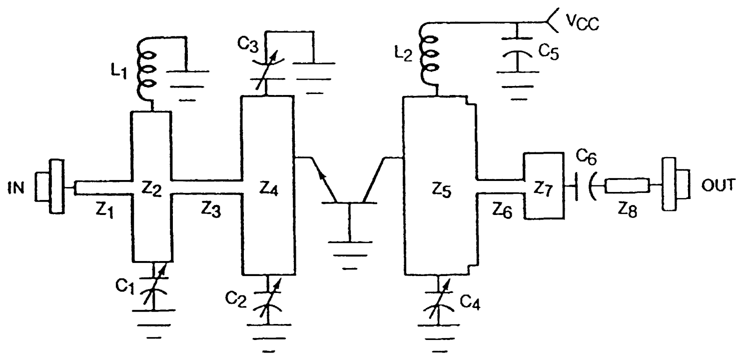
TYPICAL COLLECTOR LOAD IMPEDANCE VERSUS FREQUENCY

S88SD1540-8-07

TEST CIRCUIT P.C BOARD



S88SD1540-8-08

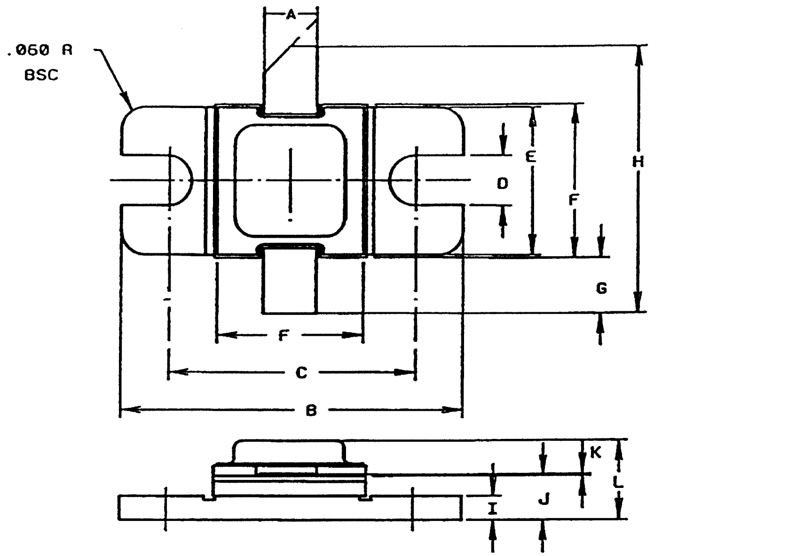


S88SD1540-8-09

C_1, C_2, C_3, C_4	.6-4.5pF Johanson Gisatrim
C_5	1000mfd. 63V electrolytic
C_6	100pF chip capacitor across .09 in .sap
L_1	2t., #24, .12 i.d., spaced wire dia.
L_2	4t., #24, .07 i.d., spaced wire dia.
Z_1	.404 x .075
Z_2	.263 x .995
Z_3	.483 x .077
Z_4	.350 x 1.203
Z_5	.505 x 1.200 with two notches .05 long by .068 wide
Z_6	.335 x .076
Z_7	.260 x .442
Z_8	.310 x .082
	All dimensions in inches

PACKAGE MECHANICAL DATA

.400 x .400 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.090/2.29	.105/2.67
B	.890/22.61	.910/23.11
C	.640/16.26	.660/16.76
D	.120/3.05	.130/3.30
E	.380/9.65	.390/9.91
F	.395/10.03	.405/10.29

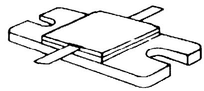
	Minimum Inches/mm	Maximum Inches/mm
G	.240/6.10	.260/6.60
H	.885/22.48	
I	.055/1.40	.065/1.65
J	.110/2.79	.130/3.30
K	.002/0.05	.006/0.15
L		.230/5.84

SGS-THOMSON MICROELECTRONICS

SD1541

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

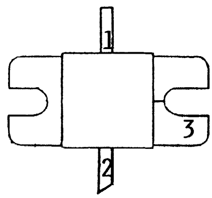
- DESIGNED FOR HIGH POWER PULSE IFF AND DME
- 450W (min.) IFF 1030-1090MHz
- 400W (min.) DME 1025-1150MHz
- GREATER THAN 7.0dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT AND OUTPUT MATCHED, COMMON BASE CONFIGURATION



.400 x .400 2LFL (M103)
epoxy sealed

ORDER CODE	**BRANDING**
SD1541	SD1541

PIN CONNECTION



1 emitter
2 collector
3 base

DESCRIPTION

The SD1541 s a gold metallized, silicon NPN power transistor. The SD1541 is designed for applications requiring high peak ad low duty cycles such as IFF and DME. The SD1541 is packaged in a metal/ceramic package with internal input/out matching, resulting in improved performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	22.0	A
P_{TOT}	Total Device Dissipation at + 25°C	1458.0	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-Case Thermal Resistance	.12	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

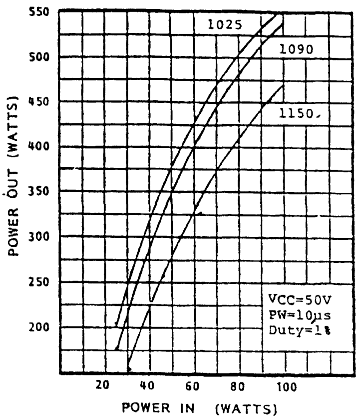
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 25mA	I_E = 0	65.0			V
BV_{EBO}	I_E = 1mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			35.0	mA

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O*	f = 1090MHz	V_{CE} = 50.0V	P_i = 90W	450.0	500.0		W
P_G	f = 1090MHz	V_{CE} = 50.0V	P_i = 90W	7.0	7.5		dB
P_O*	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 90W	400.0	450.0		W
P_g	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 90W	6.5	7.0		dB

* Pulse width 10μs, duty cycle 1%.

TYPICAL POWER vs. POWER IN



S88SD1541-02

TYPICAL IMPEDANCES

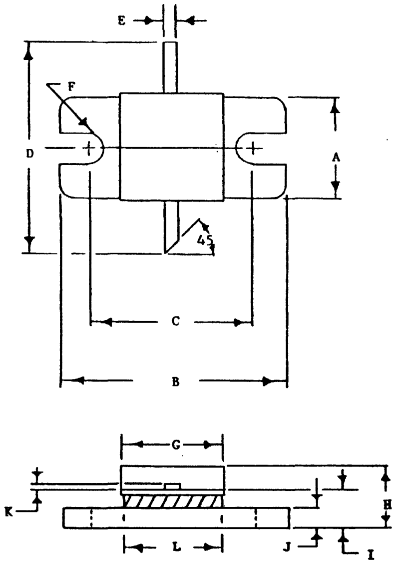
Frequency	Z_{IN}	Z_{CL}
1030	1.5 + j5.5	1.5 – j6.25
1090	2.5 + j6	1.25 – j6.6
1150	4.25 + j4.5	1.5 – j7.1

CONDITIONS

Power In = 90W
V_{CC} = 50V
Pulse Width = 10μs
Duty = 1%

PACKAGE MECHANICAL DATA

.400 x .400 2LFL



	Minimum Inches	Maximum Inches
A	.380	.395
B	.890	.910
C	.650	.670
D	.715	
E	.045	.055
F	.120	.130

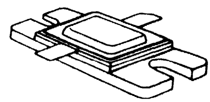
	Minimum Inches	Maximum Inches
G	.390	.410
H		.230
I	.115	.130
J	.055	.065
K	.004	.007
L	.390	.405

SGS-THOMSON
MICROELECTRONICS

SD1541-1

RF & MICROWAVE TRANSISTORS
IFF/DME APPLICATIONS

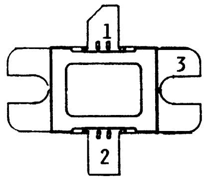
- DESIGNED FOR HIGH POWEER PULSE IFF AND DME
- 400 WATTS (min.) DME 1025-1150MHz
- GREATER THAN 6.5dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT AND OUTPUT MATCHED, COMMON BASE CONFIGURATION



.400 x .500 2LFL (M112)
hermetic sealed

ORDER CODE	BRANDING
SD1541-01	SD1541-1

PIN CONNECTION



S88SD1541-1-01

1 collector
2 emitter
3 base

DESCRIPTION

The SD1541-1 is a hermetically sealed, gold metallized, silicon NPN power transistor. The SD1541-1 is designed for applications requiring high peak power and low duty cycles such as DME. The SD1541-1 is packaged in a hermetic metal/ceramic package with internal input/output matching, resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	22.0	A
P_{TOT}	Total Device Dissipation at + 25°C	1458.0	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	.12	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

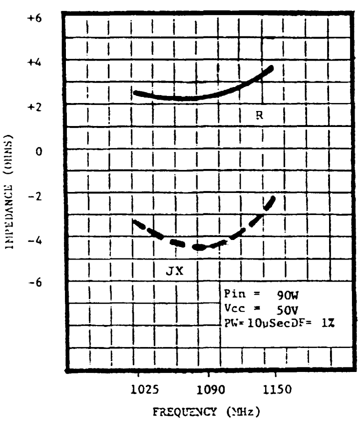
Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CBO}	I_C = 25mA	I_E = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{Ce} = 50.0V	V_{BE} = 0			25.0	mA

DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O**	f = 1090MHz	V_{CE} = 50.0V	P_i = 90W		450.0		W
P_G	f = 1090MHz	V_{CE} = 50.0V	P_i = 90W		7.0		dB
P_o**	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 90W	400.0			W
P_g	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 90W	6.5			dB

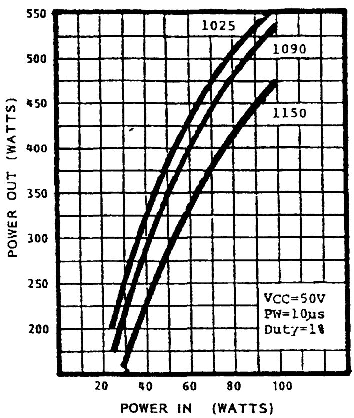
** Pulse width 10µs, duty cycle 1%.

TYPICAL INPUT IMPEDANCE vs FREQUENCY

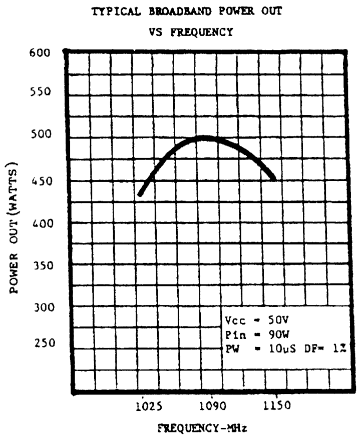


S88SD1541-1-02

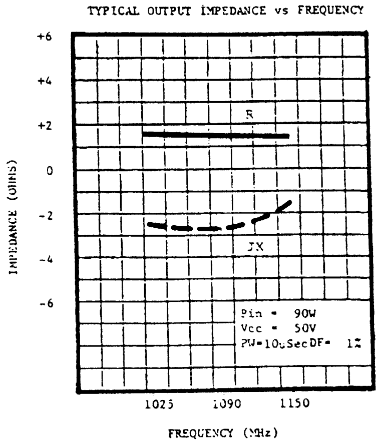
TYPICAL POWER OUT vs. POWER IN



S88S1541-1-03

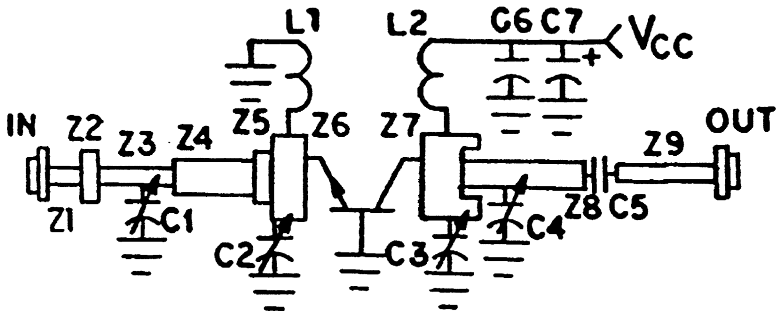


S88SD1541-1-04



S88SD1541-1-05

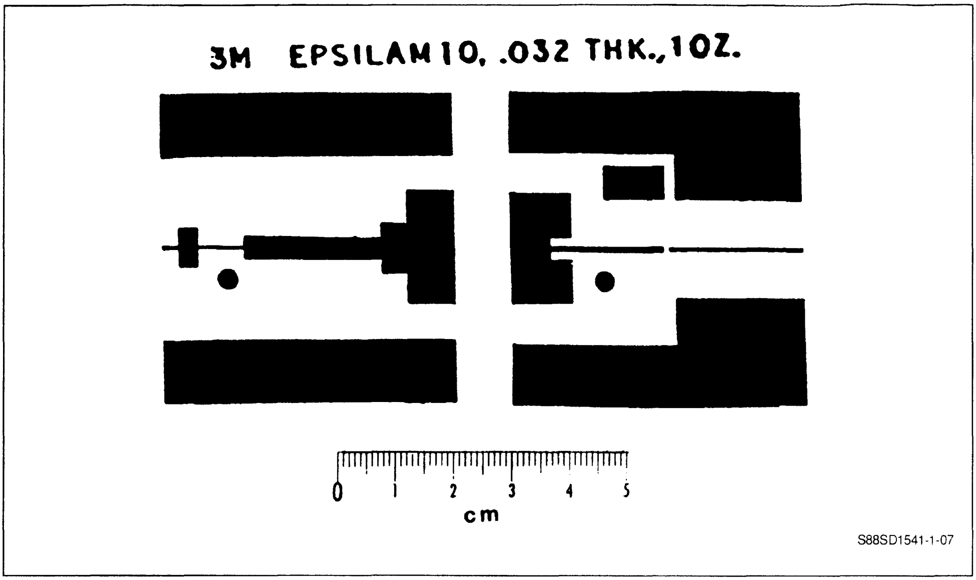
APPLICATION TEST CIRCUIT



S88S1541-1-06

C1	–	0.4–2.5pf Johanson Gisatrim	Z3	–	50Ω, .020 x .330 ; C1 tapped .15 from load.
C2, C3, C4	–	0.6–4.5pf, Johanson Gisatrim	Z4	–	.145 x .920
C5	–	82pf chip cap., .055sq.	Z5	–	.325 x .180
C6	–	pair of 820pf chip cap., .11sq.	Z6	–	.730 x .315
Z7	–	1000mfd electrolytic	Z7	–	.710 x .425 with .140 x .150 cutout
L1	–	Loop, #18 tinned, .36 wide x .27above circuit	Z8	–	0.35 x .780 ; C4 tapped .36 from sen.
L2	–	4 3/4 turns, #24 en., c.w., .075 i.d.	Z9	–	50Ω, (.02 wide)
Z1	–	50Ω (.02 wide)	All dimensions in inches unless otherwise specified.		
Z2	–	.250 x .120	C1, C4		cold end terminated through eyelet.

TEST CIRCUIT P.C BOARD

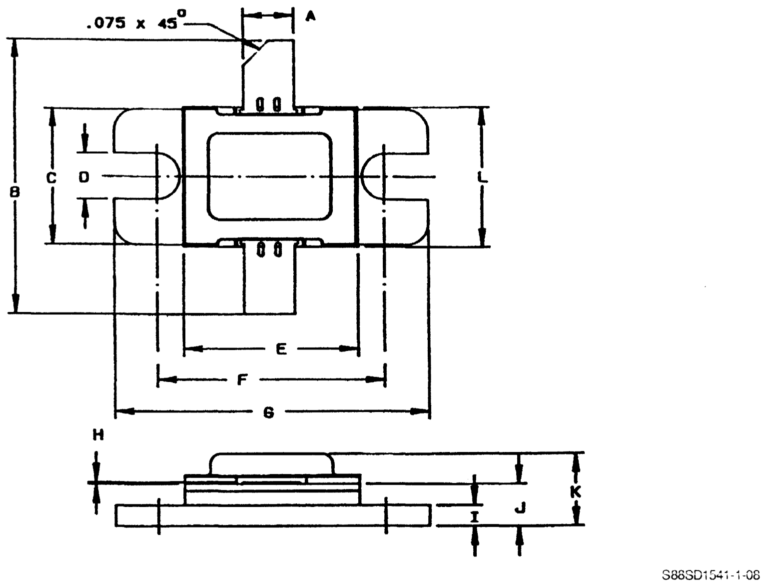


TYPICAL IMPEDANCES

Freq.	1020	1090	1150
Zin	2.898 + j4.1	2.325 + j3.4	1.994 + j2.8
Zcl	1.382 – j3.2	1.338 – j2.8	1.269 – j2.5

PACKAGE MECHANICAL DATA

.400 x .500 2LFL

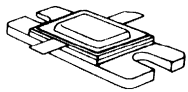


	Minimum Inches/mm	Maximum Inches/mm
A	.145/3.68	.155/3.93
B	.750/19.05	
C	.380/9.65	.390/9.91
D	.130/3.30 BSC	
E	.495/12.57	.505/12.83
F	.640/16.26	.655/16.64

	Minimum Inches/mm	Maximum Inches/mm
G	.890/22.61	.910/23.11
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.115/2.92	.135/3.43
K		.230/5.84
L	.395/10.03	.405/10.29

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

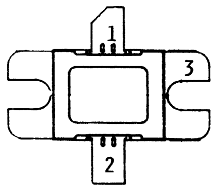
- DESIGNED FOR HIGH POWER PULSE IFF
- 450 WATTS (min.) IFF 1030-1090MHz
- GREATER THAN 7.0dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.400 x .500 2LFL (M112)
hermetic sealed

ORDER CODE	**BRANDING**
SD1541-09	SD1541-9

PIN CONNECTION



S88SD1541-9-01

1 collector
2 emitter
3 base

DESCRIPTION

The SD1541-9 is a gold metallized, silicon NPN power transistor. The SD1541-9 is designed for applications requiring high peak and low duty cycles such as IFF. The SD1541-9 is packaged in a metal/ceramic package with internal input matching, resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	22.0	A
P_{TOT}	Total Device Dissipation at + 25°C	1458.0	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	.12	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

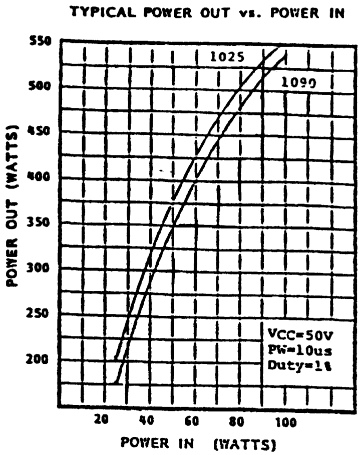
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 25mA	I_E = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CBO}	V_{CE} = 50V	V_{BE} = 0			25.0	mA

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CC} = 50V	P_i = 90W	450.0			W
P_G	f = 1090MHz	V_{CC} = 50V	P_i = 90W	7.0	7.5		dB
Z_{in}	f = 1090MHz	V_{CC} = 50V	P_i = 90W		2.5+j4.7		Ω
Z_{cl}	f = 1090MHz	V_{CC} = 50V	P_i = 90W		1.2–j1.2		Ω
η_c	f = 1090MHz	V_{CC} = 50V	P_{out} = 450W		45		%

** Pulsed width 10μs, duty cycle 1%.



S88SD1541-9-02

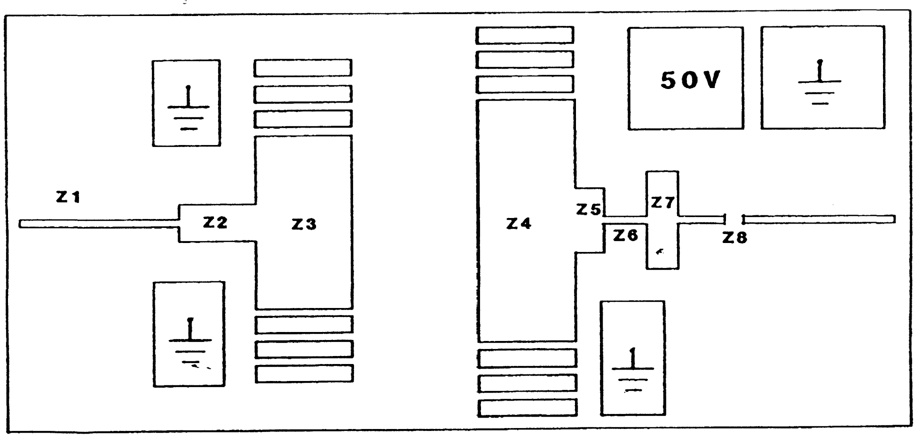
TYPICAL IMPEDANCES

Frequency	1030	1090
Z_{IN}	1.6 + j5.1	2.5 + j4.7
Z_{CL}	1.1 – j2.0	1.2 – j1.2

CONDITIONS

Power In = 90W
Vcc = 50V
Pulse Width = 10µs
Duty = 1%

TEST CIRCUIT PC BOARD

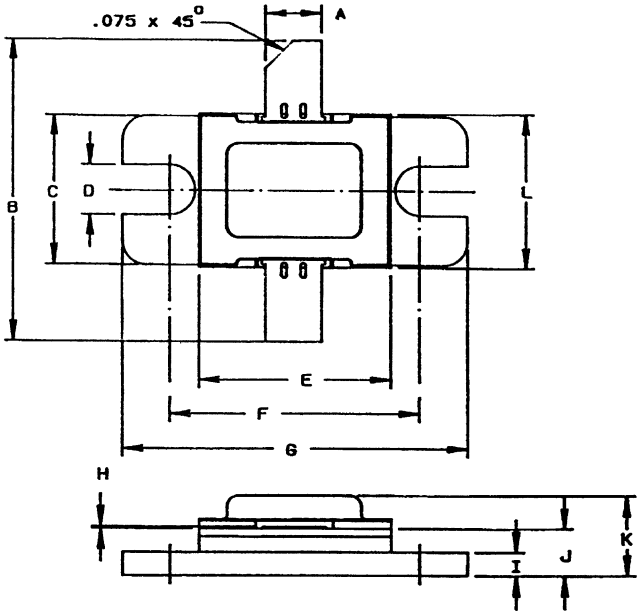


S88SD1541-9-03

Z1, Z8 - .0225 x .500
Z2 - .115 x .240
Z3 - .537 x .305
Z4 - .745 x .305
Z5 - .200 x .090
Z6 - .0225 x .135
Z7 - .300 x .100
Board Er = 10.2 H = .025"
All dimensions in inches.

PACKAGE MECHANICAL DATA

.400 x .500 2LFL



S88SD1541-9-04

	Minimum Inches/mm	Maximum Inches/mm
A	.145/3.68	.155/3.93
B	.750/19.05	
C	.380/9.65	.390/9.91
D	.130/3.30 BSC	
E	.495/12.57	.505/12.83
F	.640/16.26	.655/16.64

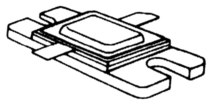
	Minimum Inches/mm	Maximum Inches/mm
G	.890/22.61	.910/23.11
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.115/2.92	.135/3.43
K		.230/5.84
L	.395/10.03	.405/10.29

SGS-THOMSON MICROELECTRONICS

SD1542

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

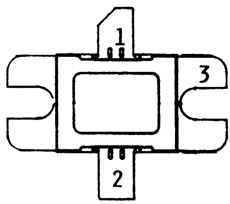
- DESIGNED FOR HIGH POWER PULSE IFF AND DME
- 600 WATTS (typ.) IFF 1030-1090MHz
- 550 WATTS (min.) DME 1025-1150MHz
- GREATER THAN 5.6dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT AND OUTPUT MATCHED, COMMON BASE CONFIGURATION



.400 x .500 2LFL (M112)
hermetic sealed

ORDER CODE	**BRANDING**
SD1542	SD1542

PIN CONNECTION



S88SD1542-01

1 collector
2 emitter
3 base

DESCRIPTION

The SD1542 is a hermetically sealed, gold metallized, silicon NPN power transistor. The SD1542 is designed for applications requiring high peak power and low duty cycles such as IFF and DME. The SD1542 is packaged in a hermetic metal/ceramic package with internal input/output matching, resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	40.0	A
P_{TOT}	Total Device Dissipation at + 25°C	1350.0	W
T_{STG}	Storage Temperature	− 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	.06	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

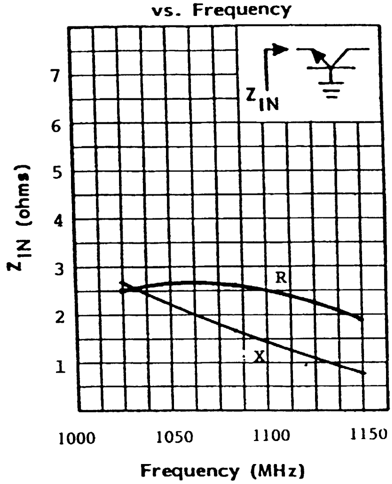
Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CBO}	I_C = 25mA	I_E = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			35.0	mA

DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O**	f = 1090MHz	V_{CE} = 50.0V	P_i = 150W		600.0		W
P_G	f = 1090MHz	V_{CE} = 50.0V	P_i = 150W		6.0		dB
P_o**	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 150W	550.0			W
P_g	f = 1025/1150MHz	V_{CE} = 50.0V	P_i = 150W	5.6			dB

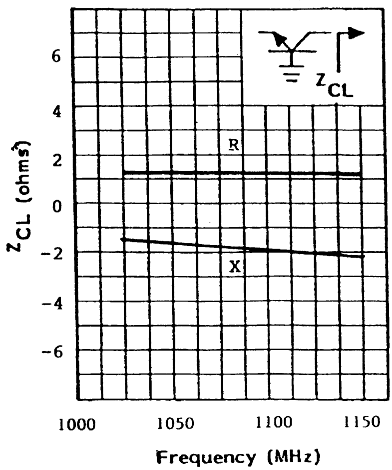
** Pulsed width 10μs, duty cycle 1%.

Typical Input Impedance vs. Frequency



S88SD1542-02

Typical Collector Load Impedance vs. Frequency



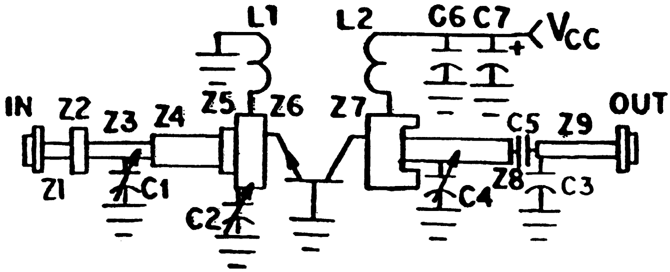
S88SD1542-03

P_{IN} = 150W
V_{CE} = 50V
P.W = 10μs
D.F. = 1%

IMPEDANCES

MHz	1020	1090	1150
Zin (Ω)	1.78 + j3	1.57 + j2.1	1.55 + j1.4
Zcl (Ω)	1.331 – j2.7	1.64 – j3.4	1.93 – j4.0

TEST CIRCUIT

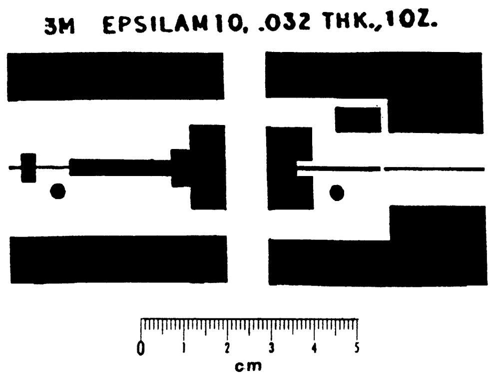


S88SD1542-04

C1	–	0.4–2.5pf, Johanson Gisatrim
C2, C3, C4	–	0.6–4.5pf, Johanson Gisatrim
C5	–	82pf chip cap., .055sq.
C6	–	pair of 820pf chip caps., .11sq.
C7	–	1000mfd electrolytic
L1	–	Loop, #18 tinned, .36 wide x .27 above circuit
L2	–	.4 3/4 turns, #24 en., c.w., .075 i.d.
Z1	–	50Ω (.02 wide)
Z2	–	.250 x .120
Z3	–	50Ω, .020 x .330 ; C1 tapped .15 from load.
Z4	–	.145 x .920
Z5	–	.325 x .180
Z6	–	.730 x .315
Z7	–	.710 x .425 with .140 x .150 cutout
Z8	–	.035 x .780 ; C4 tapped .36 from sen.
Z9	–	50Ω, (.02 wide)

All dimensions in inches unless otherwise specified
C1, C4 cold end terminated through eyelet.

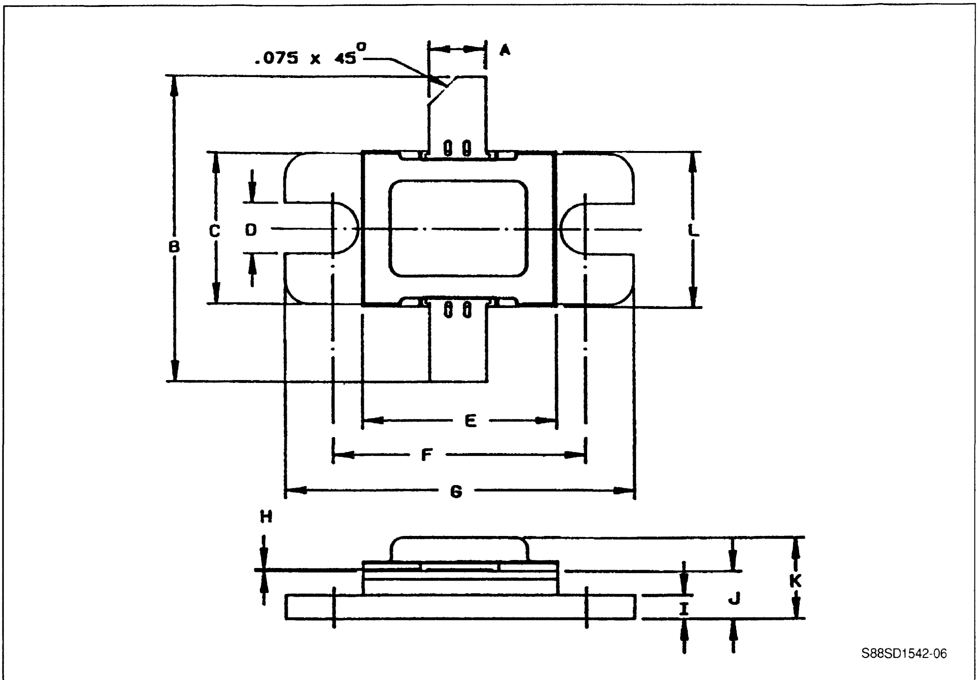
TEST CIRCUIT P.C BOARD



S88SD1542-05

PACKAGE MECHANICAL DATA

.400 x .500 2LFL

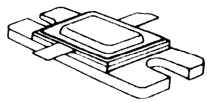


	Minimum Inches/mm	Maximum Inches/mm
A	.145/3.68	.155/3.93
B	.750/19.05	
C	.380/9.65	.390/9.91
D	.130/3.30 BSC	
E	.495/12.57	.505/12.83
F	.640/16.26	.655/16.64
G	.890/22.61	.910/23.11
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.115/2.92	.135/3.43
K		.230/5.84
L	.395/10.03	.405/10.29

SD1542-4

RF POWER TRANSISTOR
IFF PULSE APPLICATION

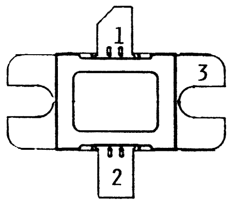
- DESIGNED FOR HIGH POWER PULSE IFF
- 600 WATTS (min) IFF 1030-1090MHz
- GREATER THAN 6.0dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD — VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.400 x .500 2LFL (M112)
hermetic sealed

ORDER CODE	**BRANDING**
SD1542-04	SD1542-4

PIN CONNECTION



S88SD1542-4-01

1 collector
2 emitter
3 base

DESCRIPTION

The SD1542-4 is a hermetically sealed, gold metallized, silicon NPN power transistor. The SD1542-4 is designed for applications requiring high peak power and low duty cycles such as IFF. The SD1542-4 is packaged in a hermetic metal/ceramic package with internal input matching, resulting in improved broadband performance and a low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	40.0	A
P_{tot}	Total Device Dissipation at + 25°C	1350.0	W
T_{stg}	Storage Temperature	– 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance (pulse mode)	.06	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

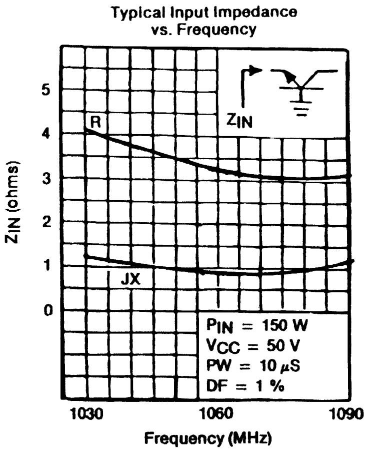
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 25mA	I_E = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			35.0	mA

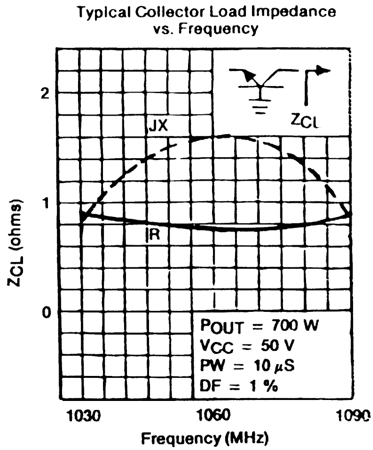
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CB} = 50.0V	P_i = 150W	600.0	700.0		W
P_g	f = 1090MHz	V_{CB} = 50.0V	P_i = 150W	6.0	6.7		dB
η_C	f = 1090MHz	V_{CB} = 50.0V	P_o = 600W		40		%

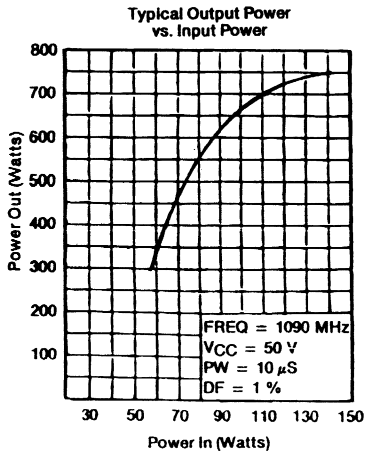
** Pulsed Width 10µs, Duty Cycle 1%.



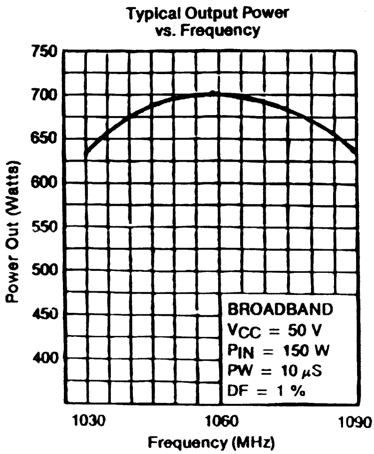
S88SD1542-4-02



S88SD1542-4-03

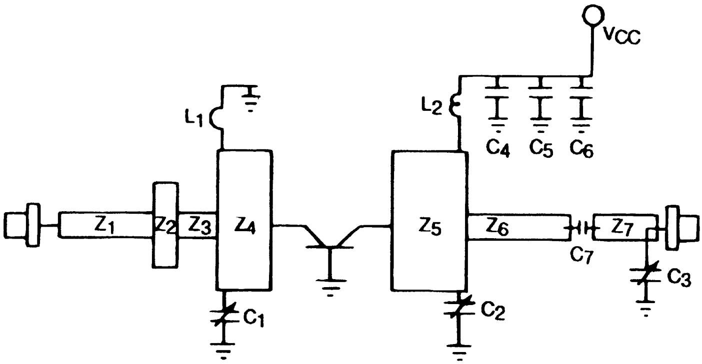


S88SD1542-4-04



S88SD1542-4-05

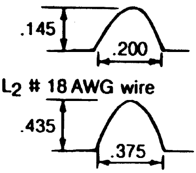
TEST CIRCUIT



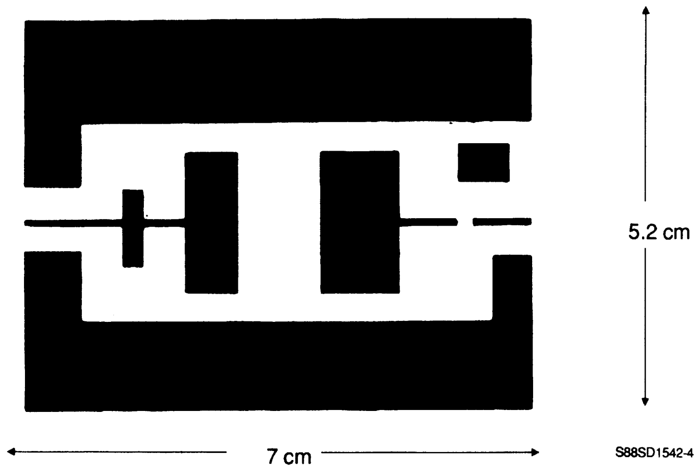
S88SD1542-4-06

C_1, C_2, C_3	.8-4.8 Gigatrim
C_4	120pF Chip Cap
C_5	680pF Chip Cap
C_6	1000µF 63 VDC Electrolytic
C_7	56pF Chip Cap
Z_1	510Mils x 20Mils
Z_2	120Mils x 380Mils
Z_3	210Mils x 20Mils
Z_4	270Mils x 725Mils
Z_5	400Mils x 720Mils
Z_6	340Mils x 20Mils
Z_7	245Mils x 20Mils
L_1	100Mils wide brass strip

P.C board TH : 0.25
εR : 10



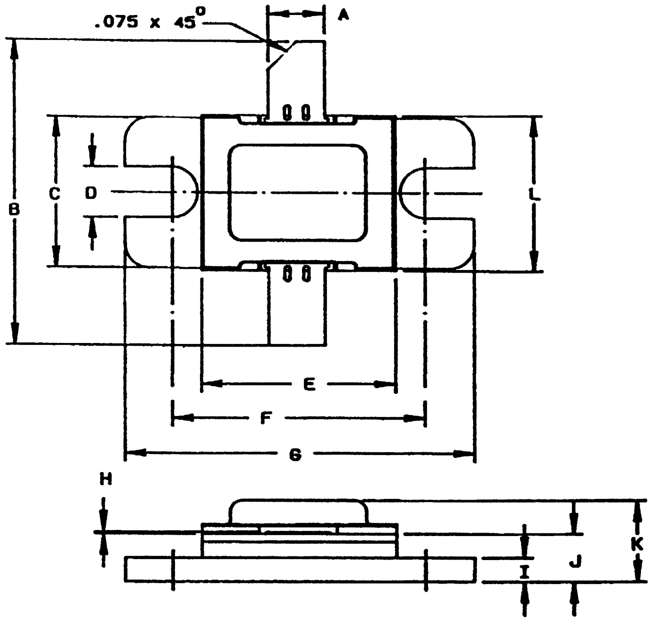
Circuit Board Layout



S88SD1542-4-07

PACKAGE MECHANICAL DATA

.400 x .500 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.145/3.68	.155/3.93
B	.750/19.05	
C	.380/9.65	.390/9.91
D	.130/3.30 BSC	
E	.495/12.57	.505/12.83
F	.640/16.26	.655/16.64

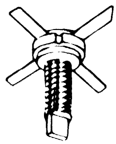
	Minimum Inches/mm	Maximum Inches/mm
G	.890/22.61	.910/23.11
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.115/2.92	.135/3.43
K		.230/5.84
L	.395/10.03	.405/10.29

SGS-THOMSON
MICROELECTRONICS

SD1544

RF & MICROWAVE TRANSISTORS
MICROWAVE POWER TRANSISTORS FOR CLASS C APPLICATIONS

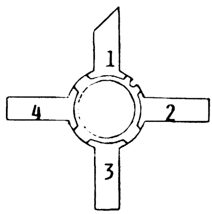
- GOLD METALLIZATION
- HERMETIC STRIPLINE PACKAGE
- 1.0W @ 2GHz WITH GREATER THAN 5dB GAIN
- DESIGNED FOR AMPLIFIERS AND OSCILLATORS



.320 4LSTUD (M126)
epoxy sealed

ORDER CODE	**BRANDING**
SD1544	SD1544

PIN CONNECTION



S88SD1544-01

1 collector	3 base
2 emitter	4 emitter

DESCRIPTION
The SD1544 is a gold metallized, silicon NPN transistor. It is primarily designed for Class A, B, and C, VHF/UHF and microwave amplifier or oscillator applications. The device is particularly suitable for use in microwave communications links, ECM, phased array radar and L Band Telemetry. The SD1544 is available in a stripline stud package featuring low inductance leads.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	50.0	V
V_{CEO}	Collector - Emitter Voltage	30.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.25	A
P_{tot}	Total Device Dissipation at + 25°C	5.8	W
T_{stg}	Storage Temperature	– 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	30.2	°C/W

May 1989

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

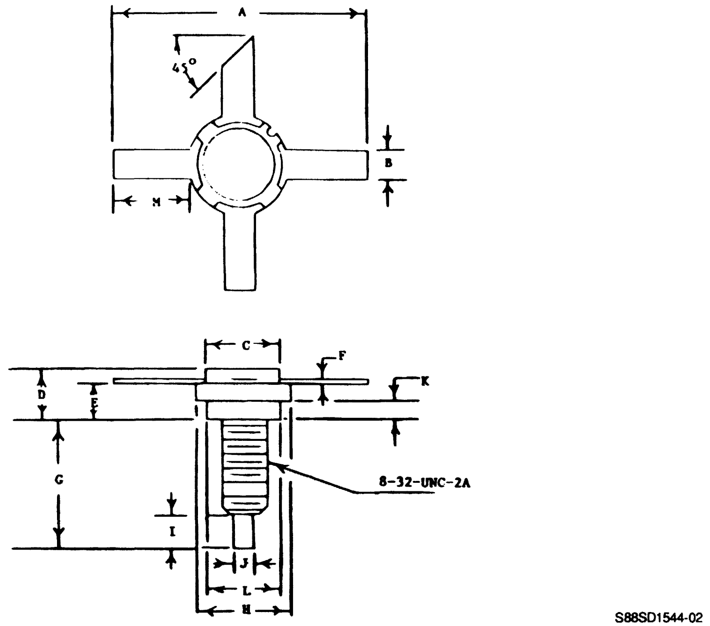
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1mA	I_E = 0	50.0			V
BV_{CEO}	I_C = 5mA	I_B = 0	30.0			V
BV_{EBO}	I_E = 1mA	I_C = 0	3.5			V
h_{FE}	V_{CE} = 5.0V	I_C = 50mA	10.0		250.0	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_o	f = 2000MHz	V_{CE} = 28.0V		1.0			W
P_g	f = 2000MHz	V_{CE} = 28.0V		5.0			dB
C_{ob}	f = 1MHz	V_{CE} = 28.0V	I_C = 0		2.0	2.5	pF

PACKAGE MECHANICAL DATA

.320 4LSTUD



	Minimum Inches	Maximum Inches
A	.835	
B	.095	.105
C	.245	.250
D	.155	.175
E	.110	.130
F	.003	.007

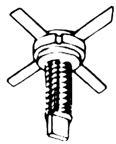
	Minimum Inches	Maximum Inches
G	.435	.465
H	.316	.324
I	.115	.145
J/K	.055	.065
L	.245	.250
M	.260	

SGS-THOMSON MICROELECTRONICS

SD1545

RF & MICROWAVE TRANSISTORS
MICROWAVE POWER TRANSISTORS FOR CLASS C APPLICATION

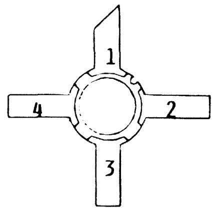
- GOLD METALLIZATION
- LOW INDUCTANCE HERMETIC STRIPLINE PACKAGE
- 2.5W @ 2GHz WITH 5.0dB GAIN
- DESIGNED FOR AMPLIFIERS AND OSCILLATORS
- COMMON EMITTER



.320 4LSTUD (M126)
epoxy sealed

ORDER CODE	**BRANDING**
SD1545	SD1545

PIN CONNECTION



S88SD1545-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The SD1545 is a gold metallized silicon NPN transistor. It is primarily designed for Class A, B, and C, VHF/UHF and microwave amplifier or oscillator applications. The device is particularly suitable for use in microwave communication links, ECM, phased array radar and L Band Telemetry. The SD1545 is available in a stripline stud package featuring low inductance leads.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	50.0	V
V_{CEO}	Collector - Emitter Voltage	30.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.5	A
P_{tot}	Total Device Dissipation at + 25°C	16.0	W
T_{stg}	Storage Temperature	– 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	10.9	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

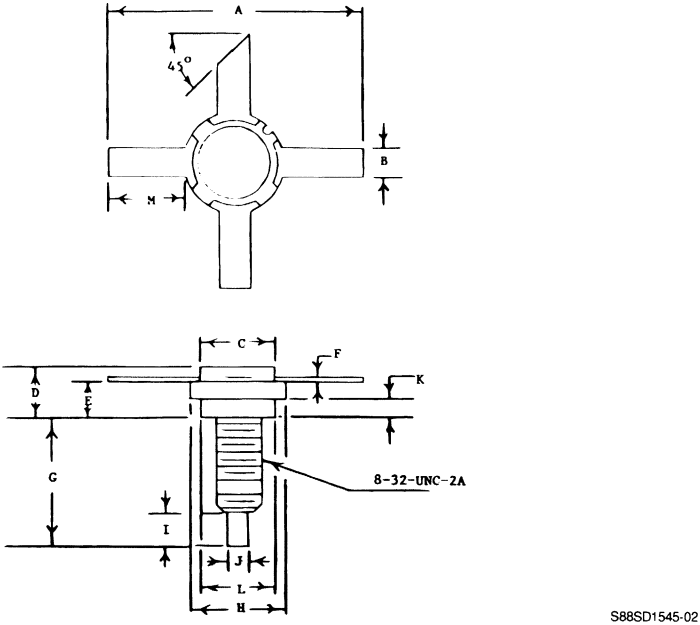
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1mA	I_B = 0	50.0			V
BV_{CEO}	I_C = 5mA	V_{BE} = 0	30.0			V
BV_{EBO}	I_E = 1mA	I_C = 0	3.5			V
h_{FE}	V_{CE} = 5.0V	I_C = 50mA	20.0		250.0	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_o	f = 2000MHz	V_{CE} = 28.0V		2.5			W
G_p	f = 2000MHz	V_{CE} = 28.0V		5.0			dB
C_{ob}	f = 1MHz	V_{CB} = 28.0V	I_E = 0			5.0	pF

PACKAGE MECHANICAL DATA

.320 4LSTUD Herm



	Minimum Inches	Maximum Inches
A	.835	
B	.095	.105
C	.245	.250
D	.155	.175
E	.110	.130
F	.003	.007

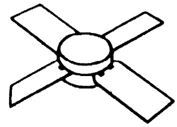
	Minimum Inches	Maximum Inches
G	.435	.465
H	.316	.324
I	.115	.145
J/K	.055	.065
L	.245	.250
M	.260	

SGS-THOMSON MICROELECTRONICS

SD1546-1

RF & MICROWAVE TRANSISTORS IFF/DME APPLICATIONS

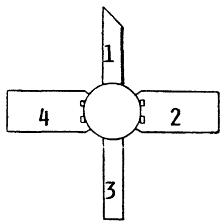
- DESIGNED FOR HIGH POWER PULSE OSCILLATORS
- 70W (min.) IFF/TRANSPONDER 1030-1090MHz
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- COMMON BASE CONFIGURATION



.280 4LS(A) (M115)
epoxy sealed

ORDER CODE	BRANDING
SD1546-01	SD1546-1

PIN CONNECTION



S88SD1546-1-01

1 collector
2 base
3 emitter
4 base

DESCRIPTION

The SD1456-1 is a gold metallized silicon NPN power transistor. The SD1546-1 is designed for oscillator applications requiring high peak power and low duty cycles.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	11.0	A
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.3	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_E = 0	65.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	3.5	5.0		V
I_{CES}	V_{CE} = 50.0V	V_{BE} = 0			10.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1A	15.0		100.0	

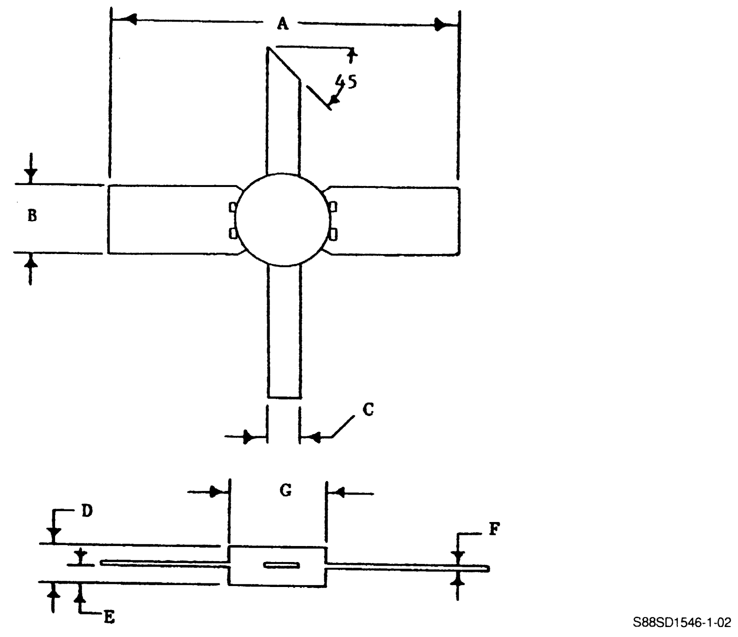
DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O*	f = 1090MHz	V_{CB} = 50.0V	60.0			W
P_O**			70.0			W

* Pulse width 10µs, duty cycle 1%
** Pulse width 1µs, duty cycle 1%.

PACKAGE MECHANICAL DATA

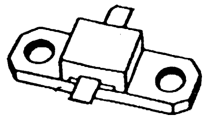
.280 4LSTUD(A)



	Minimum Inches	Maximum Inches
A	1.000	
B	.195	.205
C	.095	.105
D	.120	.135
E	.050	.065
F	.004	.007
G	.275	.285

RF & MICROWAVE TRANSISTORS
TACAN APPLICATIONS

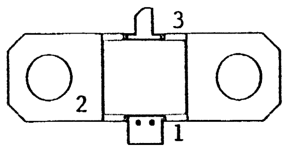
- DESIGNED FOR USE IN TACAN SYSTEMS
- EXTREMELY RUGGED
- THERMALLY STABLE
- GOLD METALLIZATION
- CAPABLE OF OPERATION AT GREATER THAN 20µs AND 10%
- STRIPLINE FLANGE PACKAGE



.250 x 250 2LFL (M171)
hermetic sealed

ORDER CODE	BRANDING
SD1550	SD1550

PIN CONNECTION



S88SD1550-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1550 is a gold metallized silicon NPN Planar Pulsed Transistor that has been designed for use in extended pulse width and duty cycle applications from 960 to 1215MHz. This device is extremely rugged, thermally stable, and is capable of operation at pulse widths in excess of 20µs and duty cycles greater than 10%.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CEO}	Collector - Emitter Voltage	30.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current (max.)	2.0	A
P_{TOT}	Total Device Dissipation at + 25°C	53.0	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	3.3	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

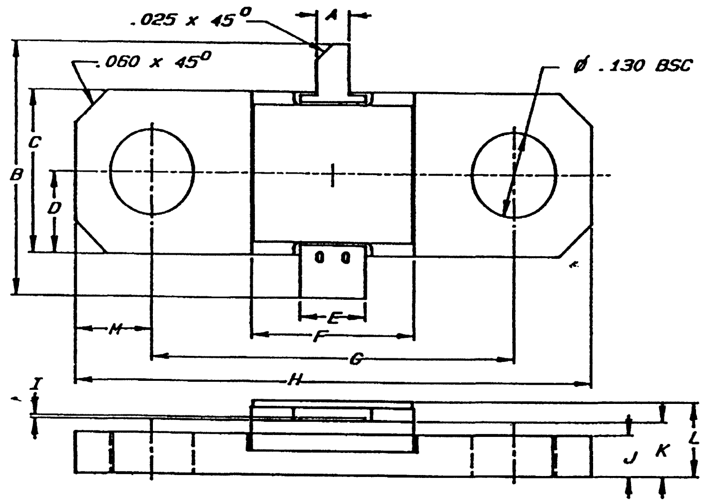
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 10mA	I_B = 0	30.0			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 28V	I_E = 0			5.0	mA
h_{FE}	V_{CE} = 5V	I_C = 100.0mA	20.0			

DYNAMIC

Symbol	Test Conditions				Value			Unit
					Min.	Typ.	Max.	
P_{out}	f = 960 to 1215MHz	V_{CE} = 35V	PW = 20μs	DC = 10%	15.0			W
P_{Gain}	f = 960 to 1215MHz	V_{CE} = 35V	PW = 20μs	DC = 10%	10.0			dB

PACKAGE MECHANICAL DATA

.250 x 250 2LFL



S88SD1550-02

	Minimum Inches/mm	Maximum Inches/mm
A	.045/1.14	.055/1.40
B	.980/24.89	
C	.245/6.22	.255/6.48
D	.125/3.18 BSC	
E	.095/2.41	.105/2.67
F	.245/6.22	.255/6.48
G	.557/14.15	.567/14.40

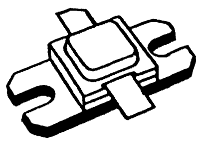
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.002/0.05	.006/0.15
J	.057/1.45	.067/1.70
K	.076/1.93	.088/2.24
L		.130/3.30
M	.119/3.02 BSC	

SGS-THOMSON
MICROELECTRONICS

SD1551

RF POWER TRANSISTOR
TACAN APPLICATIONS

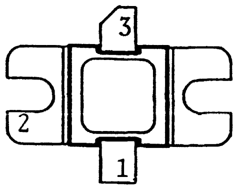
- DESIGNED FOR USE IN TACAN SYSTEMS
- EXTREMELY RUGGED
- THERMALLY STABLE
- GOLD METALLIZATION
- CAPABLE OF OPERATION AT GREATER THAN 20 SECONDS, 10%
- STRIPLINE, HERMETIC FLANGE PACKAGE
- COMMON BASE
- INTERNAL MATCHING



.400 x .400 2LFL (M138)
hermetic sealed

ORDER CODE	BRANDING
SD1551	SD1551

PIN CONNECTION



S88SD1551-01

1 emitter	3 collector
2 base	4

DESCRIPTION

The SD1551 is a gold metallized silicon NPN Planar Pulsed Transistor that has been designed for use in extended pulse width and duty cycle applications from 960 to 1215MHz. This device is extremely rugged, thermally stable, and is capable of operation at pulse widths in excess of 20 seconds and duty cycles greater than 10%.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CES}	Collector - Emitter Voltage	65	V
V_{EBO}	Emitter - Base Voltage	3	V
I_C	Collector Current (max.)	11.5	A
P_{tot}	Total Device Dissipation at + 25°C*	438	W
T_{stg}	Storage Temperature	– 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance*	0.40	°C/W

* At 40°C Flange, Pulse Width = 20µs @ 10% Duty Cycle.

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 25mA	I_E = 0	65			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
h_{FE}	V_{CE} = 10V	I_C = 5A	20			

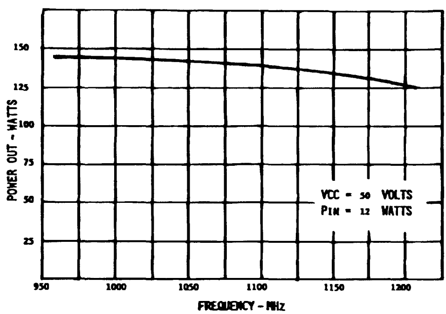
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O**	f = 960 to 1215MHz	V_{CB} = 50V	P_i = 12W	100			W
P_G	f = 960 to 1215MHz	V_{CB} = 50V	P_i = 12W	9.0			dB
η_C	f = 960 to 1215MHz	V_{CB} = 50V	P_o = 100W	45			%

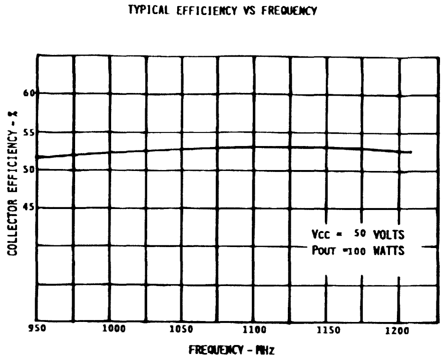
** Pulse width, duty cycle : 20µs @ 10%.

TYPICAL

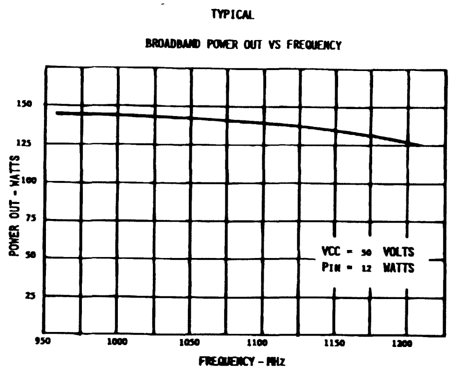
BROADBAND POWER OUT VS FREQUENCY



S88SD1551-02

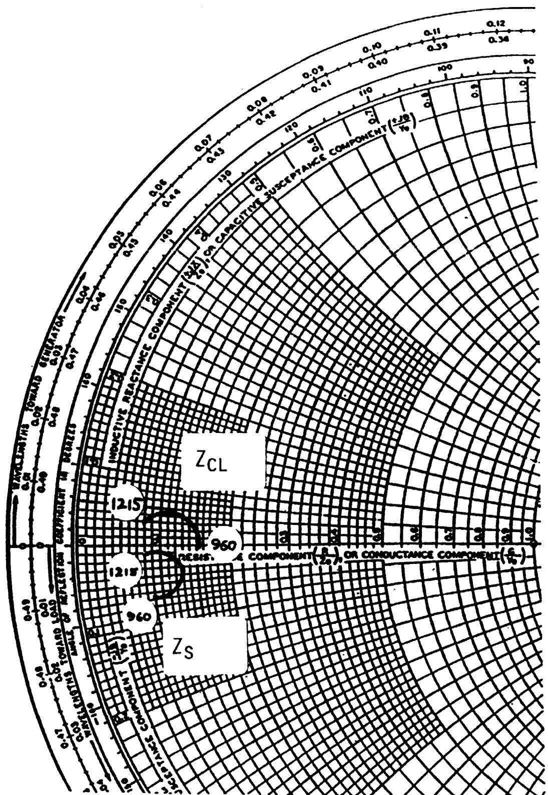


S88SD1551-03



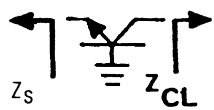
S88SD1551-04

TYPICAL SERIES EQUIVALENT INPUT/LOAD IMPEDANCE



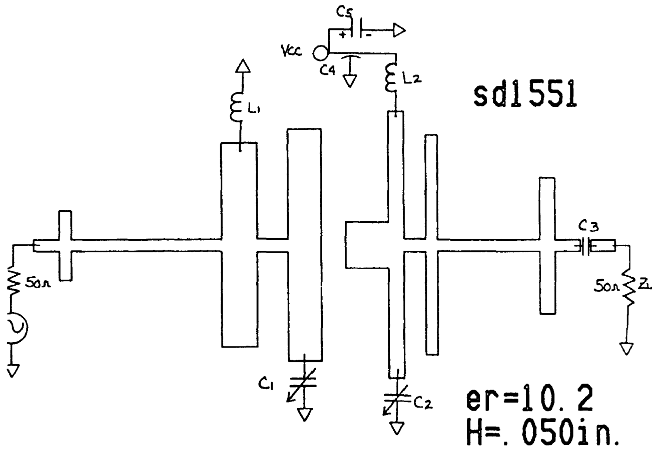
S88SD1551-05

F MHz	Z_S (Ω)	Z_{CL} (Ω)
960	4.5 – j 6.5	7.5 + j 0
1090	6.5 – j 3.5	6.5 + j 2.0
1215	4.0 – j 0.5	4.0 + j 1.5



S88SD1551-06

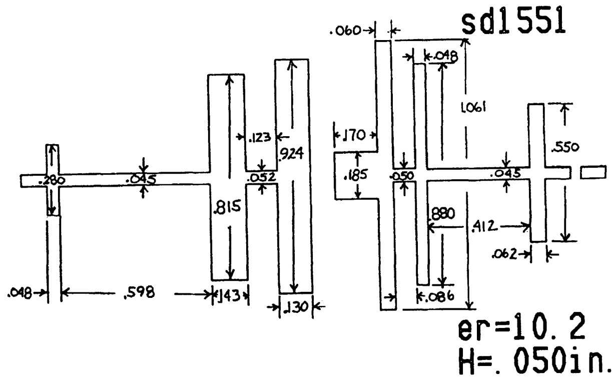
TEST CIRCUIT



S88SD1551-07

C_1, C_2	.6 – 4.5pF Johanson Gigatrim
C_3	220pF ATC Chip (#100A221KCA150)
C_4	15KpF EM1 Filter (erie #9900–381–6004)
C_5	1000µF @ 63V Electrolytic
L_1, L_2	3 Turns Wire Dia. = .025" Coil ID. = .125"

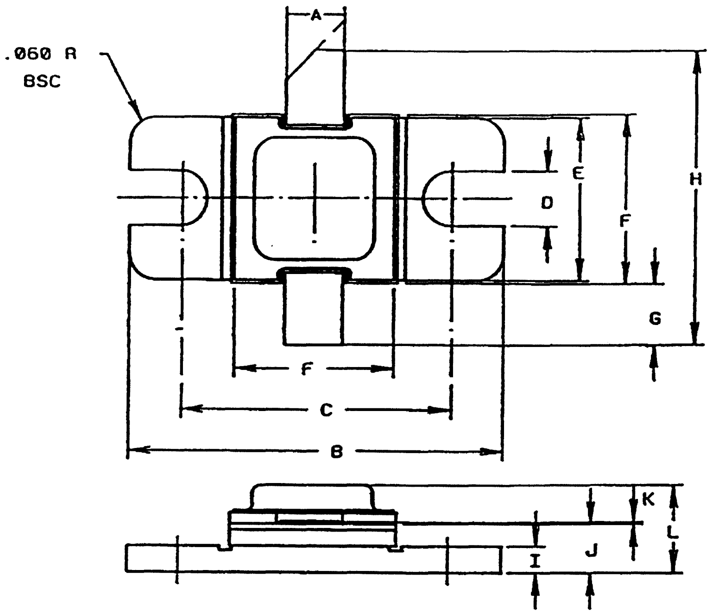
TEST CIRCUIT P.C. BOARD DIMENSIONS



S88SD1551-08

PACKAGE MECHANICAL DATA

.400 x .400 2LFL



S88SD1551-09

	Minimum Inches/mm	Maximum Inches/mm
A	.090/2.29	.105/2.67
B	.890/22.61	.910/23.11
C	.640/16.26	.660/16.76
D	.120/3.05	.130/3.30
E	.380/9.65	.390/9.91
F	.395/10.03	.405/10.29

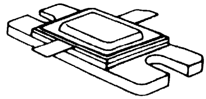
	Minimum Inches/mm	Maximum Inches/mm
G	.240/6.10	.260/6.60
H	.885/22.48	
I	.055/1.40	.065/1.65
J	.110/2.79	.130/3.30
K	.002/0.05	.006/0.15
L		.230/5.84

SGS-THOMSON
MICROELECTRONICS

SD1552

RF & MICROWAVE TRANSISTORS
TACAN APPLICATIONS

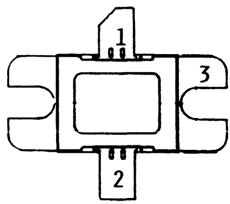
- DESIGNED FOR USE IN TACAN SYSTEMS
- EXTREMELY RUGGED
- THERMALLY STABLE
- GOLD METALLIZATION
- CAPABLE OF OPERATION AT GREATER THAN 20µS, 10%
- STRIPLINE, HERMETIC FLANGE PACKAGE



.400 x .500 2LFL (M112)
hermetic sealed

ORDER CODE	**BRANDING**
SD1552	SD1552

PIN CONNECTION



S88SD1552-01

1 collector
2 emitter
3 base

DESCRIPTION

The SD1552 is a gold metallized silicon NPN Planar Pulsed Transistor that has been designed for use in extended pulse width and duty cycle applications from 960 to 1215MHz. This device is extremely rugged, thermally stable, and is capable of operation at pulse widths in excess of 20µs and duty cycles greater than 10%.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	75.0	V
V_{CEO}	Collector - Emitter Voltage	55.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	22.0	A
P_{TOT}	Total Device Dissipation at + 25°C	1150	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.15	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

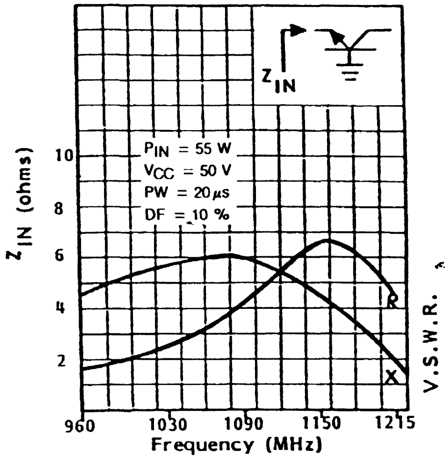
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{cbo}	I_C = 50mA	I_e = 0	75.0		100.0	V
BV_{ceo}	I_C = 50mA	I_b = 0	55.0		100.0	V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5		6.5	V
I_{ces}	V_{ce} = 50V	V_{BE} = 0			15.0	mA
h_{FE}	V_{CC} = 5V	I_C = 5A	15.0		30.0	

DYNAMIC

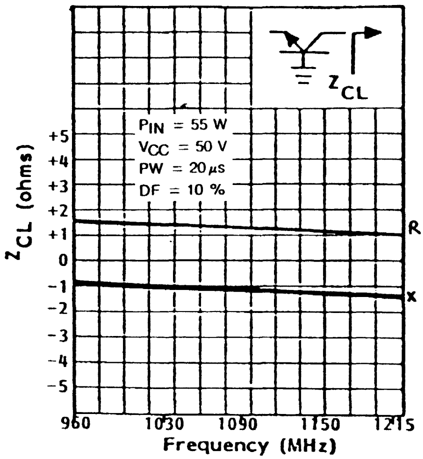
Symbol	Test Conditions				Value			Unit
					Min.	Typ.	Max.	
P_{out}	f = 960 to 1215MHz	V_{ce} = 50V	PW = 20µs	DC = 10%	285			W
G_P	f = 960 to 1215MHz	V_{ce} = 50V	PW = 20µs	DC = 10%	7.0			dB

Typical Input Impedance vs. Frequency



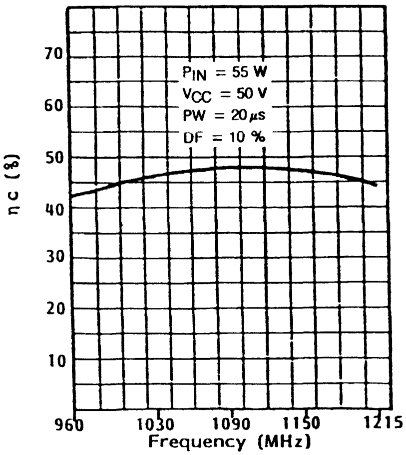
S88SD1552-02

Typical Collector Load Impedance vs. Frequency



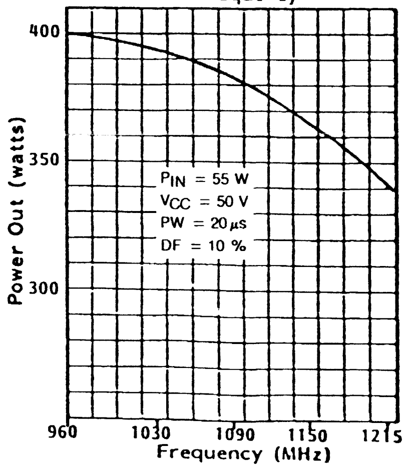
S88SD1552-03

Typical Collector Efficiency vs. Input Power



S88SD1552-04

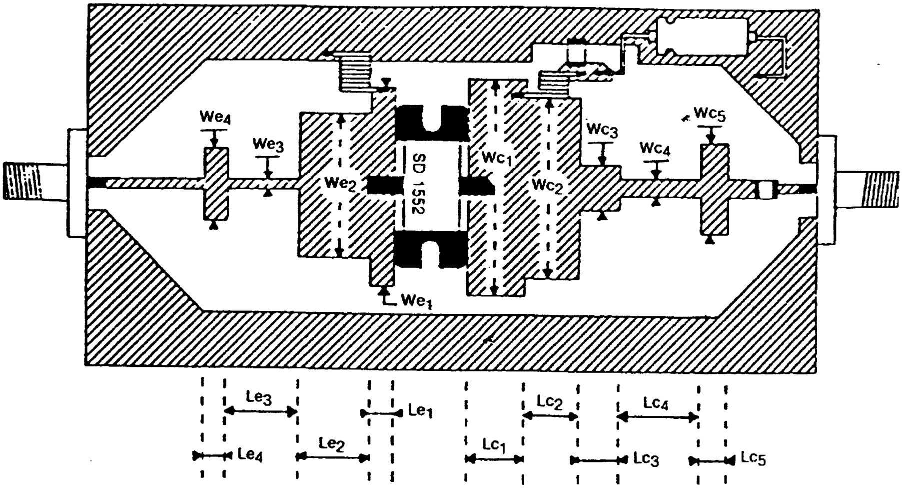
Typical Output Power vs. Frequency



S88SD1552-05

APPLICATION : TACAN

F = 960–1215MHz – PW = 20µs – DF = 10% – V_{CC} = 50V



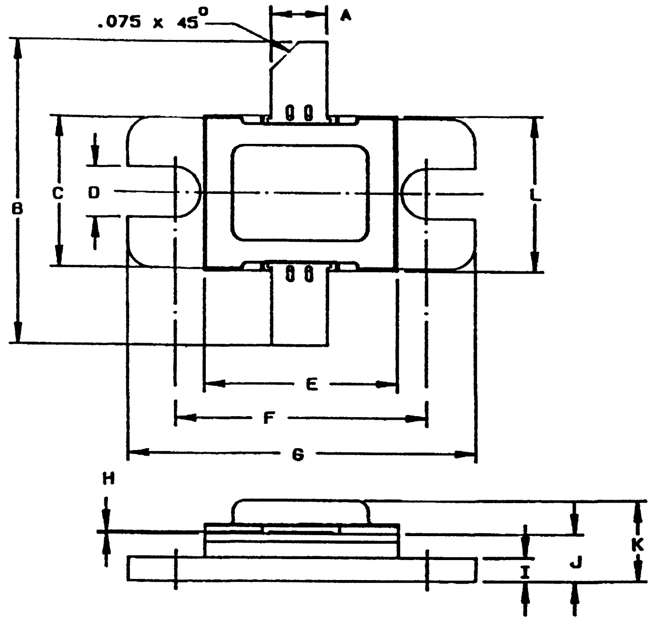
S88SD1552-06

We_1 = 28.0 mm		Le_1 = 3.5 mm	
We_2 = 20.0 mm		Le_2 = 10.5 mm	
We_3 = 1.5 mm		Le_3 = 10.0 mm	
We_4 = 10.0 mm		Le_4 = 3.0 mm	
Wc_1 = 30.5 mm		Lc_1 = 7.5 mm	
Wc_2 = 25.0 mm		Lc_2 = 8.0 mm	
Wc_3 = 7.0 mm		Lc_3 = 6.0 mm	
Wc_4 = 2.0 mm		Lc_4 = 11.0 mm	
Wc_5 = 12.0 mm		Lc_5 = 4.0 mm	

BOARD MATERIAL : ε_r = 6
Thickness = .762 mm

PACKAGE MECHANICAL DATA

.400 x .500 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.145/3.68	.155/3.93
B	.750/19.05	
C	.380/9.65	.390/9.91
D	.130/3.30 BSC	
E	.495/12.57	.505/12.83
F	.640/16.26	.655/16.64

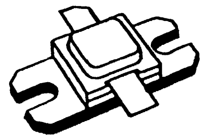
	Minimum Inches/mm	Maximum Inches/mm
G	.890/22.61	.910/23.11
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.115/2.92	.135/3.43
K		.230/5.84
L	.395/10.03	.405/10.29

SGS-THOMSON MICROELECTRONICS

SD1554

RF POWER TRANSISTOR MODE-S PULSE TRANSPONDER

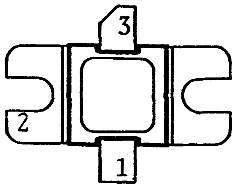
- DESIGNED FOR HIGH POWER PULSE FOR MODE-S TRANSPONDER APPLICATION
- 80W (min) MODE-S 1090
- GREATER THAN 7.2dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR INTERNAL INPUT MATCHING
- COMMON BASE CONFIGURATION
- HERMETIC PACKAGE FOR IMPROVED RELIABILITY



.400 x .400 2LFL (M138)
hermetic sealed

ORDER CODE	**BRANDING**
SD1554	SD1554

PIN CONNECTION



S88SD1554-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1554 is a hermetically sealed, gold metallized, Silicon NPN Power Transistor. The SD1554 is designed for Mode-S Transponder Applications requiring High Peak Power and Low Duty Cycles. The SD1554 is packaged in a hermetic metal/ceramic package with internal input matching, resulting in improved performance and a low Thermal Resistance. It incorporates Polysilicon Emitter Site Ballasting along with Emitter Finger Ballasting. The SD1554 is a driver for the SD1556.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CES}	Collector - Emitter Voltage	65	V
V_{EBO}	Emitter - Base Voltage	3	V
I_C	Collector Current (max.)	16	A
P_{tot}	Total Device Dissipation at + 25°C	350	W
T_{stg}	Storage Temperature	+ 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.5	°C/W

June 1989

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

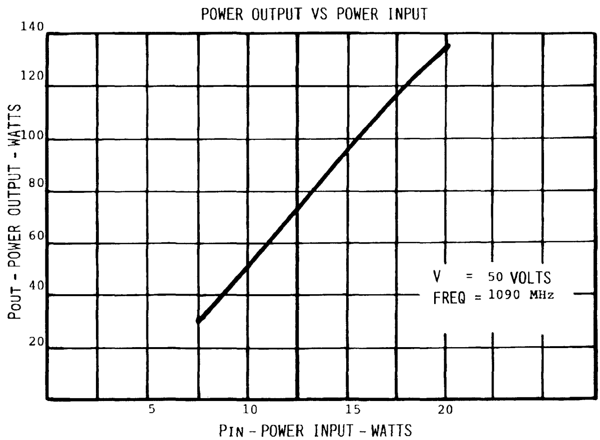
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 25mA	I_E = 0	65			V
BV_{CES}	I_C = 25mA	V_{BE} = 0	65			V
BV_{EBO}	I_E = 8mA	I_C = 0	3			V
h_{FE}	V_{CE} = 10V	I_C = 4A	10		250	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O**	f = 1090MHz	V_{CB} = 50V	P_i = 15W	80			W
P_G	f = 1090MHz	V_{CB} = 50V	P_i = 15W	7.2			dB
η_C	f = 1090MHz	V_{CB} = 50V	P_o = 80W	50			%

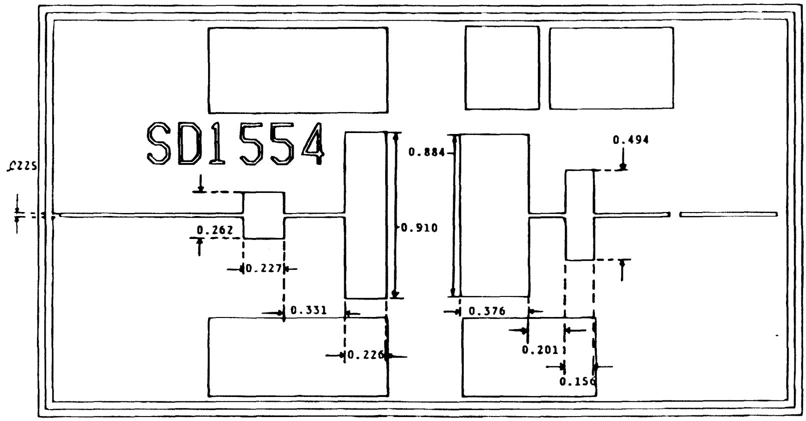
** Pulse width, duty cycle : 90μs @ 5%.

POWER OUTPUT vs. POWER INPUT



S88SD1554-02

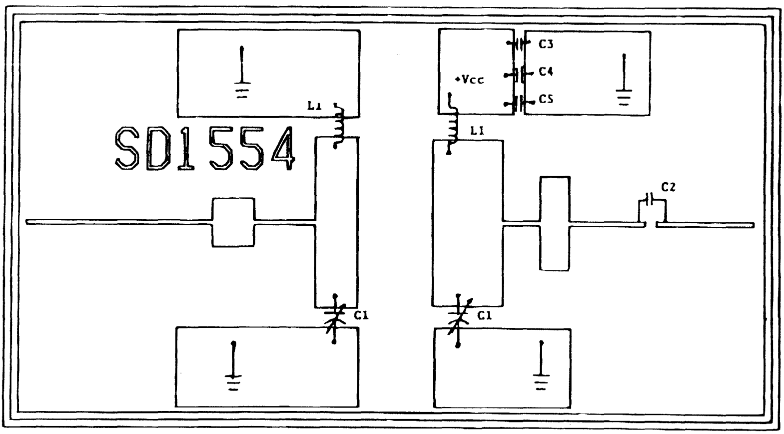
TEST FIXTURE P.C. BOARD



All dimensions in inches
Board Er = 10.2 Thickness = 0.025

S88SD1554-03

TEST CIRCUIT DRAWING

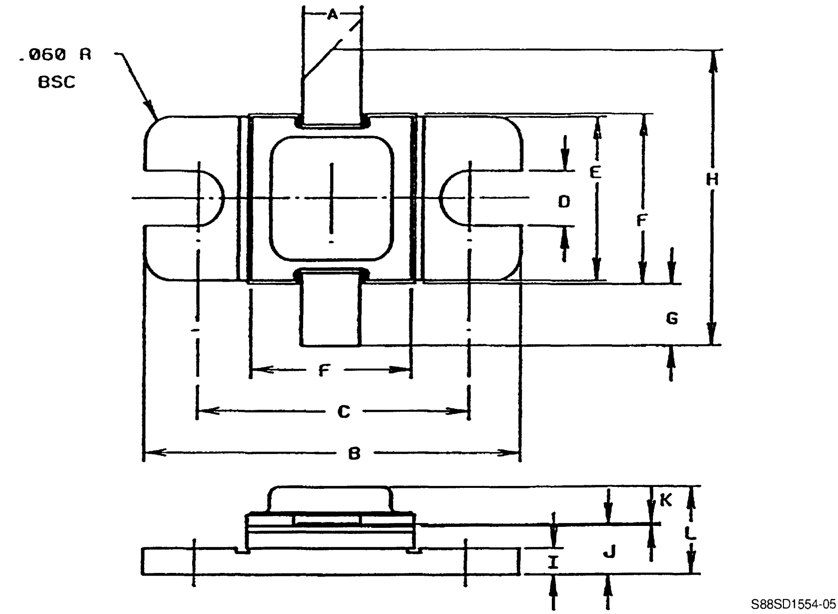


C_1	0.6-4.5pF Johanson Giga-trim
C_2 C_5	160pF ATC
C_3	Electrolytic (depends upon pulse width)
C_4	.1µf
L_1	RF CHOKE

S88SD1554-04

PACKAGE MECHANICAL DATA

.400 x .400 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.090/2.29	.105/2.67
B	.890/22.61	.910/23.11
C	.640/16.26	.660/16.76
D	.120/3.05	.130/3.30
E	.380/9.65	.390/9.91
F	.395/10.03	.405/10.29

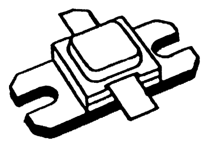
	Minimum Inches/mm	Maximum Inches/mm
G	.240/6.10	.260/6.60
H	.885/22.48	
I	.055/1.40	.065/1.65
J	.110/2.79	.130/3.30
K	.002/0.05	.006/0.15
L		.230/5.84

SGS-THOMSON
MICROELECTRONICS

SD1555

RF POWER TRANSISTOR
MODE-S PULSE INTERROGATOR

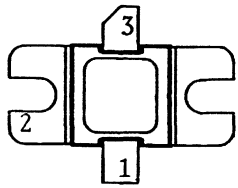
- DESIGNED FOR HIGH POWER PULSE FOR MODE-S INTERROGATOR APPLICATIONS
- 75W (min) MODE-S 1030MHz
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INTERNAL INPUT MATCHING
- COMMON BASE CONFIGURATION
- HERMETIC PACKAGE FOR IMPROVED RELIABILITY
- LOAD VSWR CAPABILITY GREATER THAN 9:1/ALL PHASE ANGLES
- HIGH EFFICIENCY FOR MARK XV AND MODE-S INTERROGATORS



.400 x .400 2LFL (M138)
hermetic sealed

ORDER CODE	**BRANDING**
SD1555	SD1555

PIN CONNECTION



S88SD1555-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1555 is a hermetically sealed, gold metallized, silicon NPN power transistor. The SD1555 is designed for Mode-S Interrogator applications requiring high peak power and low duty cycles. The SD1555 makes use of polysilicon emitter site and finger ballasting. The SD1555 is packaged in a hermetic metal/ceramic package with internal input matching, resulting in improved performance and a low thermal resistance. The SD1555 is a driver for the SD1557.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CES}	Collector - Emitter Voltage	65	V
V_{EBO}	Emitter - Base Voltage	3	V
I_C	Collector Current (max.)	8	A
P_{tot}	Total Device Dissipation at + 25°C	350	W
T_{stg}	Storage Temperature	– 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.5*	°C/W

* MODE S E.L.M.

June 1989

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

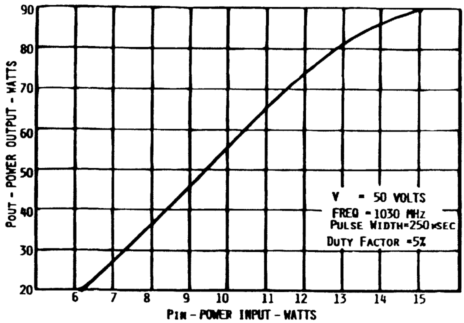
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 25mA	I_E = 0	65			V
BV_{CES}	I_C = 20mA	V_{BE} = 0	65			V
BV_{EBO}	I_E = 8mA	I_C = 0	3.5			V
h_{FE}	V_{CE} = 10V	I_C = 4A	10	50	100	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O**	f = 1030MHz	V_{CB} = 50V	P_i = 15W	75			W
P_G	f = 1030MHz	V_{CB} = 50V	P_i = 15W	7.0	7.5		dB
ηc	f = 1030MHz	V_{CB} = 50V	P_o = 75W	50	65		%

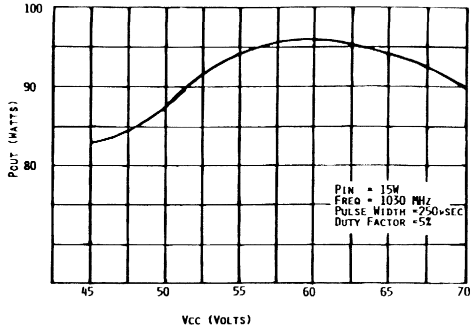
** Pulse width, duty cycle : MODE-S.

TYPICAL POWER OUTPUT VS POWER INPUT



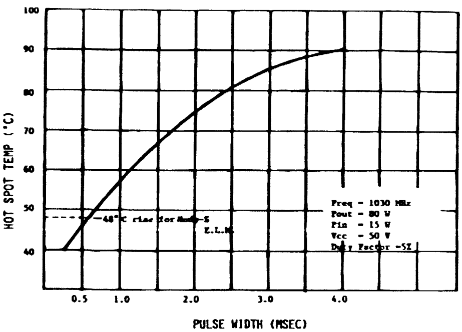
S88SD1555-02

TYPICAL OUTPUT POWER VS Vcc



S88SD1555-03

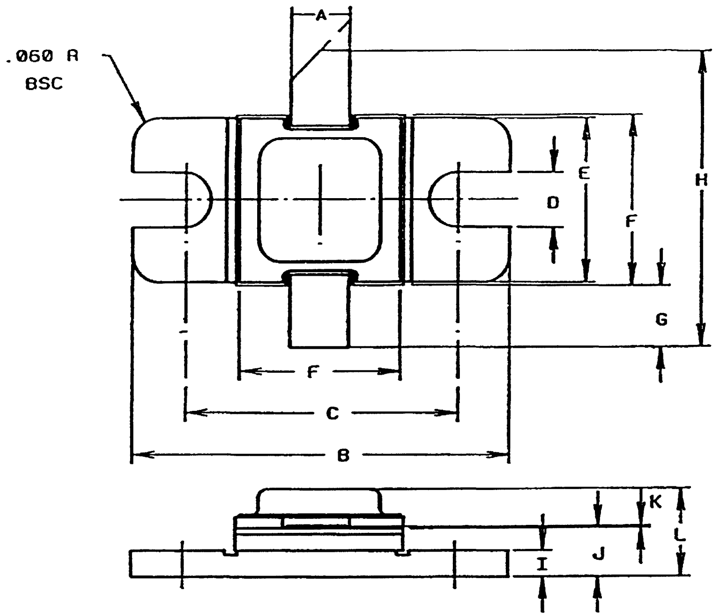
TYPICAL JUNCTION TEMP RISE VS PULSE WIDTH



S88SD1555-04

PACKAGE MECHANICAL DATA

.400 x .400 2LFL



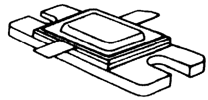
	Minimum Inches/mm	Maximum Inches/mm
A	.090/2.29	.105/2.67
B	.890/22.61	.910/23.11
C	.640/16.26	.660/16.76
D	.120/3.05	.130/3.30
E	.380/9.65	.390/9.91
F	.395/10.03	.405/10.29

	Minimum Inches/mm	Maximum Inches/mm
G	.240/6.10	.260/6.60
H	.885/22.48	
I	.055/1.40	.065/1.65
J	.110/2.79	.130/3.30
K	.002/0.05	.006/0.15
L		.230/5.84

SD1556

RF POWER TRANSISTOR
MODE-S PULSE TRANSPONDER

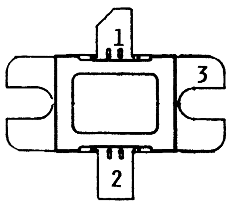
- DESIGNED FOR HIGH POWER PULSE FOR MODE-S TRANSPONDER APPLICATIONS
- 350 WATTS (min) MODE-S 1090MHz
- GREATER THAN 7.5dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INTERNAL INPUT MATCHING
- COMMON BASE CONFIGURATION
- HERMETIC PACKAGE FOR IMPROVED RELIABILITY



.400 x .500 2LFL (M112)
hermetic sealed

ORDER CODE	**BRANDING**
SD1556	SD1556

PIN CONNECTION



1 collector
2 emitter
3 base

DESCRIPTION

The SD1556 is a hermetically sealed, gold metallized, silicon NPN power transistor. The SD1556 is designed for Mode-S transponder applications requiring high peak power and low duty cycles. The SD1556 is packaged in a hermetic metal/ceramic package with internal input matching, resulting in improved performance and a low thermal resistance. The SD1556 is driven by the SD1554.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CES}	Collector - Emitter Voltage	65	V
V_{EBO}	Emitter - Base Voltage	3	V
I_C	Collector Current (max.)	30	A
P_{tot}	Total Device Dissipation at + 25°C	* 1750 ** 875	W
T_{stg}	Storage Temperature	– 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.10* 0.20**	°C/W

* Mode–S/112µs Burst – 0.5µs Pulse Width @ 50% Short Term–5% Long Term.
** Mark–15/90µs Pulse Width @ 5% Duty Factor.

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

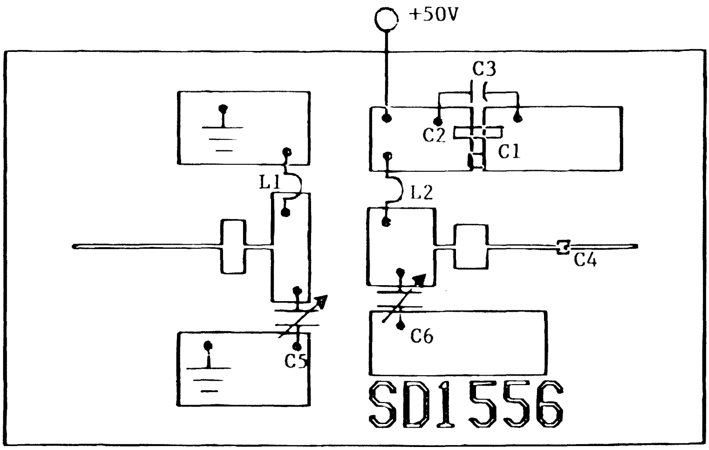
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 50mA	I_B = 0	65			V
BV_{CES}	I_C = 50mA	V_{BE} = 0	65			V
BV_{EBO}	I_E = 20mA	I_C = 0	3			V
h_{FE}	V_{CE} = 10V	I_C = 10A	20		200	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 1090MHz	V_{CB} = 50V	Pin = 60W	350	400		W
P_G	f = 1090MHz	V_{CB} = 50V	Pin = 60W	7.5			dB
ηc	f = 1090MHz	V_{CB} = 50V	Pin = 60W	45			%
Z_{IN}	f = 1090MHz	V_{CB} = 50V		3.1 + j1.9			Ω
Z_{CL}	f = 1090MHz	V_{CB} = 50V		2.9 – j0.6			Ω

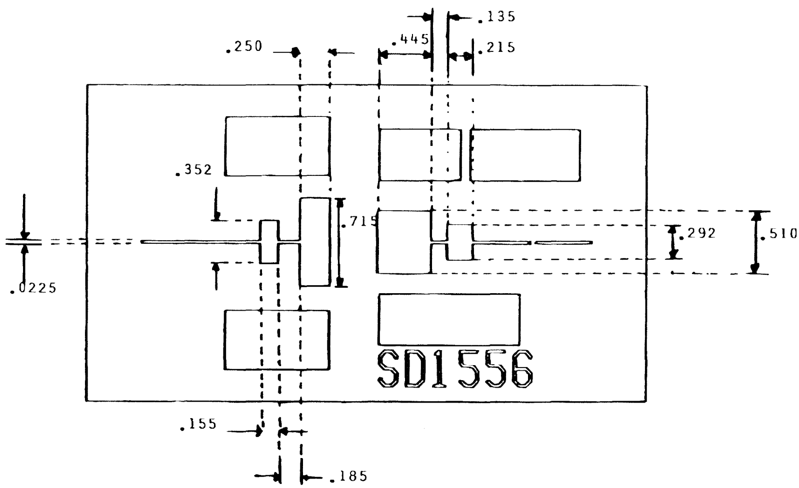
TEST CIRCUIT



C1, C4 – 100pF ATC
C2 – 0.1μF
C3 – Depends upon pulse width
C5, C6 – 2-8pF Johanson Gigitrim
L1, L2 – Choke

S88SD1556-02

TEST CIRCUIT P.C. BOARD

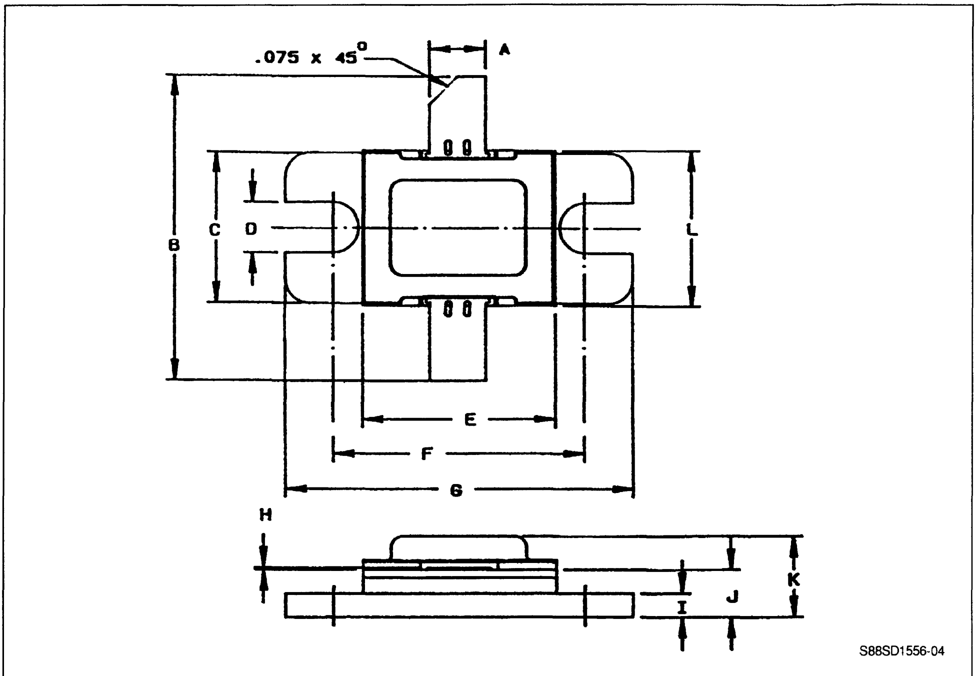


Board Material ; Er = 10.2 Thickness = 0.025
All dimensions in inches.

S88SD1556-03

PACKAGE MECHANICAL DATA

.400 x .500 2LFL

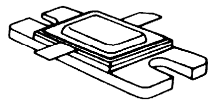


	Minimum Inches/mm	Maximum Inches/mm
A	.145/3.68	.155/3.93
B	.750/19.05	
C	.380/9.65	.390/9.91
D	.130/3.30 BSC	
E	.495/12.57	.505/12.83
F	.640/16.26	.655/16.64

	Minimum Inches/mm	Maximum Inches/mm
G	.890/22.61	.910/23.11
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.115/2.92	.135/3.43
K		.230/5.84
L	.395/10.03	.405/10.29

RF POWER TRANSISTOR MODE-S PULSE INTERROGATION

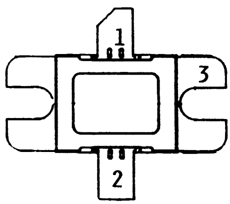
- DESIGNED FOR HIGH POWER PULSE FOR MODE-S INTERROGATOR APPLICATIONS
- 250 WATTS (min) MODE-S (1030)
- GREATER THAN 6.5dB GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE
- COMMON BASE CONFIGURATION
- HERMETIC PACKAGE FOR IMPROVED RELIABILITY
- INTERNAL INPUT/OUTPUT MATCHING
- LOAD VSWR CAPABILITY GREATER THAN 9:1/ALL PHASE ANGLES



.400 x .500 2LFL (M112)
hermetic sealed

ORDER CODE	**BRANDING**
SD1557	SD1557

PIN CONNECTION



S88SD1557-01

1 collector	3 base
2 emitter	4

DESCRIPTION

The SD1557 is a hermetically sealed, gold metallized, Silicon NPN power transistor. The SD1557 is designed for Mode-S interrogator applications requiring high peak power and low duty cycles. The SD1557 is packaged in a hermetic metal/ceramic package with internal input/output matching, resulting in improved performance and a low thermal resistance. The SD1557 is driven by the SD1555.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CES}	Collector - Emitter Voltage	65	V
V_{EBO}	Emitter - Base Voltage	3	V
I_C	Collector Current (max.)	24	A
P_{tot}	Total Device Dissipation at + 25°C	583	W
T_{stg}	Storage Temperature	– 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance *	0.30	°C/W

* Full Mode-S E.L.M.

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 50mA	I_E = 0	65			V
BV_{CES}	I_C = 50mA	V_{BE} = 0	65			V
BV_{EBO}	I_E = 20mA	I_C = 0	3			V
h_{FE}	V_{CE} = 10V	I_C = 10A	20		200	

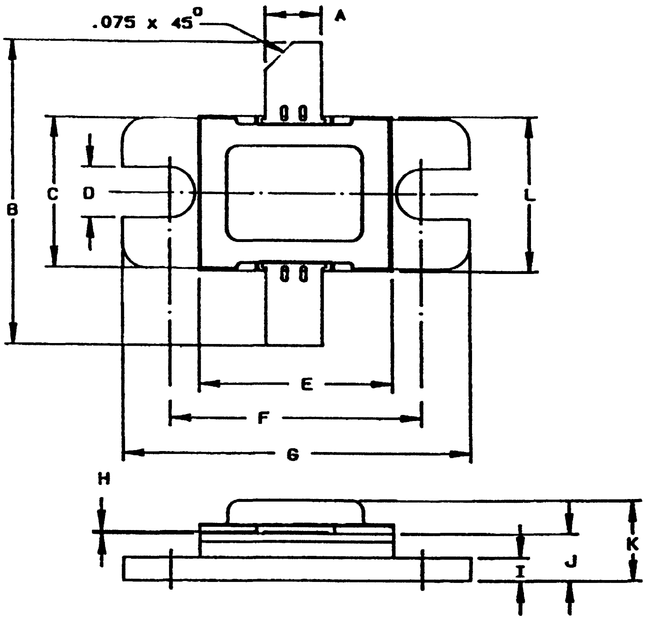
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O**	f = 1030MHz	V_{CB} = 50V	Pi = 60W	250			W
P_G	f = 1030MHz	V_{CB} = 50V	Pi = 60W	6.5			dB
ηc	f = 1030MHz	V_{CB} = 50V	Po = 250W	50			%

** Pulse width, duty cycle : MODE-S.

PACKAGE MECHANICAL DATA

.400 x .500 2LFL



S88SD1557-02

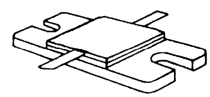
	Minimum Inches/mm	Maximum Inches/mm
A	.145/3.68	.155/3.93
B	.750/19.05	
C	.380/9.65	.390/9.91
D	.130/3.30 BSC	
E	.495/12.57	.505/12.83
F	.640/16.26	.655/16.64

	Minimum Inches/mm	Maximum Inches/mm
G	.890/22.61	.910/23.11
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.115/2.92	.135/3.43
K		.230/5.84
L	.395/10.03	.405/10.29

SD1563

RF & MICROWAVE TRANSISTORS UHF PULSE POWER

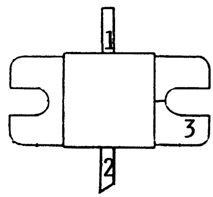
- DESIGNED FOR HIGH POWER PULSE APPLICATIONS
- 350 WATTS AT 10μs PULSE WIDTH, 10% DUTY CYCLE
- 300 WATTS AT 250μs PULSE WIDTH, 10% DUTY CYCLE
- GREATER THAN 9.5dB GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INFINITE VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.400 x .400 2LFL (M106)
hermetic seal

ORDER CODE	BRANDING
SD1563	SD1563

PIN CONNECTION



S88SD1563-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1563 is a gold metallized silicon NPN pulse power transistor. The SD1563 is designed for applications requiring high peak power and low duty cycles within the frequency range of 200-500MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	21.6	A
P_{TOT}	Total Device Dissipation at + 25°C	875.0	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 50mA	I_E = 0	65.0			V
BV_{CES}	I_C = 50mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 30.0V	V_{BE} = 0			7.5	mA

DYNAMIC

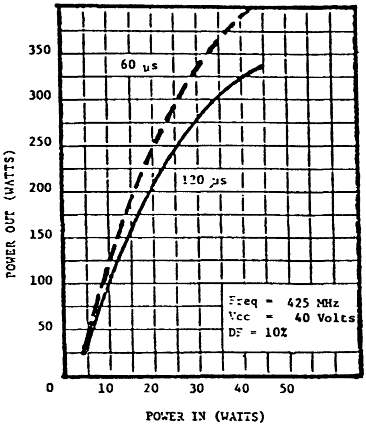
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O*	f = 425MHz	V_{CE} = 40.0V		300.0			W
P_G*	f = 425MHz	V_{CE} = 40.0V	P_o = 300W	9.5	10.0		dB
ηc*	f = 425MHz	V_{CE} = 40.0V	P_o = 300W	50.0	55.0		%
VSWR**	f = 425MHz	V_{CE} = 40.0V	P_o = 300W		30:1		

* Pulse width 250µs, duty cycle 10%.
** All phase angles.

TYPICAL PERFORMANCE @ 25°C Tc

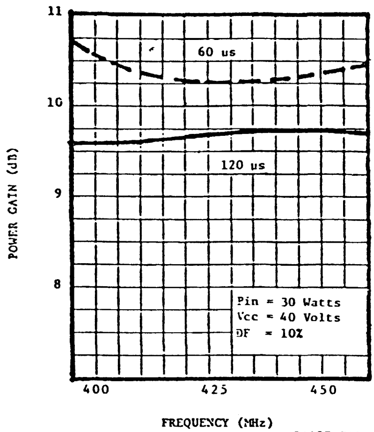
P_o (W)	PW (µs)	Duty (%)	T_j (°C max.)	V_{CC}
360	10	10	150	40
350	20	10	150	40
325	100	10	150	40
310	500	10	150	40
300	1000	10	150	40

TYPICAL POWER OUT vs POWER IN



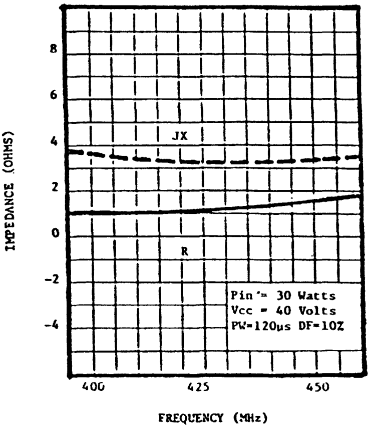
S88SD1563-02

TYPICAL POWER GAIN vs FREQUENCY



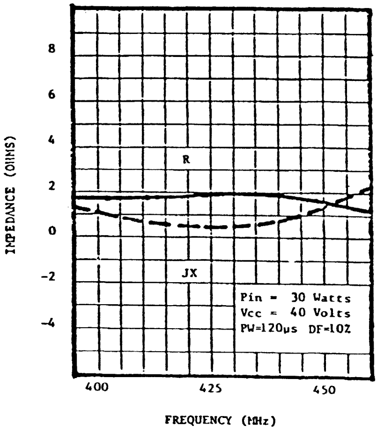
S88SD1563-03

TYPICAL INPUT IMPEDANCE vs FREQUENCY



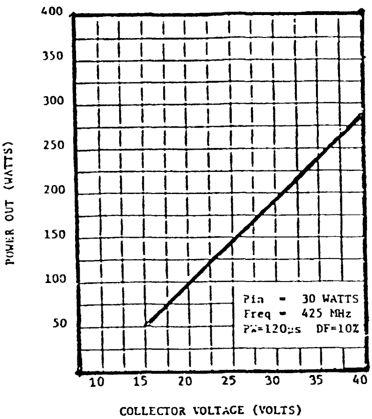
S88SD1563-04

TYPICAL OUTPUT IMPEDANCE vs FREQUENCY



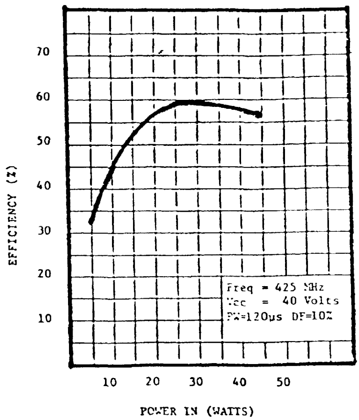
S88SD1563-05

TYPICAL POWER OUT vs COLLECTOR VOLTAGE



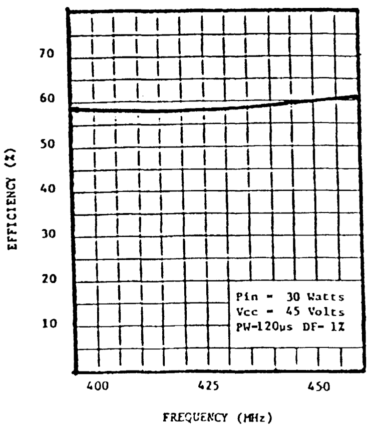
S88SD1563-06

TYPICAL EFFICIENCY vs POWER IN



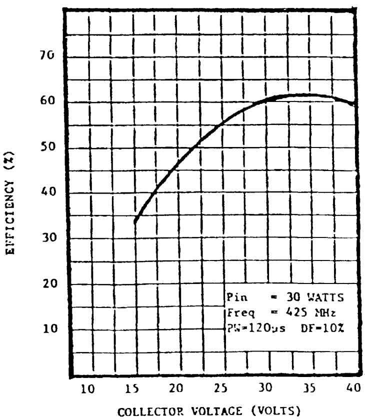
S88SD1563-07

TYPICAL EFFICIENCY vs FREQUENCY



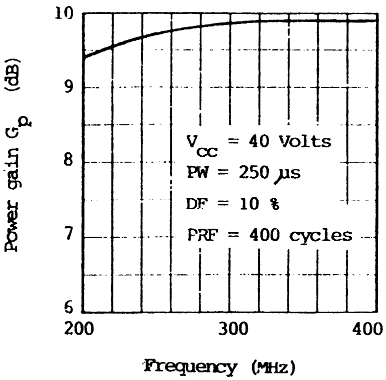
S88SD1563-08

TYPICAL EFFICIENCY vs COLLECTOR VOLTAGE



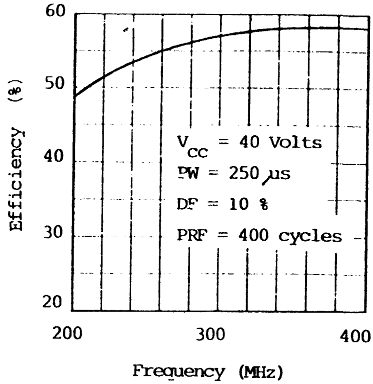
S88SD1563-09

TYPICAL POWER GAIN VS FREQUENCY



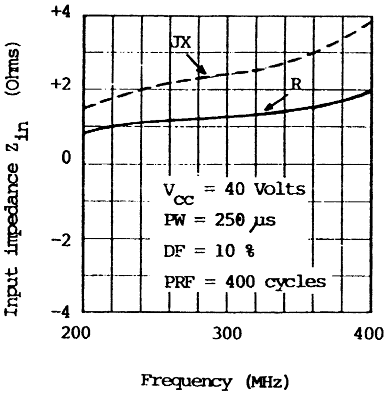
S88SD1563-10

TYPICAL EFFICIENCY VS FREQUENCY



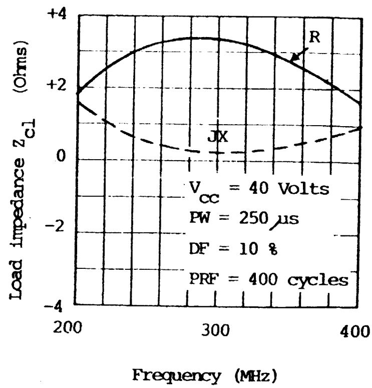
S88SD1563-11

TYPICAL INPUT IMPEDANCE VS FREQUENCY



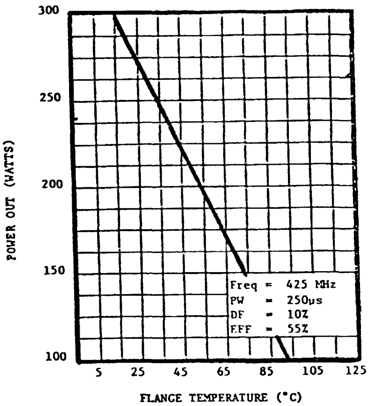
S88SD1563-12

TYPICAL LOAD IMPEDANCE VS FREQUENCY



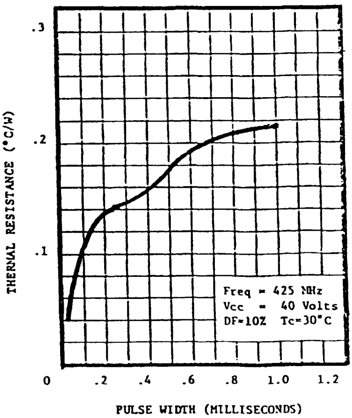
S88SD1563-13

TYPICAL POWER OUT vs FLANGE
TEMPERATURE: T_J AT CONSTANT 125°C
PULSE WIDTH: 250µs



S88SD1563-14

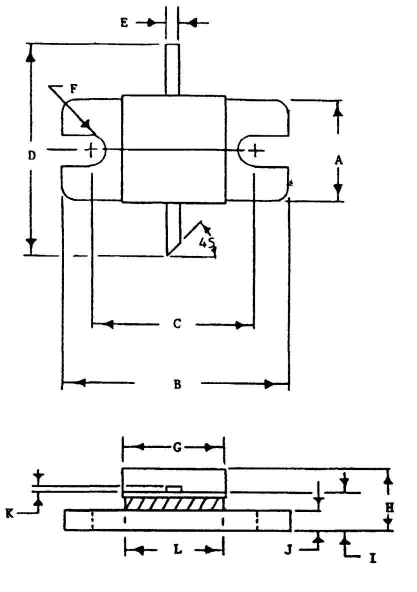
TYPICAL THERMAL RESISTANCE vs PULSE WIDTH



S88SD1563-15

PACKAGE MECHANICAL DATA

.400 x .400 2LFL



	Minimum Inches	Maximum Inches
A	.395	.410
B	.645	.755
C	.890	.910
D	.710	----
E	.045	.055
F	.060	.065
G	.395	.415

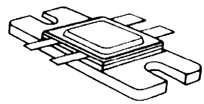
	Minimum Inches	Maximum Inches
H	----	.170
I	.110	.135
J	.055	.080
K	.003	.006
L	.140	----
M	.355	----

SGS-THOMSON MICROELECTRONICS

SD1564

RF & MICROWAVE TRANSISTORS UHF PULSE POWER

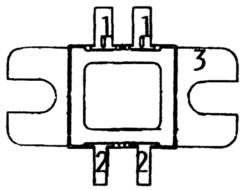
- DESIGNED FOR HIGH POWER PULSE APPLICATIONS
- 400W AT 60μs PULSE WIDTH, 2% D.F.
- GREATER THAN 7.5dB GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 VSWR CAPABILITY AT RATED OPERATING CONDITIONS
- INPUT MATCHED, COMMON EMITTER CONFIGURATION
- BALANCED CONFIGURATION
- HERMETIC PACKAGE



.400 x .425 4LFL (M119)
hermetic sealed

ORDER CODE	BRANDING
SD1564	SD1564

PIN CONNECTION



S88SD1564-01

1 base
2 collector
3 emitter

DESCRIPTION

The SD1564 is a hermetically sealed, gold metallized silicon NPN pulse power transistor, mounted in a common emitter balanced configuration. The SD1564 is designed for applications requiring high peak power and low duty cycles within the frequency range of 400-450MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	28.8	A
P_{TOT}	Total Device Dissipation at + 25°C	1167.0	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.15	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

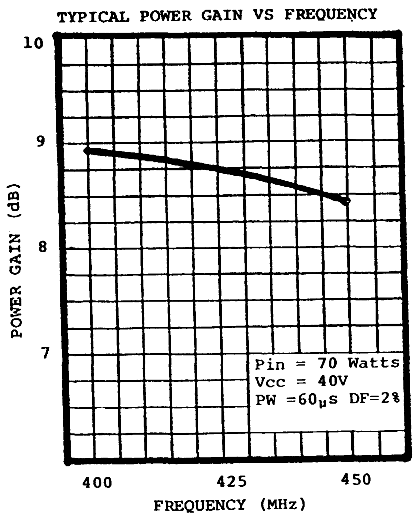
STATIC

Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CBO}	I_C = 25mA	I_E = 0	65.0			V
BV_{CES}	I_C = 10mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 40.0V	V_{BE} = 0			20.0	mA
h_{FE}	V_{CE}= 5.0V	I_C = 500mA	20.0		120.0	

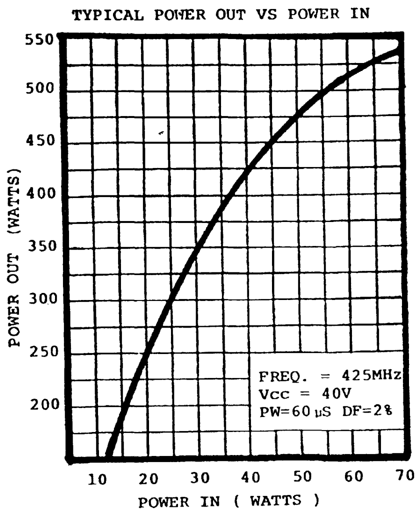
DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O*	f = 425MHz	V_{CC} = 40.0V	P_i = 70W	400.0			W
P_G	f = 425MHz	V_{CC} = 40.0V	P_i = 70W	7.5	8.5		dB
ηc	f = 425MHz	V_{CC} = 40.0V	P_i = 70W	50.0	55.0		%
VSWR**	f = 425MHz	V_{CC} = 40.0V	P_i = 70W		30:1		

* Pulse width 60µs, duty cycle 2%.
** All phase Angles.

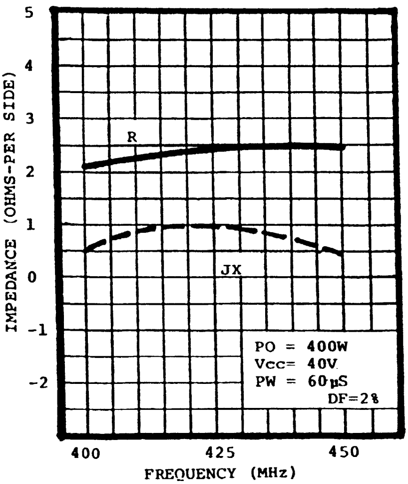


S88SD1564-02



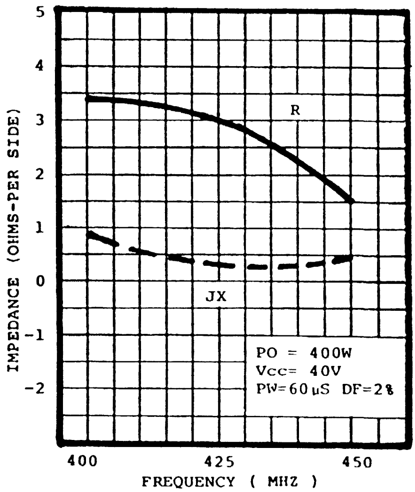
S88SD1564-03

TYPICAL OUTPUT IMPEDANCE VS FREQUENCY



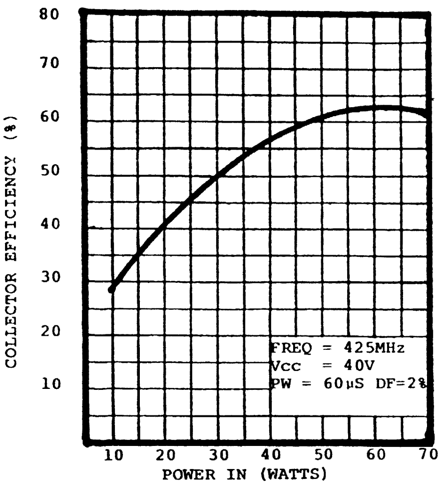
S88SD1564-04

TYPICAL INPUT IMPEDANCE VS FREQUENCY



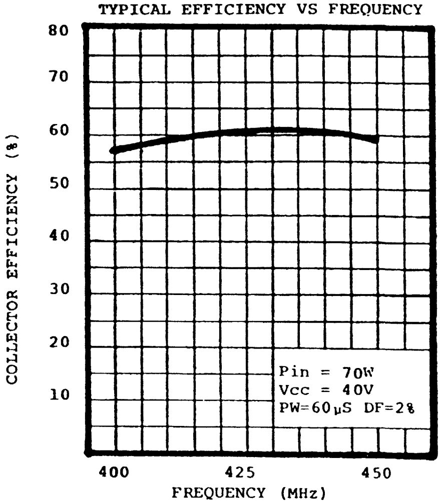
S88SD1564-05

TYPICAL EFFICIENCY VS POWER IN



S88SD1564-06

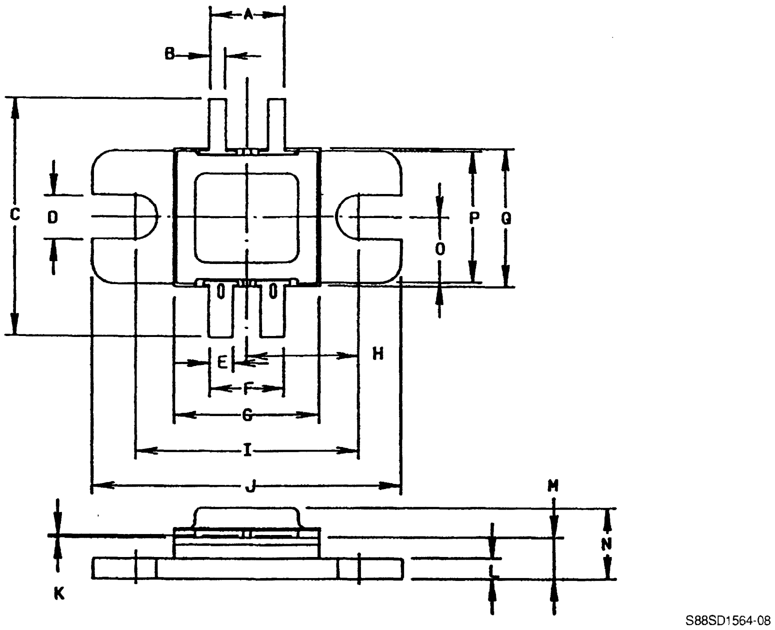
TYPICAL EFFICIENCY VS FREQUENCY



S88SD1564-07

PACKAGE MECHANICAL DATA

.400 x .425 4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.210/5.33	.230/5.84
B	.045/1.14	.055/1.40
C	1.15/29.2	1.17/29.72
D	.130/3.30 BSC	
E	.070/1.78	.080/2.03
F	.215/5.46	.235/5.97
G	.420/10.67	.430/10.93
H	.325/8.26 BSC	
I	.650/16.51 BSC	

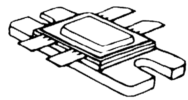
	Minimum Inches/mm	Maximum Inches/mm
J	.895/22.73	.905/22.99
K	.002/0.05	.006/0.15
L	.058/1.47	.065/1.65
M	.115/2.92	.130/3.30
N		.230/5.84
O	.190/4.83	.195/4.95
P	.380/9.65	.390/9.91
Q	.395/10.03	.405/10.29

SGS-THOMSON MICROELECTRONICS

SD1565

RF & MICROWAVE TRANSISTORS UHF PULSE POWER

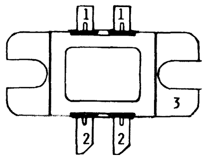
- DESIGNED FOR HIGH POWER PULSE APPLICATIONS
- 500 WATTS AT 250µs PULSE WIDTH, 10% DUTY CYCLE
- GREATER THAN 9.7dB GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- INFINITE VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION
- BALANCED CONFIGURATION
- HERMETIC PACKAGE



.400 x .500 4LFL (M102)
hermetic sealed

ORDER CODE	BRANDING
SD1565	SD1565

PIN CONNECTION



S88SD1565-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1565 is a hermetically sealed, gold metallized silicon NPN pulse power transistor mounted in a common base balanced configuration. The SD1565 is designed for applications requiring high-peak power and low duty cycles within the frequency range of 200-500MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65.0	V
V_{CES}	Collector - Emitter Voltage	65.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	43.2	A
P_{TOT}	Total Device Dissipation at + 25°C	1167.0	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.15	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

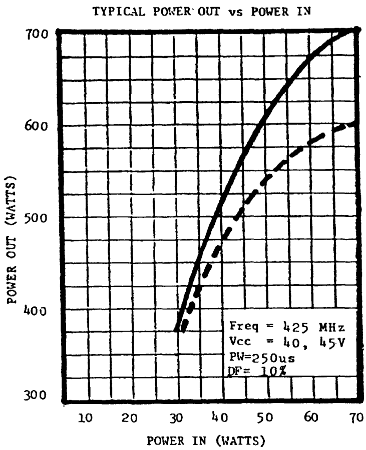
STATIC

Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CBO}	I_C = 25mA	I_E = 0	65.0			V
BV_{CES}	I_C = 10mA	V_{BE} = 0	65.0			V
BV_{EBO}	I_E = 5mA	I_C = 0	3.5			V
I_{CES}	V_{CE} = 40.0V	V_{BE} = 0			30.0	mA
h_{FE}	V_{CE} = 5.0V	I_C = 500mA	20.0		200.0	

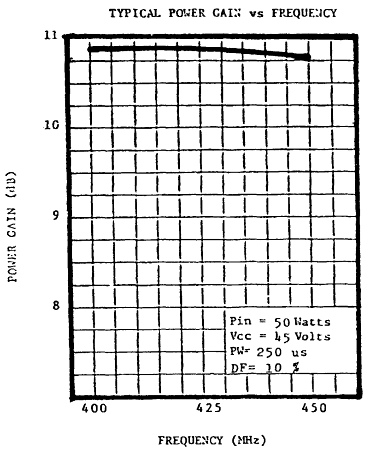
DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O*	f = 425MHz	V_{CE} = 40.0V		500.0			W
P_G*	f = 425MHz	V_{CE} = 40.0V	P_o = 500W	9.7	10.0		dB
ηc	f = 425MHz	V_{CE} = 40.0V	P_o = 500W	50.0	55.0		%
VSWR**	f = 425MHz	V_{CE} = 40.0V	P_o = 500W		30:1		

* Pulse width 250µs, duty cycle 10%.
** All phase angles.

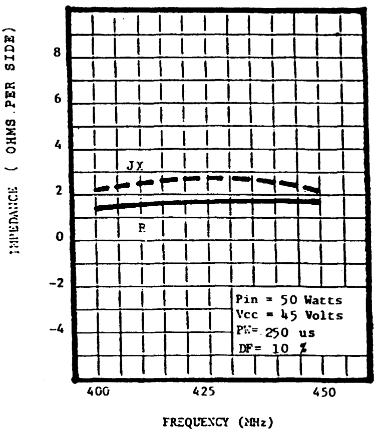


S88SD1565-02



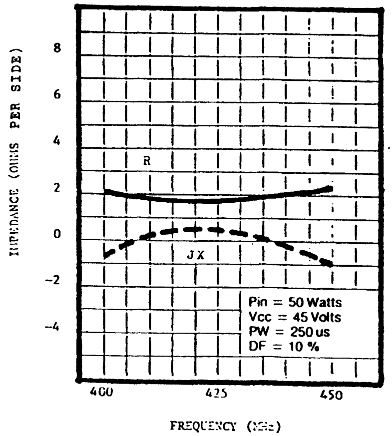
S88S1565-03

TYPICAL INPUT IMPEDANCE vs FREQUENCY



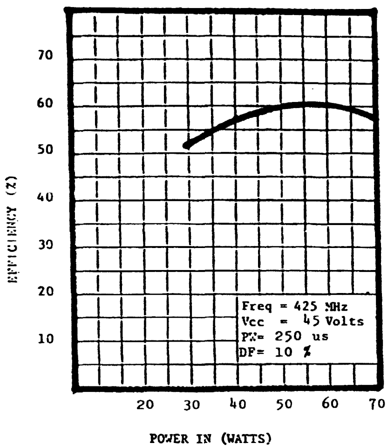
S88SD1565-04

Typical output impedance vs frequency



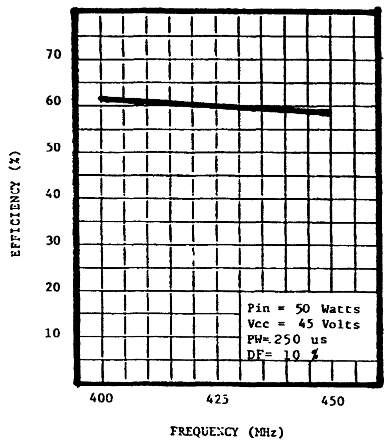
S88SD1565-05

TYPICAL EFFICIENCY vs POWER IN

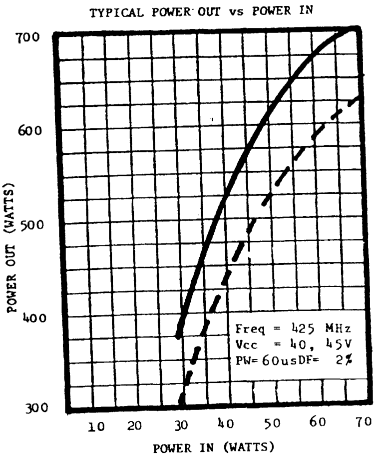


S88SD1565-06

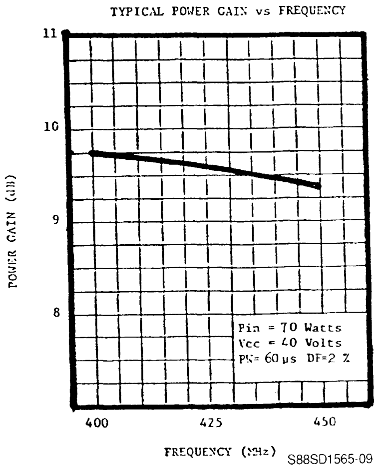
TYPICAL EFFICIENCY vs FREQUENCY



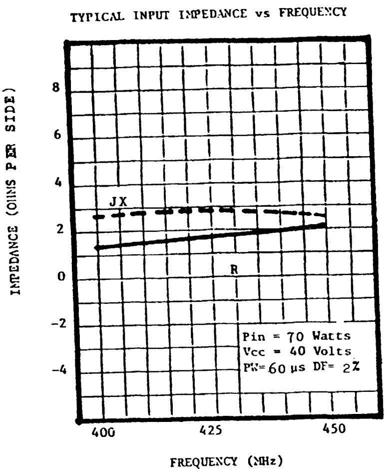
S88SD1565-07



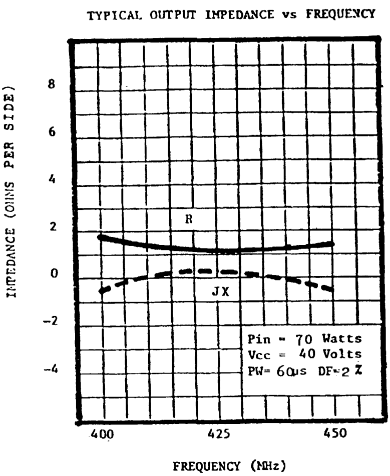
S88SD1565-08



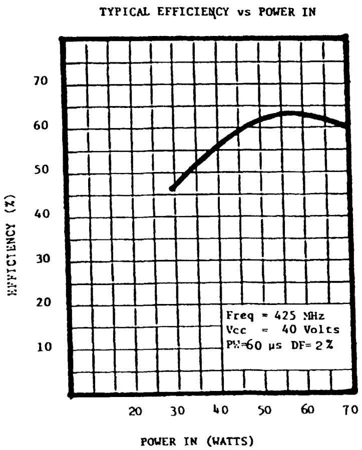
S88SD1565-09



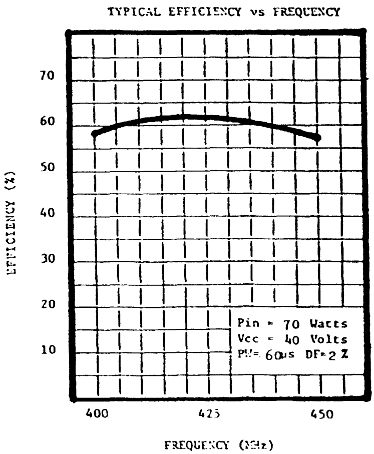
S88SD1565-10



S88SD1565-11

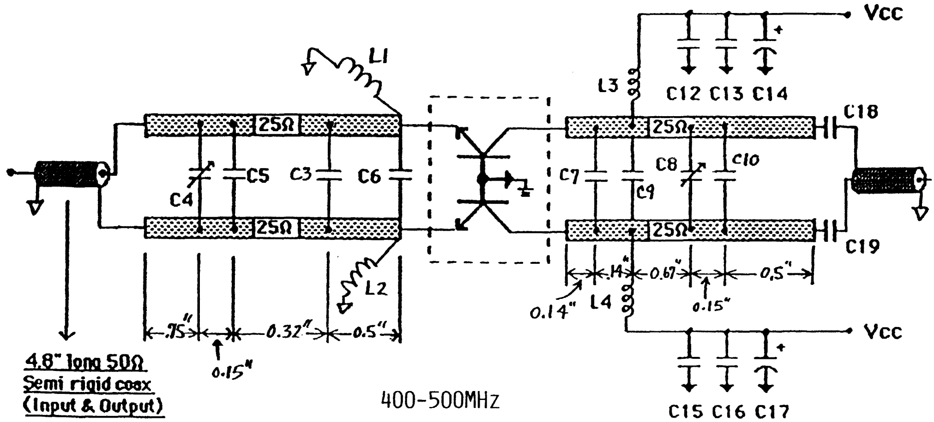


S88SD1565-12



S88SD1565-13

TEST CIRCUIT



Note : 3M Epsilom 6 PC Board (.030" Thick).

S88SD1565-14

Component	C18, C19	C3, C5	C4, C8	C9	C6, C7	C10	C11	C12, C15	C13, C16	C14, C17
Value	470	8	.4-4.5	20	39	12	N/A	.1	1000	1000
Units	pF	pF	pF	pF	pF	pF	pF	µF	pF	µF

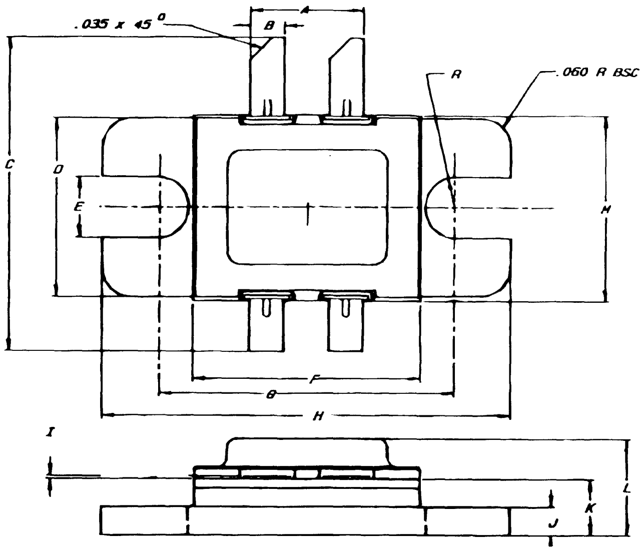
L1, 2 1" pc #18 tinned wire (mounted flat to pc board)
L3, 4 2T, #18 tinned, 0.25" ID

Baluns are 4.8" UT-141 coax, spaced to fit from coax connectors to the 25 ohm lines.

All capacitors are chip caps except C12, C15, C14 and C17.
C4, 8 are Johanson JMC# 27273
C3, 5 and 6 are 50 mil square

PACKAGE MECHANICAL DATA

.400 x .500 4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.240/6.10	.254/6.45
B	.070/1.78	.080/2.03
C	.780/19.81	.820/20.83
D	.380/9.65	.390/9.91
E	.130/3.30 BSC	
F	.500/12.70	.510/12.95
G	.645/16.38	.655/16.64

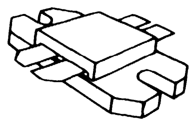
	Minimum Inches/mm	Maximum Inches/mm
H	.895/22.73	.905/22.99
I	.002/0.05	.006/0.15
J	.058/1.47	.065/1.65
K	.115/2.92	.130/3.30
L		.230/5.84
M	.395/10.03	.405/10.29

SGS-THOMSON
MICROELECTRONICS

SD1658

RF & MICROWAVE TRANSISTORS
860-900MHz BASE STATIONS

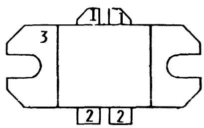
- FREQUENCY 860 – 900MHz
- POWER OUT 40W
- VOLTAGE 24V
- POWER GAIN 6dB
- CLASS AB PUSH PULL
- INTERNAL INPUT MATCHING
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH DATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION



.438 x .450 2 LFL (M173)
epoxy sealed

ORDER CODE	**BRANDING**
SD1658	SD1658

PIN CONNECTION



S88SD1658-01

1 collector
2 base
3 emitter

DESCRIPTION

The SD1658 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high lineariity class AB operation for cellular base station applications.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45	V
V_{CEO}	Collector - Emitter Voltage	28	V
V_{EBO}	Emitter - Base Voltage	3	V
I_C	Collector Current (max.)	8	A
P_{tot}	Total Device Dissipation at + 25°C	175	W
T_{stg}	Storage Temperature	– 50 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance T_{case} = 70°C	1.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

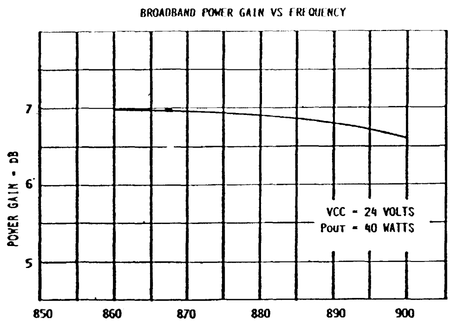
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 100mA		28			V
BV_{CBO}	I_C = 50mA		45			V
BV_{EBO}	I_E = 10mA		3			V
I_{CEO}	V_{CB} = 28V				5	mA
h_{FE}	V_{CE} = 5V	I_C = 3A	10		80	

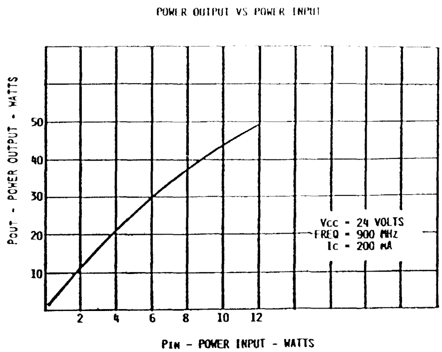
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O*	f = 900MHz	V_{CE} = 24V	I_{CQ} = 200mA	40	50		W
P_G	f = 900MHz	V_{CE} = 24V	I_{CQ} = 200mA	6.0	6.5		dB
ηc	f = 900MHz	V_{CE} = 24V	I_{CQ} = 200mA	50	60		%
IMD**	f = 900MHz	V_{CE} = 24V	I_{CQ} = 200mA			– 35	DB
C_{OB}	f = 1MHz	V_{CB} = 28V			70		pF

* @ 1 DB compression.
** @ P_{OUT} = 40WPEP ΔF = 600KHZ (2 tones).

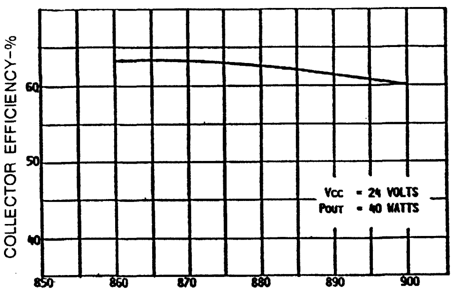


S88SD1658-02



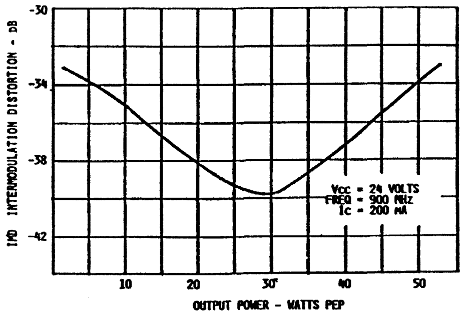
S88SD1658-03

EFFICIENCY VS FREQUENCY



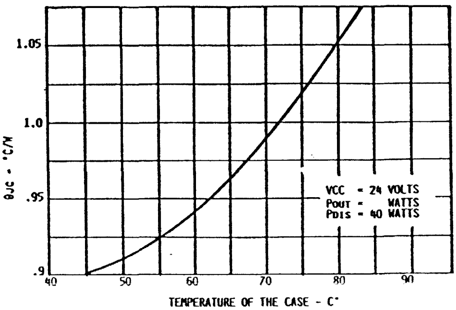
S88SD1658-04

IMD VS OUTPUT POWER



S88SD1658-05

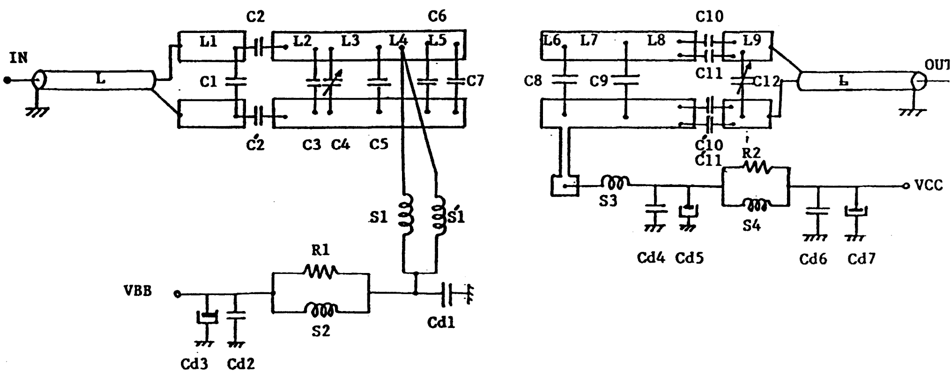
IR SCAN HOT SPOT θJC VS CASE TEMPERATURE



S88SD1658-06

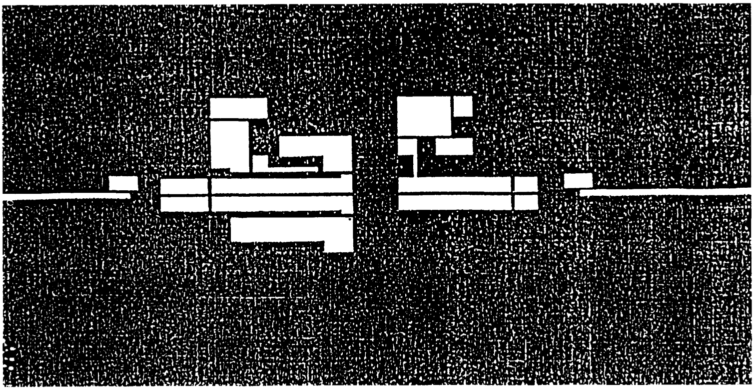
LAYOUT

470–860MHz Amplifier



S88-SD1658-07

PRINTED CIRCUIT BOARD



S88SD1658-8

CIRCUIT COMPONENTS AND VALUES

L	=	COAXIAL CABLE Z_O = 50Ω 1 = λ/4 AT 680MHz
L_1	=	PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 12 mm
L_2	=	PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 12 mm
L_3	=	PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 10 mm
L_4	=	PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 9 mm
L_5	=	PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 5.5mm
L_6	=	PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 6 mm
L_7	=	PRINTED TRANSMISSION LINE Z_O = 25Ω 1 = 14.5mm
L_8	=	PRINTED TRANSMISSION LINE Z_O = 25Ω
L_9	=	PRINTED TRANSMISSION LINE Z_O = 25Ω
C_1	=	1.5pF ATC 100A
$C_2 = C'_2$	=	100pF ATC 100A
$C_3 = C_{12}$	=	AIRTONIC ADJUSTABLE .5 TO 4.5pF
C_4	=	2.7pF ATC 100A
C_5	=	2.7pF ATC 100A
C_6	=	10pF ATC 100A
C_7	=	18pF ATC 100A
C_8	=	6.8pF ATC 100A
C_9	=	1.5pF ATC 100A + 1.8 ATC 100A
$C_{10} = C'_{10}$	=	100pF ATC 100A
$C_{11} = C'_{11}$	=	120pF ATC 100A

DECOUPLING CAPACITORS

CD_1	=	100pF ATC 100A
CD_2	=	47pF ATC 100-B = 1000pPF ATC 100B
CD_3	=	500uF 25V
CD_4	=	100pF ATC 100A
CD_5	=	22uF 35V
CD_6	=	1000pF ATC 100B
CD_7	=	47uF 63V

CHOKE INDUCTANCES

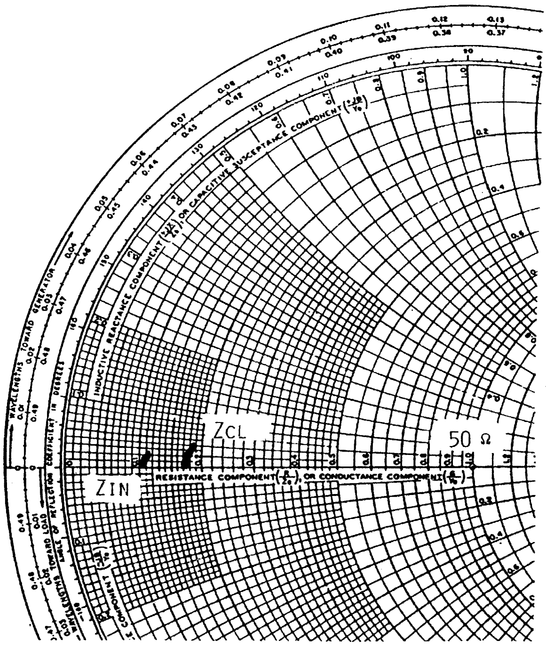
S_1 = S'_1	=	10 TURNS OF WIRE 35/100MM ON Ø = 2MM
S_2 =	=	9 TURNS OF WIRE 35/100MM ON R1
S_3 =	=	2 TURNS OF WIRE 80/100MM ON Ø = 4MM
S_4 =	=	5 TURNS OF WIRE 80/100MM ON R2

RESISTORS

R_1	=	150Ω 1/4 WATT
R_2	=	51Ω 1/4 WATT

PRINTED CIRCUIT BOARD = ε_R 2.55.020 "Thick

SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE (typical)



f MHz	Z_{IN} (Ω) Base to Base	Z_{LOAD} (Ω) Collector to Collector
830	5.6 + .55j	9.4 + 2.1j
870	5.8 + .6j	9.2 + 1.1j
910	5.9 + .95j	9.1 + 0j

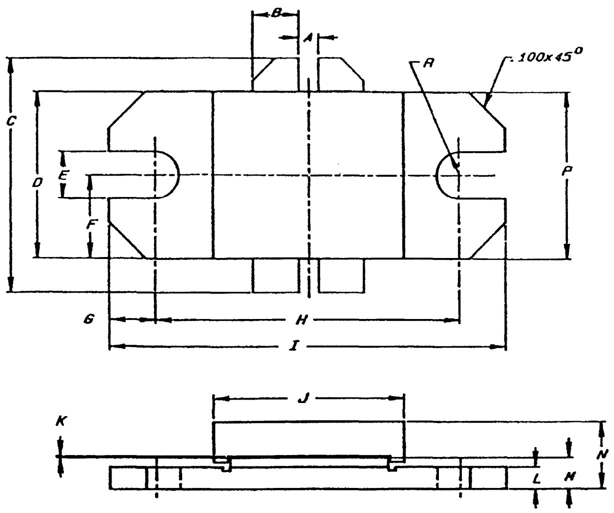
Z_{LOAD} = optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

P_{OUT} = 40W
V_{CC} = 24V
CLASS AB

S88SD1658-09

PACKAGE MECHANICAL DATA

.438 x .450 2LFL



S88SD1658-10

	Minimum Inches/mm	Maximum Inches/mm
A	.055/1.40 BSC	
B	.120/3.05	.130/3.30
C		.785/19.94
D	.455/11.56	.465/11.81
E	.125/3.18 BSC	
F	.230/5.84 BSC	
G	.128/3.25 BSC	
H	.838/21.28	.850/21.59

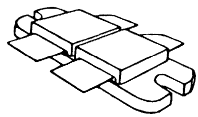
	Minimum Inches/mm	Maximum Inches/mm
I	1.095/27.81	1.105/28.07
J	.525/13.34	.535/13.59
K	.002/0.05	.006/0.15
L	.055/1.40	.065/1.65
M	.080/2.03	.088/2.24
N		.195/4.95
P	.455/11.56	.465/11.81

SGS-THOMSON
MICROELECTRONICS

SD1660

RF & MICROWAVE TRANSISTORS
860-900MHz BASE STATIONS

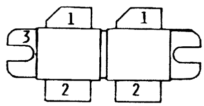
- FREQUENCY 860 - 900MHz
- POWER OUT 120 W
- VOLTAGE 24 V
- POWER GAIN 6dB
- CLASS AB PUSH PULL
- INTERNAL INPUT MATCHING
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION



2 x (.450SQ) (M175)
epoxy sealed

ORDER CODE	**BRANDING**
SD1660	SD1660

PIN CONNECTION



S88SD1660-01

1 collector
2 base
3 emitter

DESCRIPTION

The SD1660 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class AB operation for cellular base station applications.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	60	V
V_{CEO}	Collector - Emitter Voltage	28	V
V_{EBO}	Emitter - Base Voltage	3	V
I_C	Collector Current (max.)	25	A
P_{tot}	Total Device Dissipation at + 25°C	310	W
T_{stg}	Storage Temperature	– 55 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	.55	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

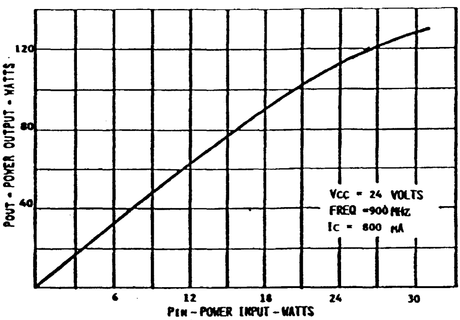
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 100mA		28			V
BV_{CBO}	I_C = 100mA		60			V
BV_{EBO}	I_E = 50mA		3			V
I_{CEO}	V_{CB} = 28V				10	mA
h_{FE}	V_{CE} = 5V	I_C = 3A	15		70	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O*	f = 900MHz	V_{CE} = 24V	I_{CQ} = 800mA	120	150		W
P_G	f = 900MHz	V_{CE} = 24V	I_{CQ} = 800mA	6.0	6.5		dB
ηc	f = 900MHz	V_{CE} = 24V	I_{CQ} = 800mA	50			%
IMD**	f = 900MHz	V_{CE} = 24V	I_{CQ} = 800mA		– 32	– 30	dB
C_{OB}	f = 1MHz	V_{CE} = 28V				100	pF

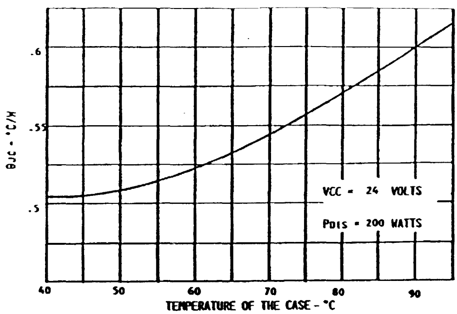
* @ DB compression.
** @ P_{OUT} = 120WPEP. ΔF = 600KHZ (2 tones).

POWER OUTPUT VS POWER INPUT

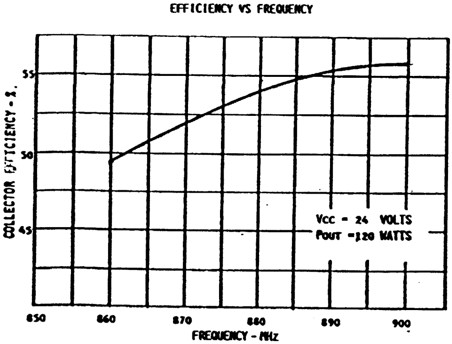


S88SD1660-02

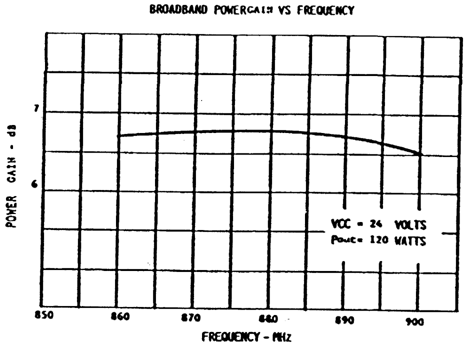
IR SCAN HOT SPOT θJC VS CASE TEMPERATURE



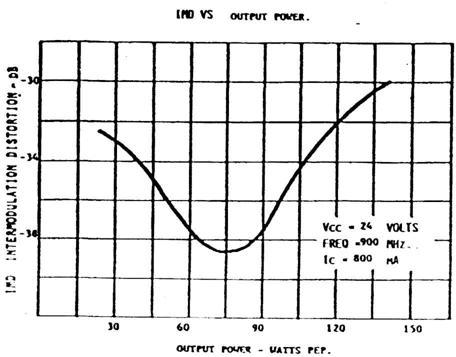
S88SD1660-03



S88SD1660-04

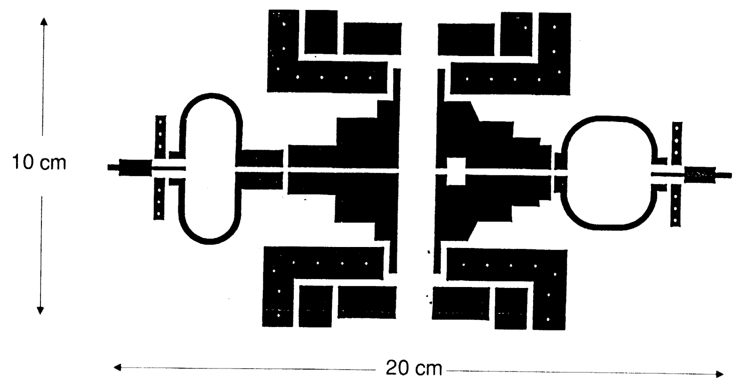


S88SD1660-05

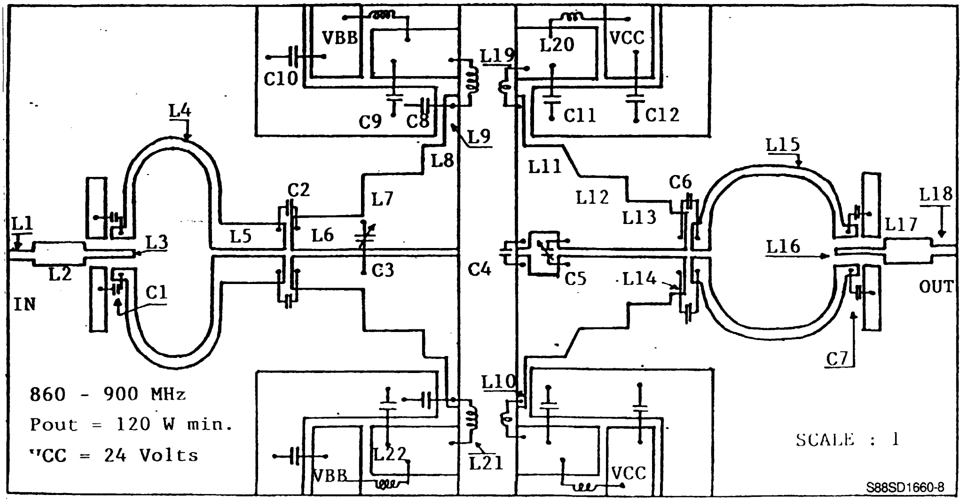


S88SD1660-06

TEST CIRCUIT



S88SD1660-07



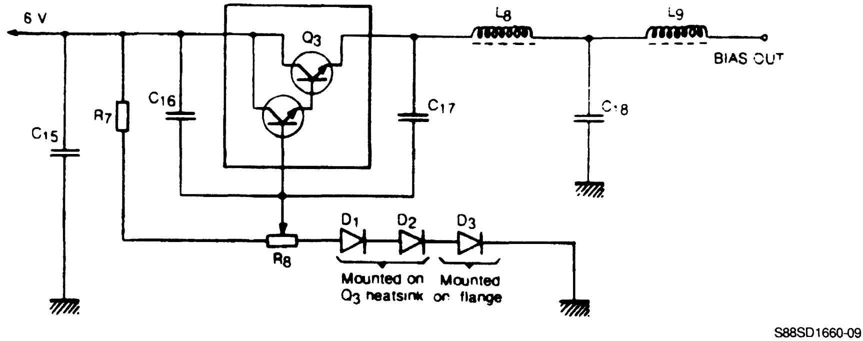
PART LIST :

L_1 . L_{18}	=	PRINTED LINE 50Ω
L_2 . L_{17}	=	PRINTED LINE 26.7Ω. 10mm
L_3 . L_{16}	=	PRINTED LINE 60Ω. 10.5mm
L_4 . L_{15}	=	PRINTED LINE 50Ω. 43mm
L_5	=	PRINTED LINE 25Ω. 13.5mm
L_6	=	PRINTED LINE 21Ω. 15mm
L_7	=	PRINTED LINE 10.5Ω. 12.5mm
L_8	=	PRINTED LINE 8Ω. 7.5mm
L_9 . L_{10}	=	PRINTED LINE 50Ω. 10mm
L_{11}	=	PRINTED LINE 9.5Ω. 10.5mm
L_{12}	=	PRINTED LINE 11Ω. 14.5mm
L_{13}	=	PRINTED LINE 15.5Ω. 8.5mm
L_{14}	=	PRINTED LINE 19Ω. 3.5mm
L_{19}	=	2 TURNS . 16AWG
L_{20}	=	2 TURNS . 16AWG
L_{21} . L_{22}	=	12 TURNS . 22AWG

C_1 . C_2	=	330pF – ATC 100B
C_3	=	JOHANSON GICA – TRIM .8 to 8pF
C_4	=	4.7 + 3.9pF – ATC 100B
C_5	=	3.9 + 1.7pF – ATC 100B + JOHANSON GICA – TRIM .8 to 8pF
C_6 . C_7	=	330pF – ATC 100B
C_8	=	120pF ATC 100B
C_9	=	1.5nF – ATC 100B
C_{10}	=	10nF + 47µF – 63V
C_{11}	=	1.5nF – ATC 100B + 10nF
C_{12}	=	470pF + 1.5nF – ATC 100B + 100µF – 63V

B_1 . B_2 = COAXIAL CABLE 25 . 43mm
SUBSTRATE = TEFLON GLASS Er = 2.55 . 30MILS.

BIAS VOLTAGE SOURCE

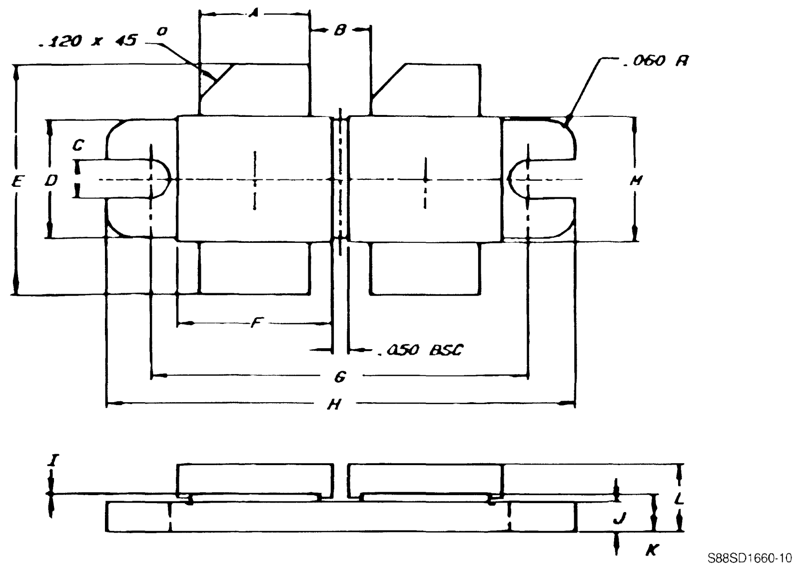


PARTS LIST (BIAS VOLTAGE SOURCE)

R_7	=	470Ω – 1/2W
R_8	=	100Ω TRIMPOT
C_{15}	=	10nF + 100 nF + 10μF
C_{16}	=	10nF
C_{17}	=	1μF
C_{18}	=	1.2nF + 27nF + 10μF
Q_3	=	BDX 63B
D_1	=	AAY 49 – Ge DIODE THERMALLY CONNECTED WITH Q_3 HEATSINK
D_2	=	1N 4005 – SI DIODE THERMALLY CONNECTED WITH Q_3 HEATSINK
D_3	=	1N 4005 – SI DIODE THERMALLY CONNECTED WITH RF TRANSISTORS FLANGE
L_8 . L_9	=	FERRITE CHOKE

PACKAGE MECHANICAL DATA

2 x (.450 SQ) 4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.373/9.47	.385/9.78
B	.190/4.83 BSC	
C	.125/3.18 BSC	
D	.411/10.44	.421/10.69
E	.825/20.96	.865/21.97
F	.525/13.34	.535/13.59
G	1.255/31.88	1.265/32.13

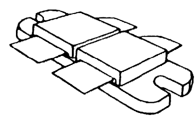
	Minimum Inches/mm	Maximum Inches/mm
H	1.675/42.55	1.685/42.80
I	.002/0.05	.006/0.15
J	.095/2.41	.105/2.67
K	.115/2.92	.135/3.43
L		.250/6.35
M	.445/11.30	.455/11.56

SGS-THOMSON
MICROELECTRONICS

SD1680

RF & MICROWAVE TRANSISTORS
915-960MHz CLASS AB BASE STATION

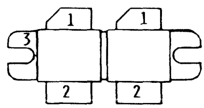
- FREQUENCY 915-960MHz
- POWER OUT 100W
- VOLTAGE 24V
- POWER GAIN 6.0dB
- CLASS AB PUSH PULL
- INTERNAL INPUT MATCHING
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION



2 x (.437 x .450 2L) FL (M175)
epoxy sealed

ORDER CODE	BRANDING
SD1680	SD1680

PIN CONNECTION



S88SD1680-01

1 collector
2 base
3 emitter

DESCRIPTION

The SD1680 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class AB operation for cellular base station applications.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	60	V
V_{CEO}	Collector - Emitter Voltage	28	V
V_{EBO}	Emitter - Base Voltage	3	V
I_C	Collector Current (max.)	25	A
P_{TOT}	Total Device Dissipation at + 25°C	310	W
T_{STG}	Storage Temperature	– 55 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance T_{CASE} = 70°C	.55	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

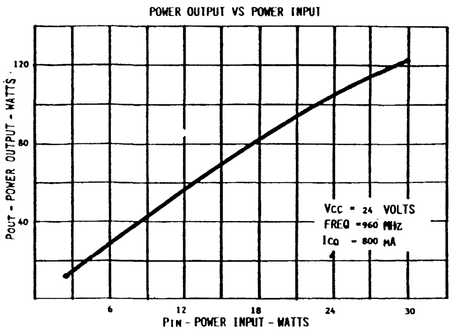
Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CEO}	I_C = 100mA		28			V
BV_{CBO}	I_C = 100mA		60			V
BV_{EBO}	I_E = 50mA		3			V
I_{CEO}	V_{CB} = 28V				10	mA
h_{FE}	V_{CE} = 5V	I_C = 3A	15		70	

DYNAMIC

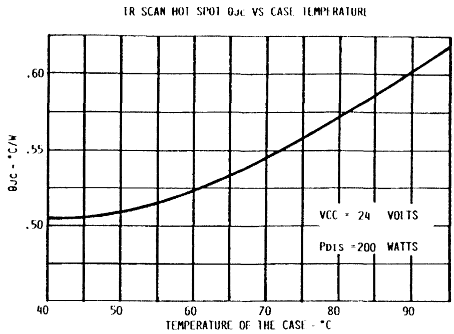
Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O*	f = 960MHz	V_{CE} = 24V	I_{CQ} = 800mA	100	120		W
P_G	f = 960MHz	V_{CE} = 24V	I_{CQ} = 800mA	6.0	6.5		dB
η_c	f = 960MHz	V_{CE} = 24V	I_{CQ} = 800mA	45	50		%
IMD**	f = 960MHz	V_{CE} = 24V	I_{CQ} = 800mA		– 32	– 30	dB
C_{OB}	f = 1MHz	V_{CB} = 28V				100	pF

* @ DB COMPRESSION
** @ POUT = 100 WPEP. Δ F = 400KHz (2 tones)

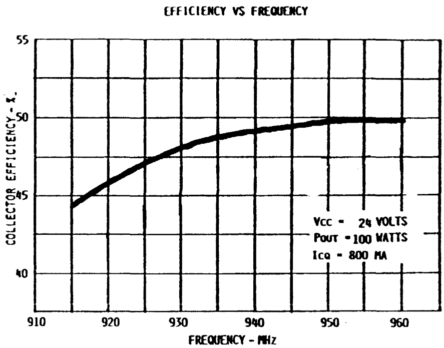
APPLICATION INFORMATION (typical curves)



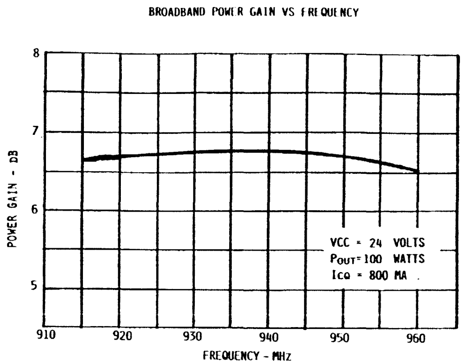
S88SD1680-01



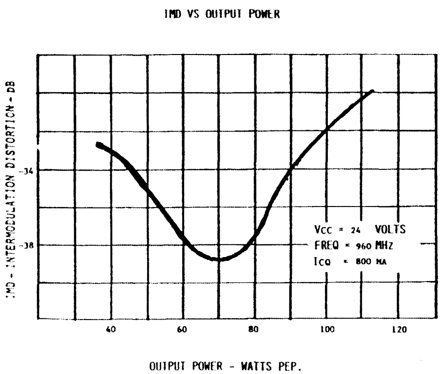
S88SD1680-02



S88SD1680-03

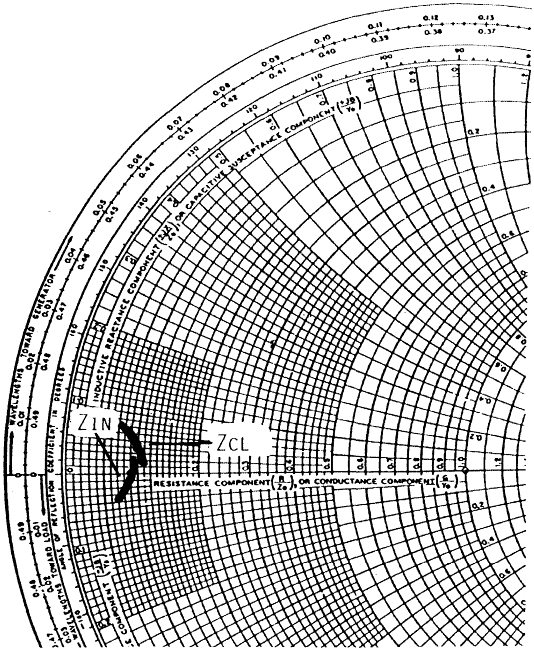


S88SD1680-04



S88SD1680-05

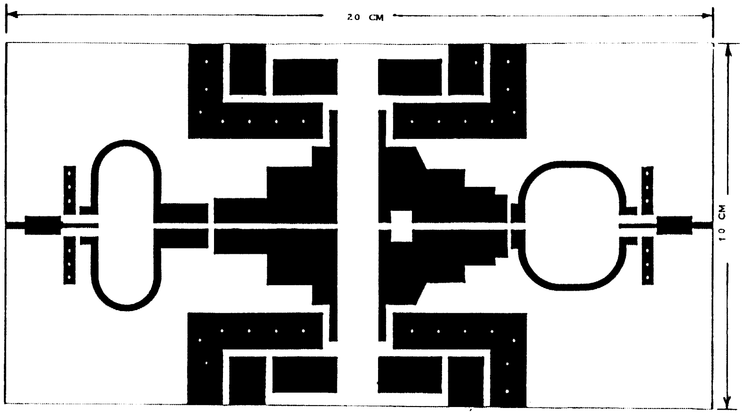
SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



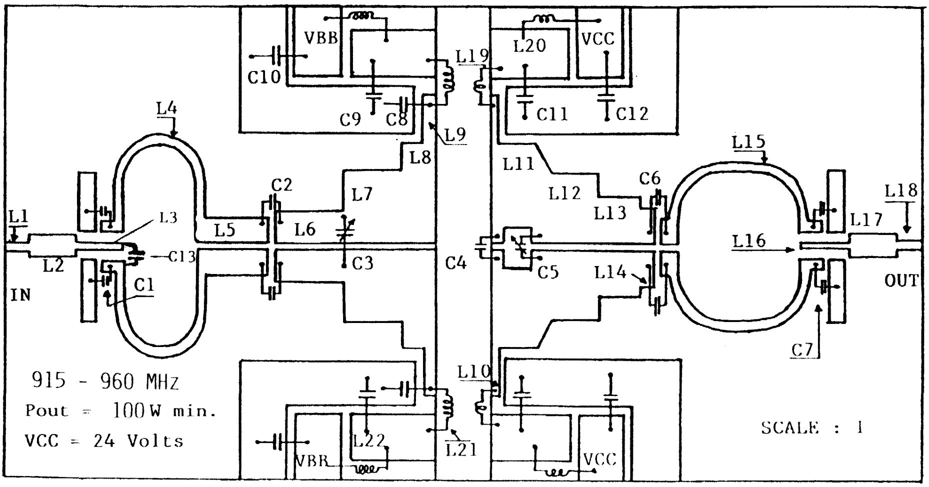
f MHz	Z_{IN} Base to Base	Z_{LOAD} Collector to Collector
910	4.8 + .95j	5 + .9j
930	4.5 + 0j	4.6 + 1.7j
950	4.3 − 1j	4.2 + 2.6j
970	4.1 − 1.9j	3.8 + 3.4j

Z_{LOAD} = optimum load impedance into which the transistor operates at the specified power out. voltage and frequency.
frequency = 910 – 970MHz
V_{CC} = 24V
P_{out} = 100W
CLASS AB
(normalized to 50Ω)

S88SD1680-06



S88SD1680 07



PARTS LIST :

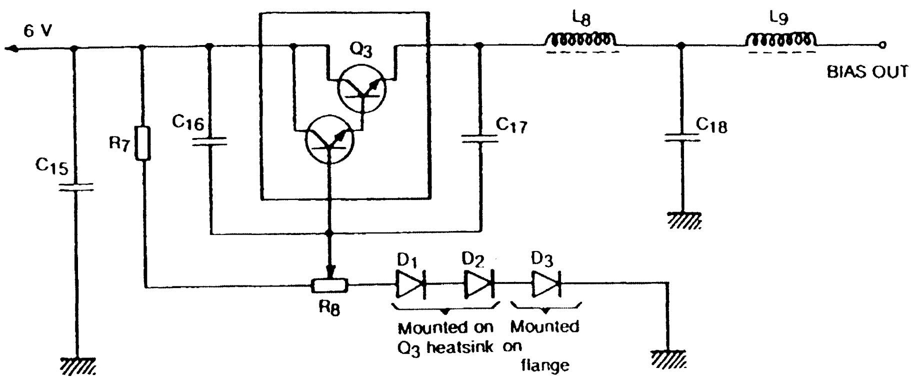
L1, L18	: Printed line 50Ω
L2, L17	: Printed line 26.7Ω, 10mm
L3, L16	: Printed line 60Ω, 10.5mm
L4, L15	: Printed line 50Ω, 43mm
L5	: Printed line 25Ω, 13.5mm
L6	: Printed line 21Ω, 15mm
L7	: Printed line 10.5Ω, 12.5mm
L8	: Printed line 8Ω, 7.5mm
L9, L10	: Printed line 50Ω, 10mm
L11	: Printed line 9.5Ω, 10.5mm
L12	: Printed line 11Ω, 14.5mm
L13	: Printed line 15.5Ω, 8.5mm
L14	: Printed line 19Ω, 3.5mm
L19	: 2 turns, 16 AWG
L20	: 8 turns, 16 AWG
L21, L22	: 12 turns, 22 AWG

C1, C2	: 330pF - ATC 100 B
C3	: Johanson GIGA - TRIM .8 to 8pF
C4	: 2 x 3.6pf + 1.6pf ATC 100 B
C5	: 3.3pf ATC 100B + Johanson GIGA - TRIM .8 to 8pF
C6, C7	: 330pF – ATC 100 B
C8	: 120pF ATC 100 B
C9	: 1.5nF - ATC 100 B
C10	: 10nF + 47μF - 63V
C11	: 1.5nF - ATC 100 B + 10nF
C12	: 470pF + 1.5nF - ATC 100 B + 100μF - 63V
C13	: Johanson GIGA - TRIM .4 to 4pf
B1, B2	: COAXIAL CABLE 25, 43mm

SUBSTRATE : TEFLON GLASS Er = 2.55, 30 mils

S88SD1680 08

BIAS VOLTAGE SOURCE

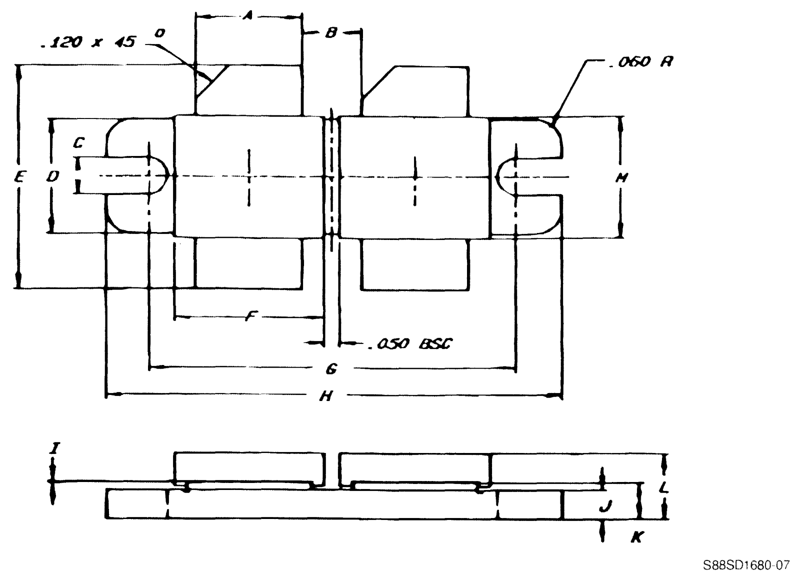


PART LIST (bias voltage source)

R_7	: 470Ω - 1/2W
R_8	: 100Ω trimpot
C_{15}	: 10nF + 100nF + 10μF
C_{16}	: 10nF
C_{17}	: 1μF
C_{18}	: 1.2nF + 27nF + 10F
Q_3	: BDX 63 B
D_1	: AAY 49 - Ge diode thermally connected with Q3 heatsink
D_2	: 1N4005 - Si diode thermally connected with Q3 heatsink
D_3	: 1N4005 - Si diode thermally connected with SD1680 (RF transistors) flange
L_8, L_9	: Ferrite choke

PACKAGE MECHANICAL DATA

2 x (.437 x .450 2L) FL



	Minimum Inches/mm	Maximum Inches/mm
A	.373/9.47	.385/9.78
B	.190/4.83 BSC	
C	.125/3.18 BSC	
D	.411/10.44	.421/10.69
E	.825/20.96	.865/21.97
F	.525/13.34	.535/13.59
G	1.255/31.88	1.265/32.13

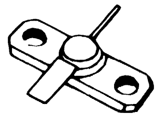
	Minimum Inches/mm	Maximum Inches/mm
H	1.675/42.55	1.685/42.80
I	.002/0.05	.006/0.15
J	.095/2.41	.105/2.67
K	.115/2.92	.135/3.43
L		.250/6.35
M	.445/11.30	.455/11.56

SGS-THOMSON
MICROELECTRONICS

SD1837

RF & MICROWAVE TRANSISTORS OSCILLATOR

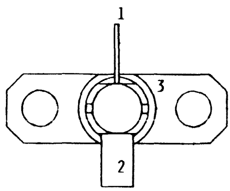
- FREQUENCY 2.3GHz
- POWER OUT 2.0W
- VOLTAGE 20.0V
- GOLD METALLIZATION
- EMITTER BALLASTING RESISTORS
- DESIGNED FOR SPECIFIC FREQUENCIES AND VOLTAGES
- FOR STRIPLINE & LUMPED ELEMENT CIRCUITS



.230 2LFL (M151)
hermetically sealed

ORDER CODE	BRANDING
SD1837	1837

PIN CONNECTION



S88SD1837-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1837 device is an NPN silicon, overlay, emitter site ballasted, gold metallized transistor which is particularly well suited for applications in S-Band, power oscillator circuits. The SD1837 is supplied in a common collector package configuration. These transistors are supplied in a low loss, metal ceramic, hermetic stripline package.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.400	A
P_{diss}	Max Device Dissipation at + 25°C	19.4	W
T_{STG}	Storage Temperature	− 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	9	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

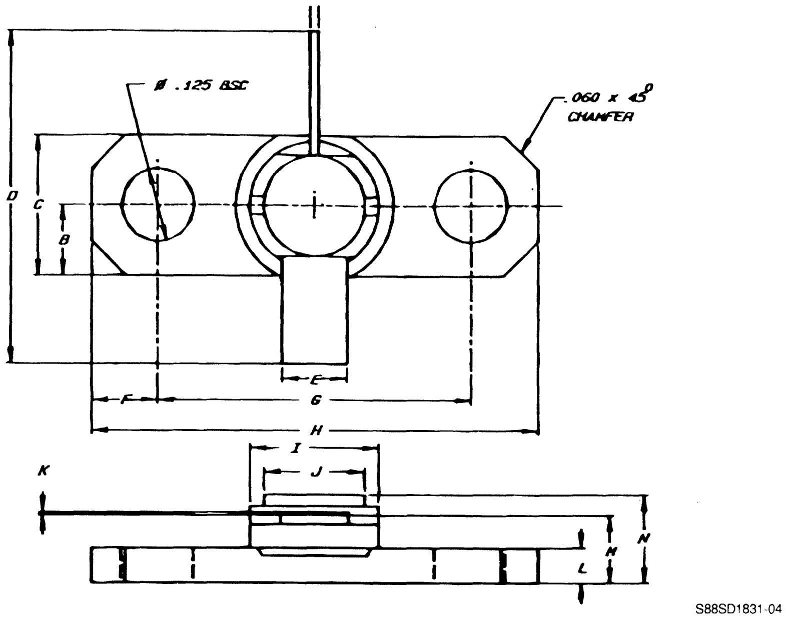
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{cbo}	I_C = 2mA	I_e = 0	40			V
BV_{ebo}	I_e = 2mA	I_C = 0	3.5			V
h_{FE}	V_{ce} = 5V	I_C = 0.1A	15		150	

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_o	f = 2.3GHz	Vcc = 20V	2.0			W
η_C	f = 2.3GHz	Vcc = 20V	25			%

PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

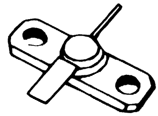
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON MICROELECTRONICS

SD1838

RF & MICROWAVE TRANSISTORS OSCILLATOR

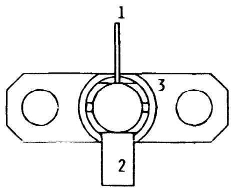
- FREQUENCY 2.3GHz
- POWER OUT 3.0W
- VOLTAGE 20.0V
- GOLD METALLIZATION
- EMITTER BALLASTING RESISTORS
- DESIGNED FOR SPECIFIC FREQUENCIES AND VOLTAGES
- FOR STRIPLINE & LUMPED ELEMENT CIRCUITS



.230 2LFL (M151)
hermetically sealed

ORDER CODE	**BRANDING**
SD1838	1838

PIN CONNECTION



S88SD1838-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1838 device is an NPN silicon, overlay, emitter site ballasted, gold metallized transistor which is particularly well suited for applications in S-Band, power oscillator circuits. The SD1838 is supplied in a common collector package configuration. These transistors are supplied in a low loss, metal ceramic, hermetic stripline package.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	.500	A
P_{diss}	Max Device Dissipation at + 25°C	19.4	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	9	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

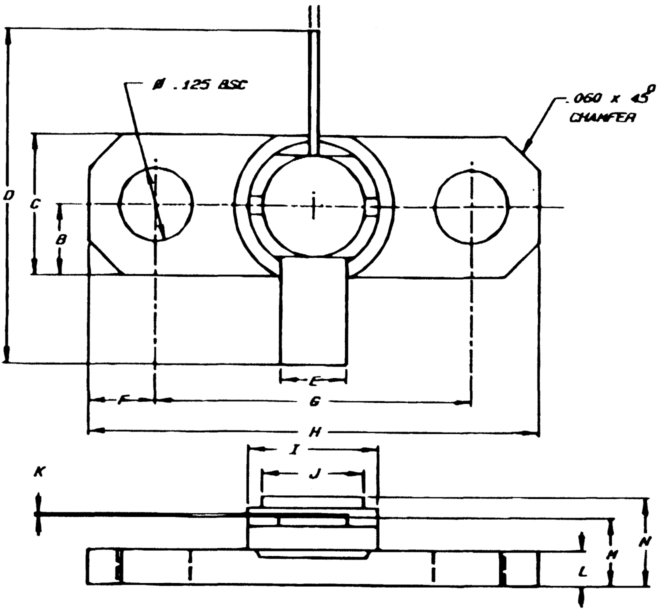
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{cbo}	I_C = 2mA	I_e = 0	40			V
BV_{ebo}	I_E = 2mA	I_C = 0	3.5			V
h_{FE}	V_{ce} = 5V	I_C = 0.1A	15		150	

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_o	f = 2.3GHz	Vcc = 20V	3.0			W
η_C	f = 2.3GHz	Vcc = 20V	30			%

PACKAGE MECHANICAL DATA

.230 2LFL



S88SD1838-02

	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

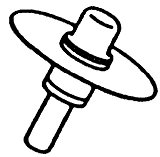
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON MICROELECTRONICS

SD1840

RF & MICROWAVE TRANSISTORS OSCILLATOR

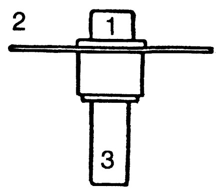
- FREQUENCY 2.0GHz
- POWER OUT 1.0W
- VOLTAGE 20.0V
- GOLD METALLIZATION
- EMITTER BALLASTING RESISTORS
- DESIGNED FOR SPECIFIC FREQUENCIES AND VOLTAGES
- FOR COAXIAL, STRIPLINE, AND LUMPED ELEMENT CIRCUITS



.500 COAX (M144)
hermetically sealed

ORDER CODE	**BRANDING**
SD1840	SD1840

PIN CONNECTION



S88SD1840-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1840 device is an NPN silicon, overlay emitter site ballasted, gold metallized transistor which is particularly well suited for applications in S-Band, power oscillator circuits. The SD1840 device can be provided in either Common Emitter or Common Base bonding configurations to provide flexibility with regard to frequency, power output, supply voltage, and circuit topology. These transistors are supplied in a low loss, metal ceramic, hermetic coaxial TO 215 AA package.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CEO}	Collector - Emitter Voltage	20	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.14	A
P	Device Dissipation at + 25°C	7.0	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	25	°C/W

May 1989

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

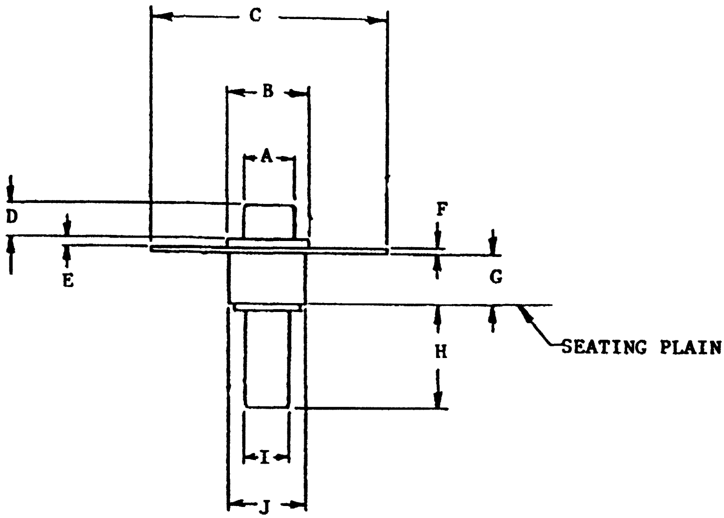
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 5mA	I_b = 0	20			V
BV_{CBO}	I_C = 1.0mA	I_E = 0	40			V
BV_{EBO}	I_E = 100μA	I_C = 0	3.5			V
h_{FE}	V_{CE} = 5.0V	I_C = 100mA	15		150	

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O	f = 2GHz	V_{CC} = 20V	1.0			W
N_C	f = 2GHz	V_{CC} = 20V	28			%
C_{ob}	V_{CB} = 28.0V	f = 1MHz		3.5		pF

PACKAGE MECHANICAL DATA

.500 COAX

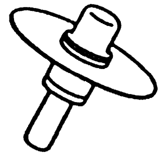


	Maximun Inches/mm	Minimun Inches/mm
A	.123/3.12	.117/2.97
B	.185/4.70	.175/4.45
C	.504/12.80	.496/12.60
D	.105/2.67	.098/2.49
E	.040/1.01	.028/0.71
F	.012/0.30	.009/0.23
G	.125/3.18	.115/2.92
H	.191/4.85	.179/4.55
I	.091/2.31	.090/2.29
J	.167/4.24	.157/3.99

SD1842

RF & MICROWAVE TRANSISTORS
OSCILLATOR

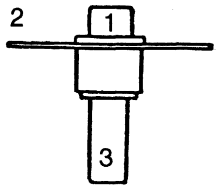
- FREQUENCY 2.3GHz
- POWER OUT 1.2W
- VOLTAGE 21V
- GOLD METALLIZATION
- EMITTER BALLASTING RESISTORS
- DESIGNED FOR SPECIFIC FREQUENCIES AND VOLTAGES
- FOR COAXIAL, STRIPLINE, AND LUMPED ELEMENT CIRCUITS



.500 COAX (M144)
hermetically sealed

ORDER CODE	BRANDING
SD1842	SD1842

PIN CONNECTION



S88SD1842-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1842 device is an NPN silicon, overlay, emitter site ballasted, gold metallized transistor which is particularly well suited for applications in S-Band. power oscillator circuits. The SD1842 is supplied in a common emitter package configuration. These transistors are supplied in a low loss, metal ceramic, hermetic coaxial TO 215 AA package.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.24	A
P_{diss}	Max Device Dissipation at + 25°C	8.75	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	20	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

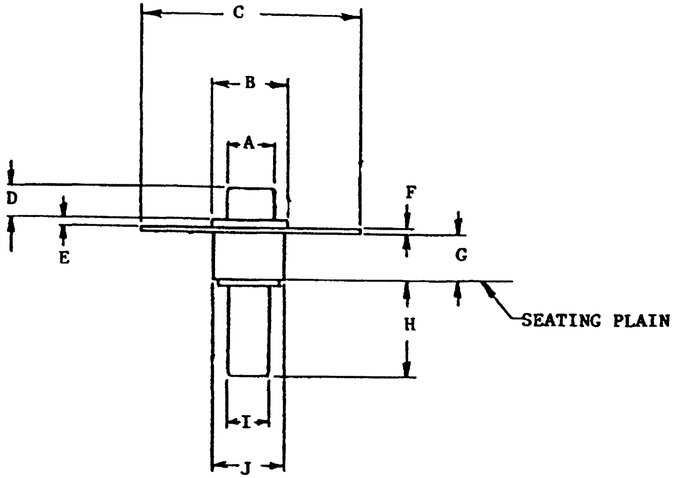
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{cbo}	I_C = 1mA	I_e = 0	40			V
BV_{ebo}	I_e = 1mA	I_C = 0	3.5			V
hFE	Vce = 5V	I_C = 100mA	15		150	

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O	f = 2.3GHz	V_{CC} = 21V	1.2			W
N_C	f = 2.3GHz	V_{CC} = 21V	24			%
Cob	Vcb = 28V			3.5		pF

PACKAGE MECHANICAL DATA

.500 COAX



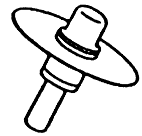
	Maximun Inches/mm	Minimun Inches/mm
A	.123/3.12	.117/2.97
B	.185/4.70	.175/4.45
C	.504/12.80	.496/12.60
D	.105/2.67	.098/2.49
E	.040/1.01	.028/0.71
F	.012/0.30	.009/0.23
G	.125/3.18	.115/2.92
H	.191/4.85	.179/4.55
I	.091/2.31	.090/2.29
J	.167/4.24	.157/3.99

SGS-THOMSON MICROELECTRONICS

SD1843

RF & MICROWAVE TRANSISTORS OSCILLATOR

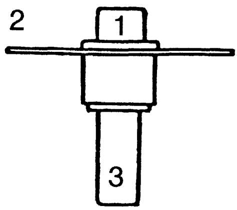
- GOLD METALLIZATION
- EMITTER BALLASTING RESISTORS
- DESIGNED FOR SPECIFIC FREQUENCIES AND VOLTAGES
- FOR COAXIAL, STRIPLINE AND LUMPED ELEMENT CIRCUITS



.500 COAX (M144)
hermetically sealed

ORDER CODE	**BRANDING**
SD1843	SD1843

PIN CONNECTION



1 emitter
2 base
3 collector

DESCRIPTION

The SD1843 device is an NPN silicon, overlay, emitter site ballasted, gold metallized transistor which is particularly well suited for applications in S-Band, power oscillator circuits. The SD1843 is supplied in a common emitter package configuration. These transistors are supplied in a low loss, metal ceramic, hermetic coaxial TO 215 AA package.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	50.0	V
V_{CEO}	Collector - Emitter Voltage	26.0	V
V_{EBO}	Emitter - Base Voltage	2.5	V
I_C	Collector Current (max.)	.150	A
P_{diss}	Max Device Dissipation at + 25°C	8.75	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	20	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

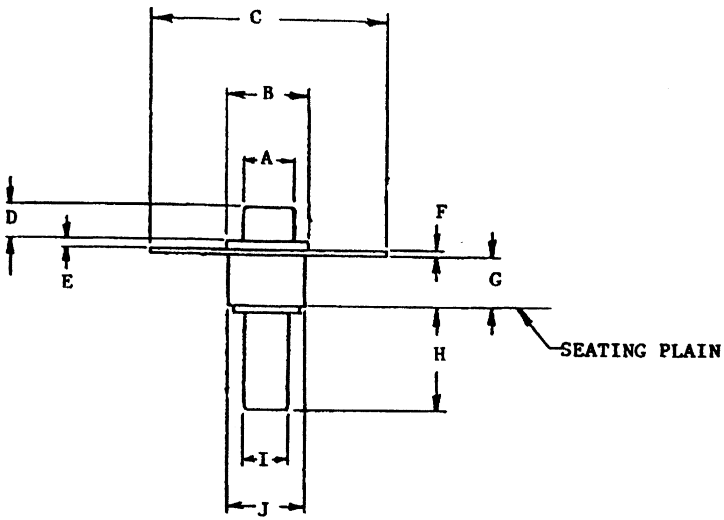
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{ceo}	I_C = 500μA	I_b = 0	26			V
BV_{cbo}	I_C = 1mA	I_E = 0	50			V
BV_{EBO}	I_E = 100μA	I_C = 0	2.5			V
h_{FE}	V_{CE} = 5V	I_C = 100mA	15		150	

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O	f = 2GHz	V_{CC} = 28V	1.3			W
η_C	f = 2GHz	V_{CC} = 28V	31			%
C_{ob}	V_{CB} = 28V			3.5		pF

PACKAGE MECHANICAL DATA

.500 COAX



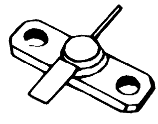
	Maximun Inches/mm	Minimun Inches/mm
A	.123/3.12	.117/2.97
B	.185/4.70	.175/4.45
C	.504/12.80	.496/12.60
D	.105/2.67	.098/2.49
E	.040/1.01	.028/0.71
F	.012/0.30	.009/0.23
G	.125/3.18	.115/2.92
H	.191/4.85	.179/4.55
I	.091/2.31	.090/2.29
J	.167/4.24	.157/3.99

SGS-THOMSON MICROELECTRONICS

SD1845

RF & MICROWAVE TRANSISTORS OSCILLATOR

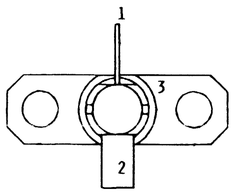
- FREQUENCY 2.3GHz
- POWER OUT .5W
- VOLTAGE 20V
- GOLD METALLIZATION
- EMITTER BALLASTING RESISTORS
- DESIGNED FOR SPECIFIC FREQUENCIES AND VOLTAGES
- FOR STRIPLINE & LUMPED ELEMENT CIRCUITS



.230 2LFL (M151)
hermetic sealed

ORDER CODE	BRANDING
SD1845	SD1845

PIN CONNECTION



S88SD1845-01

1 emitter
2 base
3 collector

DESCRIPTION

the SD1845 device is an NPN silicon, overlay, emitter site ballasted, gold metallized transistor which is particularly well suited for applications in S-Band, power oscillator circuits. The SD1845 is supplied in a common collector package configuration. These transistors are supplied in a low loss, metal ceramic, hermetic stripline package.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	90	A
P_{diss}	Max Device Dissipation at + 25°C	5.0	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	35	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

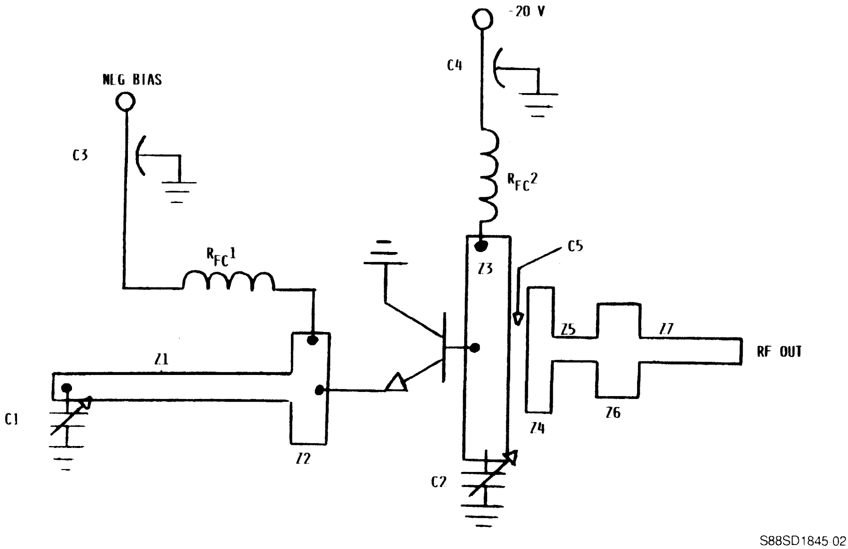
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{cbo}	I_C = 1mA	I_e = 0	40			V
BV_{ebo}	I_e = 1mA	I_C = 0	3.5			V
h_{FE}	V_{ce} = 5V	I_C = .5A	10		150	

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_o	f = 2.3GHz	Vcc = 20V	0.5			W
η_c	f = 2.3GHz	Vcc = 20V	30			%

TEST CIRCUIT

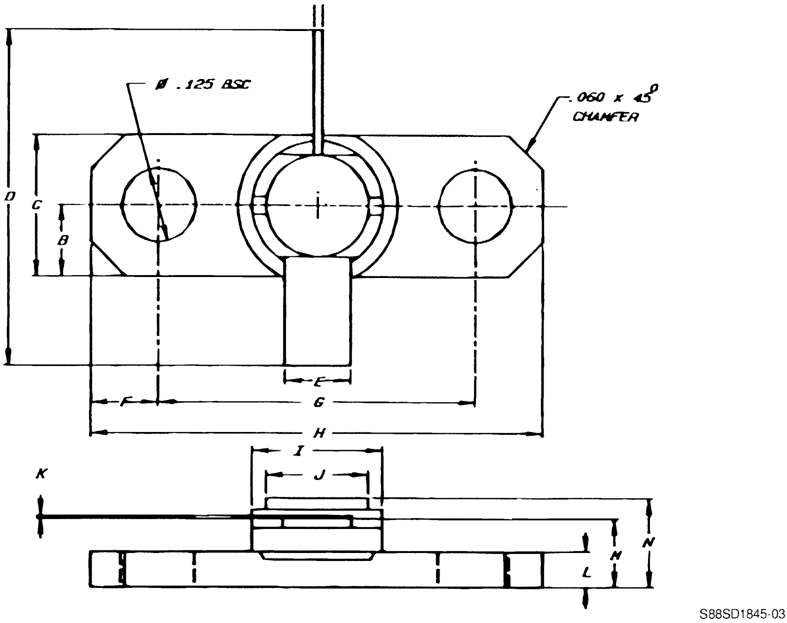


C1, C2	0.6-4.5pF Johanson Trimmer		
C3, C4	1500pf EMI-Filter/Erie		
C5	22pF ATC Chip Cap		
$R_{FC}1$, $R_{FC}2$	3 Turns #26 AWG, 0.100" I.D.		
Z1	0.850 X 0.140	Z5	0.170 X 0.086
Z2	0.135 X 0.400	Z6	0.150 X 0.320
Z3	0.140 X 0.800	Z7	0.086 Wide
Z4	0.110 X 0.450		

Printed Circuit Board : Er = 2.5 Thickness - 0.031"

PACKAGE MECHANICAL DATA

.230 2LFL



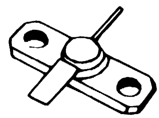
	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SD1847

RF & MICROWAVE TRANSISTORS OSCILLATOR

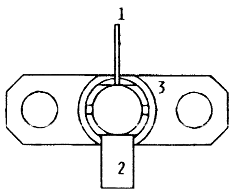
- FREQUENCY 2.3GHz
- POWER OUT 1.5W
- VOLTAGE 20.0
- GOLD METALLIZATION
- EMITTER BALLASTING RESISTORS
- DESIGNED FOR SPECIFIC FREQUENCIES AND VOLTAGES
- FOR STRIPLINE & LUMPED ELEMENT CIRCUITS



.230 2LFL (M151)
hermetic sealed

ORDER CODE	BRANDING
SD1847	SD1847

PIN CONNECTION



S88SD1847-01

1 emitter
2 base
3 collector

DESCRIPTION

The SD1847 device is an NPN silicon, overlay, emitter site ballasted, gold metallized transistor which is particularly well suited for applications in S-Band, power oscillator circuits. The SD1847 is supplied in a common collector package configuration. These transistors are supplied in a low loss, metal ceramic, hermetic stripline package.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.250	A
P_{diss}	Max Device Dissipation at + 25°C	11.0	W
T_{STG}	Storage Temperature	− 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	16	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

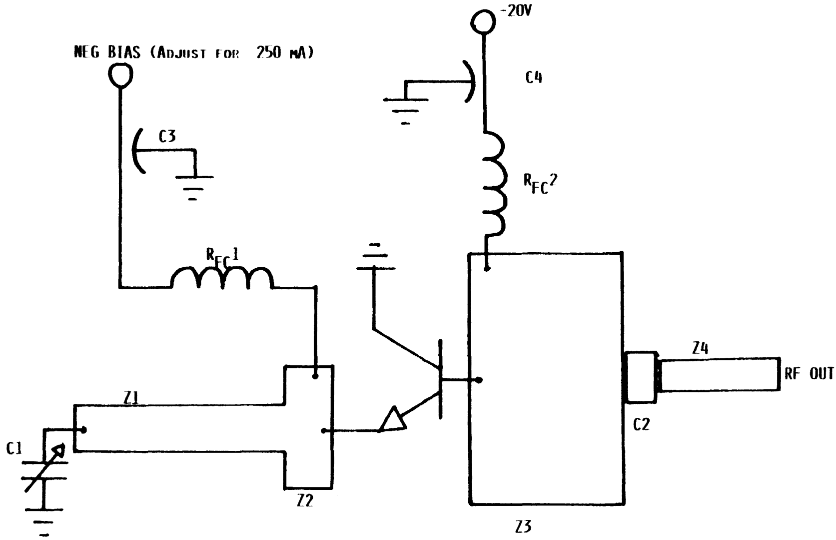
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{cbo}	I_C = 1mA	I_e = 0	40			V
BV_{ebo}	I_e = 1mA	I_C = 0	3.5			V
h_{FE}	V_{ce} = 5V	I_C = 100mA	15		150	

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_o	f = 2.3GHz	Vcc = 20V	1.5			W
η_c	f = 2.3GHz	Vcc = 20V	25			%

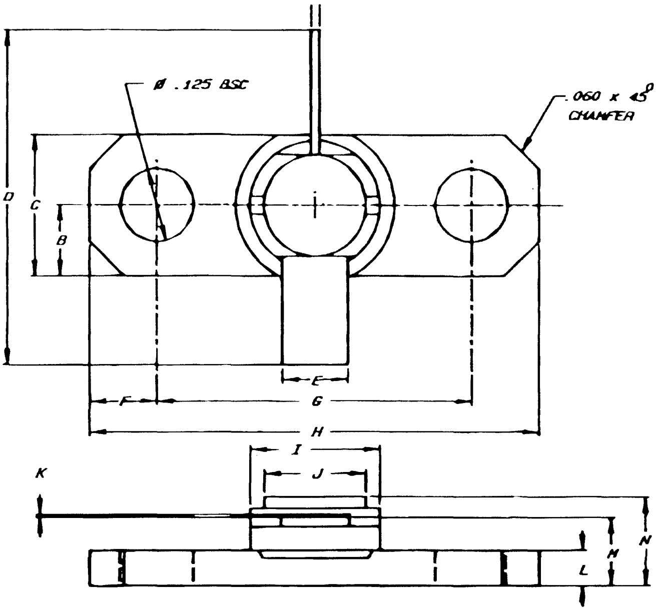
TEST CIRCUIT



C1 0.8-8.0pF Johanson Trimmer
C2 22pF ATC Chip Cap
C3. C4 1500pF EMI Filter Erie
$R_{FC}1$. $R_{FC}2$ 3 Turns #26 AWG. 0.100" I.D.
Z1 0.700 X 0.140
Z2 0.140 X 0.400
Z3 0.520 X 0.830
Z4 0.086 Wide
Printed Circuit Board : Er = 2.5 Thickness = .031"

PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

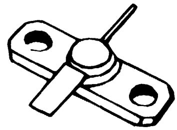
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON
MICROELECTRONICS

SD1850

RF & MICROWAVE TRANSISTORS
CLASS A MICROWAVE

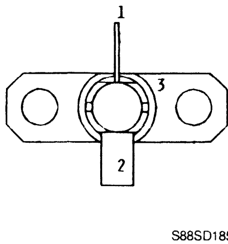
- FREQUENCY 2.3GHz
- POWER OUT .2W
- POWER GAIN 11dB
- VOLTAGE 15V
- I_C 80mA
- GOLD METALLIZED DIE
- OVERLAY GEOMETRY
- HERMETIC STRIPLINE PACKAGE
- COMMON EMITTER CONFIGURATION



.230 2LFL (M151)
hermetically sealed

ORDER CODE	BRANDING
SD1850	SD1850

PIN CONNECTION



1 collector
2 base
3 emitter

DESCRIPTION

The SD1850 is an NPN silicon transistor designed for high gain linear performance at 2.0GHz. This part uses gold metallized die and polysilicon site ballasting to achieve high reliability and ruggedness. The part can be used for applications such as Telecommunications, Radar, ECM, Space and other commercial and military systems.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	30	V
V_{CES}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	2	V
I_C	Collector Current (max.)	0.1	A
P_{DISS}	Total Device Dissipation at + 25°C	3.9	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	45	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 5mA		30	35		V
BV_{CEO}	I_C = 5mA		15	20		V
BV_{EBO}	I_E = 1mA		2	3		V
h_{FE}	V_{CE} = 3V	I_C = 50mA	20	75	150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O*	f = 2.3GHz	V_{CE} = 15V	I_C = 80mA	0.2	0.3		W
P_G	f = 2.3GHz	V_{CE} = 15V	I_C = 80mA	11	12		dB

** 1db compresson point.

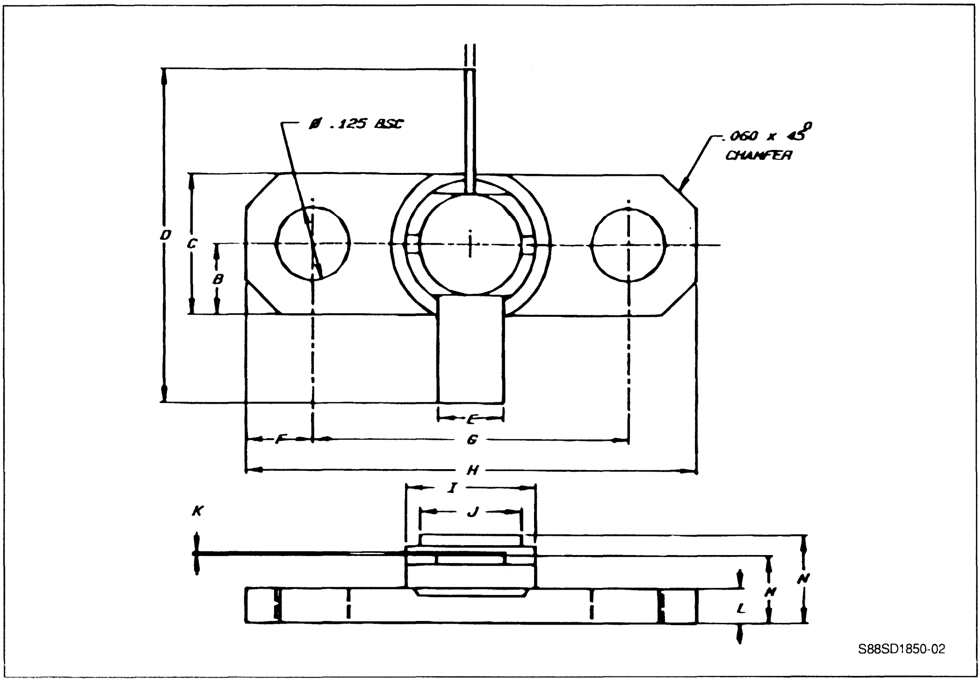
S-PARAMETER DATA

Bias : CURRENT = 60mA
VOLTAGE = 15.000V

Frequency	Return Loss-in		Gain Forward				Loss-reverse		Return Loss-out	
	S11		S21			Hfe	S12		S22	
MHz	DB	ANG	DB	MAG	ANG		DB	ANG	DB	ANG
500	2.35	– 173.8	+ 18.80	6.76	78.1	– 10.9389	29.59	31.4	9.70	– 141.8
1000	2.32	172.5	+ 11.10	3.59	53.6	– 6.8204	25.67	40.1	7.88	– 184.5
1500	2.54	160.2	+ 7.54	2.38	31.2	– 5.2930	23.35	41.5	6.02	179.7
2000	2.93	147.7	+ 5.82	1.98	11.0	– 4.5951	20.70	37.4	4.34	166.2
2500	3.9	129.0	+ 4.3	1.64	– 10.0	– 3.2462	18.6	32.0	3.3	148.0
3000	5.3	98.0	+ 2.9	1.40	– 35.0	– 2.6655	17.1	17.0	1.9	133.0
3500	7.4	51.0	+ 1.8	1.20	– 58.0	– 3.0508	15.9	– 2.0	1.0	120.0
4000	8.3	– 22.0	+ 0.1	1.01	– 83.0	– 3.1661	15.7	– 22.0	0.6	108.0

PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

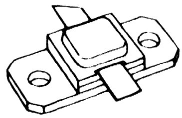
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON
MICROELECTRONICS

SD1868

RF & MICROWAVE TRANSISTORS
MICROWAVE TELECOMMUNICATION APPLICATIONS

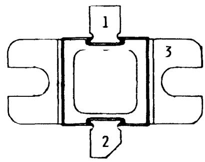
- FREQUENCY 1.6–1.65GHz
- POWER OUT 30W
- POWER GAIN 8.7dB
- VOLTAGE 28.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2LFL (M147)
hermetic sealed

ORDER CODE	BRANDING
SD1868	SD1868

PIN CONNECTION



S88SD1868-01

1 emitter
2 collector
3 base

DESCRIPTION

The SD1868 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The SD1868 is a 28V device designed to provide 30W (narrow band) for inmarsat and geostar applications. The device is branded SD1868.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15	V
V_{CBO}	Collector - Emitter Voltage	45	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	5.2	A
P_{tot}	Total Device Dissipation at + 25°C	58.3	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

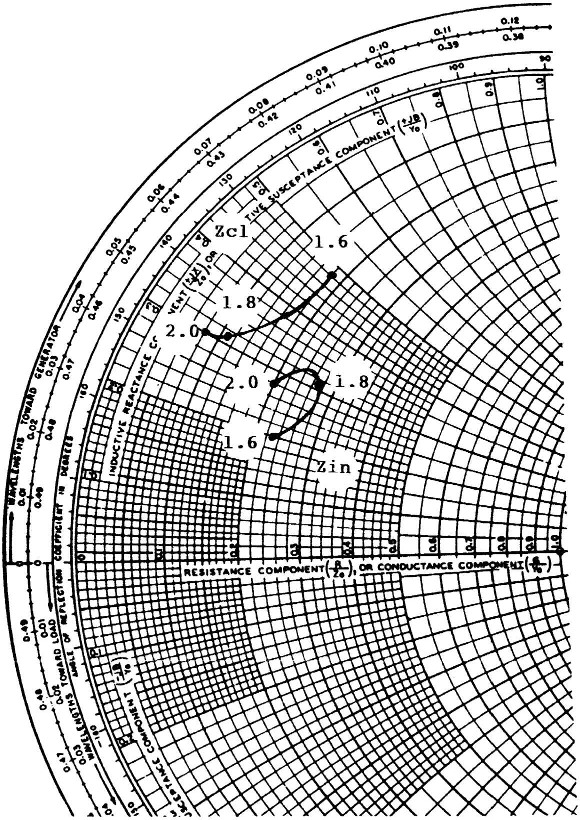
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}*	I_C = 10mA	I_B = 0	15			V
BV_{CBO}*	I_C = 10mA	V_{BE} = 0	45			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CEO}	V_{CB} = 24V	V_{BE} = 0			.5	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	15		150	

* Pulsed through 25MH Inductor.

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 1.6 – 1.65GHz	V_{CB} = 28V	P_{IN} = 4.0W	30			W
P_G	f = 1.6 – 1.65GHz	V_{CB} = 28V	P_{IN} = 4.0W	8.7			dB
ηc	f = 1.6 – 1.65GHz	V_{CB} = 28V	P_{OUT} = 30W	40			%

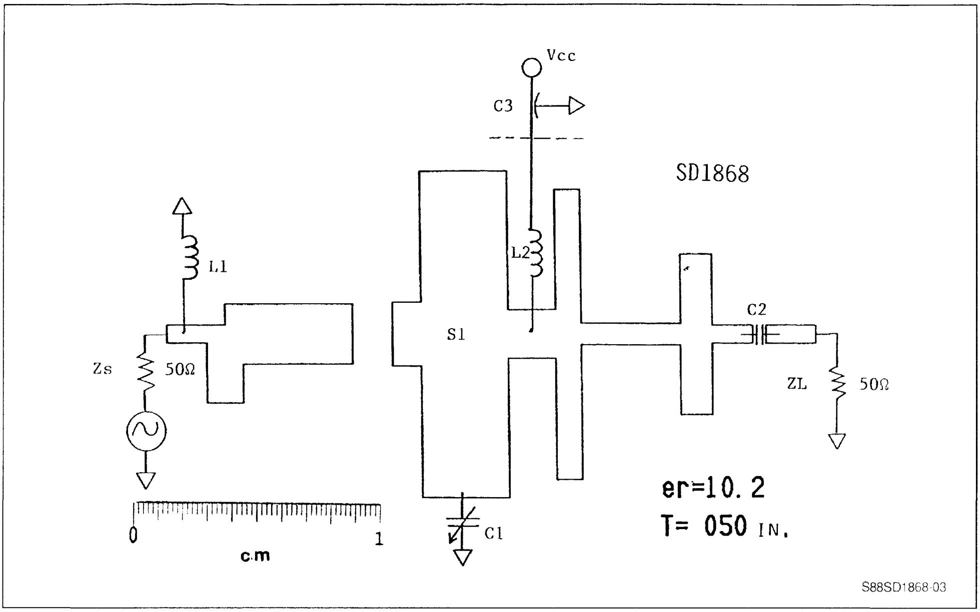
TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE WORKSHEET



F GHz	Z_{IN} (Ω)	Z_{CL} (Ω)
1.6	11.6 + j10.2	9.0 + j24.2
1.8	13.7 + j15.5	5.4 + j15.7
2.0	10.2 + j13.9	4.1 + j14.8

Z_{OUT} = Conjugate of the optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

S88-SD1868-02

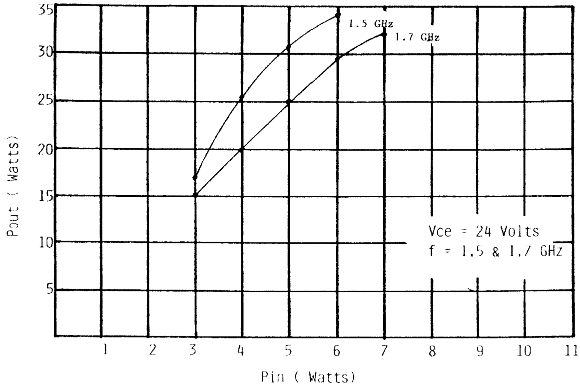


PARTS LIST

ITEM REF.	Description
L1	4 Turns # 28 Wire .080" Dia
L2	4 Turns # 28 Wire .080" Dia
C1	.4 – 2.5pF Johanson Capacitor
C2	100pF Chip Capacitor ATC
C3	15.000pF Emi Filter Murata/erie
S1	Epsilam 10 er = 10.2 T = .050 Ioz Copper
	SMA Launcher CDI (2 pieces)
	.397 so Fixture Housing
	Heat Sink

TYPICAL DATA CURVES WORKSHEET

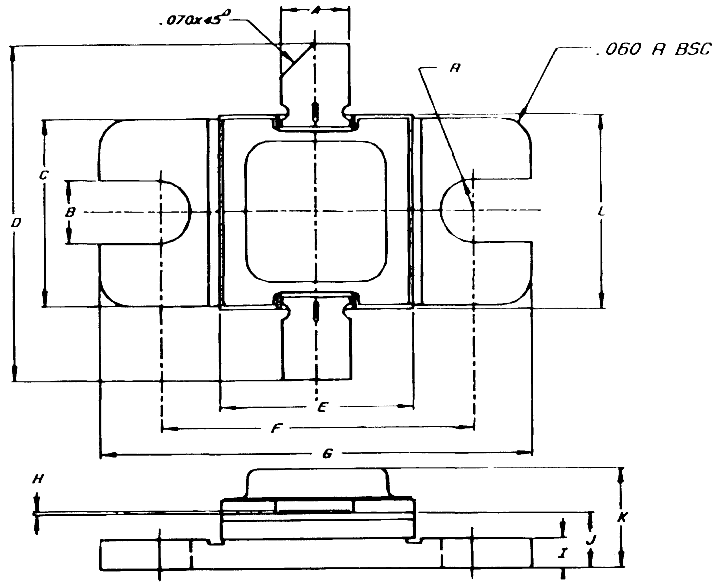
POUT vs PIN



S88SD1868 04

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



S88SD1868-05

	Minimum Inches/mm	Maximum Inches/mm
A	.135/3.43	.145/3.68
B	.125/3.18 BSC	
C	.380/9.65	.390/9.91
D	.885/22.48	
E	.392/9.96	.402/10.29
F	.645/16.38	.655/16.64

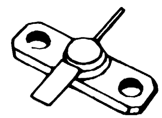
	Minimum Inches/mm	Maximum Inches/mm
G	.895/22.73	.905/22.99
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.105/2.67	.125/3.18
K		.230/5.84
L	.392/9.96	.402/10.29

SGS-THOMSON
MICROELECTRONICS

SD1891

RF & MICROWAVE TRANSISTORS MARISAT APPLICATIONS

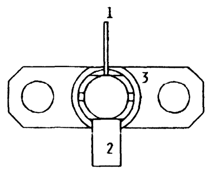
- FREQUENCY 1.65GHz
- POWER OUT 3.0W
- POWER GAIN 11.5dB
- VOLTAGE 28.0V
- HERMETIC STRIPLINE PACKAGE
- ALL GOLD METALLIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL (M151)
hermetic sealed

ORDER CODE	**BRANDING**
SD1891	SD1891

PIN CONNECTION



S88SD1891-01

1 collector
2 emitter
3 base

DESCRIPTION

The SD1891 is a 28V NPN Silicon Transistor designed for MARISAT Applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CEO}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	1.1	A
P_{DISS}	Total Device Dissipation at + 25°C	8.8	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	20	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

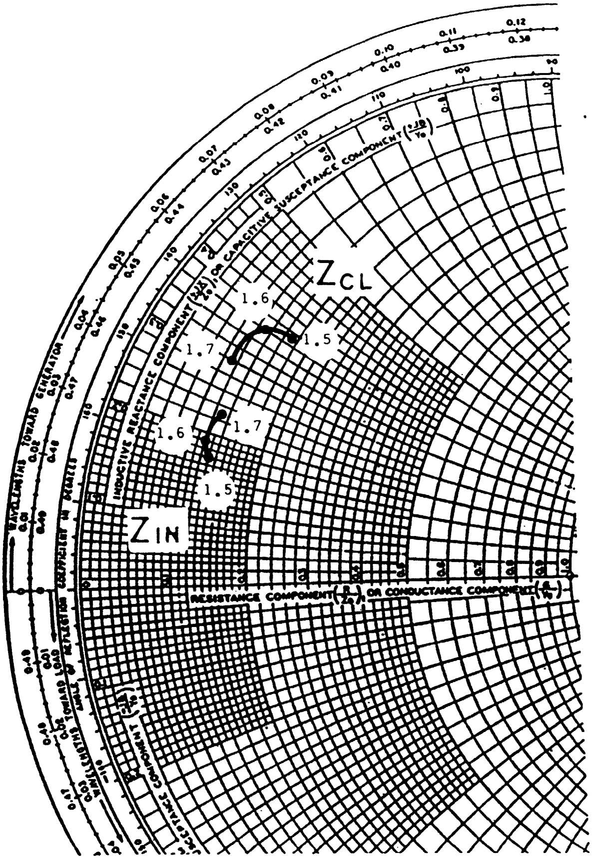
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1mA		45			V
BV_{EBO}	I_E = 1mA		3.5			V
I_{CBO}	V_{CB} = 24V				0.5	mA
H_{FE}	V_{CE} = 5V	I_C = 100mA	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 1.65GHz	V_{cc} = 28V	P_{in} = 0.25W	3.0			W
P_{GAIN}	f = 1.65GHz	V_{cc} = 28V	P_{in} = 0.25W	11.5			dB
η_C	f = 1.65GHz	V_{cc} = 28V	P_o = 0.25W	40			%
C_{ob}	V_{CB} = 28V	f = 1MHz	I_E = 0			2.5	PF

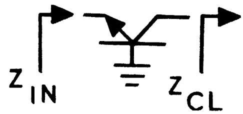
IMPEDANCE DATA (typical values)

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



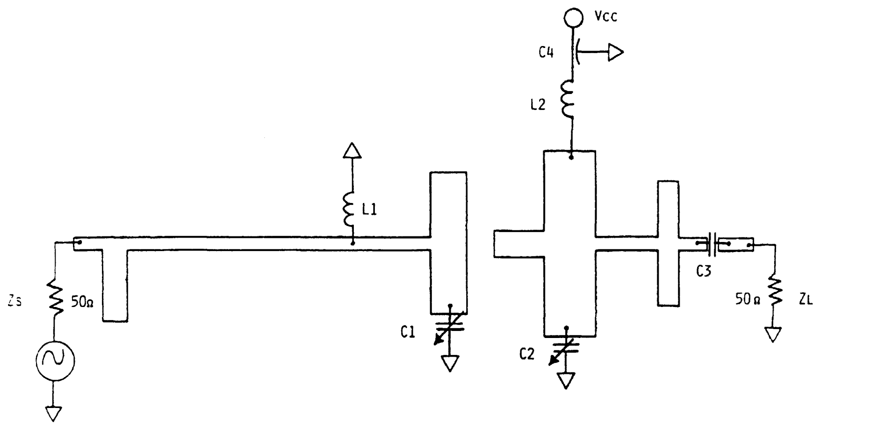
S88SD1891-02

F GHz	Z_{IN} (Ω)	Z_{CL} (Ω)
1.5	6.5 + j8.5	8.5 + j18.5
1.6	6.0 + j9.5	6.5 + j18.0
1.7	6.5 + j11.5	5.5 + j15.0



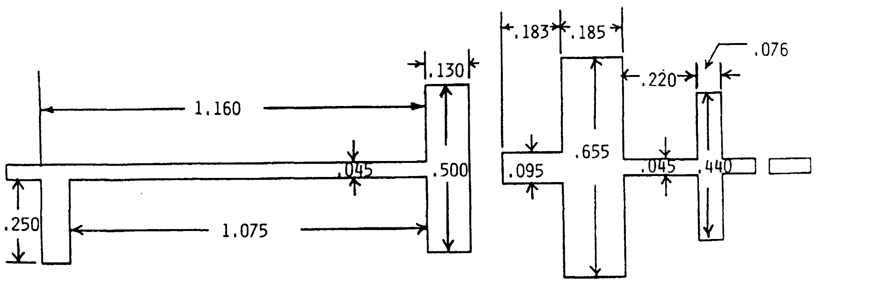
S88SD1891-03

TEST CIRCUIT



S88SD1891-04

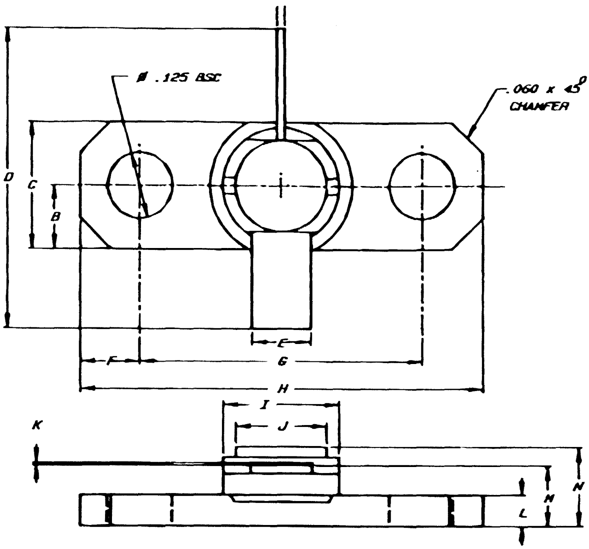
L1, L2	4 Turn Choke #28 AWG .080" I.D.	
C1, C2	.4-2.5 of Johanson Capacitor	#27283
C3	100pF Chip Capacitor ATC	ATC100 A101KCA 150
C4	15.000pF EMI Filter	Murata/Erie 9900-381-6004
S1	Epsilam 10 er = 10.2 H = .050"	
	1 oz cu SMA Laucher CD1 (2 pieces)	
	.230" Fixture Housing Heat Sink	Advance Corp. 5308-2CC



S88SD1891-05

PACKAGE MECHANICAL DATA

.230 2LFL



S88SD1891-06

	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

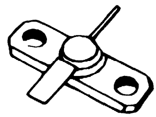
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON
MICROELECTRONICS

SD1893

RF & MICROWAVE TRANSISTORS
MARISAT APPLICATIONS

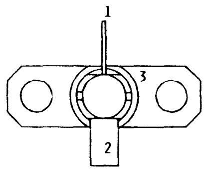
- FREQUENCY 1.65GHz
- POWER OUT 10.0W
- POWER GAIN 11.0dB
- VOLTAGE 28.0V
- HERMETIC STRIPLINE PACKAGE
- ALL GOLD METALLIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL (M151)
hermetic sealed

ORDER CODE	BRANDING
SD1893	1893

PIN CONNECTION



S88SD1893-01

1 collector
2 emitter
3 base

DESCRIPTION

The SD1893 is a 28V NPN Silicon Transistor designed for MARISAT Applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45	V
V_{CEO}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	4.4	A
P_{DISS}	Total Device Dissipation at + 25°C	43	W
T_{STG}	Storage Temperature	− 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	5.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

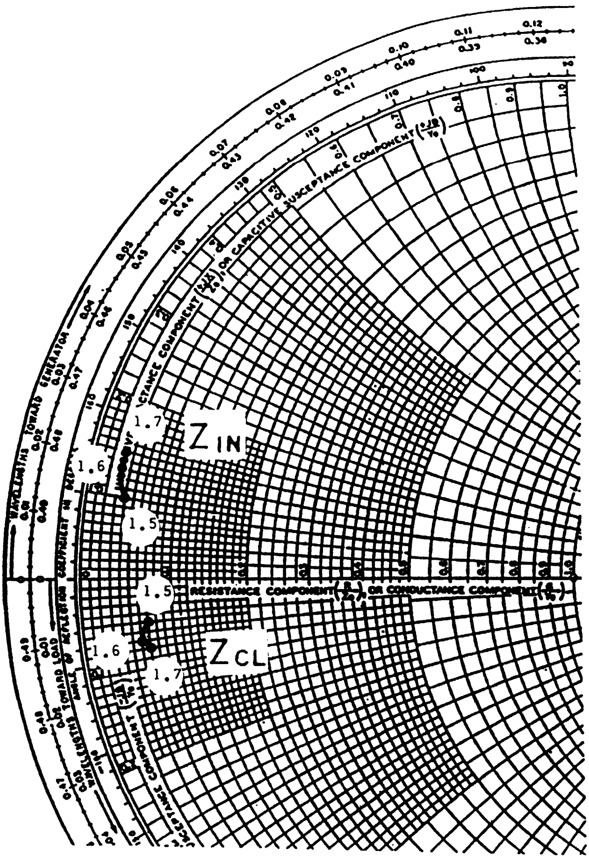
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 4mA		45			V
BV_{EBO}	I_E = 4mA		3.5			V
I_{CBO}	V_{CB} = 28V				5	mA
H_{FE}	V_{CE} = 5V	I_C = 500mA	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 1.65GHz	V_{cc} = 28V	P_{in} = 0.8W	10			W
P_{GAIN}	f = 1.65GHz	V_{cc} = 28V	P_{in} = 0.8W	11			dB
η_C	f = 1.65GHz	V_{cc} = 28V	P_o = 0.8W	40			%
C_{ob}	V_{CB} = 28V	f = 1MHz	I_E = 0			19	PF

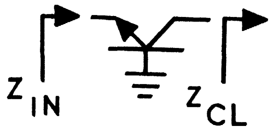
IMPEDANCE DATA (typical values)

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



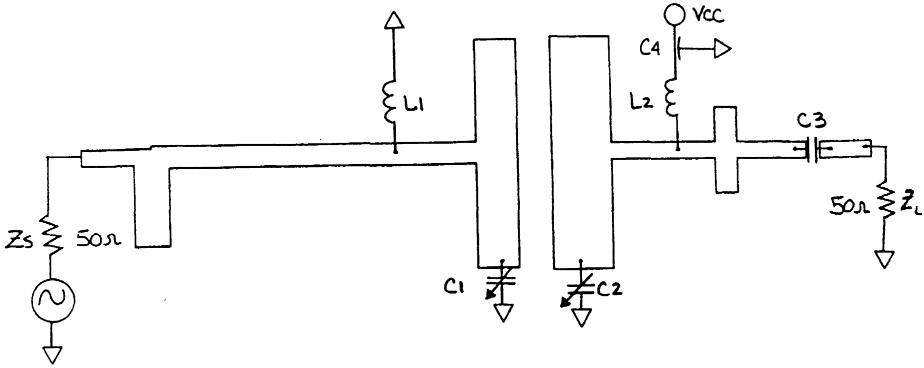
S88SD1893-02

F GHz	Z_{IN} (Ω)	Z_{CL} (Ω)
1.5	2.5 + j4.5	3.5 – j2.6
1.6	2.0 + j6.0	3.0 – j3.3
1.7	2.0 + j7.0	3.5 – j4.0



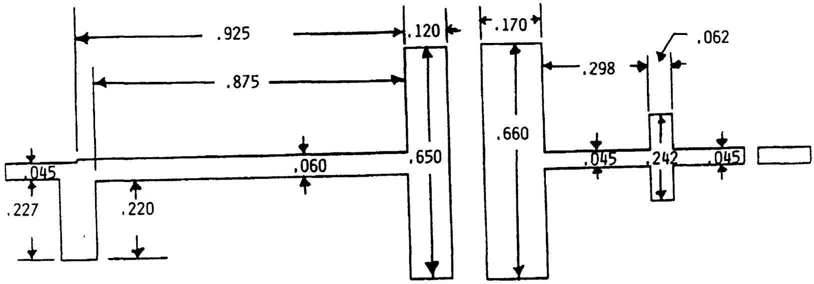
S88SD1893-03

TEST CIRCUIT

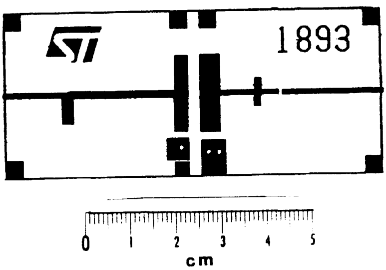


S88SD1893-04

L1, L2	4 Turn Choke #28 AWG .080" I.D.	
C1, C2	.4-2.5 of Johanson Capacitor	#27283
C3	100pF Chip Capacitor ATC	ATC 100 A101KCA 150
C4	15.000pF EMI Filter	Murata/Erie 9900-381-6004
S1	Epsilam 10 er = 10.2 H = .050"	
	1 oz cu SMA Launcher CD1 (2 pieces)	
	.230" Fixture Housing Heat Sink	Advanced Corp. 5308-2CC



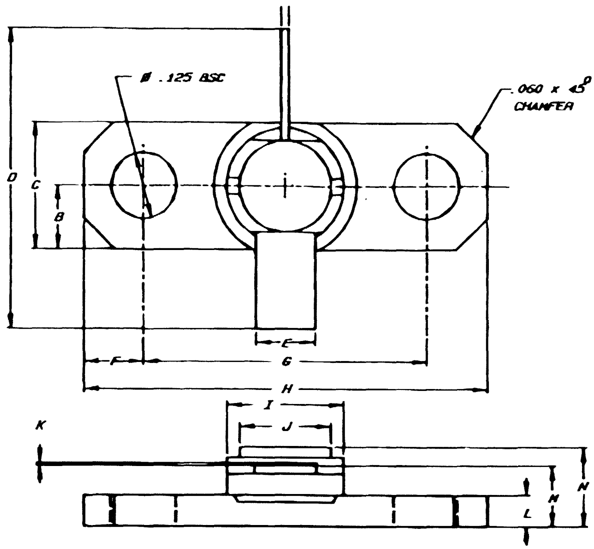
S88SD1893-05



S88SD1893-06

PACKAGE MECHANICAL DATA

.230 2LFL

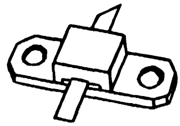


	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

RF & MICROWAVE TRANSISTORS MARISAT APPLICATIONS

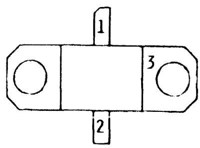
- FREQUENCY 1.65GHz
- POWER OUT 15.0W
- POWER GAIN 9.2dB
- VOLTAGE 28.0V
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- POLYSILICON SITE BALLASTING
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE



.250 x .250 2LFL (M170)
hermetic sealed

ORDER CODE	**BRANDING**
SD1895	SD1895

PIN CONNECTION



S88SD1895-01

1 collector
2 base
3 emitter

DESCRIPTION

The SD1895 is a 28V NPN Silicon Transistor designed for MARISAT Applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CEO}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	3.0	A
P_{DISS}	Total Device Dissipation at + 25°C	37.2	W
T_{STG}	Storage Temperature	− 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	4.7	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 5mA		40			V
BV_{EBO}	I = 5mA		3.5			V
H_{FE}	V_{CE} = 5V	I_C = 0.5A	15		150	

DYNAMIC

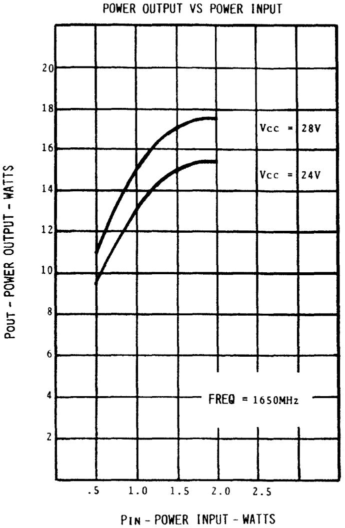
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 1650MHz	V_{CB} = 28V	P_i = 1.8W	15			W
P_{GAIN}	f = 1650MHz	V_{CB} = 28V	P_i = 1.8W	9.2			dB
N_C	f = 1650MHz	V_{CB} = 28V	P_o = 15W	45	50		%
VSWR*	f = 1650MHz	V_{CB} = 28V	P_o = 15W	10 : 1			
ZIN	f = 1650MHz	V_{CB} = 28V		17 + j 18			Ω
ZCL	f = 1650MHz	V_{CB} = 28V		3.5 – j 2.0			Ω

* All phase angles.

IMPEDANCE DATA (typical values)

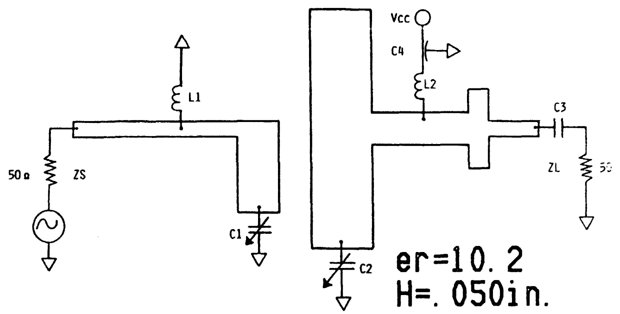
Symbol	Test Conditions		Value	Unit
Z_{IN}	f = 1650MHz	V_{CB} = 28V	17 + j18	Ω
Z_{CL}	f = 1650MHz	V_{CB} = 28V	3.5 – j2.0	Ω

APPLICATION INFORMATION (typical curves)



S88SD1895-03

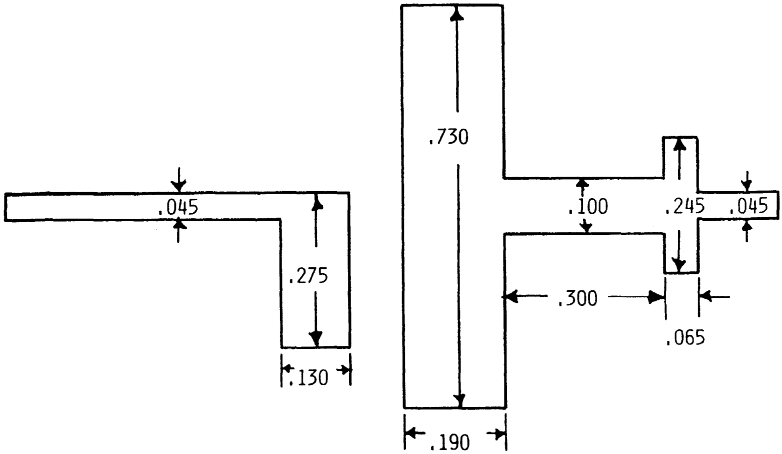
TEST CIRCUIT



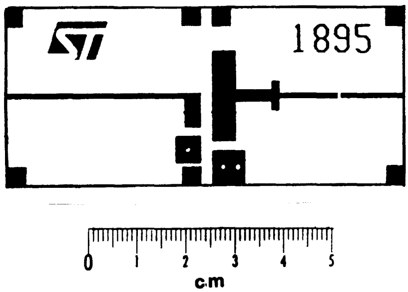
S88SD1895-04

L1, L2 – 4 Turns #28 Awg. .080" I.D.
C1, C2 – 0.4 - 2.5pF #27283 Johanson Trimmer
C3 – 100pF ATC#100A101KCA150 Chip Cap
C4 – 15KpF EMI Filter Murata/Erie #9900-381-6004

TEST CIRCUIT



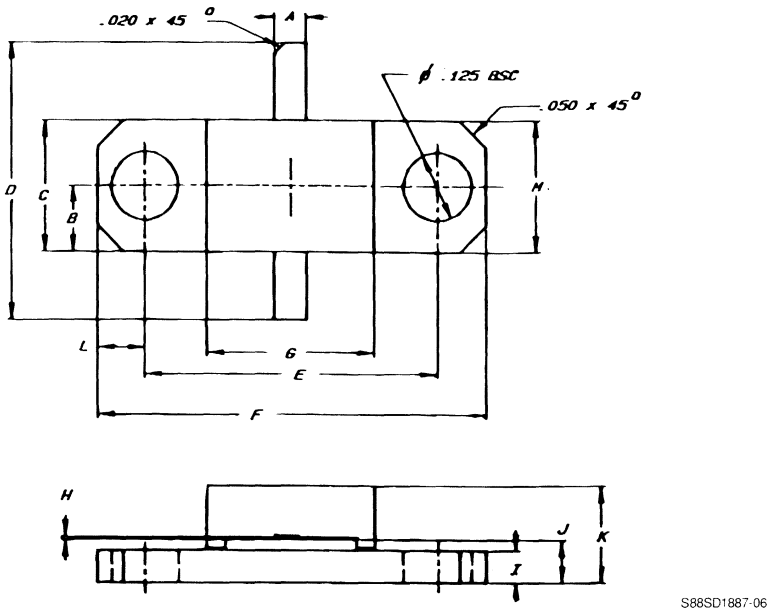
S88SD1895-05



S88SD1895-06

PACKAGE MECHANICAL DATA

.250 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.055/1.40	.065/1.65
B	.124/3.15 BSC	
C	.243/6.17	.253/6.43
D	.635/16.13	.665/16.89
E	.555/14.10	.565/14.35
F	.739/18.77	.749/19.02
G	.315/8.00	.325/8.26

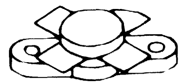
	Minimum Inches/mm	Maximum Inches/mm
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.075/1.91	.095/2.41
K		.190/4.83
L	.092/2.34 BSC	
M	.245/6.22	.255/6.48

SGS-THOMSON MICROELECTRONICS

SD1900

RF & MICROWAVE TRANSISTORS HF/VHF/UHF N-CHANNEL MOSFETS

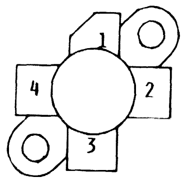
- FREQUENCY 2 - 400MHz
- POWER OUT 5W
- VOLTAGE 28V
- POWER GAIN 13dB
- CLASS A OR AB
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



. 380 4LFL (M113)
epoxy sealed

ORDER CODE	**BRANDING**
SD1900	SD1900

PIN CONNECTION



S88SD190-01

1 drain	3 gate
2 source	4 source

DESCRIPTION

The SD1900 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1900 is intended for use in 28V DC large signal applications up to 400MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain - Source Voltage	65	V
V_{DGR}	Drain - Gate Voltage	65	V
V_{GS}	Gate - Source Voltage	± 20	V
I_D	Drain Current (max.)	1.25	A
P_{TOT}	Total Device Dissipation at + 25°C	17.5	W
T_{STG}	Storage Temperature	– 65 to 150	°C
T_{CH}	Channel Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	10 TYP	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

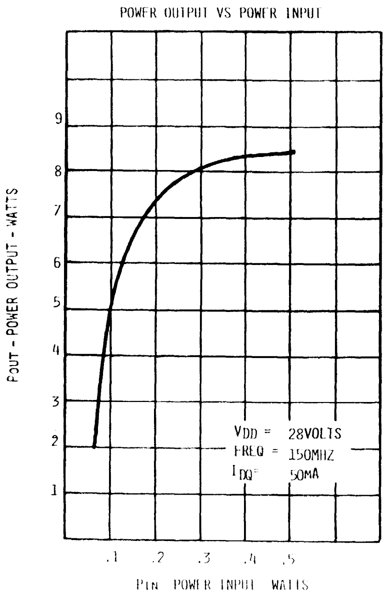
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 5mA	65			VDC
I_{DSS}	V_{DS} = 28V, V_{GS} = ?V			1	mA DC
I_{GSS}	V_{GS} = 20V, V_{DS} = 0V			1	µA DC
G_{fs}	V_{DS} = 10V, I_D = 100mA	80			mhos
C_{iss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			15	pF
C_{oss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			15	pF
C_{rss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			5	pF
$V_{GS(th)}$	V_{DS} = 10V, I_D = 10mA	1		6	VDC

DYNAMIC

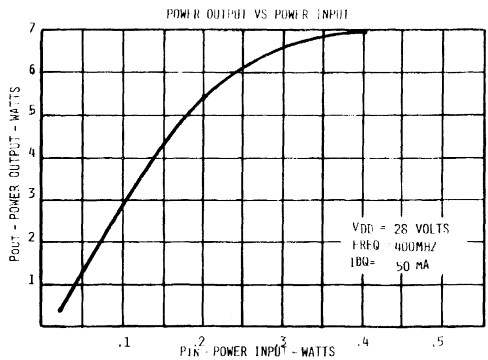
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_L	V_{DS} = 28V	I_{DQ} = 50mA	f = 150MHz	5			W
G_{ps}	V_{DS} = 28V	F = 150MHz	I_{DQ} = 50mA	13			dB
η_D	V_{DS} = 28V	I_{DQ} = 50mA	F = 150MHz	50			%

Note : The transistor can be used up to 400MHz, see application curve enclosed.

APPLICATION INFORMATION



S88SD1900-02

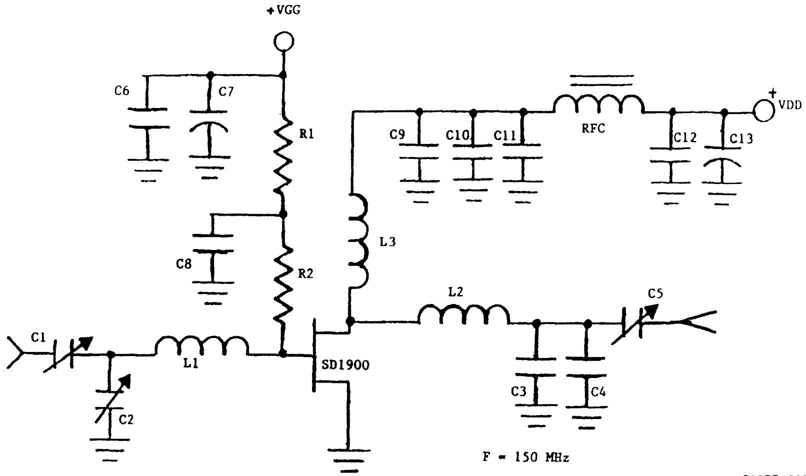


S88SD1900-03

S-PARAMETERS

V_{DS} = 28V I_D = 0.1A								
Freq	S11		S21		S12		S22	
MHz	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
2	.7693	− 43.4	19.85	116.0	.0132	123.4	.9120	− 41.2
35	.9400	− 40.1	14.03	151.8	.0464	61.9	.8929	− 37.7
70	.8462	− 68.0	11.46	131.4	.0709	46.8	.7913	− 65.5
100	.7615	− 88.9	9.17	117.0	.0874	35.0	.7239	− 84.4
130	.7172	− 103.9	7.51	106.8	.0926	26.0	.6690	− 98.8
160	.6872	− 114.6	6.26	98.8	.0929	20.6	.6522	− 108.3
195	.6700	− 123.0	5.33	92.2	.0937	15.5	.6381	− 116.5
225	.6613	− 129.8	4.62	86.8	.0931	13.6	.6231	− 122.5
260	.6583	− 134.7	4.08	82.3	.0847	10.7	.6163	− 127.5
290	.6592	− 139.5	3.64	77.9	.0903	9.5	.6232	− 131.6
320	.6641	− 143.7	3.27	74.5	.0866	6.7	.6303	− 134.7
350	.6599	− 147.3	2.94	69.9	.0878	6.7	.6388	− 137.6
385	.6636	− 150.4	2.71	67.8	.0783	8.3	.6428	− 139.5
415	.6686	− 153.7	2.52	64.4	.0754	8.1	.6610	− 142.1
450	.6741	− 156.7	2.31	62.2	.0772	7.4	.6689	− 143.6
480	.6745	− 159.6	2.18	60.1	.0718	9.7	.6687	− 146.0
515	.6798	− 162.6	2.08	57.9	.0694	11.1	.6778	− 147.2
545	.6848	− 165.6	2.03	53.7	.0643	14.7	.6814	− 148.2
575	.6870	− 168.4	1.76	52.1	.0656	16.6	.6852	− 150.0
610	.6910	− 171.4	1.69	50.8	.0656	22.5	.6894	− 151.4

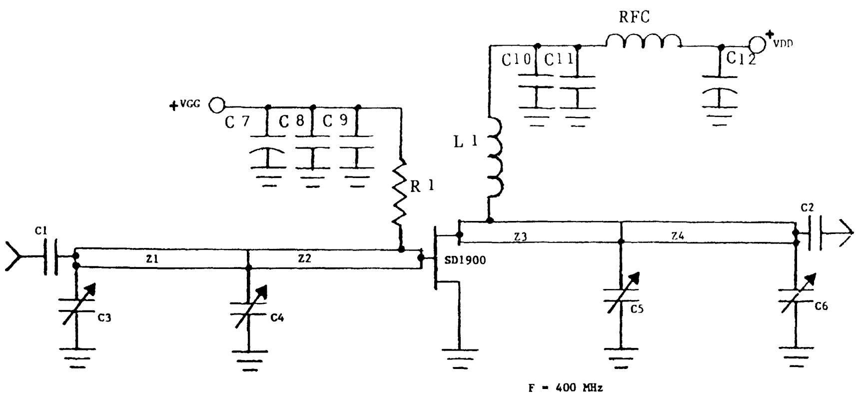
TEST CIRCUIT AT F = 150MHz



S88SD1900-04

C_1, C_2	- ARCO #403	L_1	- 3 TURNS #18AWG .3" I.D.
C_3, C_4	- 0.5pF ATC	L_2	- 3 1/2 TURNS #18AWG .3" I.D.
C_5	- ARCO #402	L_3	- 25 TURNS #18AWG .25" I.D.
C_6, C_{10}	- .01µF	R_1	- 10KΩ
C_7, C_{13}	- 47µF	R_2	- 68Ω
C_8, C_9	- .1µF	RFC	- VK – 200
C_{11}, C_{12}	- 680pF ATC		

TEST CIRCUIT AT F = 400MHz

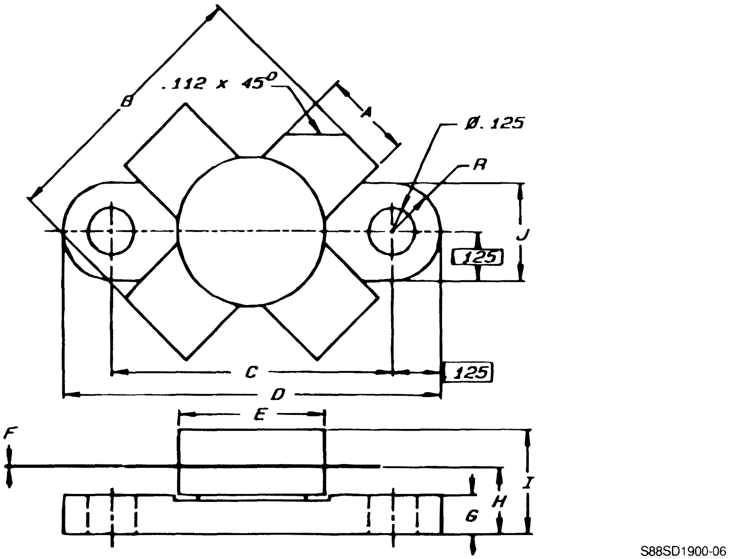


S88SD1900-05

C_1, C_2	- 300pF ATC	RFC	- VK – 200
C_3, C_4, C_5, C_6	- 1-30pF Johanson	Z_1	- .176" W 1.46"L
C_7, C_{12}	- 47µF	Z_2	- .176" W 1.38"L
C_8, C_{10}	- .01µF CK05	Z_3	- .176" W 1.37"L
C_9, C_{11}	- .1µF CK05	Z_4	- .176" W 1.50"L
L_1	- 10 TURNS #20AWG .12 I.D.	Board Material : Teflon-Glass .0625" THK Er = 2.5	
R_1	- 22KΩ 1/4W		

PACKAGE MECHANICAL DATA

. 380 4LFL (M113)



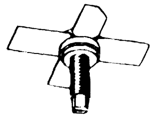
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON MICROELECTRONICS

SD1900-1

RF & MICROWAVE TRANSISTORS HF/VHF/UHF N-CHANNEL MOSFETS

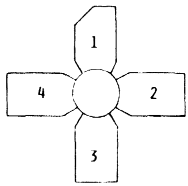
- FREQUENCY 2 – 400MHz
- POWER OUT 5W
- VOLTAGE 28V
- POWER GAIN 13dB
- CLASS A OR AB
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



. 280 4LSTUD (M122)
epoxy sealed

ORDER CODE	**BRANDING**
SD1900-01	SD1900-1

PIN CONNECTION



S88SD1900-1-01

1 drain
2 source
3 gate
4 source

DESCRIPTION

The SD1900-1 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1900-1 is intended for use in 28V DC large signal applications up to 400MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain - Source Voltage	65	V
V_{DGR}	Drain - Gate Voltage	65	V
V_{GS}	Gate - Source Voltage	± 20	V
I_D	Drain Current (max.)	1.25	A
P_{TOT}	Total Device Dissipation at + 25°C	17.5	W
T_{STG}	Storage Temperature	– 65 to + 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	10 TYP	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

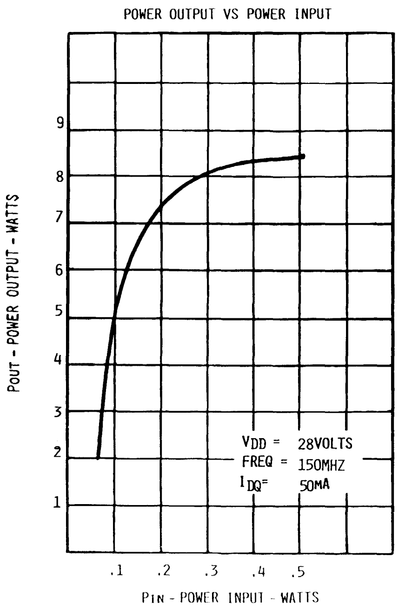
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 5mA	65			VDC
I_{DSS}	V_{DS} = 28V, V_{GS} = 0V			1	mA DC
I_{GSS}	V_{GS} = 20V, V_{DS} = 0V			1	μA DC
G_{fs}	V_{DS} = 10V, I_D = 100mA	80			mhos
C_{iss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			15	pF
C_{oss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			15	pF
C_{rss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			5	pF
$V_{GS(th)}$	V_{DS} = 10V, I_D = 10mA	1		6	VDC

DYNAMIC

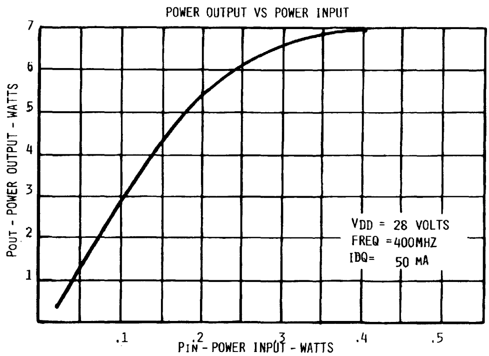
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_L	V_{DS} = 28V	I_{DQ} = 50mA	f = 150MHz	5			W
G_{ps}	V_{DS} = 28V	I_{DQ} = 50mA	F = 150MHz	13			dB
η_D	V_{DS} = 28V	I_{DQ} = 50mA	F = 150MHz	50			%

Note : The transistor can be used up to 400MHz, see application curve enclosed.

APPLICATION INFORMATION



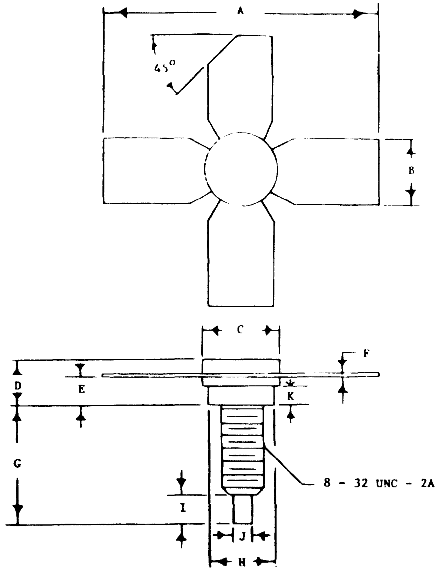
S88SD1900-1-02



S88SD1900-1-03

PACKAGE MECHANICAL DATA

. 280 4LSTUD (M122)



	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

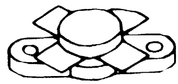
	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SGS-THOMSON
MICROELECTRONICS

SD1902

RF & MICROWAVE TRANSISTORS
HF/VHF/UHF N-CHANNEL MOSFETS

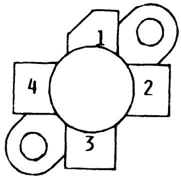
- FREQUENCY 2 - 400MHz
- POWER OUT 15W
- VOLTAGE 28V
- POWER GAIN 10dB
- CLASS A OR AB
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



.380 4LFL (M113)
epoxy sealed

ORDER CODE	BRANDING
SD1902	SD1902

PIN CONNECTION



S88SD1902-01

1 drain
2 source
3 gate
4 source

DESCRIPTION

The SD1902 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1902 is intended for use in 28V DC large signal applications up to 400MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-Source Voltage	65	V
V_{DGR}	Drain-Gate Voltage	65	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current (max.)	3.9	A
P_{TOT}	Total Device Dissipation at + 25°C	55.0	W
T_{STG}	Storage Temperature	– 65 to 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 5mA	65			VDC
I_{DSS}	V_{DS} = 28V, V_{GS} = 0V			2	mA DC
I_{GSS}	V_{GS} = 20V, V_{DS} = 0V			1	µA DC
G_{fs}	V_{DS} = 10V, I_D = 250mA	.250			mhos
C_{iss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			30	pF
C_{oss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			30	pF
C_{rss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			10	pF
$V_{GS(th)}$	V_{DS} = 10V, I_D = 25mA	1		6	VDC

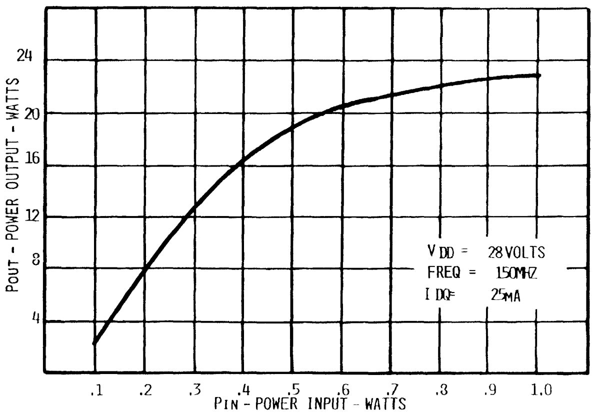
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_L	V_{DS} = 28V	I_{DQ} = 25mA	F = 150MHz	15			W
G_{ps}	V_{DS} = 28V	I_{DQ} = 25mA	F = 150MHz	13			dB
η_D	V_{DS} = 28V	I_{DQ} = 25mA	F = 150MHz	50			%

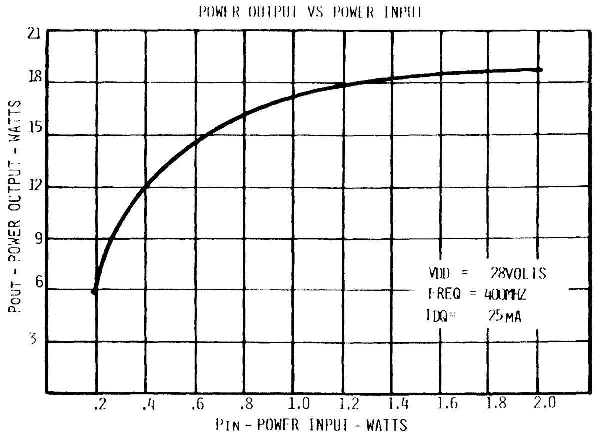
Note : The transistor can be used up to 400MHz, see application curve enclosed.

APPLICATION INFORMATION : TYPICAL CURVES

POWER OUTPUT VS POWER INPUT



S88SD1902-02

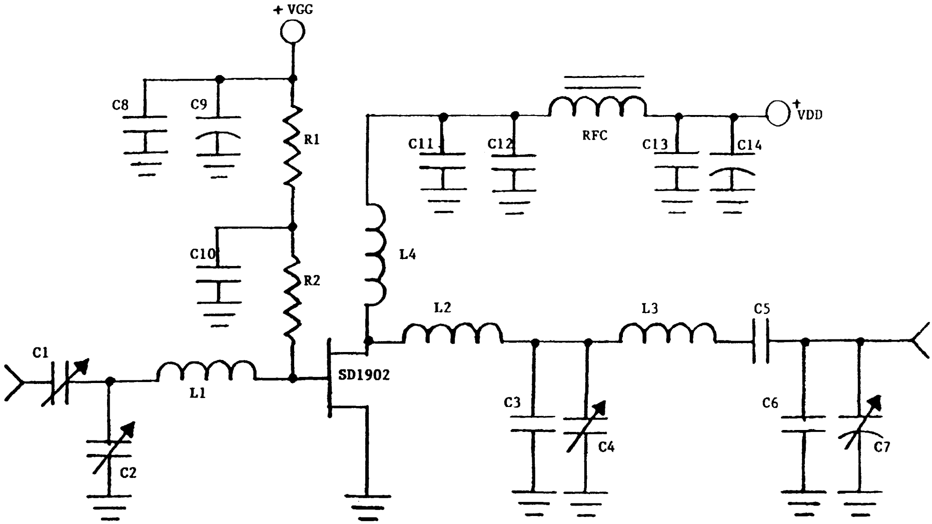


S88SD1902 03

S PARAMETERS

V_{DS} = 28V, I_D = 0.5A								
Freq	S11		S21		S12		S22	
MHz	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
35	.8176	– 104.2	19.80	119.3	.5243	38.1	.6885	– 101.0
70	.7366	– 135.3	11.49	101.3	.5871	17.8	.6251	– 132.1
100	.7266	– 148.5	7.91	92.1	.6026	15.7	.6109	– 143.8
130	.7226	– 155.7	6.02	85.7	.6214	6.4	.6101	– 150.5
160	.7259	– 160.1	4.82	80.6	.5776	6.5	.6164	– 153.9
195	.7307	– 163.5	4.00	76.2	.5389	2.4	.6299	– 156.8
225	.7357	– 166.0	3.40	72.4	.5552	6.9	.6318	– 158.6
260	.7403	– 167.9	2.98	68.9	.5317	5.2	.6470	– 160.8
290	.7481	– 169.6	2.63	65.4	.5006	6.4	.6641	– 161.4
320	.7559	– 171.4	2.34	63.0	.4976	11.2	.6746	– 163.1
350	.7608	– 173.1	2.08	58.9	.4866	9.0	.6869	– 163.5
385	.7664	– 174.6	1.92	57.4	.4565	16.4	.7011	– 164.7
415	.7735	– 176.1	1.77	54.2	.4337	18.5	.7159	– 165.9
450	.7814	– 177.6	1.62	52.9	.4019	27.7	.7223	– 166.7
480	.7856	– 179.3	1.53	50.8	.4100	33.8	.7370	– 167.6
515	.7904	178.9	1.45	48.8	.4249	39.5	.7380	– 168.9
545	.8005	177.6	1.39	44.1	.3985	43.3	.7510	– 165.9
575	.8037	157.7	1.22	44.9	.5219	54.1	.7483	– 171.5
610	.8099	173.8	1.17	43.5	.4696	55.5	.7648	– 172.1

TEST CIRCUIT AT F = 150MHz



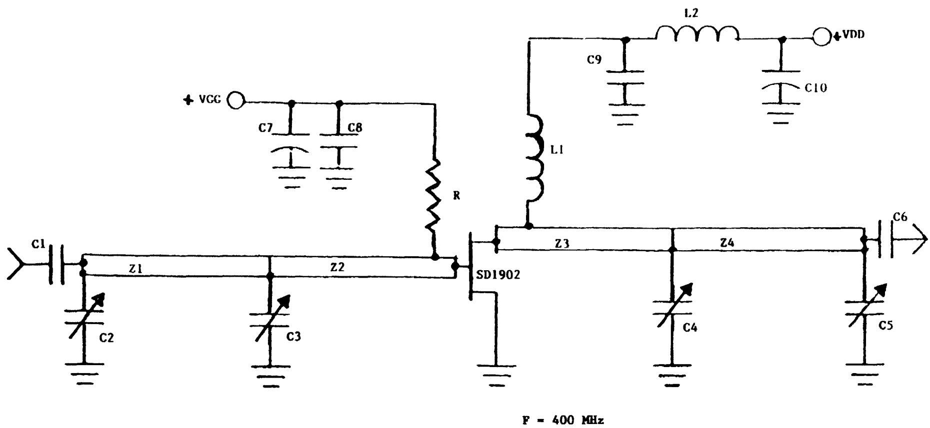
F = 150 MHz

C1, C4	– ARCO # 404
C2	– ARCO # 406
C3	– 43pF UNELCO MINI
C5, C12, C13	– 680pF ATC
C6	– 11pF UNELCO MINI
C8, C11	– .01μF
C9, C14	– 47μF
C10	– .1μF

L1	– 2 TURNS # 18 AWG .3" I.D.
L2	– 2 TURNS # 18 AWG .2" I.D.
L3	– 2 1/2 TURNS # 18 AWG .3" I.D.
L4	– 25 TURNS # 18 AWG .25" I.D.
R1	– 10KΩ
R2	– 27Ω
RFC	– VK 200

S88SD1902-04

TEST CIRCUIT AT F = 400MHz

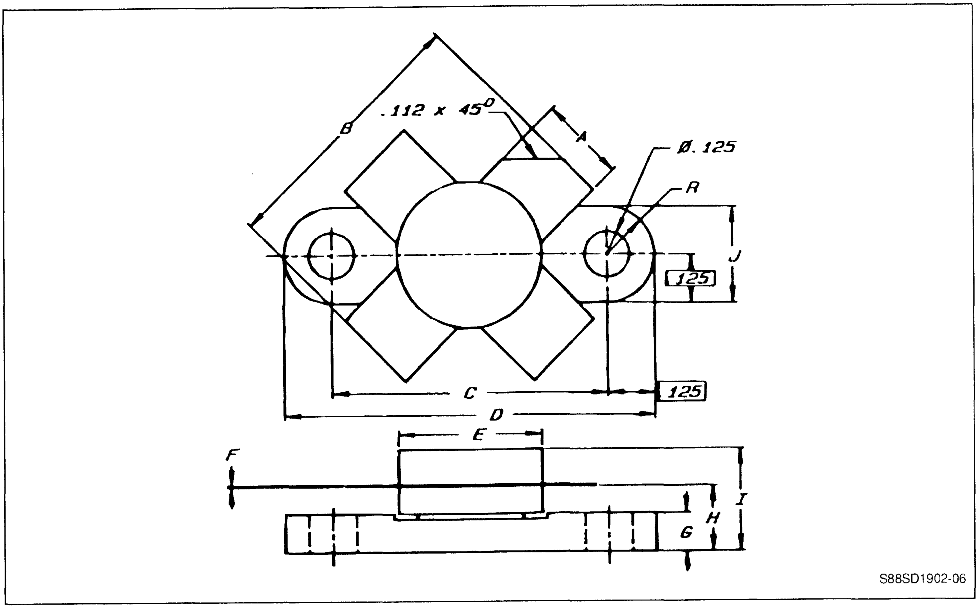


C1, C6	– 330pF ATC	R1	– 22KW 1/4W
C2, C3, C4, C5	– Johanson 1-30pF	Z1	– .17"W 1.79" L
C7, C10	– 47mF @ 63V	Z2	– .17"W .72" L
C8	– .01mF CK05	Z3	– .17"W 1.05" L
C9	– .1mF CK05	Z4	– .17"W 1.79" L
L1	– 10 TURNS # 20 AWG .125" I.D.	Board Material : TEFLON-GLASS .0625" THK.	
L2	– VK200	ER = 2.5	

S88SD1902-05

PACKAGE MECHANICAL DATA

.380 4LFL



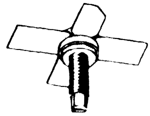
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON MICROELECTRONICS

SD1902-1

RF & MICROWAVE TRANSISTORS HF/VHF/UHF N-CHANNEL MOSFETS

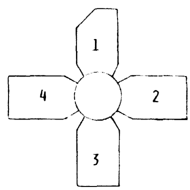
- FREQUENCY 2 - 400MHz
- POWER OUT 15W
- VOLTAGE 28V
- POWER GAIN 10dB
- CLASS A OR AB
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



.280 4 LSTUD (B) (M122)
epoxy sealed

ORDER CODE	BRANDING
SD1902-01	SD1902-1

PIN CONNECTION



S88SD1902-1-01

1 drain	3 gate
2 source	4 source

DESCRIPTION

The SD1902-1 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1902-1 is intended for use in 28V DC large signal applications up to 400MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-Source Voltage	65	V
V_{DGR}	Drain-Gate Voltage	65	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current (max.)	3.9	A
P_{TOT}	Total Device Dissipation at + 25°C	55.0	W
T_{STG}	Storage Temperature	– 65 to 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 5mA	65			VDC
I_{DSS}	V_{DS} = 28V, V_{GS} = 0V			2	mA DC
I_{GSS}	V_{GS} = 20V, V_{DS} = 0V			1	μA DC
G_{fs}	V_{DS} = 10V, I_D = 250mA	.250			mhos
C_{iss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			30	pF
C_{oss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			30	pF
C_{rss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			10	pF
$V_{GS(th)}$	V_{DS} = 10V, I_D = 25mA	1		6	VDC

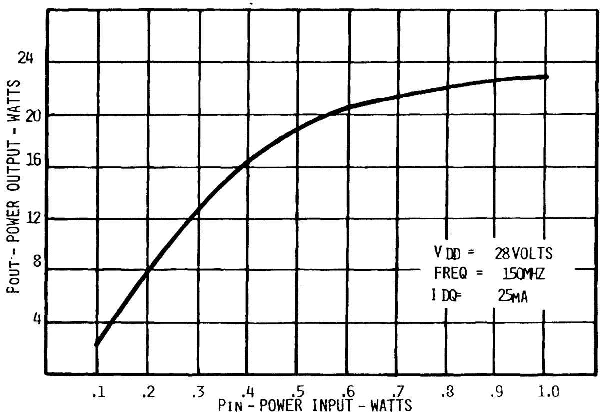
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_L	V_{DS} = 28V	I_{DQ} = 25mA	F = 150MHz	15			W
G_{ps}	V_{DS} = 28V	I_{DQ} = 25mA	F = 150MHz	13			dB
ηD	V_{DS} = 28V	I_{DQ} = 25mA	F = 150MHz	50			%

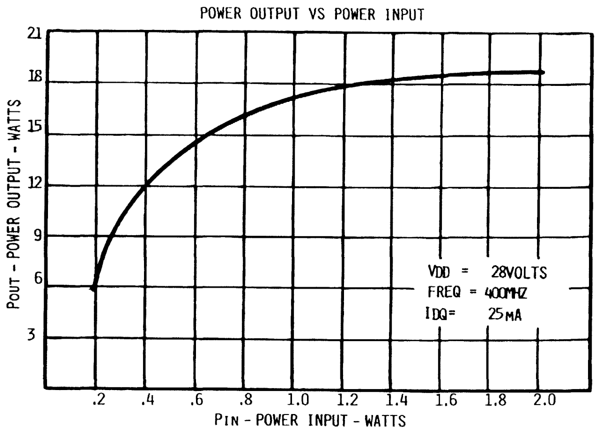
Note : The transistor can be used up to 400MHz, see application curve enclosed.

APPLICATION INFORMATION (typical curves)

POWER OUTPUT VS POWER INPUT



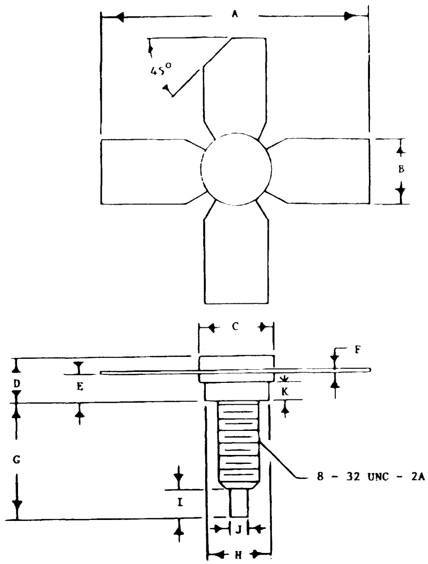
S88SD1902-1-02



S88SD1902-1-03

PACKAGE MECHANICAL DATA

.280 4LSTUD



	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

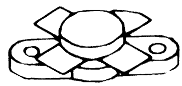
	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SGS-THOMSON
MICROELECTRONICS

SD1904

RF & MICROWAVE TRANSISTORS HF/VHF/UHF N-CHANNEL MOSFETS

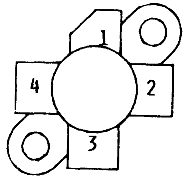
- FREQUENCY 2 - 400MHz
- POWER OUT 30W
- VOLTAGE 28V
- POWER GAIN 9dB
- CLASS A OR AB
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



.280 4 LFL (M113)
epoxy sealed

ORDER CODE	BRANDING
SD1904	SD1904

PIN CONNECTION



S88SD1904-01

1 drain
2 source
3 gate
4 source

DESCRIPTION

The SD1904 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1904 is intended for use in 28V DC large signal applications up to 400MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-Source Voltage	65	V
V_{DGR}	Drain-Gate Voltage	65	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current (max.)	7.0	A
P_{TOT}	Total Device Dissipation at + 25°C	98	W
T_{STG}	Storage Temperature	– 65 to 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.8	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

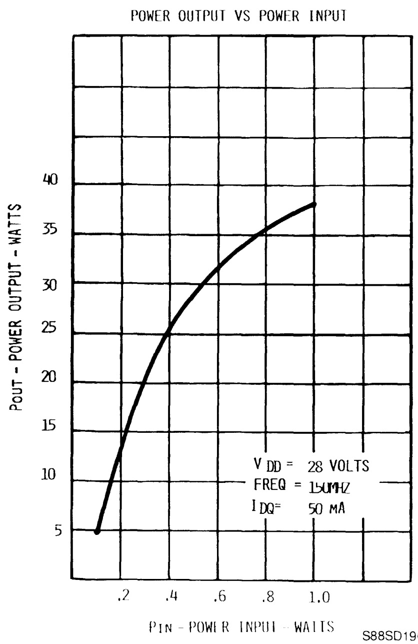
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 10mA	65			VDC
I_{DSS}	V_{DS} = 28V, V_{GS} = 0V			4	mA DC
I_{GSS}	V_{GS} = 20V, V_{DS} = 0V			1	µA DC
G_{fs}	V_{DS} = 10V, I_D = 500mA	.5			mhos
C_{iss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			60	pF
C_{oss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			60	pF
C_{rss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			15	pF
$V_{GS(th)}$	V_{DS} = 10V, I_D = 25mA	1		6	VDC

DYNAMIC

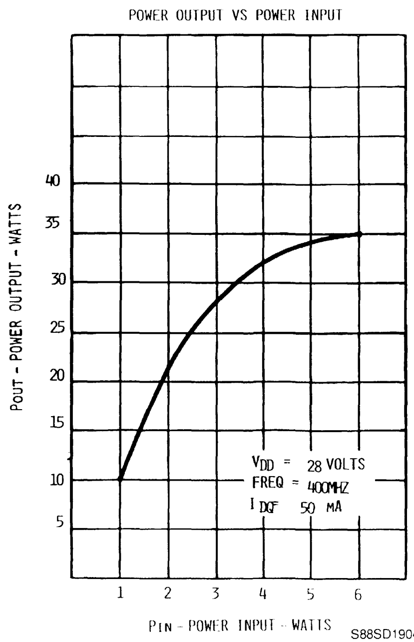
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_L	V_{DS} = 28V	I_{DQ} = 25mA	F = 150MHz	30			W
G_{ps}	V_{DS} = 28V	I_{DQ} = 25mA	F = 150MHz	13			dB
η_D	V_{DS} = 28V	I_{DQ} = 25mA	F = 150MHz	50			%

Note : The transistor can be used up to 400MHz, see application curve enclosed.

APPLICATION INFORMATION (typical curves)



S88SD1904-02

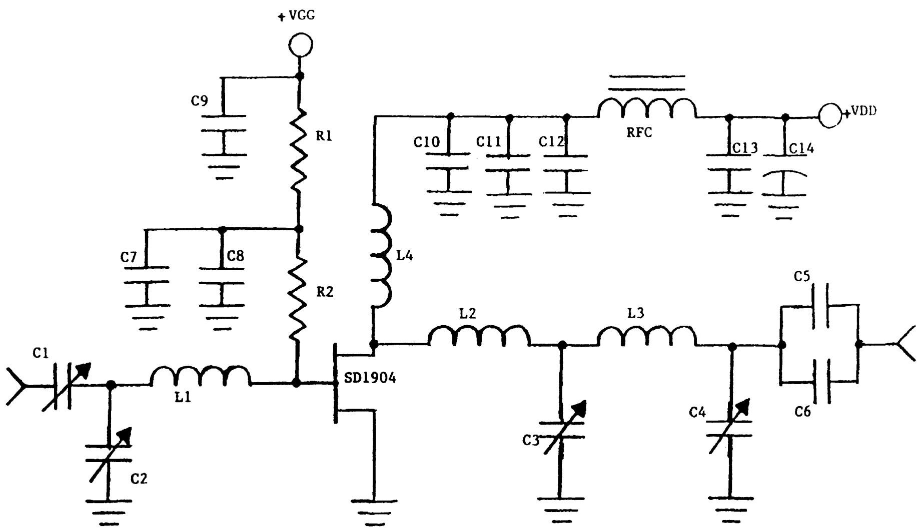


S88SD1904-03

S PARAMETERS

V_{DS} = 28V I_D = .75A								
Freq	S11		S21		S12		S22	
MHz	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
35	.8143	– 150.6	13.94	98.7	.4511	8.8	.7218	– 163.0
70	.8075	– 164.7	7.26	88.6	.4498	4.2	.7361	– 164.4
100	.8086	– 169.5	4.87	82.7	.3858	5.7	.7384	– 168.8
130	.8102	– 172.3	3.65	78.3	.3720	6.1	.7428	–170.9
160	.8147	– 173.7	2.91	74.0	.3893	5.1	.7497	– 171.8
195	.8238	– 175.1	2.40	70.1	.3760	4.5	.7585	– 172.5
225	.8285	– 176.0	2.04	67.0	.3641	10.5	.7673	– 173.1
260	.8361	– 176.9	1.76	63.9	.3171	13.5	.7790	– 173.9
290	.8404	– 178.0	1.54	60.7	.3227	20.4	.7893	– 174.3
320	.8492	– 178.8	1.38	58.1	.3370	21.0	.7986	– 174.8
350	.8546	– 179.8	1.25	57.1	.3369	35.1	.8165	– 174.6
385	.8595	179.5	1.10	52.4	.3268	33.1	.8152	– 175.9
415	.8618	178.4	1.01	50.3	.3302	49.1	.8253	– 176.9
450	.8701	177.5	.9339	48.9	.3382	49.9	.8359	– 177.7
480	.8728	176.4	.8709	47.1	.3395	54.3	.8412	– 178.7
515	.8795	157.6	.8152	45.8	.3875	60.3	.8474	– 179.4
545	.8851	174.4	.7779	43.2	.4014	66.1	.8552	179.7
575	.8881	173.3	.6425	42.0	.4388	63.5	.8700	177.6
610	.8930	1721.3	.6455	42.1	.4739	72.2	.8679	177.9

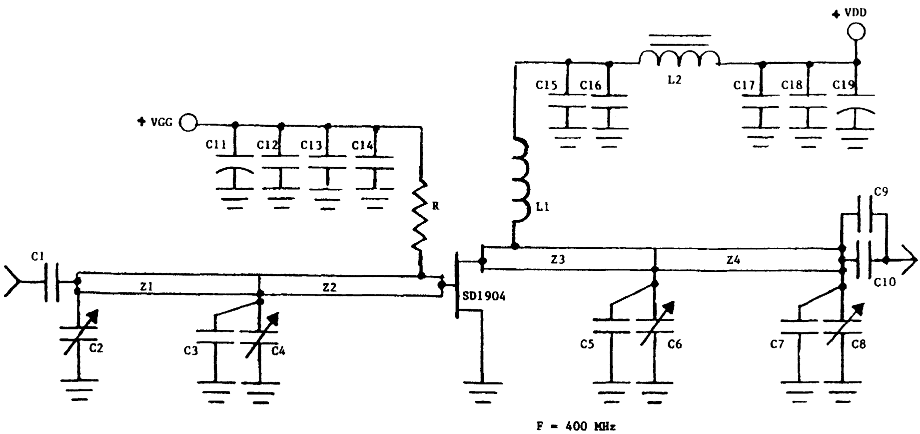
TEST CIRCUIT AT F = 150MHz



C1	– ARCO #405	L1	– 2 TURNS #18 AWG .3"I.D.
C2	– ARCO #402	L2	– 1 1/2 TURNS #18 AWG .2"I.D.
C3	– ARCO #424	L3	– 2 TURNS #18 AWG .2"I.D.
C4	– ARCO #422	L4	– 25 TURNS #18 AWG .25"I.D.
C5, C6	– 330pF ATC	R1	– 20KΩ
C7, C11	– .01μF	R2	– 10KΩ
C8, C10	– .1μF	RFC	– VK 200
C9, C14	– 47μF		
C12, C13	– 680pF ATC		

S88SD1904-04

TEST CIRCUIT AT F = 400MHz



C1, C9, C10	– 290pF ATC
C2, C6	– Johanson #5401
C3	– 18pF ATC
C4, C8	– Johanson #5601
C5	– 18 and 22pF ATC
C7	– 2 x 1.5pF ATC
C11, C19	– 47μF @ 63V
C12, C18	– .01μF CK05
C13, C15	– .1μF CK05
C14, C16, C17	– 680pF ATC

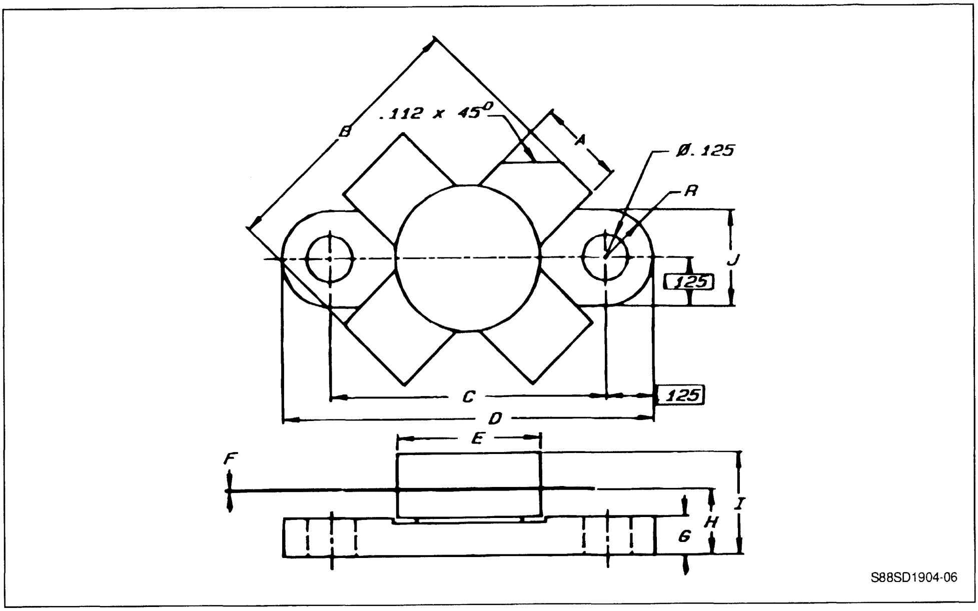
L1	– 7 TURNS #18 AWG .3"I.D.
L2	– VK 200-4B
R1	– 20KΩ 1/4W
Z1	– .18"W 2.3"L
Z2	– .18"W .64"L
Z3	– .18"W .95"L
Z4	– .18"W 1.8"L

Board material : TEFLON-GLASS
.062" THK ER = 2.55

S88SD1904-05

PACKAGE MECHANICAL DATA

.380 4LFL



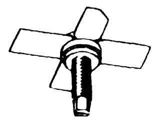
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON
MICROELECTRONICS

SD1904-1

RF & MICROWAVE TRANSISTORS
HF/VHF/UHF N-CHANNEL MOSFETS

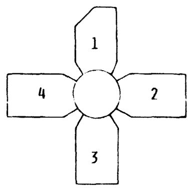
- FREQUENCY 2 - 400MHz
- POWER OUT 30W
- VOLTAGE 28V
- POWER GAIN 9dB
- CLASS A OR AB
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



.280 4LSTUD (M122)
epoxy sealed

ORDER CODE	BRANDING
SD1904-01	SD1904-1

PIN CONNECTION



S88SD1904-1-01

1 drain
2 source
3 gate
4 source

DESCRIPTION

The SD1904-1 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1904-1 is intended for use in 28V DC large signal applications up to 400MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-Source Voltage	65	V
V_{DGR}	Drain-Gate Voltage	65	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current (max.)	7.0	A
P_{TOT}	Total Device Dissipation at + 25°C	98	W
T_{STG}	Storage Temperature	– 65 to 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.8	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 10mA	65			VDC
I_{DSS}	V_{DS} = 28V, V_{GS} = 0V			4	mA DC
I_{GSS}	V_{GS} = 20V, V_{DS} = 0V			1	µA DC
G_{fs}	V_{DS} = 10V, I_D = 500mA	.5			mhos
C_{iss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			60	pF
C_{oss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			60	pF
C_{rss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			15	pF
$V_{GS(th)}$	V_{DS} = 10V, I_D = 25mA	1		6	VDC

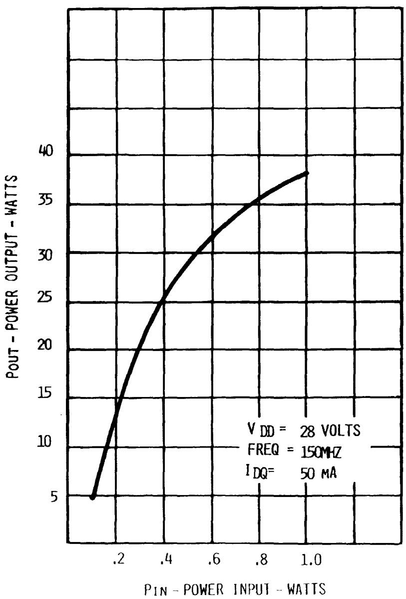
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_L	V_{DS} = 28V	I_{DQ} = 25mA	f = 150MHz	30			W
G_{ps}	V_{DS} = 28V	F = 150MHz	I_{DQ} = 25mA	13			dB
η_D	V_{DS} = 28V	I_{DQ} = 25mA	F = 150MHz	50			%

Note : The transistor can be used up to 400MHz, see application curve enclosed.

APPLICATION INFORMATION (typical curves)

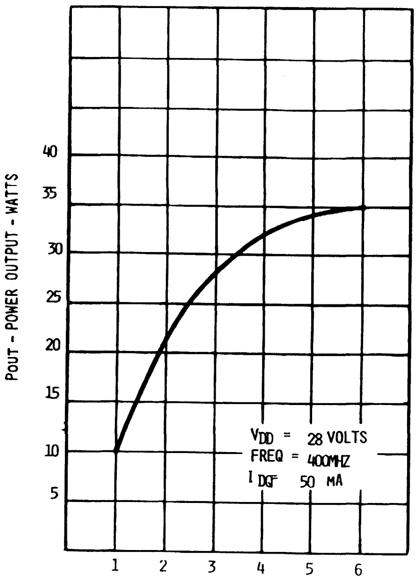
POWER OUTPUT VS POWER INPUT



S88SD1904-1-02

APPLICATION INFORMATION (continued)

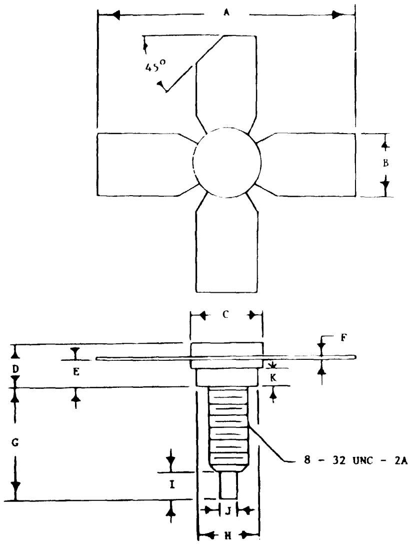
POWER OUTPUT VS POWER INPUT



S88SD1904-1-03

PACKAGE MECHANICAL DATA

.280 4 LSTUD



	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

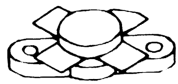
	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SGS-THOMSON MICROELECTRONICS

SD1905

RF & MICROWAVE TRANSISTORS HF/VHF N-CHANNEL MOSFETS

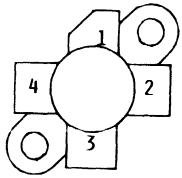
- FREQUENCY 2-200MHz
- POWER OUT 45W
- VOLTAGE 28V
- POWER GAIN 13dB
- CLASS A OR AB
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



.380 4LFL (M113)
epoxy sealed

ORDER CODE	BRANDING
SD1905	SD1905

PIN CONNECTION



S88SD1905-01

1 drain	3 gate
2 source	4 source

DESCRIPTION

The SD1905 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1905 is intended for use in 28V DC large signal applications up to 200MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain - Source Voltage	65	V
V_{DGR}	Drain - Gate Voltage	65	V
V_{GS}	Gate - Source Voltage	± 20	V
I_D	Drain Current (max.)	8.4	A
P_{tot}	Total Device Dissipation at + 25°C	117	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

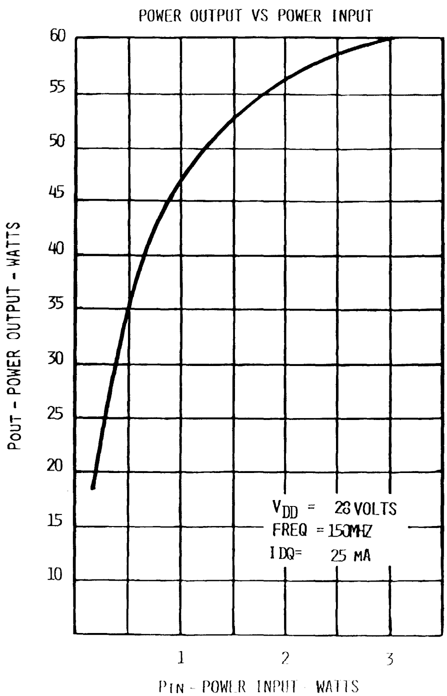
$R_{th(j-c)}$	Junction-case Thermal Resistance	1.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
$V_{(BR)DSS}$	VGS = 0V	ID = 10mA		65			VDC
I_{DSS}	VDS = 28V	VGS = 0V				5	mA DC
I_{GSS}	VGS = 20V	VDS = 0V				1	µA DC
G_{fs}	VDS = 10V	ID = 10A		.7			mhos
C_{iss}	VDS = 28V	VGS = 0V	F = 1MHz			80	pF
C_{oss}	VDS = 28V	VGS = 0V	F = 1MHz			70	pF
C_{rss}	VDS = 28V	VGS = 0V	F = 1MHz			20	pF

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_L	VDS = 28V	IDQ = 25mA	F = 150MHz	45			W
G_{ps}	VDS = 28V	IDQ = 25mA	F = 150MHz	12			dB
η_D	VDS = 28V	IDQ = 25mA	F = 150MHz	50			%

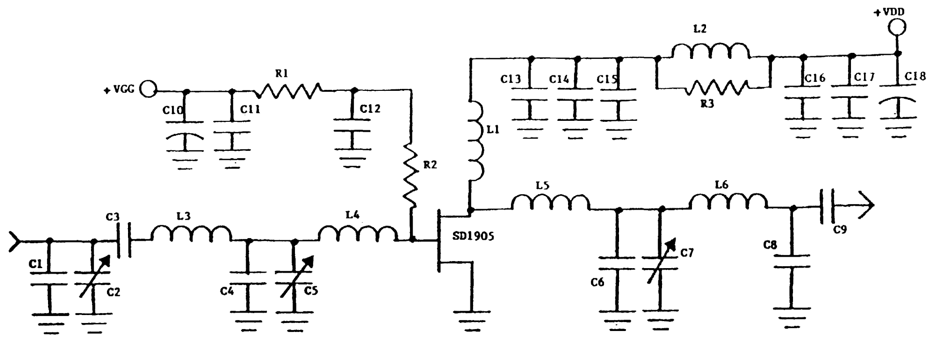
APPLICATION INFORMATION (typical curves)



S88SD1905-02

VDS = 28V ID = 0.5A								
FREQ.	S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2	.7153	− 151.0	89.42	130.1	.0109	− 12.7	.9804	− 90.2
20	.7900	− 140.6	21.02	102.5	.0345	15.1	.7598	− 146.5
35	.8057	− 159.1	11.80	93.4	.0323	8.6	.7471	− 160.9
50	.8135	− 165.6	6.11	88.2	.0353	5.1	.7505	− 166.2
65	.8146	− 168.2	4.89	84.5	.0357	2.8	.7488	− 168.8
80	.8189	− 170.6	4.06	81.4	.0330	3.8	.7565	− 170.3
100	.8202	− 171.3	3.49	78.6	.0317	7.4	.7581	− 171.5
115	.8290	− 172.7	3.04	76.0	.0329	7.3	.7609	− 172.2
130	.8289	− 173.6	2.68	73.6	.0305	7.6	.7673	− 172.9
145	.8286	− 173.9	2.41	71.0	.0313	5.5	.7698	− 173.2
160	.8348	− 174.6	2.16	68.8	.0310	10.0	.7747	− 174.0
175	.8363	− 174.7	1.98	66.4	.0296	8.7	.7790	− 174.4
195	.8460	− 175.7	1.79	64.3	.0292	10.9	.7814	− 175.3
210	.8507	− 175.7	1.66	62.1	.0190	14.5	.7874	− 175.9
225	.8527	− 176.1	1.54	60.1	.0270	12.3	.7883	− 177.3
240	.8575	− 176.5	1.44	58.0	.0295	11.0	.7816	− 179.1
255	.8594	− 177.0	1.36	55.4	.0279	17.2	.7574	− 176.6
270	.8674	− 177.2	1.19	51.5	.0169	6.5	.7600	− 163.6
290	.8778	− 177.5	948.81	37.0	.0203	35.6	.7995	− 154.7
305	.8705	− 178.3	975.4	61.8	.0248	41.2	.8469	− 163.1

TEST CIRCUIT at f = 150MHz

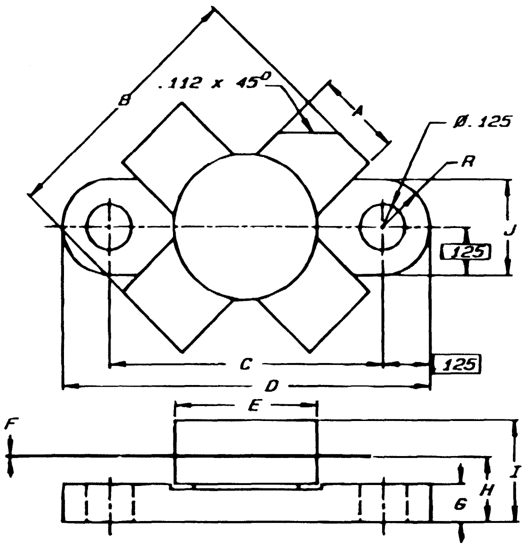


C1	47pF ATC
C2, C5, C7	ARCO #402
C3,C15, C16	680pF ATC
C4, C6	63pF ATC
C8	12pF ATC
C9	2x680 pF ATC
C10, C18	47 µfd 63V SPRAGUE
C11, C13	.01 µfd CK05
C12, C14, C17	.1mfd CK05

L1	22TURNS#18AWG .3"I.D.
L2	20TURNS #18 AWG on R3
L3, L6	2 TURNS #18AWG .23I.D.
L4	11/2 TURNS #18 AWG .2" I.D.
L5	1 TURN #18 AWG .2"I.D.
R1	10K Ω 1/4W
R2	27 Ω 1/4W

PACKAGE MECHANICAL DATA

.380 4LFL



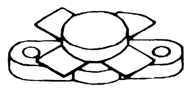
	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.785/19.94	
C	.720/18.29	.730/18.54
D	.970/24.64	.980/24.89
E		.385/9.78
F	.004/0.10	.006/0.15
G	.085/2.16	.105/2.67
H	.160/4.06	.180/4.57
I		.280/7.11
J	.240/6.10	.255/6.48

SGS-THOMSON
MICROELECTRONICS

SD1906-1

RF & MICROWAVE TRANSISTORS
HF/VHF N-CHANNEL MOSFETS

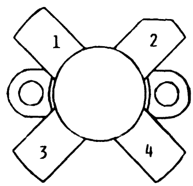
- FREQUENCY 2 - 200MHz
- POWER OUT 60W
- VOLTAGE 28V
- POWER GAIN 13dB
- CLASS AB, A
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



.500 4LFL (M174)
epoxy sealed

ORDER CODE	**BRANDING**
SD1906-01	SD1906-1

PIN CONNECTION



S88SD1906-01

1 source	3 gate
2 drain	4 source

DESCRIPTION

The SD1906-1 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1906-1 is intended for use in 28V DC large signal applications up to 200MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain - Source Voltage	65.0	V
V_{DGR}	Drain - Gate Voltage	65.0	V
V_{GS}	Gate - Source Voltage	± 30	V
I_D	Drain Current (max.)	7.1	A
P_{tot}	Total Device Dissipation at + 25°C	110	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.6 TYP	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

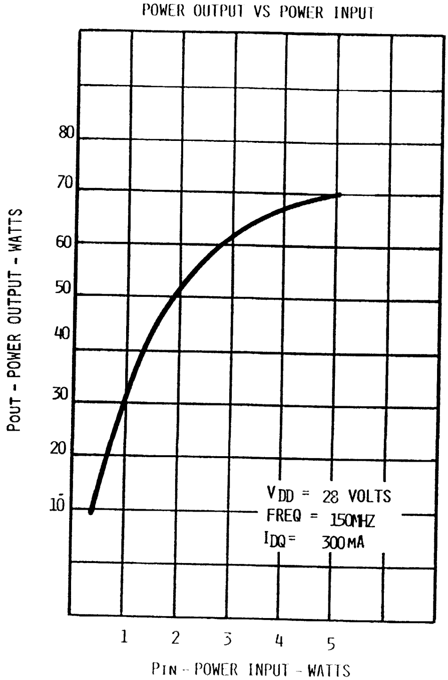
STATIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
$V_{(BR)DSS}$	VGS = 0V	ID = 10mA		65			VDC
I_{DSS}	VDS = 28V	VGS = 0V				5	mA DC
I_{GSS}	VGS = 20V	VDS = 0V				1	µA DC
G_{fs}	VDS = 10V	ID = 1A		1.2			mhos
C_{iss}	VDS = 28V	VGS = 0V	F = 1MHz			155	pF
C_{oss}	VDS = 28V	VGS = 0V	F = 1MHz			115	pF
C_{rss}	VDS = 28V	VGS = 0V	F = 1MHz			60	pF

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_L	V_{DS} = 28V	IDQ = 300mA	F = 150MHz	60			W
G_{ps}	VDS = 28V	IDQ = 300mA	F = 150MHz	13			dB
η_D	VDS = 28V	IDQ = 300mA	F = 150MHz	60			%

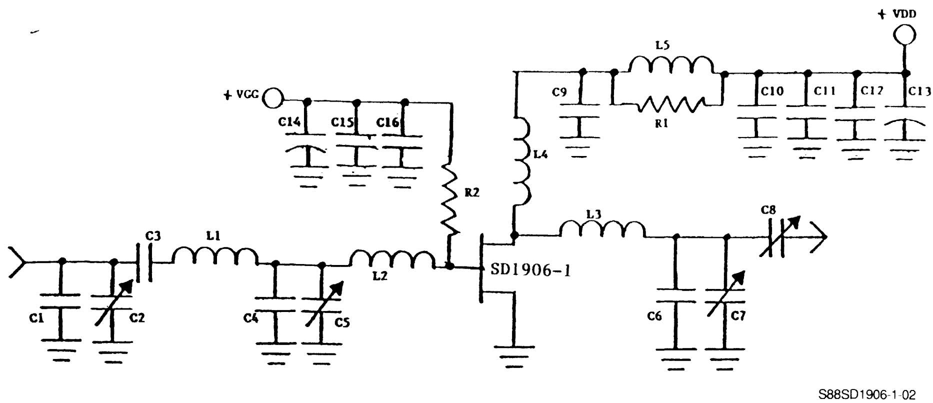
APPLICATION INFORMATION (typical curves)



S88SD1906-1-02

VDS = 28V ID = 1.5A								
Freq.	S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2	.9932	– 25.7	79.08	130.6	.0274	127.2	.6715	– 84.4
20	.8433	– 156.4	21.26	95.7	.0206	8.3	.7353	– 157.3
35	.8255	– 166.7	11.32	87.2	.0196	8.0	.7403	– 166.4
50	.8330	– 170.6	7.62	81.4	.0197	1.8	.7480	– 169.2
65	.8374	– 172.2	5.71	76.9	.0199	4.1	.7555	– 170.4
80	.8409	– 173.6	4.51	72.8	.0186	7.1	.7691	– 170.9
100	.8464	– 174.5	3.70	69.1	.0171	16.8	.7776	– 171.2
115	.8589	– 175.2	3.12	65.6	.0163	19.2	.7877	– 171.2
130	.8630	– 175.8	2.68	62.3	.0177	20.7	.7996	– 171.6
145	.8680	– 176.3	2.32	59.1	.0162	26.4	.8112	– 171.8
160	.8645	– 177.0	2.05	56.2	.0163	31.4	.8209	– 172.0
175	.8812	– 177.3	1.81	53.6	.0155	39.0	.8312	– 172.3
195	.8890	– 178.2	1.62	51.1	.0168	44.4	.8404	– 172.6
210	.8953	– 178.6	1.45	48.8	.0171	52.3	.8532	– 173.1
225	.8996	– 179.2	1.31	46.7	.0193	51.6	.8591	– 173.5
240	.9061	– 179.6	1.20	45.2	.0210	60.7	.8692	– 174.0
255	.9084	179.9	1.10	43.3	.0221	60.4	.8777	– 174.3
270	.9178	179.3	1.01	41.5	.0224	72.0	.8810	– 174.6
290	.9205	178.7	.9264	40.2	.0258	74.9	.8893	– 175.1
305	.9223	178.0	.8627	38.9	.0281	73.2	.8973	– 175.2

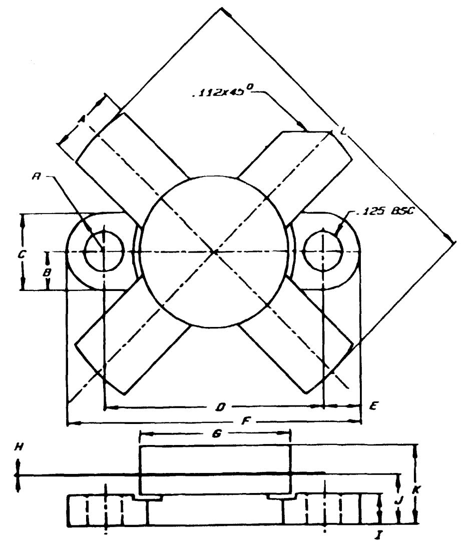
TEST CIRCUIT



C1	6pF UNELCO	C12, C15	.1µfd
C2	ARCO #420	C13, C14	47 µfd SPRAGUE
C3	470pF ATC	L1	11/4 TURNS #16 AWG .213" I.D.
C4	36pF UNELCO	L2	HAIRPIN #16 AWG
C5	ARCO #424		
C6	33pF UNELCO		
C7	ARCO#422		
C8	ARCO#464	L3	HAIRPIN #16 AWG
C9, C10	680pF ATC		
C11, C16	.01µFd		
		L4	18TURNS #16 .3"
		I.D.	
		L5	10 TURNS # 16 AWG Wound on R1
		R1	10Ω 2W
		R2	10KΩ

PACKAGE MECHANICAL DATA

.500 4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

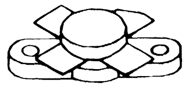
	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

SGS-THOMSON
MICROELECTRONICS

SD1907

RF & MICROWAVE TRANSISTORS
HF/VHF N-CHANNEL MOSFETS

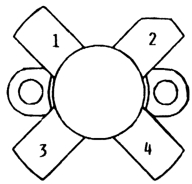
- FREQUENCY 2-200MHz
- POWER OUT 80W
- VOLTAGE 28V
- POWER GAIN 10.0dB
- CLASS AB, A
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



.500 4LFL (M174)
epoxy sealed

ORDER CODE	BRANDING
SD1907	1907

PIN CONNECTION



1 source	3 gate
2 drain	4 source

DESCRIPTION

The SD1907 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1907 is intended for use in 28V DC large signal applications up to 200MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain - Source Voltage	65.0	V
V_{DGR}	Drain - Gate Voltage	65.0	V
V_{GS}	Gate - Source Voltage	± 30.0	V
I_D	Drain Current (max.)	12.5	A
P_{TOT}	Total Device Dissipation at + 25°C	175	W
T_{STG}	Storage Temperature	– 65 to 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.0 TYP	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

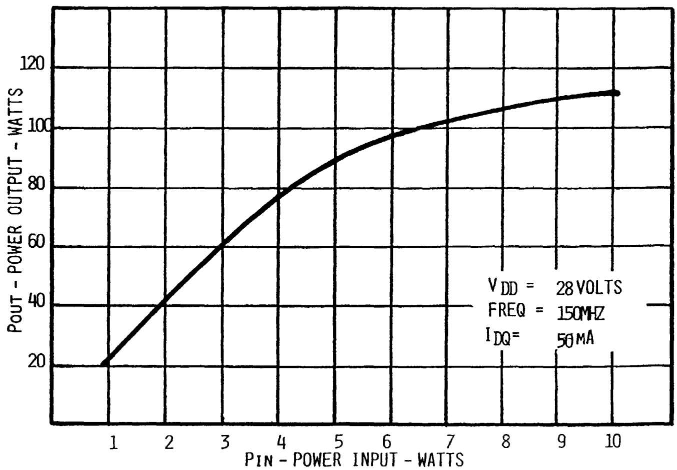
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 50mA	65			VDC
I_{DSS}	V_{DS} = 28V, V_{GS} = 0V			5.0	mA DC
I_{GSS}	V_{GS} = 20V, V_{DS} = 0V			1.0	μA DC
G_{fs}	V_{DS} = 10V, I_D = 2A	1.2			mhos
C_{iss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			150	pF
C_{oss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			125	pF
C_{iss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			26	pF
$V_{GS(th)}$	V_{DS} = 10V, I_D = 50mA	1.0		6.0	VDC

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_L	V_{DS} = 28V	I_{DQ} = 50mA	f = 150MHz	80			W
G_{ps}	V_{DS} = 28V	F = 150MHz	I_{DQ} = 50mA	10			dB
η_D	V_{DS} = 28V	I_{DQ} = 50mA	F = 150MHz	50			%

APPLICATION INFORMATION (typical)

POWER OUTPUT VS POWER INPUT

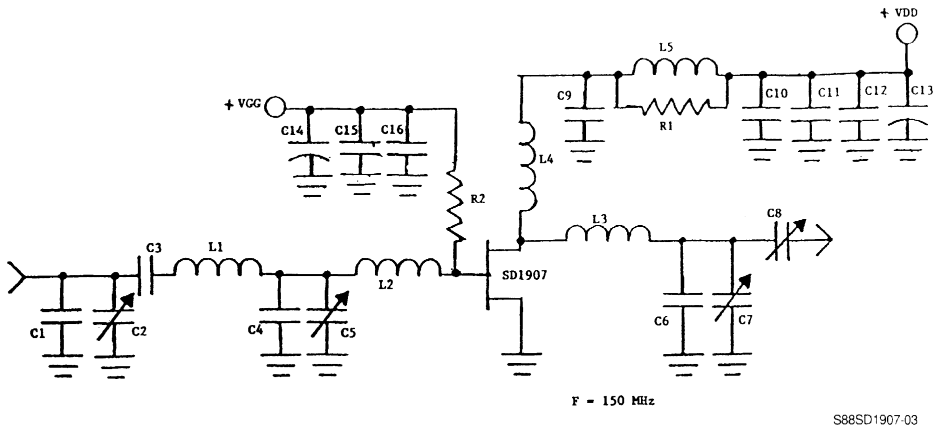


S88SD1907-02

S-PARAMETERS

V_{DS} = 28V, I_D = 2A								
Freq.	S11		S21		S12		S22	
MHz	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
2	.9833	– 113.1	82.09	113.7	.0140	28.1	.7149	– 90.6
20	.9040	- 168.7	12.09	92.3	.0182	3.7	.8557	– 171.3
35	.8946	– 174.1	6.40	87.3	.0195	7.8	.8549	– 175.3
50	.8959	– 176.4	4.32	83.5	.0188	9.6	.8582	– 176.6
65	.8947	– 177.5	3.26	80.6	.0173	10.1	.8618	– 177.3
80	.8979	– 178.3	2.61	77.8	.0184	12.2	.8657	– 177.6
100	.8976	– 179.6	2.16	75.2	.0206	26.2	.8652	– 177.9
115	.9039	– 179.2	1.85	72.7	.0180	24.1	.8702	– 178.4
130	.9005	– 179.7	1.61	70.3	.0187	26.2	.8733	– 173.3
145	.9038	180.0	1.43	67.7	.0175	31.8	.8759	– 178.6
160	.9057	179.5	1.28	65.5	.0185	36.7	.8777	– 178.9
175	.9075	179.4	1.15	63.2	.0218	43.5	.8837	– 178.9
195	.9128	178.9	1.05	60.9	.0196	44.1	.8856	– 179.1
210	.9159	178.5	.9504	58.9	.0216	50.4	.8903	– 179.2
225	.9174	178.1	.8805	55.8	.0228	55.8	.8963	– 179.6
240	.9193	177.6	.8186	55.1	.0228	58.1	.8981	– 179.9
255	.9198	177.5	.7599	52.5	.0244	61.8	.9022	180.0
270	.9273	177.0	.7188	50.0	.0261	61.5	.9050	179.8
290	.9282	176.7	.6728	45.5	.0292	66.2	.9081	179.5
305	.9350	176.3	.5937	35.0	.0281	64.9	.9109	179.7

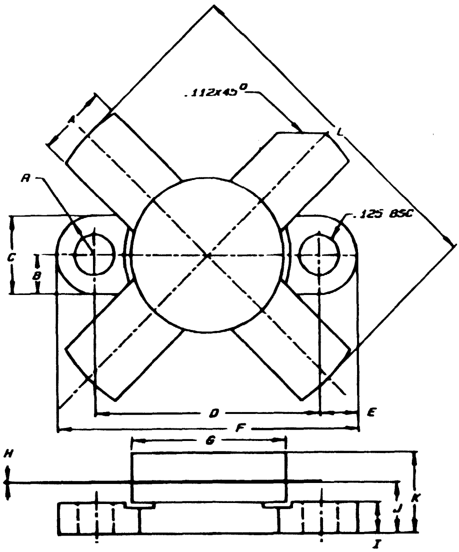
TEST CIRCUIT AT F = 150MHz



C_1	- 6pF UNELCO	L_2	- HAIRPIN #16AWG .25" .062"
C_2	- ARCO #420		
C_3	- 470pF ATC		
C_4	- 36pF UNELCO		
C_5	- ARCO #424	L_3	- HAIRPIN #16AWG .5" .2"
C_6	- 33pF UNELCO		
C_7	- ARCO #422		
C_8	- ARCO #463		
C_9, C_{10}	- 680pF ATC	L_4	- 18 TURNS #16AWG .3" I.D.
C_{11}, C_{16}	- .01μfd	L_5	- 10 TURNS #16AWG Wound on R1
C_{12}, C_{15}	- .1μfd	R_1	- 10Ω 2W
C_{13}, C_{14}	- 47μfd SPRAGUE	R_2	- 10KΩ
L_1	- 1 1/4 TURNS #16AWG .213" I.D.		

PACKAGE MECHANICAL DATA

. 500 4LFL (M174)



S88SD1907-04

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

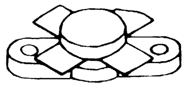
	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

SGS-THOMSON MICROELECTRONICS

SD1908-1

RF & MICROWAVE TRANSISTORS HF/VHF N-CHANNEL MOSFETS

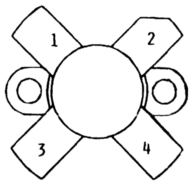
- FREQUENCY 2 – 200MHz
- POWER OUT 120W
- VOLTAGE 28V
- POWER GAIN 10dB
- CLASS AB, A
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



. 500 4LFL (M174)
epoxy sealed

ORDER CODE	BRANDING
SD1908-01	SD1908-1

PIN CONNECTION



S88SD1908-1-01

1 source
2 drain
3 gate
4 source

DESCRIPTION

The SD1908-1 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1908-1 is intended for use in 28V DC large signal applications up to 200MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-Source Voltage	65.0	V
V_{DGR}	Drain-Gate Voltage	65.0	V
V_{GS}	Gate-Source Voltage	± 30.0	V
I_D	Drain Current (max.)	19.2	A
P_{TOT}	Total Device Dissipation at + 25°C	270	W
T_{STG}	Storage Temperature	– 65 to 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	.65 TYP	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

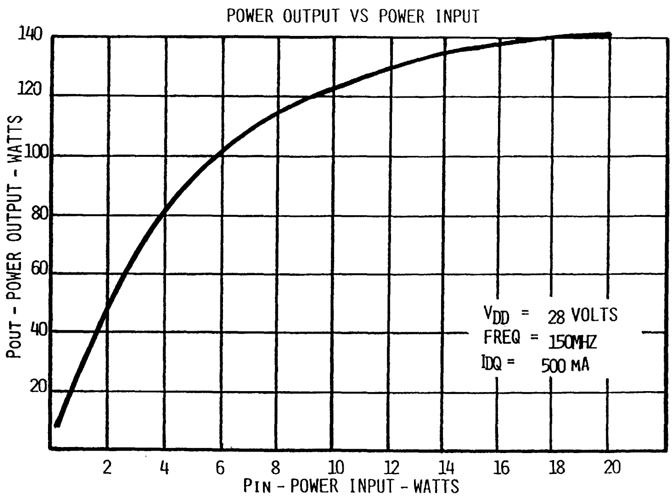
STATIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 50mA	65			VDC
I_{DSS}	V_{DS} = 28V, V_{GS} = 0V			5	mA DC
I_{GSS}	V_{GS} = 20V, V_{DS} = 0V			1	µA DC
G_{fs}	V_{DS} = 10V, I_D = 3A	2			mhos
C_{iss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			265	pF
C_{oss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			205	pF
C_{iss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			40	pF
$V_{GS(th)}$	V_{DS} = 10V, I_D = 100mA	1		6	VDC

DYNAMIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_L	V_{DS} = 28V I_{DQ} = 500mA f = 150MHz	120			W
G_{ps}	V_{DS} = 28V P_{out} = 120W F = 150MHz I_{DQ} = 500mA	10			dB
η_D	V_{DS} = 28V P_{out} = 120W I_{DQ} = 500mA F = 150MHz	50			%

APPLICATION INFORMATION (typical)

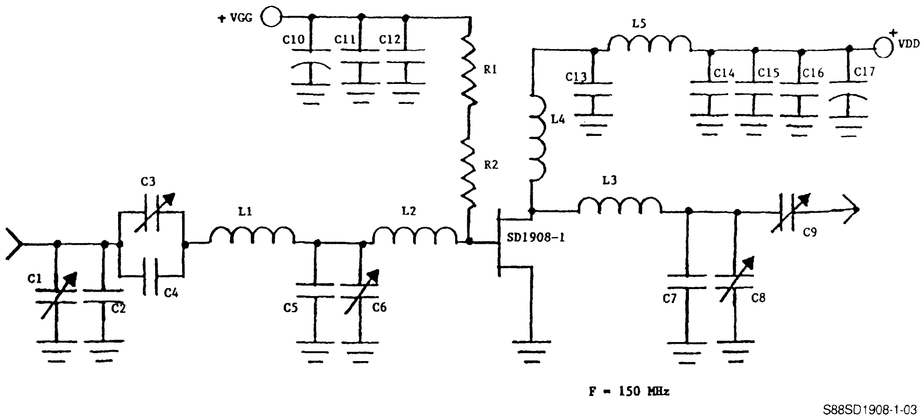


S88SD1908-1-02

S-PARAMETERS

V_{DS} = 28V, I_D = 3.0A								
Freq.	S11		S21		S12		S22	
MHz	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
20	.8844	– 171.9	11.35	87.9	.0140	3.7	.8414	– 173.6
35	.8950	– 175.2	5.97	80.1	.0135	5.1	.8384	– 175.7
50	.8995	– 176.2	4.01	73.7	.0124	2.7	.8411	– 175.8
65	.9017	– 177.0	2.98	68.1	.0139	9.5	.8491	– 175.9
80	.9054	– 177.2	2.35	62.7	.0121	16.2	.8572	– 176.2
100	.9131	– 177.5	1.91	57.4	.0127	17.8	.8664	– 176.2
115	.9165	– 177.7	1.59	52.4	.0119	21.8	.8754	- 176.2
130	.9241	– 178.1	1.34	48.1	.0124	31.1	.8832	– 176.4
145	.9285	– 178.4	1.16	44.0	.0132	42.9	.8930	– 176.6
160	.9321	– 178.7	1.01	40.3	.0140	48.6	.8983	– 176.8
175	.9380	– 179.0	.888	36.7	.0156	53.5	.9064	– 177.3
195	.9435	– 179.3	.791	33.4	.0157	56.5	.9102	– 177.6
210	.9476	– 179.6	.710	30.1	.0161	58.2	.9176	– 178.3
225	.9505	179.9	.637	26.8	.0191	58.7	.9264	– 178.5
240	.9519	179.6	.574	23.5	.0211	60.4	.9283	– 179.1
255	.9552	179.2	.518	21.2	.0226	61.3	.9327	– 179.6
270	.9581	178.8	.474	19.2	.0234	62.4	.9350	– 179.9
290	.9592	178.3	.435	17.1	.0270	64.1	.9419	179.5
305	.9624	178.1	.402	15.0	.0290	66.3	.9449	179.4
320	.9630	177.6	.374	13.3	.0317	64.2	.9467	179.3

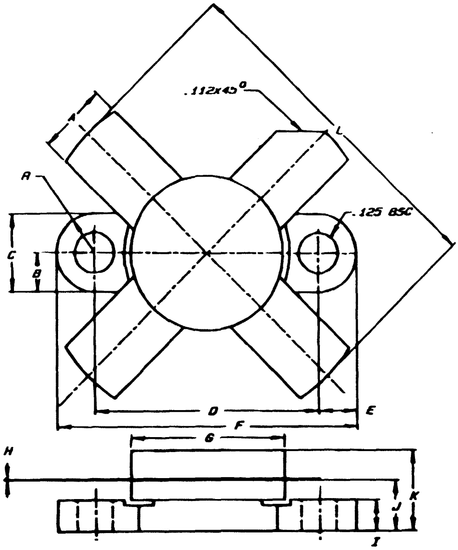
TEST CIRCUIT AT F = 150MHz



C_1, C_5	- 22pF UNELCO	C_{12}, C_{15}	- .01μfd
C_2, C_3, C_6	- ARCO #424	C_{13}, C_{14}	- 560pF ATC
C_4	- 47pF ATC	L_1	- 1 1/4 TURNS #16AWG .3" I.D.
C_7	- 36pF UNELCO	L_2	- HAIRPIN #16AWG
C_8	- ARCO #462	L_3	- HAIRPIN #16AWG
C_9	- ARCO #463	L_4	- 18 TURNS #16AWG .3" I.D.
C_{10}, C_{17}	- .47μfd	L_5	- VK200
C_{11}, C_{16}	- .1μfd	R_1, R_2	- 10KΩ

PACKAGE MECHANICAL DATA

. 500 4LFL (M174)



S88SD1908-1-04

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

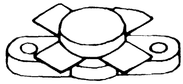
	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

SGS-THOMSON MICROELECTRONICS

SD1912

RF & MICROWAVE TRANSISTORS HF/VHF N-CHANNEL MOSFETS

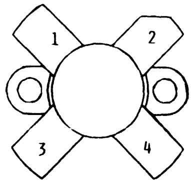
- FREQUENCY 2 – 200MHz
- POWER OUT 150W
- VOLTAGE 28V
- POWER GAIN 6.0dB
- IMD – 30dB
- CLASS AB
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



.500 4LFL (M174)
epoxy sealed

ORDER CODE	BRANDING
SD1912	SD1912

PIN CONNECTION



S88SD1912-01

1 source
2 drain
3 gate
4 source

DESCRIPTION

The SD1912 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1912 is intended for use in 28V DC large signal applications up to 200MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain - Source Voltage	65.0	V
V_{DGR}	Drain - Gate Voltage	65.0	V
V_{GS}	Gate - Source Voltage	± 30.0	V
I_D	Drain Current (max.)	20.9	A
P_{TOT}	Total Device Dissipation at + 25°C	292	W
T_{STG}	Storage Temperature	– 65 to 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	.6	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

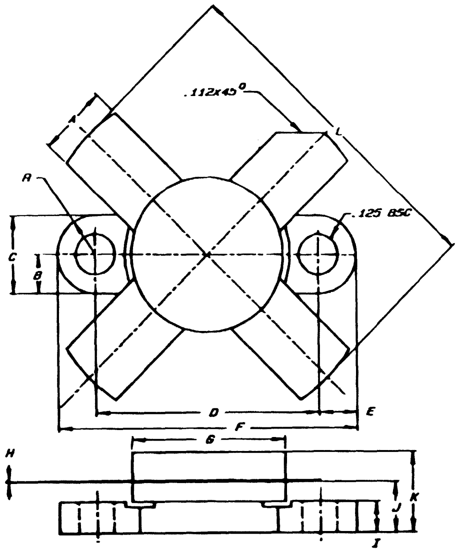
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 100mA	65			VDC
I_{DSS}	V_{DS} = 28V, V_{GS} = 0V			5	mA DC
I_{GSS}	V_{GS} = 20V, V_{DS} = 0V			1	µA DC
$V_{DS\ (on)}$	V_{GS} = 10V, I_D = 10A			1.5	VDC
G_{fs}	V_{DS} = 10V, I_D = 5A	4			mhos
C_{iss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			560	pF
C_{oss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			475	pF
C_{rss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz			125	pF
$V_{GS(th)}$	V_{DS} = 10V, I_D = 100mA	1		5	VDC

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_L	V_{DS} = 28V	I_{DQ} = 2 X 250mA	f = 150MHz	150			W
G_{ps}	V_{DS} = 28V	I_{DQ} = 2 X 250mA	f = 150MHz	6.0			dB
η_D	V_{DS} = 28V	I_{DQ} = 2 X 250mA	f = 150MHz	50			%

PACKAGE MECHANICAL DATA

.500 4LFL (M174)



S88SD1912-02

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

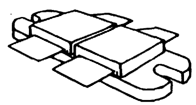
	Minimum Inches/mm	Maximum inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

SGS-THOMSON MICROELECTRONICS

SD1912-2

RF & MICROWAVE TRANSISTORS HF/VHF N-CHANNEL MOSFETS

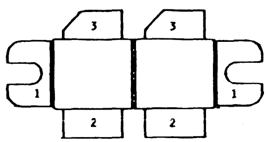
- FREQUENCY 2 - 200MHz
- POWER OUT 300W
- VOLTAGE 28V
- POWER GAIN 6dB
- IMD - 30dB
- CLASS AB
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



2 x (.400 x .425 x 2L)FL (M176)
epoxy sealed

ORDER CODE	**BRANDING**
SD1912-02	SD1912-2

PIN CONNECTION



S88SD1912-2-01

1 source
2 gate
3 drain

DESCRIPTION

The SD1912-2 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1912-2 is intended for use in 28V DC large signal applications up to 200MHz.

ABSOLUTE MAXIMUM RATINGS

PER SIDE

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain - Source Voltage	65.0	V
V_{DGR}	Drain - Gate Voltage	65.0	V
V_{GS}	Gate - Source Voltage	± 30.0	V
I_D	Drain Current (max.)	20.9	A
P_{TOT}	Total Device Dissipation at + 25°C	292	W
T_{STG}	Storage Temperature	– 65 to 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-Case Thermal Resistance	.6	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC PER SIDE**

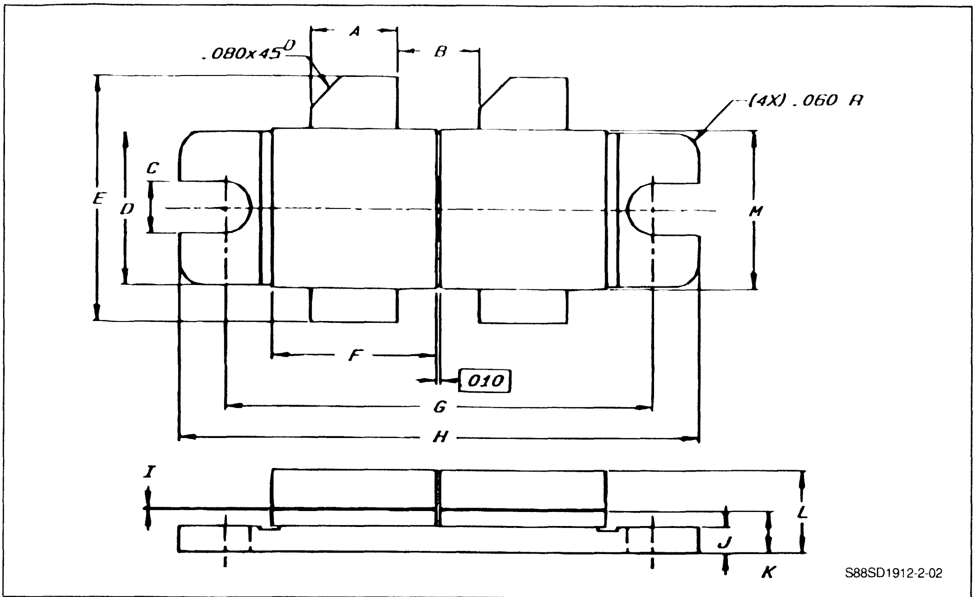
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 100mA **	65			VDC
I_{DSS}	V_{DS} = 28V, V_{GS} = 0V **			5	mA DC
I_{GSS}	V_{GS} = 20V, V_{DS} = 0V **			1	µA DC
$V_{DS(on)}$	V_{GS} = 10V, I_D = 10A **			1.5	VDC
G_{fs}	V_{DS} = 10V, I_D = 5A **	4			mhos
C_{iss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz **			560	pF
C_{oss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz **			475	pF
C_{rss}	V_{DS} = 28V, V_{GS} = 0V, F = 1MHz **			125	pF
$V_{GS(th)}$	V_{DS} = 10V, I_D = 100mA **	1		5	VDC

DYNAMIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_L	V_{DS} = 28V I_{DQ} = 2 x 250mA f = 150MHz	300			W
G_{ps}	V_{DS} = 28V I_{DQ} = 2 x 250mA f = 150MHz	6.0			dB
nD	V_{DS} = 28V I_{DQ} = 2 x 250mA f = 150MHz	50			%

PACKAGE MECHANICAL DATA

2 x (.400 x .425 2L)FL



	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.210/5.33 BSC	
C	.125/3.18 BSC	
D	.380/9.65	.390/9.91
E	.580/14.73	.620/15.75
F	.420/10.67	.430/10.93
G	1.090/27.69	1.105/28.07

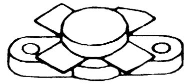
	Minimum Inches/mm	Maximum Inches/mm
H	1.335/33.91	1.345/34.16
I	.003/0.08	.007/0.18
J	.060/1.52	.070/1.78
K	.100/2.54	.115/2.92
L		.230/5.84
M	.395/10.03	.405/10.29

SGS-THOMSON
MICROELECTRONICS

SD1920

RF & MICROWAVE TRANSISTORS
HF/VHF N-CHANNEL MOSFETS

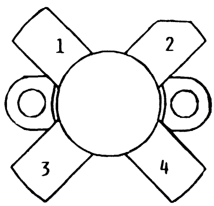
- FREQUENCY 2 - 200MHz
- POWER OUT 150W
- VOLTAGE 50V
- POWER GAIN 8.0dB
- IMD – 30dB
- CLASS AB
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



.500 4 LFL (M174)
epoxy sealed

ORDER CODE	BRANDING
SD1920	SD1920

PIN CONNECTION



S88SD1920-01

1 source	3 gate
2 drain	4 source

DESCRIPTION

The SD1920 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1920 is intended for use in 50V DC large signal applications up to 200MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-Source Voltage	125.0	V
V_{DGR}	Drain-Gate Voltage	125.0	V
V_{GS}	Gate-Source Voltage	± 30.0	V
I_D	Drain Current (max.)	13.9	A
P_{TOT}	Total Device Dissipation at + 25°C	215	W
T_{STG}	Storage Temperature	– 65 to 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	.70 TYP	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

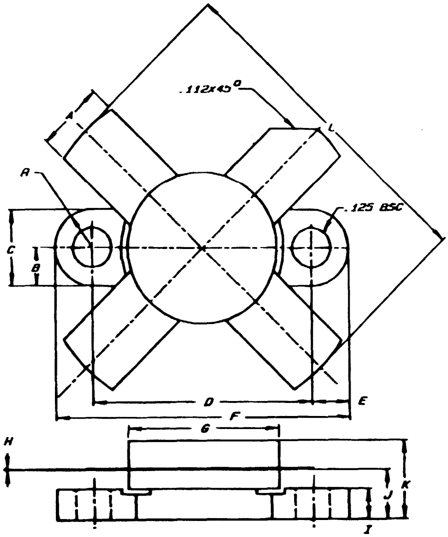
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 100mA	125.0			VDC
I_{DSS}	V_{DS} = 50V, V_{GS} = 0V	5.0			mA DC
I_{GSS}	V_{GS} = 20V, V_{DS} = 0V	1.0			μA DC
$V_{DS(on)}$	V_{GS} = 10V, I_D = 10A			5.0	VDC
G_{fs}	V_{DS} = 10V, I_D = 5A	4.0			mhos
C_{iss}	V_{DS} = 50V, V_{GS} = 0V, F = 1MHz			500	pF
C_{oss}	V_{DS} = 50V, V_{GS} = 0V, F = 1MHz			250	pF
C_{rss}	V_{DS} = 50V, V_{GS} = 0V, F = 1MHz			50	pF
$V_{GS(th)}$	V_{DS} = 10V, I_D = 100mA			5.0	VDC

DYNAMIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_L	V_{DS} = 50V I_{DQ} = 250mA F = 150MHz	150			W
G_{ps}	V_{DS} = 50V, Pout = 150W, I_{DQ} = 250mA, F = 150MHz	8.0			dB
η_D	V_{DS} = 50V, Pout = 150W, I_{DQ} = 250mA, F = 150MHz	45			%

PACKAGE MECHANICAL DATA

.500 4LFL



S88SD1920-02

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

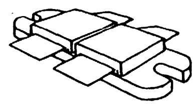
	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

SGS-THOMSON
MICROELECTRONICS

SD1920-2

RF & MICROWAVE TRANSISTORS
HF/VHF N-CHANNEL MOSFETS

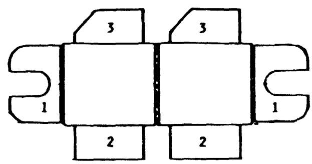
- FREQUENCY 2 - 200MHz
- POWER OUT 300W
- VOLTAGE 50V
- POWER GAIN 8.0dB
- IMD = – 30dB
- CLASS AB
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- MICROPROCESSOR CONTROLLED WIRING SCHEME
- WIDEBAND TUNING
- NO THERMAL RUNAWAY
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION



2 x (.437 x .450 2L)FL (M176)
epoxy sealed

ORDER CODE	BRANDING
SD1920-02	SD1920-2

PIN CONNECTION



S88SD1920-2-01

1 source
2 gate
3 drain

DESCRIPTION

The SD1920-2 is a gold metallized N-channel MOS field-effect RF power transistor. The SD1920-2 is intended for use in 50V DC large signal applications up to 200MHz.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

PER SIDE

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-Source Voltage	125.0	V
V_{DGR}	Drain-Gate Voltage	125.0	V
V_{GS}	Gate-Source Voltage	± 30.0	V
I_D	Drain Current (max.)	13.9	A
P_{TOT}	Total Device Dissipation at + 25°C	215	W
T_{STG}	Storage Temperature	– 65 to 150	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	.70	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

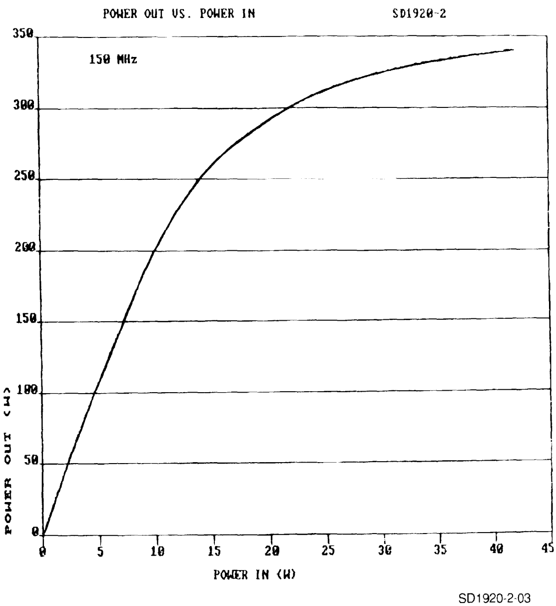
STATIC DC PER SIDE **

Symbol	Test Conditions	Value Min.	Value Typ.	Value Max.	Unit
$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 100mA **	125.0			VDC
I_{DSS}	V_{DS} = 50V, V_{GS} = 0V **	5.0			mA DC
I_{GSS}	V_{GS} = 20V, V_{DS} = 0V **	1.0			µA DC
$V_{DS\ (on)}$	V_{GS} = 10V, I_D = 10A **			5.0	VDC
G_{fs}	V_{DS} = 10V, I_D = 5A **	4.0			mhos
C_{iss}	V_{DS} = 50V, V_{GS} = 0V, F = 1MHz **			500	pF
C_{oss}	V_{DS} = 50V, V_{GS} = 0V, F = 1MHz **			250	pF
C_{rss}	V_{DS} = 50V, V_{GS} = 0V, F = 1MHz **			50	pF
$V_{GS(th)}$	V_{DS} = 10V, I_D = 100mA **	1.0		5.0	VDC

DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_L	V_{DS} = 50V	I_{DQ} = 2 x 250mA	F = 150MHz	300			W
G_{ps}	V_{DS} = 50V	I_{DQ} = 2 x 250mA	F = 150MHz	8.0			dB
η_D	V_{DS} = 50V	I_{DQ} = 2 x 250mA	F = 150 MHz	45			%

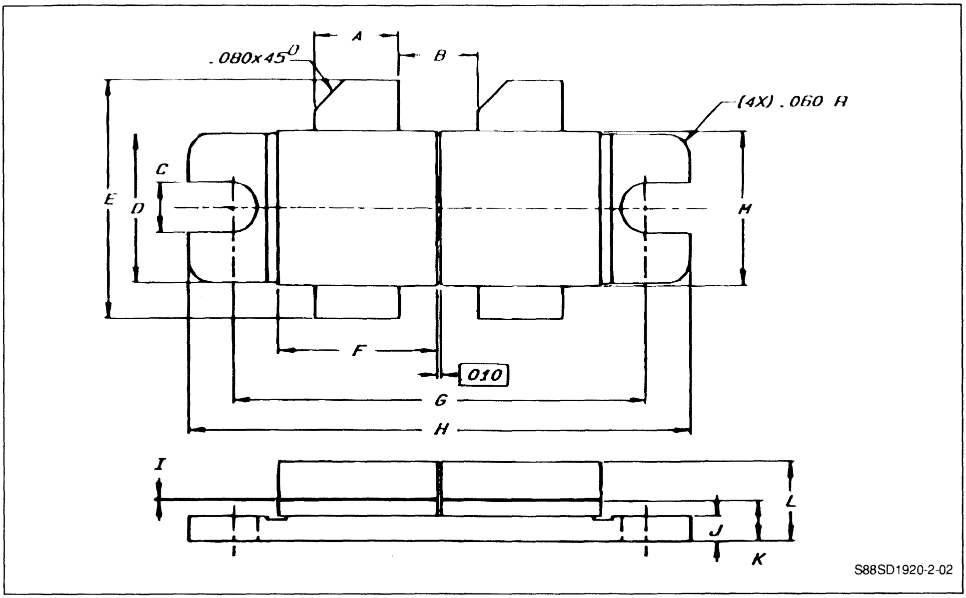
TYPICAL IMPEDANCES (at Dynamic test conditions)
Z_{in} : 1.2 – j 0.1Ω (Gate to Gate)
Z_{CL} : 3.3 + j 4.7Ω (Drain to Drain)



SD1920-2-03

PACKAGE MECHANICAL DATA

2 x (.437 x .450 2L)FL



	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.210/5.33 BSC	
C	.125/3.18 BSC	
D	.380/9.65	.390/9.91
E	.580/14.73	.620/15.75
F	.420/10.67	.430/10.93
G	1.090/27.69	1.105/28.07

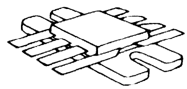
	Minimum Inches/mm	Maximum Inches/mm
H	1.335/33.91	1.345/34.16
I	.003/0.08	.007/0.18
J	.060/1.52	.070/1.78
K	.100/2.54	.115/2.92
L		.230/5.84
M	.395/10.03	.405/10.29

SGS-THOMSON
MICROELECTRONICS

TCC0105-100

RF & MICROWAVE TRANSISTORS
WIDEBAND VHF - UHF CLASS C

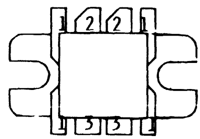
- CLASS C TRANSISTOR
- FREQUENCY 500MHz
- VOLTAGE 28V
- POWER OUT 100W
- POWER GAIN 6.5dB
- EFFICIENCY 55%
- GOLD METALLIZATION
- COMMON EMITTER
- INPUT MATCHING



.400 x .425 8LFL (M168)
epoxy sealed

ORDER CODE	BRANDING
SD1464	0105-125

PIN CONNECTION



S88TCC0105-100-01

1 emitter
2 collector
3 base

DESCRIPTION

The 0105-100 is a 28V gold metallized, epitaxial silicon NPN planar transistor designed for UHF military and commercial equipment. The 0105-100 is an internally matched, broadband device optimized for operation within the 100-500MHz frequency range. This device utilizes diffused emitter resistors to achieve 5 : 1 VSWR at rated operating conditions.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	60.0	V
V_{CEO}	Collector - Emitter Voltage	33.0	V
V_{CES}	Collector - Emitter Voltage	60.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	15.0	A
P_{tot}	Total Power Dissipation	260.0	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.67	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 100mA	I_E = 0	60.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	33.0			V
BV_{EBO}	I_E = 20mA	I_C = 0	4.0			V
I_{CBO}	V_{CB} = 30V	I_E = 0			10	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1.A	20	40		

DYNAMIC

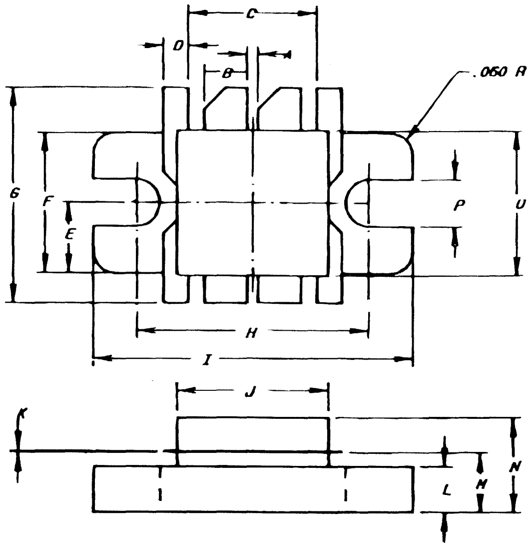
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O	f = 100-500MHz	V_{CE} = 28.0V	100.0			W
G_P	f = 100-500MHz	V_{CE} = 28.0V	6.5			dB
η_C	f = 500MHz	V_{CE} = 28V	55			%

IMPEDANCE DATA (typical)

	V_{CE} = 28V	P_o = 100W
F	100MHz	500MHz
Z_{IN}	0.7 + j 1.8Ω	1.6 + j 2.2Ω

PACKAGE MECHANICAL DATA

.400 x .425 4LFL



S88TCC0105-02

	Minimum Inches/mm	Maximum Inches/mm
A	.030/0.76 BSC	
B	.115/2.92	.125/3.18
C	.355/9.02	.365/9.27
D	.065/1.65	.075/1.91
E	.192/4.88 BSC	
F	.380/9.65	.390/9.91
G	.735/18.67	.765/19.43
H	.645/16.38	.655/16.64

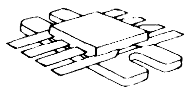
	Minimum Inches/mm	Maximum Inches/mm
I	.895/22.73	.905/22.99
J	.420/10.67	.430/10.92
K	.003/0.08	.007/0.18
L	.120/3.05	.130/3.30
M	.159/4.04	.175/4.45
N	.250/6.35	.265/6.73
O	.395/10.03	.405/10.29
P	.130/3.30 BSC	

SGS-THOMSON MICROELECTRONICS

TCC0204–125

RF AND MICROWAVE TRANSISTORS WIDE BAND VHF–UHF CLASS C

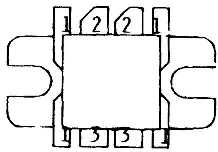
- CLASS C TRANSISTOR
- FREQUENCY 400MHz
- VOLTAGE 28V
- POWER OUT 125W
- POWER GAIN 6.5dB
- EFFICIENCY 60%
- GOLD METALLIZATION
- COMMON EMITTER
- INPUT MATCHED



.400 x .425 8LFL (M168)
epoxy sealed

ORDER CODE	**BRANDING**
SD1463	0204–125

PIN CONNECTION



S88TCC0204–125–01

1 emitter
2 collector
3 base

DESCRIPTION

The 0204-125 is a 28V gold metallized, epitaxial silicon NPN planar transistor designed for UHF military and commercial equipment. The 0204-125 is an internally matched, broadband device optimized for operation within the 225-400MHz frequency range. This device utilizes diffused emitter resistors to achieve 10:1 VSWR at rated operating

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	60.0	V
V_{CEO}	Collector - Emitter Voltage	33.0	V
V_{EBO}	Emitter - Base Voltage	4.0	V
I_C	Collector Current	15.0	A
P_{tot}	Total Power Dissipation	270	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.65	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 100mA	I_E = 0	60.0			V
BV_{CEO}	I_C = 50mA	I_B = 0	33.0			V
BV_{EBO}	I_E = 20mA	I_C = 0	4.0			V
I_{CBO}	V_{CE} = 30V	I_E = 0			10	mA
h_{FE}	V_{CE} = 5.0V	I_C = 1A	20	40.0		

DYNAMIC

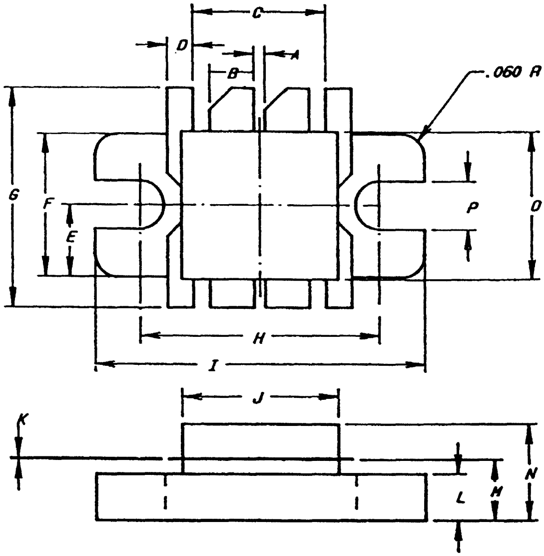
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_O	f = 225-400MHz	V_{CE} = 28.0V	125.0			W
G_P	f = 225-400MHz	V_{CE} = 28.0V	6.5			dB
η_C	f = 400MHZ		60			

IMPEDANCE DATA (typical)

	f = 225MHz	f = 400MHz
Z_S	0.5 + j2.5Ω	1.5 + j1.7Ω
Z_{CL}	8.8 + j3.5Ω	5.0 + j0Ω
	V_{CE} = 28V	P_o = 125W

PACKAGE MECHANICAL DATA

.400 x .425 8LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.030/0.76 BSC	
B	.115/2.92	.125/3.18
C	.355/9.02	.365/9.27
D	.065/1.65	.075/1.91
E	.192/4.88 BSC	
F	.380/9.65	.390/9.91
G	.735/18.67	.765/19.43
H	.645/16.38	.655/16.64

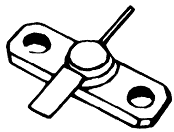
	Minimum Inches/mm	Maximum Inches/mm
I	.895/22.73	.905/22.99
J	.420/10.67	.430/10.92
K	.003/0.08	.007/0.18
L	.120/3.05	.130/3.30
M	.159/4.04	.175/4.45
N	.250/6.35	.265/6.73
O	.395/10.03	.405/10.29
P	.130/3.30 BSC	

SGS-THOMSON
MICROELECTRONICS

TCC20L08

RF & MICROWAVE TRANSISTORS
CLASS A MICROWAVE

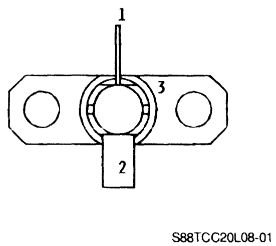
- FREQUENCY 2.0GHz
- POWER OUT .8W
- POWER GAIN 8.0dB
- VOLTAGE 20.0V
- CURRENT 120mA
- CLASS A
- GOLD METALLIZED DIE
- OVERLAY GEOMETRY
- HERMETIC STRIPLINE PACKAGE
- COMMON EMITTER CONFIGURATION



.230 2LFL/FLM (M151)
hermetic sealed

ORDER CODE	**BRANDING**
SD1851	20L08

PIN CONNECTION



1 collector
2 base
3 emitter

DESCRIPTION

The TCC20L08 is an NPN silicon transistor designed for high gain linear performance at 2.0GHz. This part uses gold metallized die and polysilicon site ballasting to achieve high reliability and ruggedness. The part can be used for applications such as Telecommunications, Radar, ECM, Space and other commercial and military systems.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CEO}	Collector - Emitter Voltage	21	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.15	A
P_{DISS}	Total Device Dissipation at + 25°C	5.8	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	30	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1mA		40	45		V
BV_{CEO}	I_C = 5mA		21	25		V
BV_{EBO}	I_E = 1mA		3.5	4		V
h_{FE}	V_{CE} = 5V	I_C = 100mA	15		150	

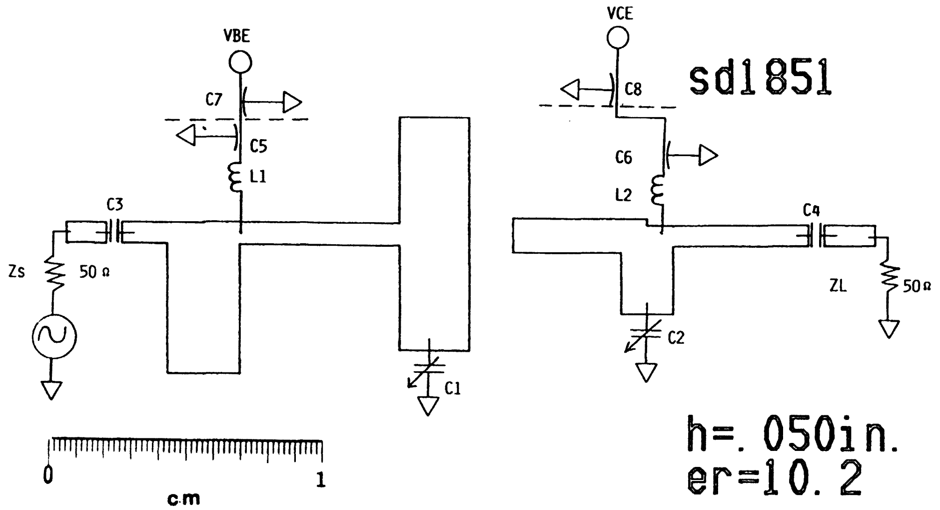
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 2GHz	V_{CE} = 20V	I_C = 120mA	0.8			W
P_G	f = 2GHz	V_{CE} = 20V	I_C = 120mA	8			dB

BIAS CONDITIONS

V_{ce} = 20V

Frequency	S11		S21		S12		S22	
MHz	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
500	.914	178.6	4.446	77.3	.022	28.6	.227	–108.
1000	.906	168.9	2.317	58.8	.026	43.6	.323	– 123.
1500	.876	159.0	1.590	40.7	.035	55.3	.426	– 138.
2000	.845	146.4	1.270	22.4	.050	62.3	.498	– 152.
2500	.811	130.7	1.088	8.4	.073	59.7	.569	– 168.
3000	.744	105.3	.931	10.9	.107	54.5	.618	175



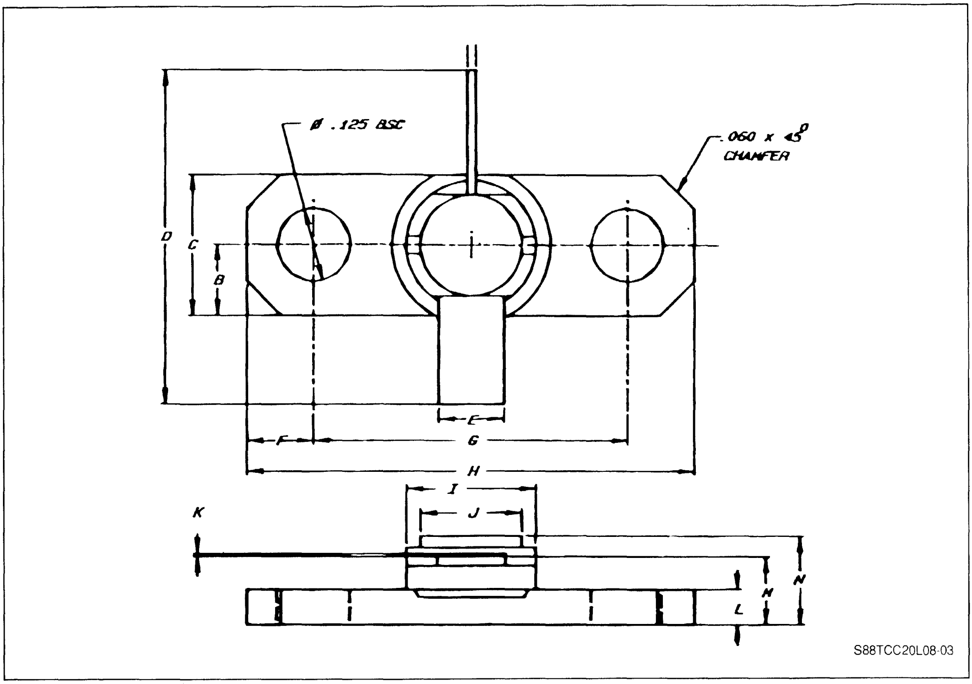
S88TCC20L08-02

PARTS LIST

- L_1 – 3 turn choke #28 wire .080" dia.
- L_2 – 3 turn choke #28 wire .080" dia.
- C_1 – .4 – 2.5pF Johanson capacitor
- C_2 – .4 – 2.5pF Johanson capacitor
- C_3 – 100pF chip capacitor ATC
- C_4 – 100pF chip capacitor ATC
- C_5 – 15,000pF chip capacitor ATC
- C_6 – 15,000pF chip capacitor ATC
- C_7 – 15,000pF EMI Filter 4 – 40
- C_8 – 15,000pF EMI Filter 4 – 40
- S_1 – Epsilam 10 er = 10.2H = .050" 1 oz cu
  SMA Launcher CDI (2 pieces)
  .397 sq fixture housing
  Heat sink

PACKAGE MECHANICAL DATA

.230 2LFL/FLM



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

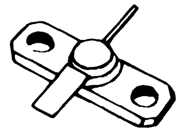
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON MICROELECTRONICS

TCC20L15

RF & MICROWAVE TRANSISTORS CLASS A MICROWAVE

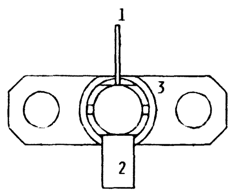
- FREQUENCY 2.0GHz
- POWER OUT 1.5W
- POWER GAIN 7.0dB
- VOLTAGE 20.0V
- CURRENT 220mA
- CLASS A
- GOLD METALLIZED DIE
- OVERLAY GEOMETRY
- HERMETIC STRIPLINE PACKAGE
- COMMON EMITTER CONFIGURATION



.230 2LFL/FLM (M151)
hermetic sealed

ORDER CODE	**BRANDING**
SD1853	20L15

PIN CONNECTION



S88TCC20L15-01

1 collector
2 base
3 emitter

DESCRIPTION

The TCC20L15 is an NPN silicon transistor designed for high gain linear performance at 2.0GHz. This part uses gold metallized die and polysilicon site ballasting to achieve high reliability and ruggedness. The part can be used for applications such as Telecommunications, Radar, ECM, Space and other commercial and military systems.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CEO}	Collector - Emitter Voltage	21	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.25	A
P_{DISS}	Total Device Dissipation at + 25°C	11.7	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	15	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1mA		40	45		V
BV_{CEO}	I_C = 5mA		20	25		V
BV_{EBO}	I_E = 1mA		3.5	4		V
h_{FE}	V_{CE} = 5V	I_C = 200mA	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 2GHz	V_{CE} = 20V	I_C = 220mA	1.5	1.8		W
P_G	f = 2GHz	V_{CE} = 20V	I_C = 220mA	7	8		dB

S-PARAMETER DATA :

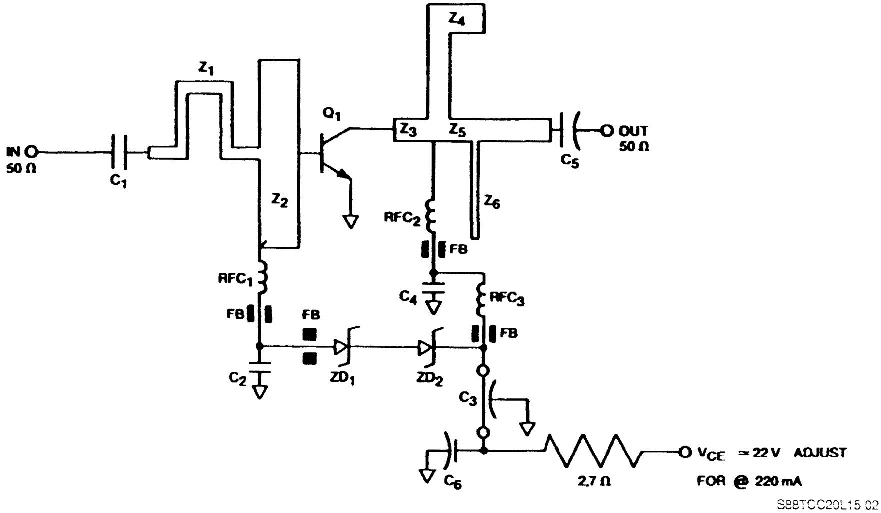
BIAS : Current = 208.0mA
Voltage = 20.000V

FREQUENCY

MHz	S11		S21		S12		S22	
	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
500	.92	176.0	3.53	81.9	.03	28.2	.30	– 155.9
1000	.94	166.0	1.66	69.7	.03	45.1	.36	– 161.3
1500	.93	156.1	1.27	57.1	.04	64.3	.43	– 169.1
2000	.89	142.2	1.00	47.9	.05	70.4	.54	– 172.1
2500	.82	124.4	.88	38.9	.06	74.8	.59	– 178.2
3000	.76	97.5	.89	22.5	.08	71.5	.61	171.1
3500	.75	63.6	.93	2.1	.11	61.7	.66	156.0

1W - 2.3GHz LINEAR AMPLIFIER

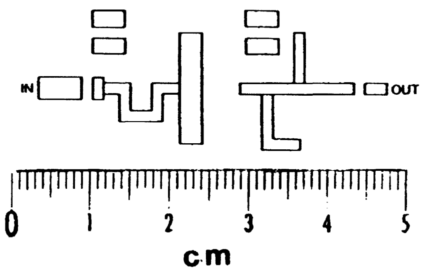
V_{CE} = 22V
I_{CQ} = 220mA
G_P ≥ 7dB } at 1dB compression
P_{OUT} ≥ 1W



PARTS LISTS

Q_1	: TCC20L15	FB	: Ferrite Bead
C_1, C_2, C_4, C_5	: ≈ 22pF CHIP CAP	Z_{D1}	: 9V - 1W - ZENER
C_3	: 0.001 Feed thru CAP	Z_{D2}	: 12V - 1W - ZENER
C_6	: 10µF - 25V	Z_1, Z_2, Z_3, Z_4, Z_5, Z_6	: MICROSTRIP on 1/32" Glass teflon $\varepsilon_r \approx 2.55$
RFC_1, RFC_2	: 3 Turns - AWG # 28-.1" I.D.		
RFC_3	: 8 Turns - AWG # 26-.15" I.D.		

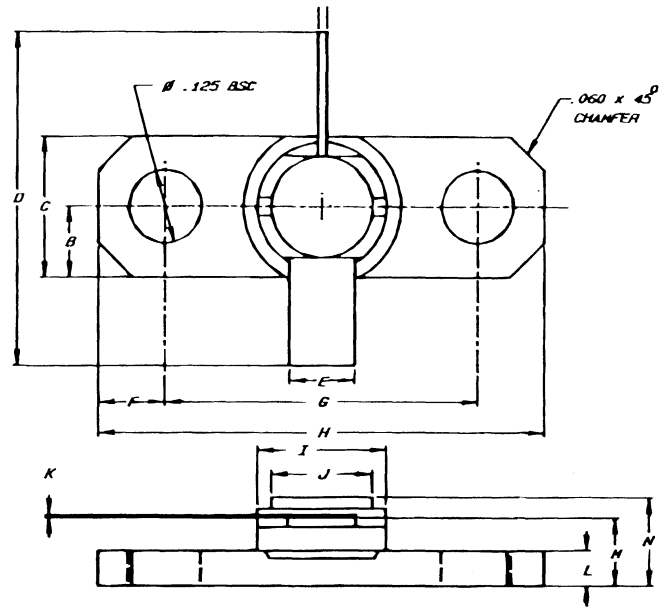
P.C. ARTWORK TO SCALE



S88TCC20L15-03

PACKAGE MECHANICAL DATA

.230 2LFL/FLM



S88TCC20L15-04

	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

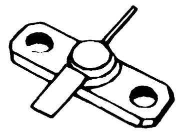
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON
MICROELECTRONICS

TCC20L25

RF & MICROWAVE TRANSISTORS
CLASS A MICROWAVE POWER

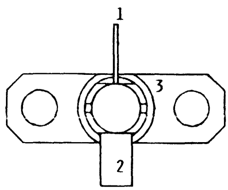
- FREQUENCY 2.0GHz
- POWER OUT 2.5W
- POWER GAIN 6.0dB
- VOLTAGE 20.0V
- CURRENT 440mA
- CLASS A
- GOLD METALLIZED DIE
- OVERLAY GEOMETRY
- HERMETIC STRIPLINE PACKAGE
- COMMON EMITTER CONFIGURATION



.230 2LFL/FLM (M151)
hermetic sealed

ORDER CODE	**BRANDING**
SD1855	20L25

PIN CONNECTION



S88TCC20L25-01

1 collector
2 base
3 emitter

DESCRIPTION

The TCC20L25 is an NPN silicon transistor designed for high gain linear performance at 2.0GHz. This part uses gold metallized die and polysilicon site ballasting to achieve high reliability and ruggedness. The part can be used for applications such as Telecommunications, Radar, ECM, Space and other commercial and military systems.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CES}	Collector - Emitter Voltage	21	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.5	A
P_{DISS}	Total Device Dissipation at + 25°C	20.6	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	8.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 200mA		40	45		V
BV_{CEO}	I_C = 5mA		21	25		V
BV_{EBO}	I_E = 2mA		3.5	4		V
h_{FE}	V_{CE} = 5V	I_C = 400mA	15		150	

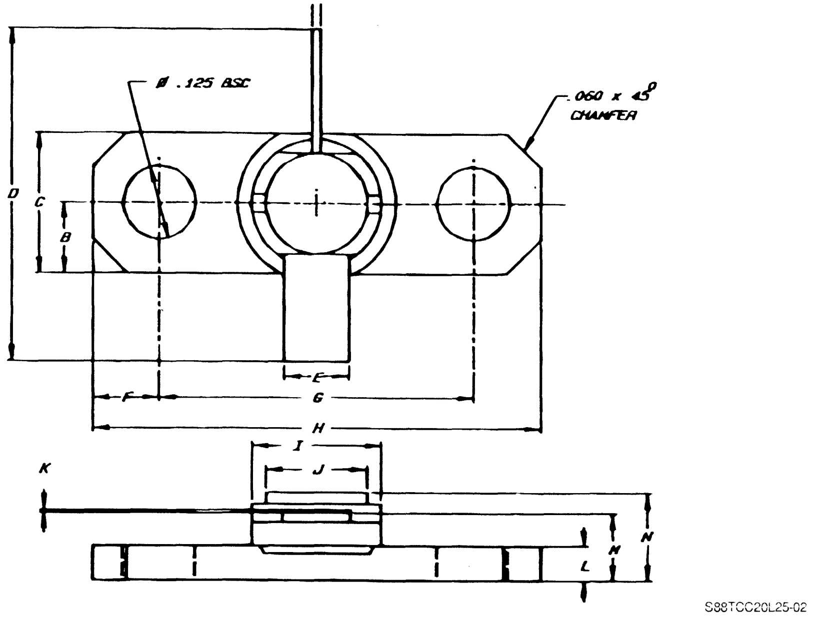
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O*	f = 2.0GHz	V_{CE} = 20V	I_C = 440mA	2.5			W
P_G	f = 2.0GHz	V_{CE} = 20V	I_C = 440mA	6			dB

* 1db Compression Point.

PACKAGE MECHANICAL DATA

.230 2LFL/FLM



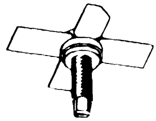
	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

TCC598

RF POWER TRANSISTORS
TV BAND IV AND V APPLICATIONS

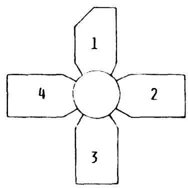
- FREQUENCY 470-860MHz
- POWER OUT 4W
- VOLTAGE 25V
- POWER GAIN 7dB
- IMD – 60dB
- CLASS A
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION



.280 4 LEAD STUD (M122)
epoxy sealed

ORDER CODE	**BRANDING**
SD1448	TCC598

PIN CONNECTION



S88-TCC598-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The TCC598 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors.The TCC598 is intended for use in linear applications up to 1GHZ, in particular, UHF television transmitters and transposers.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45	V
V_{CEO}	Collector - Emitter Voltage	25	V
V_{EBO}	Emitter - Base Voltage	3	V
I_C	Collector Current (max.)	2.3	A
P_{tot}	Total Device Dissipation at 25°C	29	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	T_C = 70°C	5.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

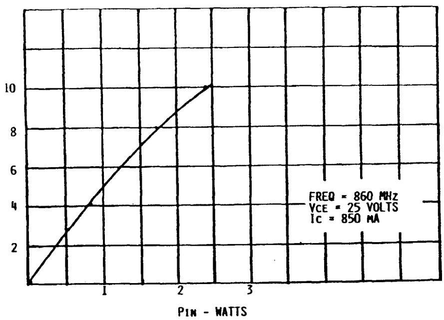
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 20mA		25			V
BV_{CBO}	I_C = 10mA		45			V
BV_{EBO}	I_E = 1mA		3			V
h_{FE}	V_{CE} = 20V	I_C = .5A	10			

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 860MHz	V_{CE} = 25V	I_C = 850MA	4			W
P_G	f = 860MHz	V_{CE} = 25V	I_C = 850MA	7			dB
IMD	f = 860MHz	V_{CE} = 25V	P_{REF} = 4W		− 60	− 58	DB
V_{SWR}	f = 860MHz	V_{CE} = 25V	P_O = 4W	∞			
C_{ob}	f = 1MHz	V_{CB} = 25V			17.5	20	pF

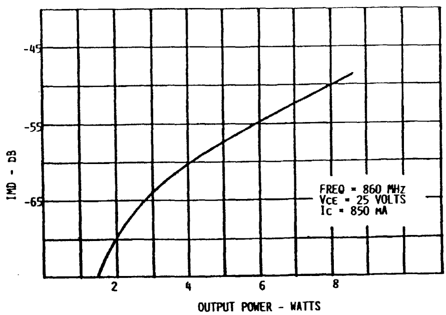
APPLICATION INFORMATION (typical curves)

POWER OUT vs. POWER IN



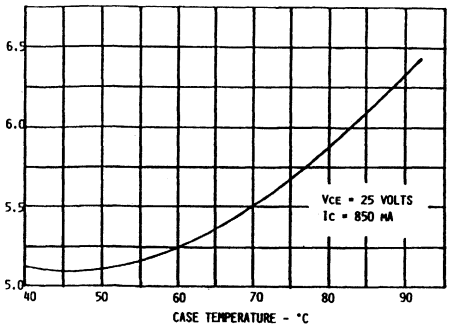
S88-TCC598-02

IMD vs. OUTPUT POWER



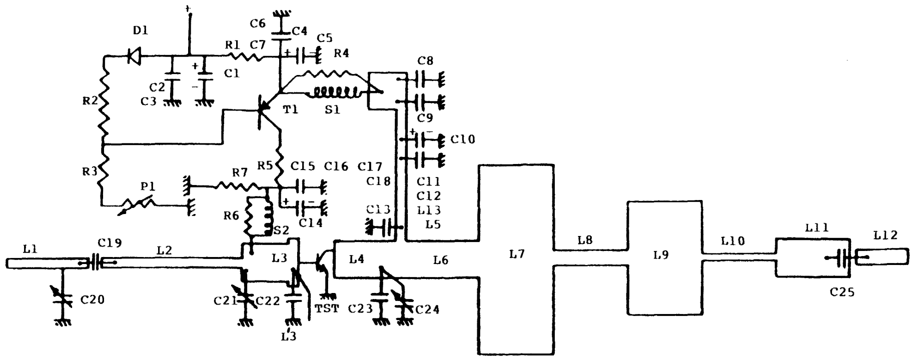
S88-TCC598-03

IR SCAN HOT SPOT θJC vs. CASE TEMPERATURE



S88-TCC598-04

TEST CIRCUIT



S88-TCC598-05

- L_1 : 50Ω transmission line - length 18mm.
- L_2 : 50Ω transmission line - length 22mm.
- L_3 : 16,4Ω transmission line - length 12mm.
- L'_3 : 10,5Ω transmission line - length 3.5mm.
- L_4 : 20Ω transmission line - length 13mm.
- L_5 : 50Ω transmission line - length 2.5mm.
- L_6 : 20Ω transmission line - length 23mm.
- L_7 : 4Ω transmission line - length 8% λ g at 860MHz.
- L_8 : 55Ω transmission line - length 7.5% λ g at 860MHz.
- L_9 : 7.5Ω transmission line - length 8% λ g at 860MHz.
- L_{10} : 100Ω transmission line - length 8% λ g at 860MHz.
- L_{11} : 20Ω transmission line - length 8% λ g at 860MHz.
- L_{12} : 50Ω transmission line - length 5mm.
- L_{13} : 50Ω transmission line -length 12mm.

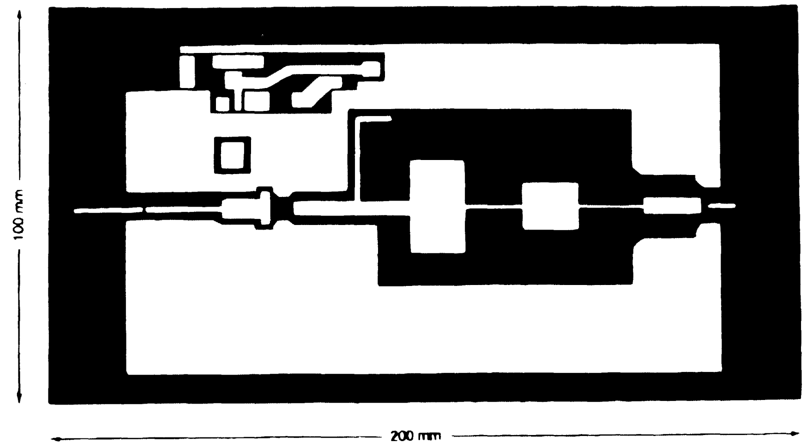
PART LIST

C_1	:	22μF -63V - SPRAGUE
$C_2 = C_6 = C_8 = C_{15}$	:	4.7nF chip LCC
$C_3 = C_7 = C_9 = C_{11} = C_{16}$	:	100nF chip LCC
$C_4 = C_{10}$	:	4.7μF- 40V- SPRAGUE
$C_5 = C_{14}$	:	4.7μF -63V- SPRAGUE
$C_{12} = C_{17} = C_{18}$	:	470pF chip LCC
$C_{13} = C_{25}$	:	47pF ATC 100B
C_{19}	:	47pF ATC 100A
C_{20}	:	0.5 -4.5pF adjustable AIRTRONIC
$C_{21} = C_{24}$	:	0.8 - 5pF adjustable JOHANSON
C_{22}	:	10pF ATC 100A
C_{23}	:	15pF ATC100B
D_1	:	1N 4001 or 1N 914
P_1	:	3.3kΩ adjustable
R_1	:	2.2Ω - 3W - SFERNICE
R_2	:	100Ω -1/2W
R_3	:	510Ω - 1/2W
$R_4 = R_6$	:	100Ω - 1/2W
$R_5 = R_7$	:	56Ω - 1W
T_1	:	BDX 54 B

- S_1 : 6 turns - ∅ wire 5/10 on 2.5mm internal diameter
- S_2 : 10 to 12 turns on R6 - ∅ wire 5/10.

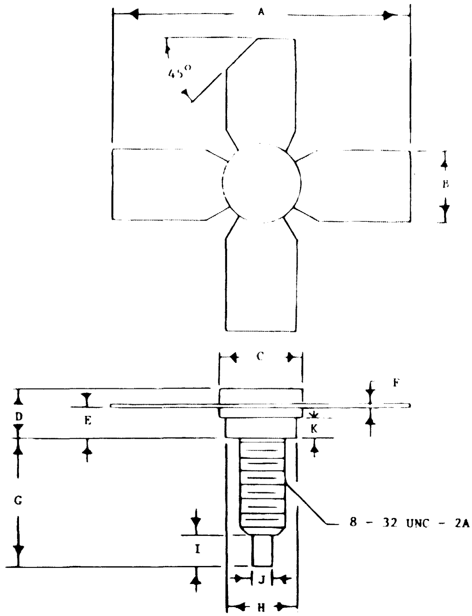
PC BOARD MATERIAL
$\varepsilon_r = 2.55$ .020" Thick

TEST CIRCUIT



PACKAGE MECHANICAL DATA

.280 4L STUD



	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

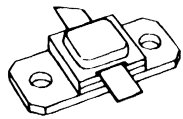
	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065

SGS-THOMSON
MICROELECTRONICS

TCC1417-12

RF & MICROWAVE TRANSISTORS
MICROWAVE TELECOMMUNICATION APPLICATIONS

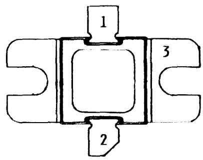
- FREQUENCY 1.4-1.7GHz
- POWER OUT 12W
- POWER GAIN 7.8dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2 LFL (M147)
hermetic sealed

ORDER CODE	BRANDING
SD1869	1417-12

PIN CONNECTION



S88TCC1417-12-01

1 emitter
2 collector
3 base

DESCRIPTION

The TCC1417-12 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC1417-12 is a 24V device designed to provide 12W over the 1.4-1.7GHz band with a minimum gain of 7.8dB. The SD1869 is branded 1417-12.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15	V
V_{CBO}	Collector - Emitter Voltage	40	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	3.6	A
P_{tot}	Total Device Dissipation at + 25°C	38.9	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	4.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

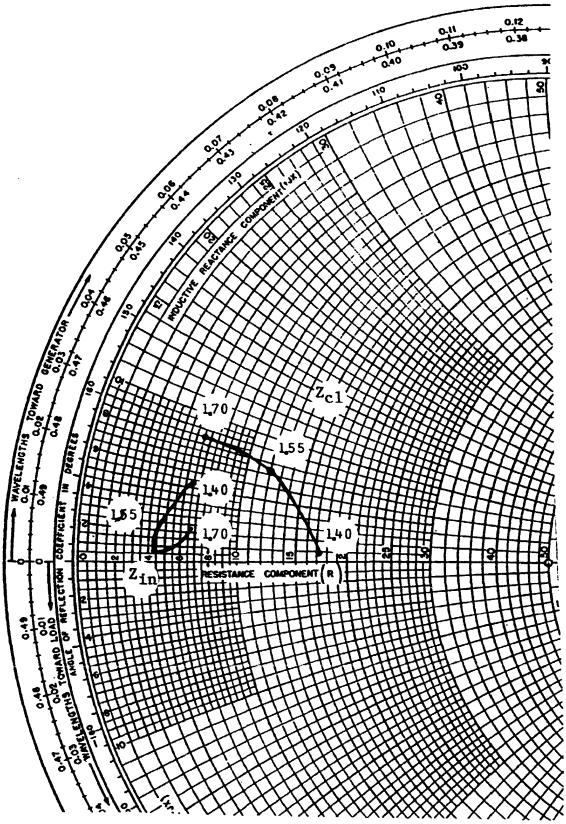
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 4mA	I_B = 0	15			V
BV_{CBO}	I_C = 4mA	V_{BE} = 0	45			V
BV_{EBO}	I_E = 4mA	I_C = 0	3.5			V
I_{CEO}	V_{CB} = 24V	V_{BE} = 0			.2	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 1.4 – 1.7GHz	V_{CB} = 24V	P_{IN} = 2W	12			W
P_G	f = 1.4 – 1.7GHz	V_{CB} = 24V	P_{IN} = 2W	7.8			dB
ηc	f = 1.4 – 1.7GHz	V_{CB} = 24V	P_{OUT} = 12W	45			%

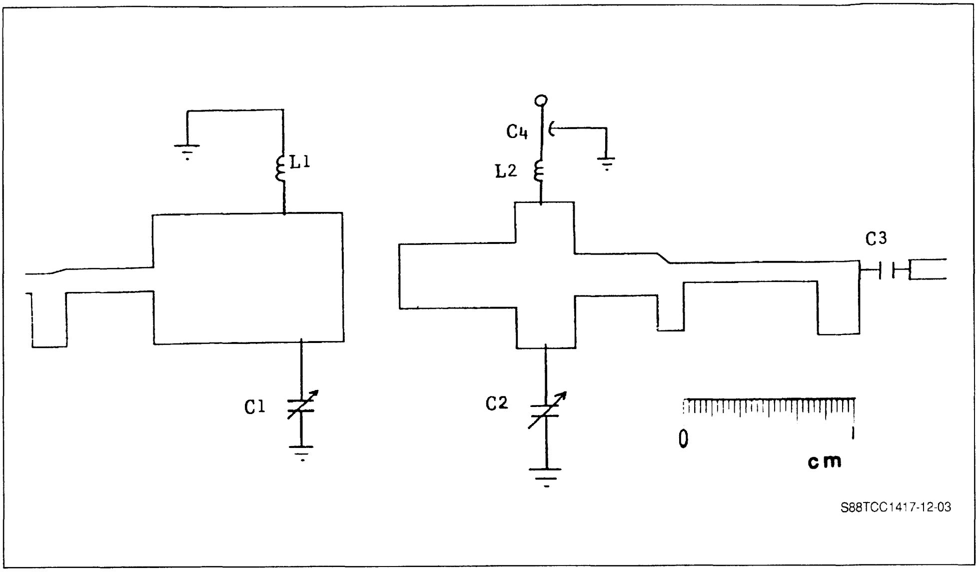
TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE WORKSHEET



F_{GHZ}	Z_{IN} (Ω)	Z_{CL} (Ω)
1.4	6.6 + j5.3	17.3 + j0.7
1.55	4.3 + j0.8	12.2 + j7.4
1.7	6.4 + j2.3	6.7 + j8.6

Z_{CL} = The optimum load impedance into which the transistor operates at the specified power out, voltage

S88TCC1417-12-02

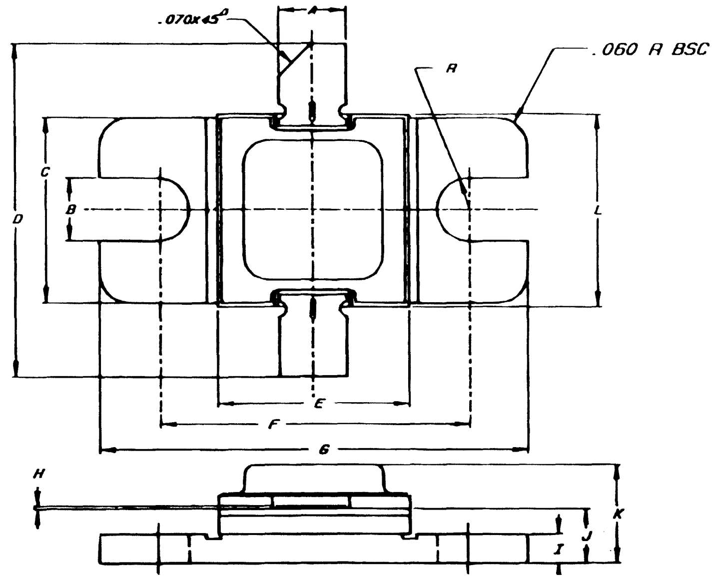


PARTS LIST

ITEM REF.	Description of ITEM
L1	3 Turns # 28 Wire .080" Dia
L2	3 Turns # 28 Wire .080" Dia
C1	.4 – 2.5pF Johanson Trimmer Cap.
C2	.4 – 2.5pF Johanson Trimmer Cap.
C3	100pF ATC Chip Capacitor Size A
C4	15.000pF Emi Filter Cap (erie)
	Circuit Board Material
	Epsilam 10
	er = 10.2 T = .050" Ioz Copper

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.135/3.43	.145/3.68
B	.125/3.18 BSC	
C	.380/9.65	.390/9.91
D	.885/22.48	
E	.392/9.96	.402/10.29
F	.645/16.38	.655/16.64

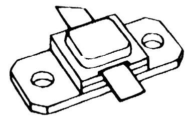
	Minimum Inches/mm	Maximum Inches/mm
G	.895/22.73	.905/22.99
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.105/2.67	.125/3.18
K		.230/5.84
L	.392/9.96	.402/10.29

SGS-THOMSON MICROELECTRONICS

TCC1417-25

RF & MICROWAVE TRANSISTORS MICROWAVE TELECOMMUNICATION APPLICATIONS

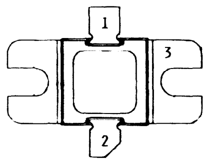
- FREQUENCY 1.4-1.7GHz
- POWER OUT 25W
- POWER GAIN 8.0dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2 LFL (M147)
hermetic sealed

ORDER CODE	**BRANDING**
SD1866	1417-25

PIN CONNECTION



S88TCC1417-25-01

1 emitter
2 collector
3 base

DESCRIPTION

The TCC1417-25 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC1417-25 is a 24 Volt device designed to provide 25 Watts over the 1.4-1.7GHz band with a minimum gain of 7.5dB.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15.0	V
V_{CBO}	Collector - Emitter Voltage	40.0	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	6.1	A
P_{tot}	Total Device Dissipation at + 25°C	58	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

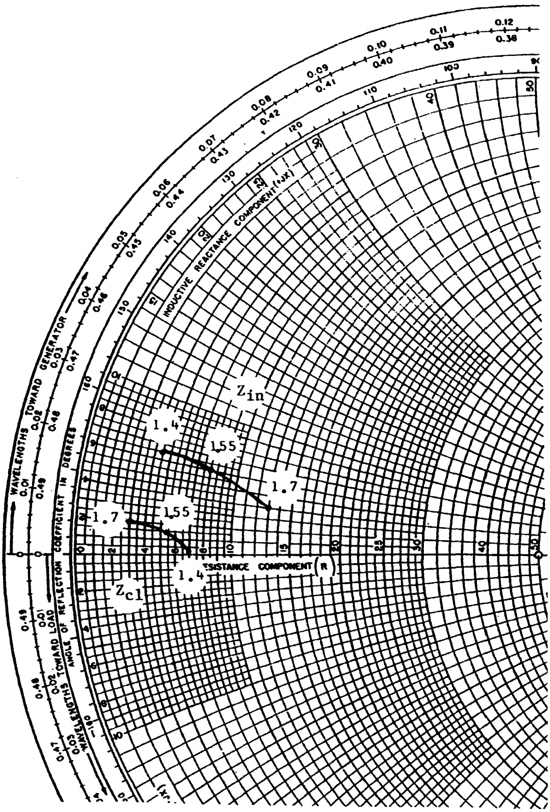
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 10mA	I_B = 0	15			V
BV_{CBO}	I_C = 10mA	V_{BE} = 0	40			V
BV_{EBO}	I_E = 10mA	I_C =	3.5			V
I_{CBO}	V_{CB} = 24V	V_{BE} =			0.5	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 1.4 – 1.7GHz	V_{CB} = 24V	P_{IN} = 4.4W	25			W
P_G	f = 1.4 – 1.7GHz	V_{CB} = 24V	P_{IN} = 4.4W	8			dB
ηc	f = 1.4 – 1.7GHz	V_{CB} = 24V	P_{OUT} = 25W	40			%

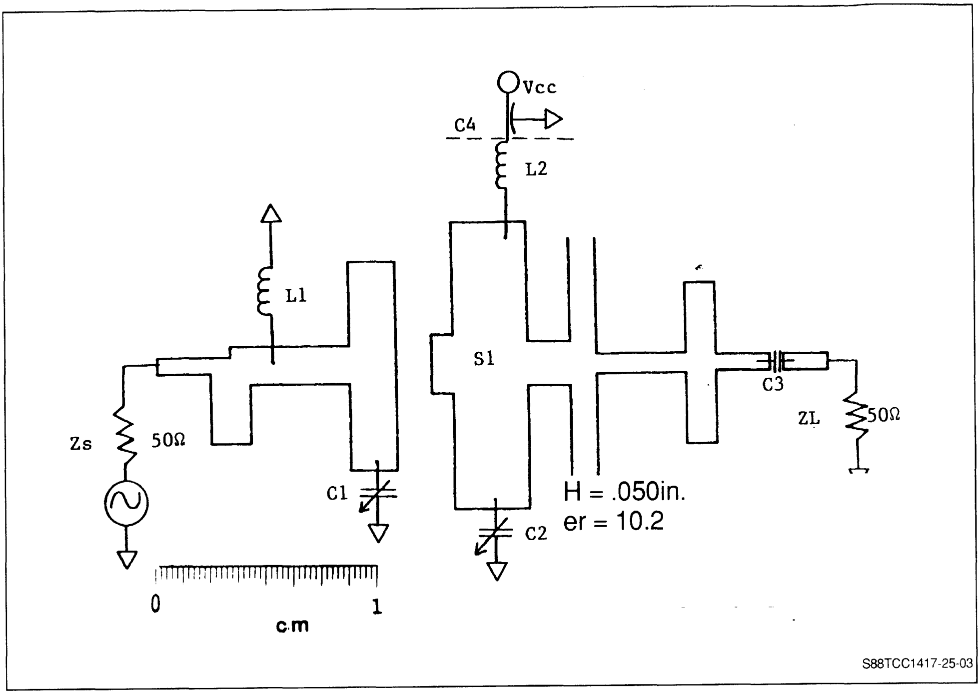
TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE WORKSHEET



F_{GHZ}	Z_{IN} (Ω)	Z_{CL} (Ω)
1.4	4.5 + j6.5	3.0 + j2.0
1.55	8.0 + j6.0	5.2 + j1.5
1.7	13 + j4.0	7.0 + j0.1

Z_{CL} = The optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

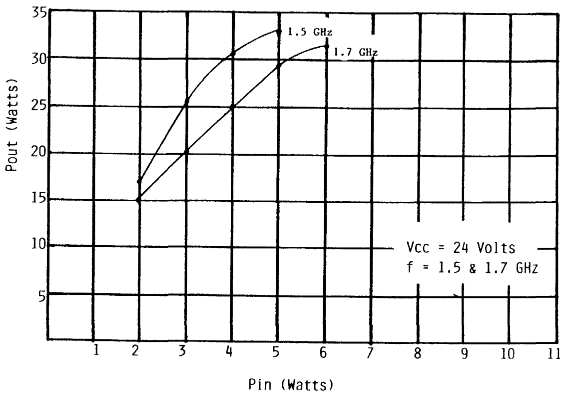
S88TCC1417-25-02



PARTS LIST

ITEM REF.	Description of ITEM
L1	4 Turnchoke # 28 Wire .080" Dia
L2	4 Turnchoke # 28 Wire .080" Dia
C1	.4 – 2.5pF Johanson Capacitor
C2	.4 – 2.5pF Johanson Capacitor
C3	100pF Chip Capacitor ATC
C4	15.000pF Emi Filter
S1	Epsilam 10 er = 10.2 T = .050" loz Cu
	SMA Launcher CDI (2 pieces)
	.397 so Fixture Housing
	Heat Sink

TYPICAL DATA CURVES WORKSHEET

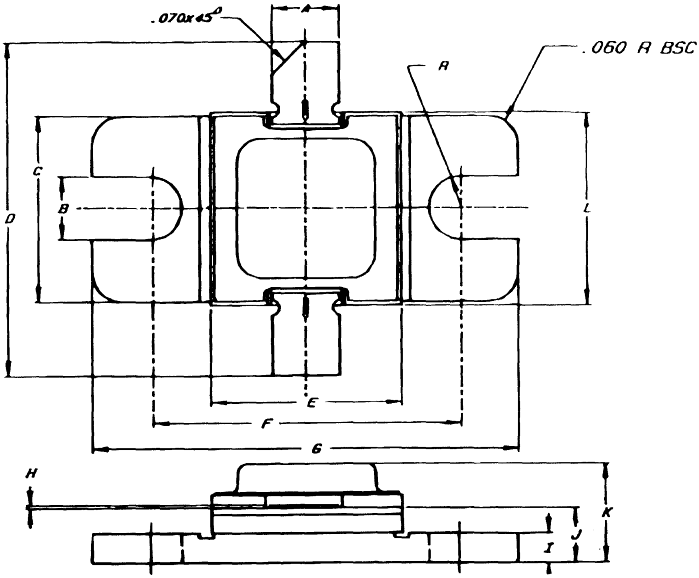


At V_{CC} = 24V
f = 1.5 and 1.7GHz

S88TCC1417-25-04

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



S88TCC1417-25-05

	Minimum Inches/mm	Maximum Inches/mm
A	.135/3.43	.145/3.68
B	.125/3.18 BSC	
C	.380/9.65	.390/9.91
D	.885/22.48	
E	.392/9.96	.402/10.29
F	.645/16.38	.655/16.64

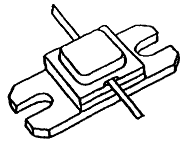
	Minimum Inches/mm	Maximum Inches/mm
G	.895/22.73	.905/22.99
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.105/2.67	.125/3.18
K		.230/5.84
L	.392/9.96	.402/10.29

SGS-THOMSON MICROELECTRONICS

TCC1720-3

RF & MICROWAVE TRANSISTORS
MICROWAVE TELECOMMUNICATION TRANSISTORS

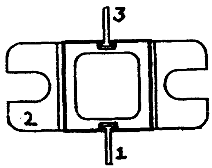
- FREQUENCY 1.7-2.0GHz
- POWER OUT 3.0W
- POWER GAIN 8.0dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2LFL (M155)
hermetic sealed

ORDER CODE	**BRANDING**
SD1876	1720-3

PIN CONNECTION



S88TCC172063-01

1 emitter
2 collector
3 base

DESCRIPTION

The TCC1720-3 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC1720-3 is a 24V device designed to provide 3W over the 1.7-2.0GHz band with a minimum gain of 8.0dB.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15	V
V_{CBO}	Collector - Emitter Voltage	45	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.7	A
P_{tot}	Total Device Dissipation at + 25°C	11.7	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	15	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

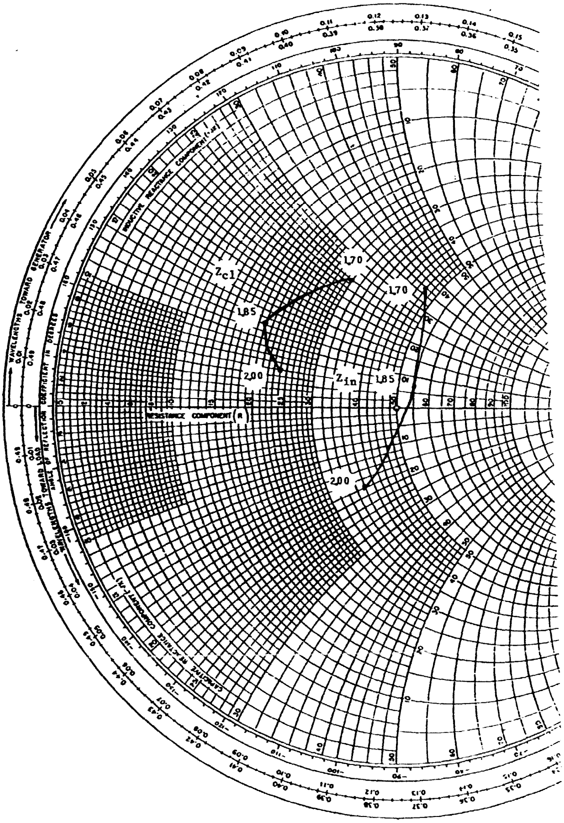
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 1mA	I_B = 0	15			V
BV_{CBO}	I_C = 1mA	V_{BE} = 0	45			V
BV_{EBO}	I_E = 1mA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 24V	V_{BE} = 0			0.05	mA
h_{FE}	V_{CE} = 5V	I_C = .1A	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 1.7-2.0GHz	V_{CB} = 24V	P_{IN} = 0.5W	3.0			W
P_G	f = 1.7-2.0GHz	V_{CB} = 24V	P_{IN} = 0.5W	8.0			dB
ηc	f = 1.7-2.0GHz	V_{CB} = 24V	P_{OUT} = 3.0W	40			%

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



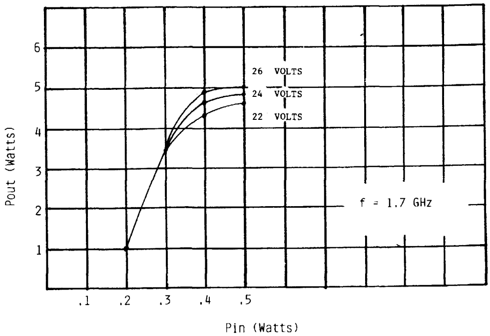
F GHz	Z IN Ω	Z CL Ω
1.7	46 + j36	30 + j26
1.85	55 + j7.0	20 + j17
2.0	38 – j18	24 + j6

Z_{CL} = the optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

S88TCC1720-3-02

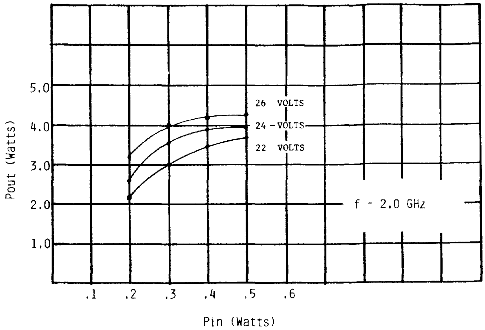
TYPICAL DATA CURVES

POUT vs PIN



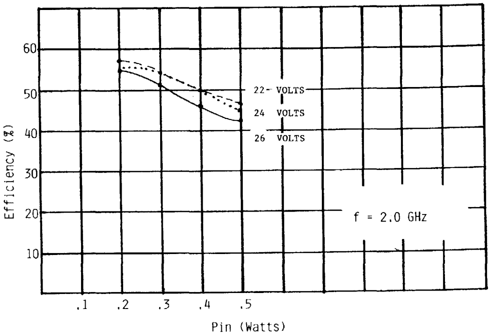
S88TCC1720-3-03

POUT vs PIN



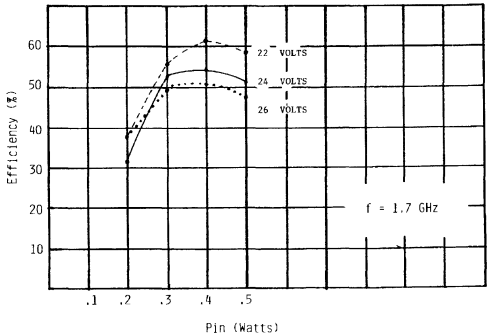
S88TCC1720-3-04

EFFICIENCY vs PIN



S88TCC1720-3-05

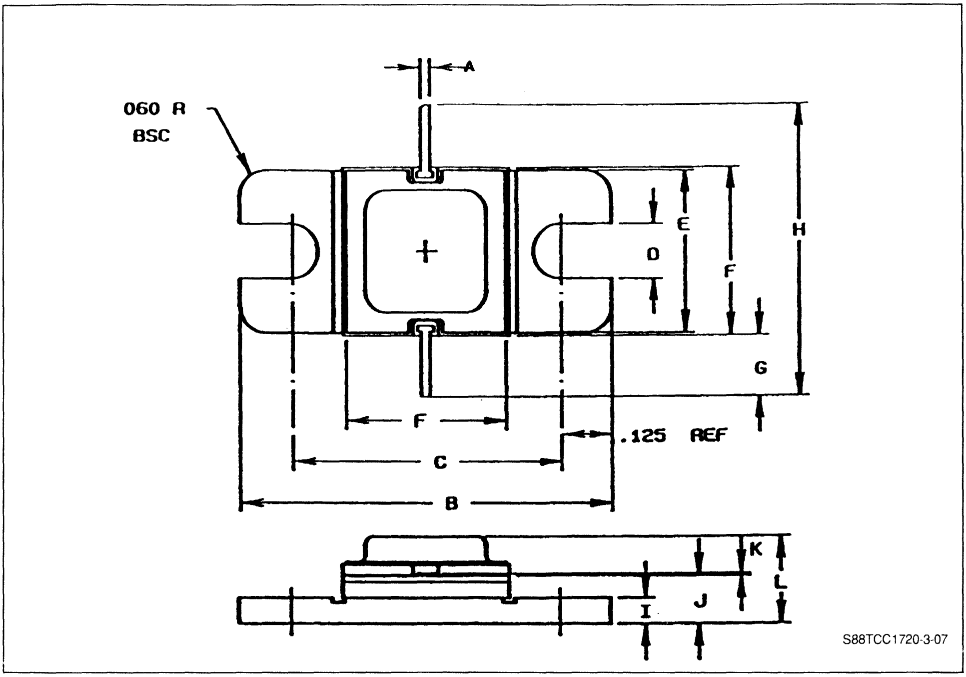
EFFICIENCY vs PIN



S88TCC1720-3-06

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.015/0.38	.025/0.64
B	.890/22.61	.910/23.11
C	.640/16.26	.660/16.76
D	.120/3.05	.130/3.30
E	.380/9.65	.390/9.91
F	.392/9.96	.402/10.29

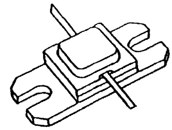
	Minimum Inches/mm	Maximum Inches/mm
G	.240/6.10	.260/6.60
H	.885/22.48	
I	.055/1.40	.065/1.65
J	.110/2.79	.130/3.30
K	.003/0.08	.006/0.15
L	.200/5.08	.200/5.59

SGS-THOMSON
MICROELECTRONICS

TCC1720-6

RF & MICROWAVE TRANSISTORS
MICROWAVE TELECOMMUNICATION APPLICATIONS

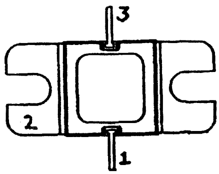
- FREQUENCY 1.7-2.0GHz
- POWER OUT 6.0W
- POWER GAIN 8.0dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2LFL (M155)
hermetic sealed

ORDER CODE	**BRANDING**
SD1885	1720-6

PIN CONNECTION



S88TCC1720-6-01

1 emitter
2 collector
3 base

DESCRIPTION

The TCC1720-6 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC1720-6 is a 24V device designed to provide 6W over the 1.7-2.0GHz band with a minimum gain of 8dB.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15	V
V_{CBO}	Collector - Emitter Voltage	40	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	1.7	A
P_{tot}	Total Device Dissipation at + 25°C	18.4	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	9.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

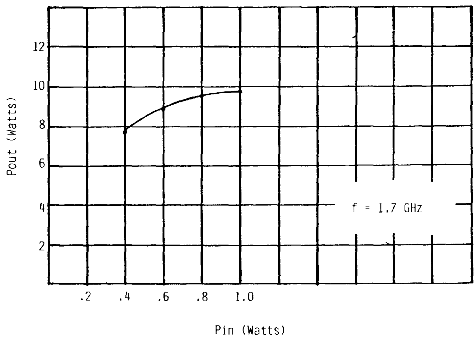
Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CEO}	I_C = 2mA	I_B = 0	15			V
BV_{CBO}	I_C = 2mA	V_{BE} = 0	40			V
BV_{EBO}	I_E = 2mA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 24V	V_{BE} = 0			0.1	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	15		150	

DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	f = 1.7-2.0GHz	V_{CB} = 24V	P_{IN} = 0.9W	6.0			W
P_G	f = 1.7-2.0GHz	V_{CB} = 24V	P_{IN} = 0.9W	8.0			dB
nc	f = 1.7-2.0GHz	V_{CB} = 24V	P_{OUT} = 6W	40			%

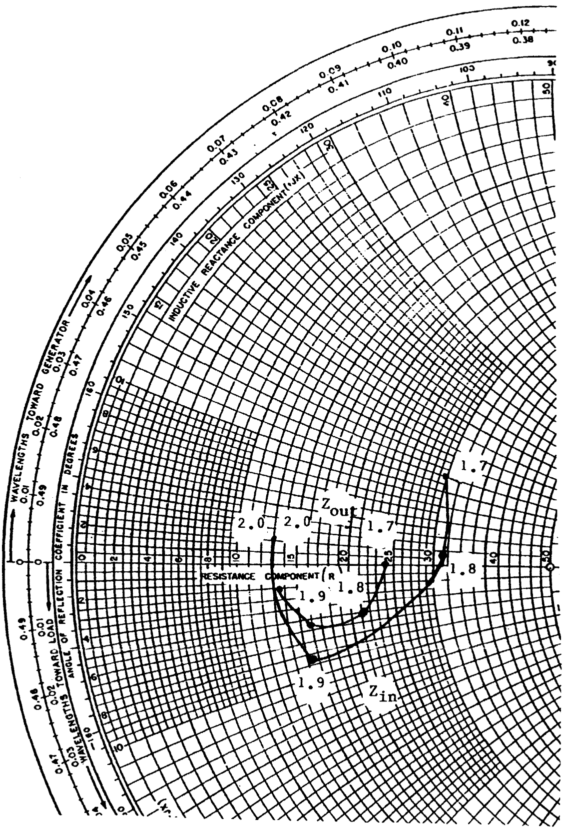
TYPICAL DATA CURVES

P_{OUT} vs. P_{IN} AT f = 1.7GHz



S88TCC1720-6-02

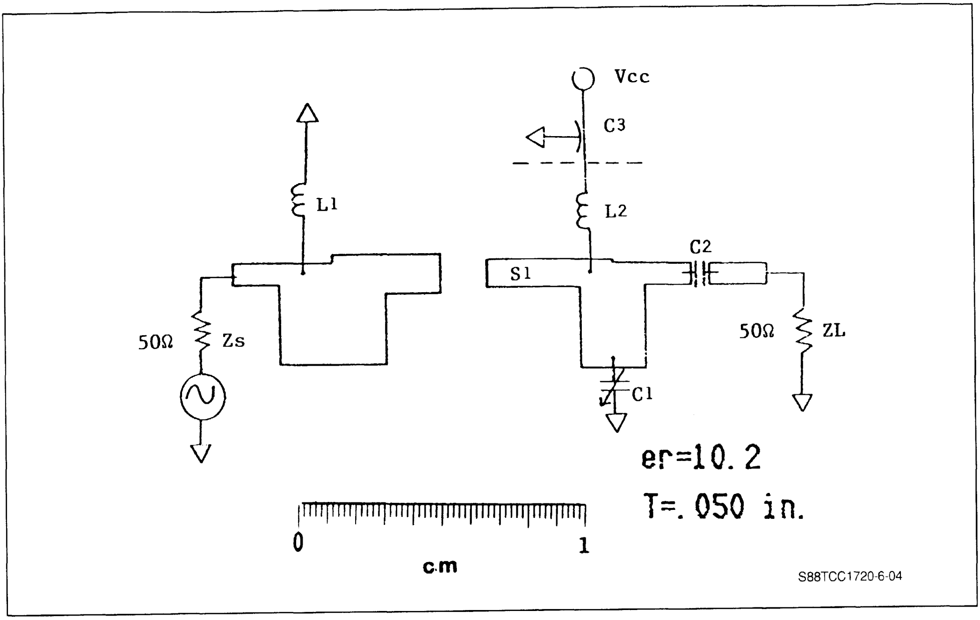
TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



F GHz	Z IN Ω	Z OUT Ω
1.7	30 + j12	24 + j0
1.8	31.5 + j1.5	21.5 – j5.0
1.9	15.5 – j8.5	16 – j5.5
2.0	13 + j2.2	13.5 – j2.0

Z_{OUT} = conjugate of the optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

S88TCC1720-6-03

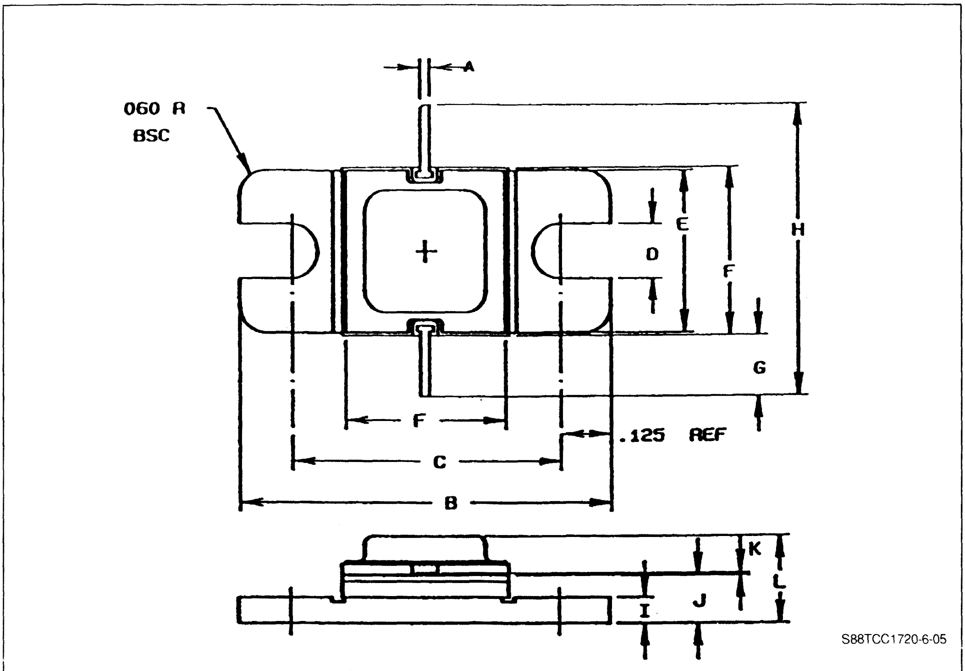


PARTS LIST

ITEM REF.	Descritpion of ITEM
LI	3 Turn Choke #28 ,Wire .080# ID.
L2	3 Turn Choke #28 ,Wire .080# ID.
CI	.4-2.5pF Johanson Cap.
C2	100pF Chip Cap. ATC
C3	15,000pF Emi Murata/Erie
S1	Epsilam 10 er = 10.2 T = .050" I oz cu
	SMA Launcher CDI (2 pieces)
	397 so Fixture Housing
	Heat Sink

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.015/0.38	.025/0.64
B	.890/22.61	.910/23.11
C	.640/16.26	.660/16.76
D	.120/3.05	.130/3.30
E	.380/9.65	.390/9.91
F	.392/9.96	.402/10.29

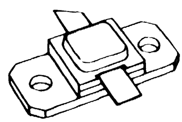
	Minimum Inches/mm	Maximum Inches/mm
G	.240/6.10	.260/6.60
H	.885/22.48	
I	.055/1.40	.065/1.65
J	.110/2.79	.130/3.30
K	.003/0.08	.006/0.15
L	.200/5.08	.200/5.59

SGS-THOMSON
MICROELECTRONICS

TCC1720-10

RF & MICROWAVE TRANSISTORS
MICROWAVE TELECOMMUNICATION APPLICATIONS

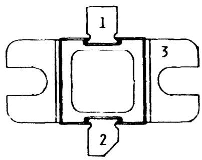
- FREQUENCY 1.7-2.0GHz
- POWER OUT 10W
- POWER GAIN 7.0dB
- VOLTAGE 24V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2 LFL (M147)
hermetic sealed

ORDER CODE	BRANDING
SD1860	1720-10

PIN CONNECTION



S88TCC1720-10-01

1 emitter
2 collector
3 base

DESCRIPTION

The TCC1720-10 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC1720-10 is a 24V device designed to provided 10W over the 1.7-2.0GHz band with a minimum gain of 7.0dB.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15	V
V_{CBO}	Collector - Emitter Voltage	40	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	4.1	A
P_{tot}	Total Device Dissipation at + 25°C	43.8	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	4.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

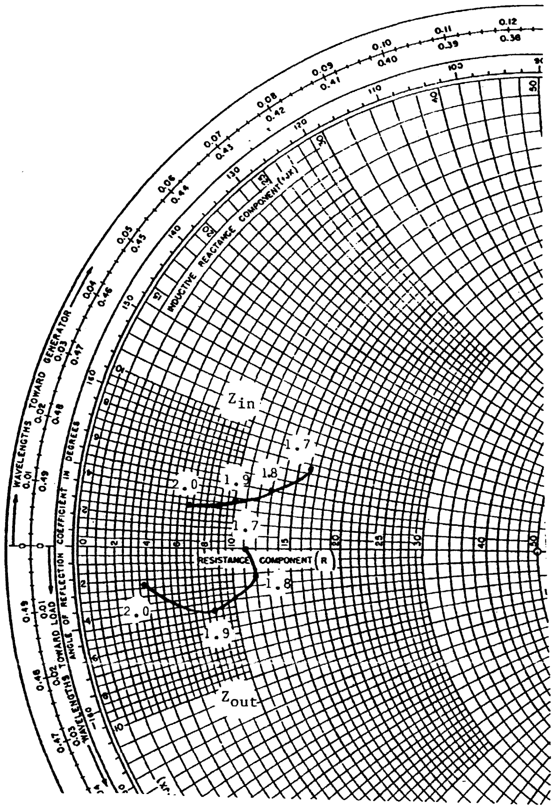
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 4mA	I_B = 0	15			V
BV_{CBO}	I_C = 4mA	V_{BE} = 0	40			V
BV_{EBO}	I_E = 4mA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 24V	V_{BE} = 0			.2	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 1.7 – 2.0GHz	V_{CB} = 24V	P_{IN} = 2.0W	10			W
P_G	f = 1.7 – 2.0GHz	V_{CB} = 24V	P_{IN} = 2.0W	7			dB
ηc	f = 1.7 – 2.0GHz	V_{CB} = 24V	P_{OUT} = 10W	.45			%

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE WORKSHEET



F GHZ	Z IN (Ω)	Z OUT (Ω)
1.7	16.2 + j6.6	11.3 + j0
1.8	13.8 + j5.0	12 – j2.3
1.9	10 + j3.9	8 – j4.5
2.0	6.8 + j3.0	3.8 – j2.2

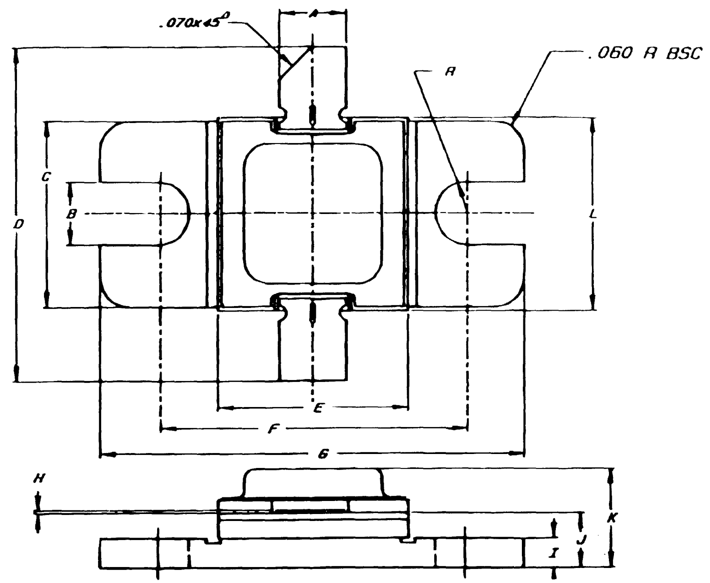
Z_{OUT} = Conjugate of the optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

S88-TCC1720-10-02

Special conditions : V_{CC} = 24 Volts POWER IN = 2 Watts

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.135/3.43	.145/3.68
B	.125/3.18 BSC	
C	.380/9.65	.390/9.91
D	.885/22.48	
E	.392/9.96	.402/10.29
F	.645/16.38	.655/16.64

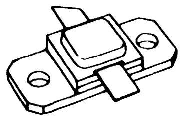
	Minimum Inches/mm	Maximum Inches/mm
G	.895/22.73	.905/22.99
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.105/2.67	.125/3.18
K		.230/5.84
L	.392/9.96	.402/10.29

SGS-THOMSON
MICROELECTRONICS

TCC1720-13

RF & MICROWAVE TRANSISTORS
MICROWAVE TELECOMMUNICATION APPLICATIONS

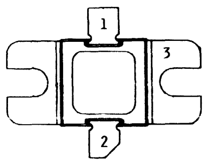
- FREQUENCY 1.7-2.0GHz
- POWER OUT 13.0W
- POWER GAIN 7.7dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2LFL (M147)
hermetic sealed

ORDER CODE	**BRANDING**
SD1883	1720-13

PIN CONNECTION



S88TCC1720-13-

1 emitter
2 collector
3 base

DESCRIPTION

The TCC1720-13 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC1720-13 is a 24V device designed to provide 13W over the 1.7-2.0GHz band with a minimum gain of 7.7dB.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15	V
V_{CBO}	Collector - Emitter Voltage	45	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	4.1	A
P_{tot}	Total Device Dissipation at + 25°C	43.8	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	4.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

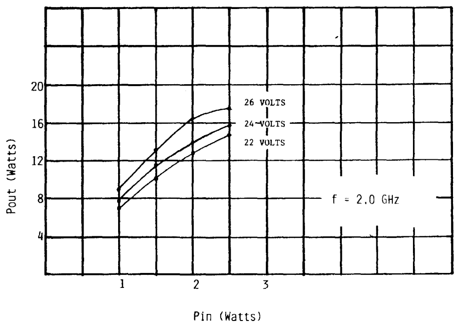
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 5mA	I_B = 0	15			V
BV_{CBO}	I_C = 5mA	V_{BE} = 0	45			V
BV_{EBO}	I_E = 5mA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 5V	V_{BE} = 0			.25	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 1.7-2.0GHz	V_{CB} = 24V	P_{IN} = 2.2W	13	14		W
P_G	f = 1.7-2.0GHz	V_{CB} = 24V	P_{IN} = 2.2W	7.7	8.5		dB
ηc	f = 1.7-2.0GHz	V_{CB} = 24V	P_{OUT} = 13W	45	48		%

TYPICAL DATA CURVES

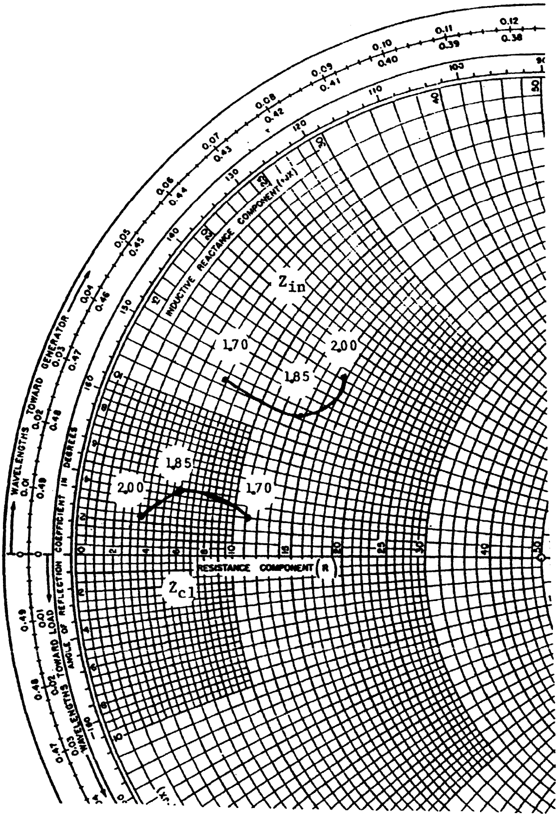
POUT vs PIN



S88TCC1720-13-02

V_{CC} = 22/24/26V

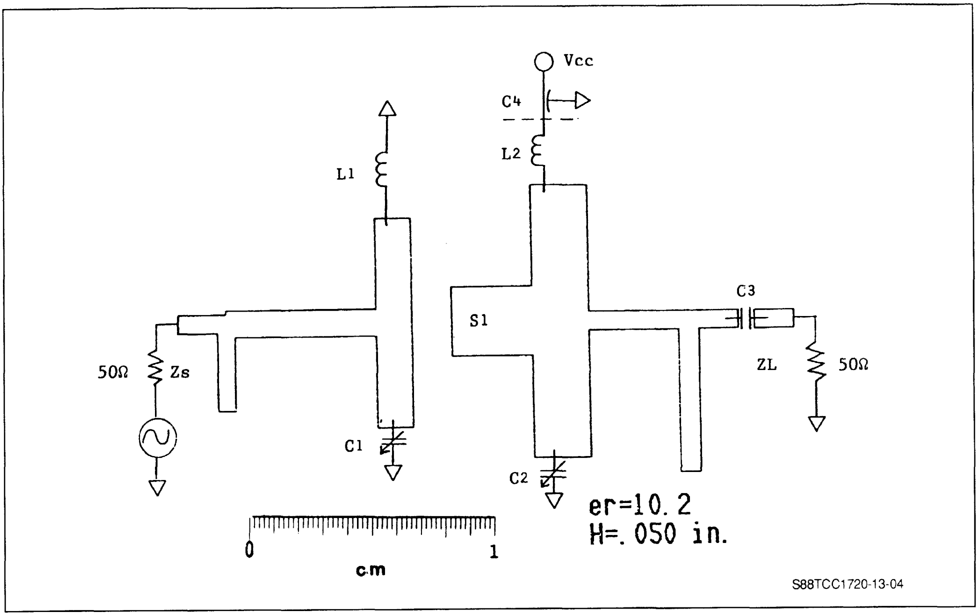
TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



F_{GHZ}	$Z_{IN}\Omega$	$Z_{CL}\Omega$
1.7	6.7 + j12.4	11.1 + j3.0
1.85	13.5 + j12.3	6.0 + j4.4
2.0	15.8 + j17.4	3.6 + j2.5

Z_{cl} = the optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

S88TCC1720-13-03

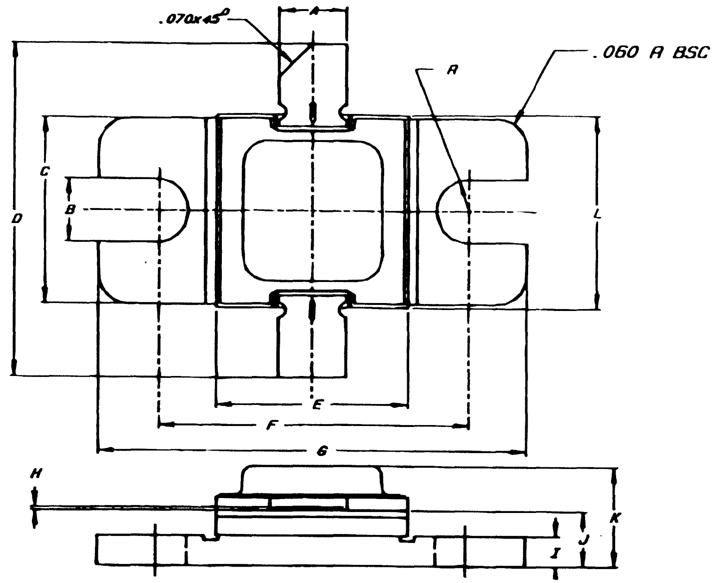


PARTS LIST

ITEM REF.	Descritpion of ITEM
L1	3 Turn Choke #28 Wire .080# Dia.
L2	3 Turn Choke #28 Wire .080# Dia.
C1	.4-2.5pF Johanson Capacitor
C2	.4-2.5pF Johanson Capacitor
C3	100pF Chip Capacitor ATC
C4	15.000pF Emi Filter
SI	Epsilam 10 er = 10.2 T = .050" I_{02} Copper
	SMA Launcher CDI (2 pieces)
	.397 so Fixture Housing
	Heat Sink

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.135/3.43	.145/3.68
B	.125/3.18 BSC	
C	.380/9.65	.390/9.91
D	.885/22.48	
E	.392/9.96	.402/10.29
F	.645/16.38	.655/16.64

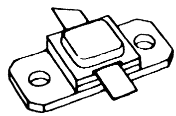
	Minimum Inches/mm	Maximum Inches/mm
G	.895/22.73	.905/22.99
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.105/2.67	.125/3.18
K		.230/5.84
L	.392/9.96	.402/10.29

SGS-THOMSON
MICROELECTRONICS

TCC1720-20

RF & MICROWAVE TRANSISTORS
MICROWAVE TELECOMMUNICATION APPLICATIONS

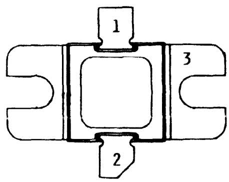
- FREQUENCY 1.7-2.0GHz
- POWER OUT 20.0W
- POWER GAIN 7.5dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2LFL (M147)
hermetic sealed

ORDER CODE	**BRANDING**
SD1873	1720-20

PIN CONNECTION



S88TCC1720-20-01

1 emitter
2 collector
3 base

DESCRIPTION

The TCC1720-20 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC1720-20 is a 24V device designed to provide 10W over 2.2-2.3GHz band with minimum gain of 7.5dB.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CE}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	4.1	A
P_{tot}	Total Device Dissipation at + 25°C	38.9	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	4.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

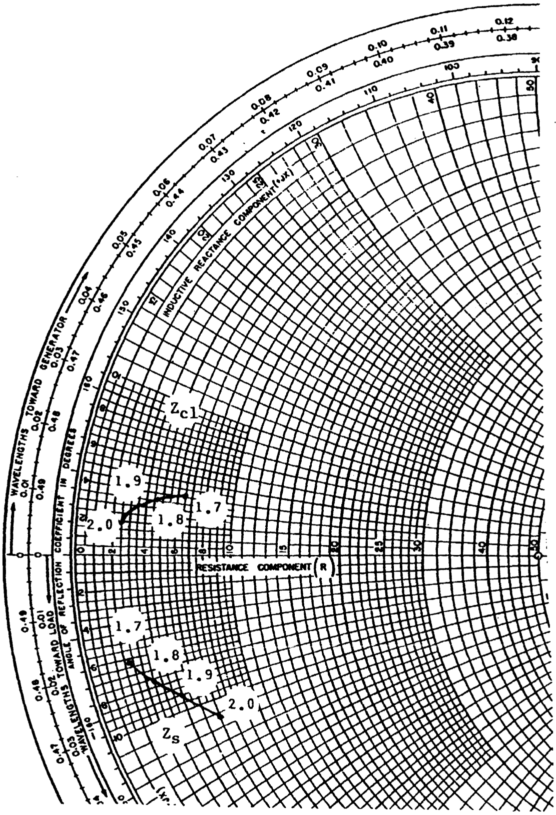
STATIC

Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CBO}	I_C = 4mA	I_B = 0	40			V
BV_{EBO}	I_E = 4mA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 24V	I_E = 0			0.2	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	15		150	

DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	f = 2.2 – 2.3GHz	V_{CB} = 24V	P_{IN} = 2.0W	10			W
P_G	f = 2.2 – 2.3GHz	V_{CB} = 24V	P_{IN} = 2.0W	7			dB
ηc	f = 2.2 – 2.3GHz	V_{CB} = 24V	P_{OUT} = 10W	40			%

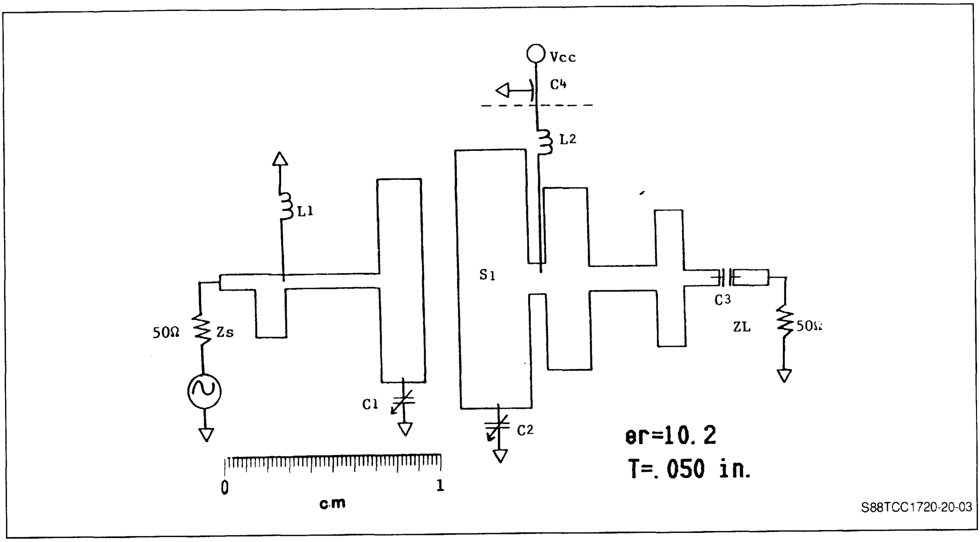
TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



S88TCC1720-20-02

F GHZ	Z IN (Ω)	Z CL (Ω)
2.0	15 – j0.5	5.0 + j5.5
2.1	20 – j3.5	7.5 + j7.5
2.2	33 – j10	8.5 + j9.5
2.3	33 – j17	10.0 + j13

Z_{CL} = the optimum load impedance into switch the transistor operates at the specified power out, voltage and frequency.

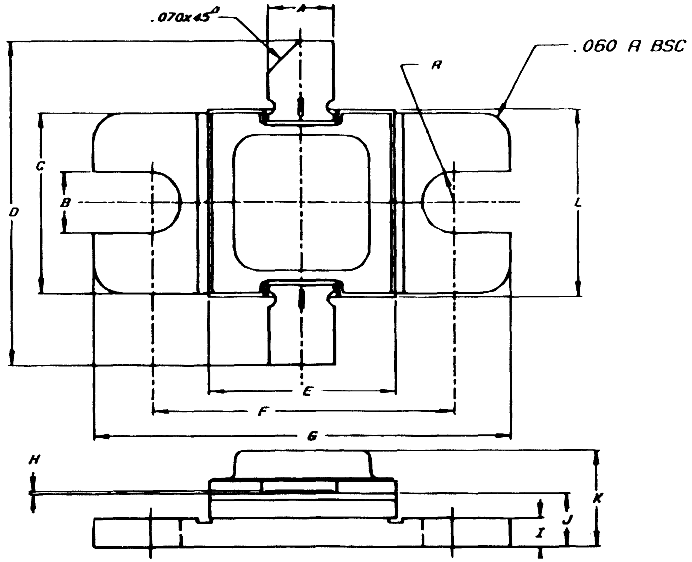


PARTS LIST

ITEM REF.	Description of ITEM
L1	3 Turn # 28 Wire .080" Dia
L2	3 Turn # 28 Wire .080" Dia
C1	.4 – 2.5pF Johanson Capacitor
C2	100pF Chip Capacitor
C3	15.000pF Emi Filter Murata/erie
S1	Epsilam 10 er = 10.2 T = .050" loz Copper
	SMA Launcher CDI (2 pieces)
	.397 so Fixture Housing
	Heat Sink

PACKAGE MECHANICAL DATA

. 397 x . 397 2LFL



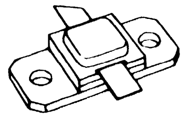
	Minimum Inches/mm	Maximum Inches/mm
A	.135/3.43	.145/3.68
B	.125/3.18 BSC	
C	.380/9.65	.390/9.91
D	.885/22.48	
E	.392/9.96	.402/10.29
F	.645/16.38	.655/16.64

	Minimum Inches/mm	Maximum Inches/mm
G	.895/22.73	.905/22.99
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.105/2.67	.125/3.18
K		.230/5.84
L	.392/9.96	.402/10.29

TCC1720-25

RF & MICROWAVE TRANSISTORS MICROWAVE TELECOMMUNICATION APPLICATIONS

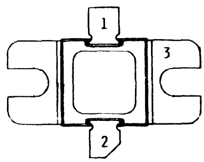
- FREQUENCY 1.7-2.0GHz
- POWER OUT 25.0W
- POWER GAIN 7.4dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2LFL (M147)
hermetic sealed

ORDER CODE	BRANDING
SD1874	1720-25

PIN CONNECTION



S88TCC1720-25-01

1 emitter
2 collector
3 base

DESCRIPTION

The TCC1720-25 is an internally input and output matched NPN silicon0 transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC1720-25 is a 24V device designed to provide 25W over the 1.7-2. OGHZ band with a minimum gain of 7.4dB.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15	V
V_{CBO}	Collector - Emitter Voltage	40	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	6.1	A
P_{tot}	Total Device Dissipation at + 25°C	58.3	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

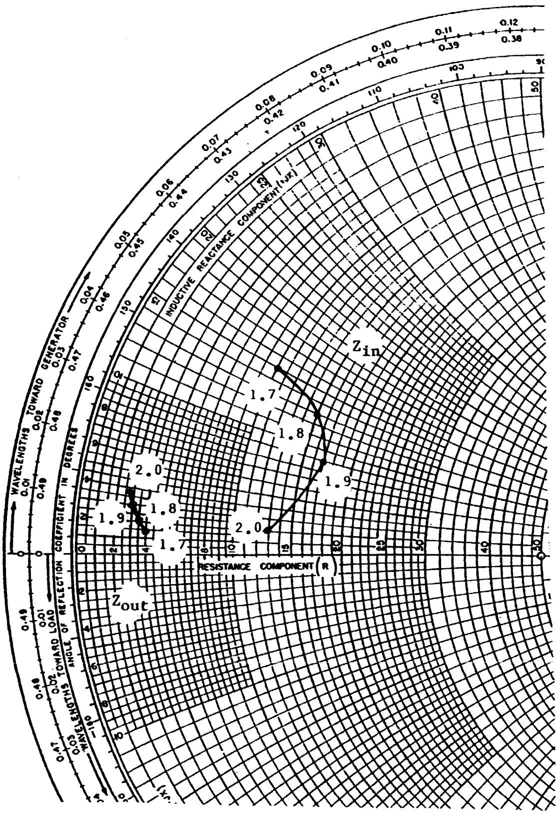
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 10mA	I_B = 0	15			V
BV_{CBO}	I_C = 10mA	V_{BE} = 0	40			V
BV_{EBO}	I_E = 10mA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 24V				0.5	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 1.7-2.0GHz	V_{CB} = 24V	P_{IN} = 4.5W	25			W
P_G	f = 1.7-2.0GHz	V_{CB} = 24V	P_{IN} = 4.5W	7.4			dB
nc	f = 1.7-2.0GHz	V_{CB} = 24V	P_{OUT} = 25W	40			%

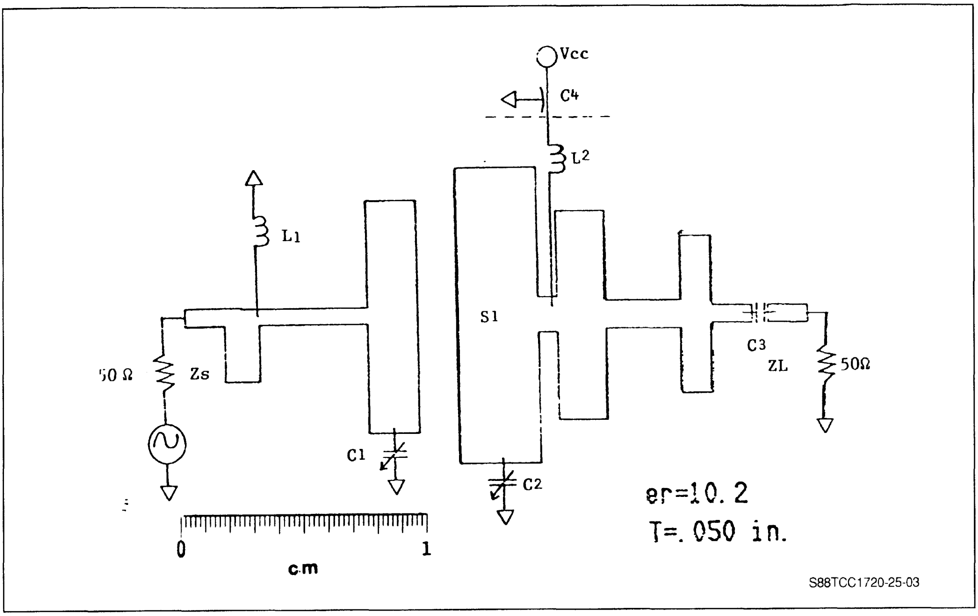
TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



F GHz	Z IN Ω	Z OUT Ω
1.7	10 + j15	4 + j3.5
1.8	15 + j13	3.5 + j2.5
1.9	17 + j9	3.0 + j3.0
2.0	13 + j2	2.5 + j3.5

Z_{OUT} = conjugate of the optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

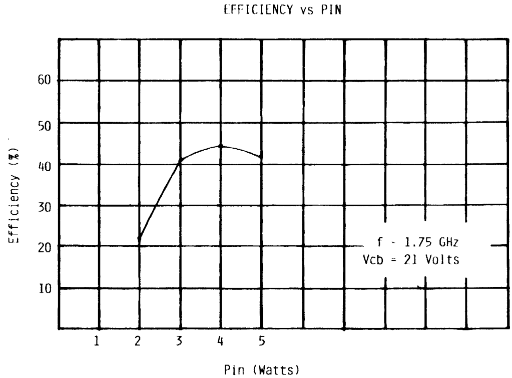
S88TCC1720-25-02



PARTS LIST

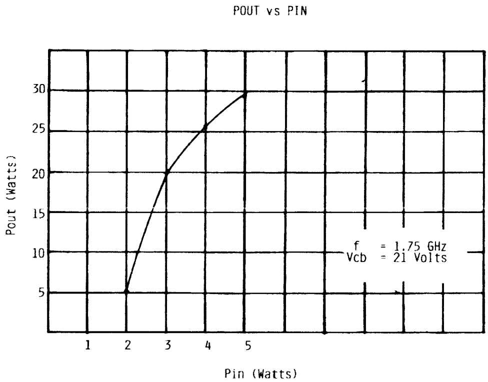
ITEM REF.	Description of ITEM
L1	3 Turn Choke #28 Wire .080## DIA.
L2	3 Turn Choke #28 Wire .080## DIA.
C1	.4-2.5pF Johanson Capacitor
C2	.4-2.5pF Johanson Capacitor
C 3	100pF Chip Capacitor ATC
C 4	15,000pF EMI Filter
S1	Epsilam 10 er = 10.2 T = 050" lozcu
	SMA Launcher CDI (2pieces)
	.397" so Fixture Housing
	Heat Sink

TYPICAL DATA CURVES



S88TCC1720-25-04

V_{CC} = 21V
f = 1.750Hz

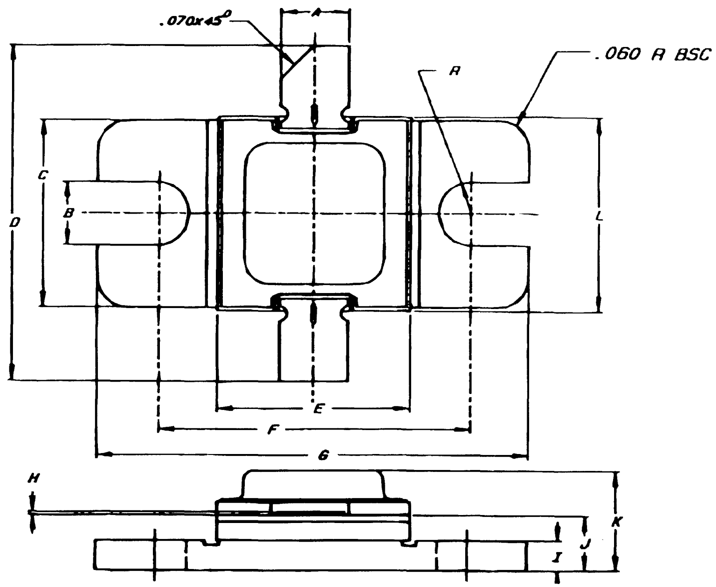


S88TCC1720-25-05

V_{CC} = 21V
f = 1.756Hz

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



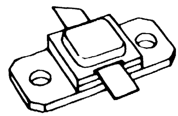
	Minimum Inches/mm	Maximum Inches/mm
A	.135/3.43	.145/3.68
B	.125/3.18 BSC	
C	.380/9.65	.390/9.91
D	.885/22.48	
E	.392/9.96	.402/10.29
F	.645/16.38	.655/16.64

	Minimum Inches/mm	Maximum Inches/mm
G	.895/22.73	.905/22.99
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.105/2.67	.125/3.18
K		.230/5.84
L	.392/9.96	.402/10.29

TCC1922-18

RF & MICROWAVE TRANSISTORS MICROWAVE TELECOMMUNICATION APPLICATIONS

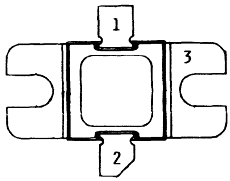
- FREQUENCY 1.9-2.2GHz
- POWER OUT 18.0W
- POWER GAIN 6.0dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2LFL (M147)
hermetic sealed

ORDER CODE	**BRANDING**
SD1872	1922-18

PIN CONNECTION



S88TCC1922-18-01

1 emitter
2 collector
3 base

DESCRIPTION

The TCC1922-18 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC1922-18 is a 24V device designed to provide 18W : over 1.9-2.2GHz band with minimum gain of 6.0dB.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15	V
V_{CBO}	Collector - Emitter Voltage	45	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	2.75	A
P_{tot}	Total Device Dissipation at + 25°C	31	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

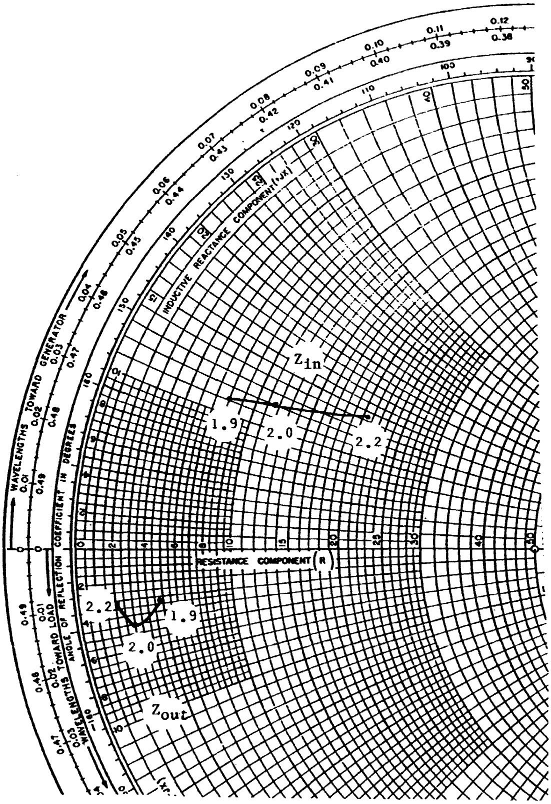
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 8mA	I_B = 0	45			V
BV_{CEO}	I_C = 8mA	V_{BE} = 0	15			V
BV_{EBO}	I_E = 8mA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 24V	V_{BE} = 0			0.4	mA
h_{FE}	V_{CB} = 5V	I_C = .5A	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 1.9 – 2.2GHz	V_{CB} = 24V	P_{IN} = 4.5W	18			W
P_G	f = 1.9 – 2.2GHz	V_{CB} = 24V	P_{IN} = 4.5W	6			dB
ηc	f = 1.9 – 2.2GHz	V_{CB} = 24V	P_{IN} = 4.5W	40			%

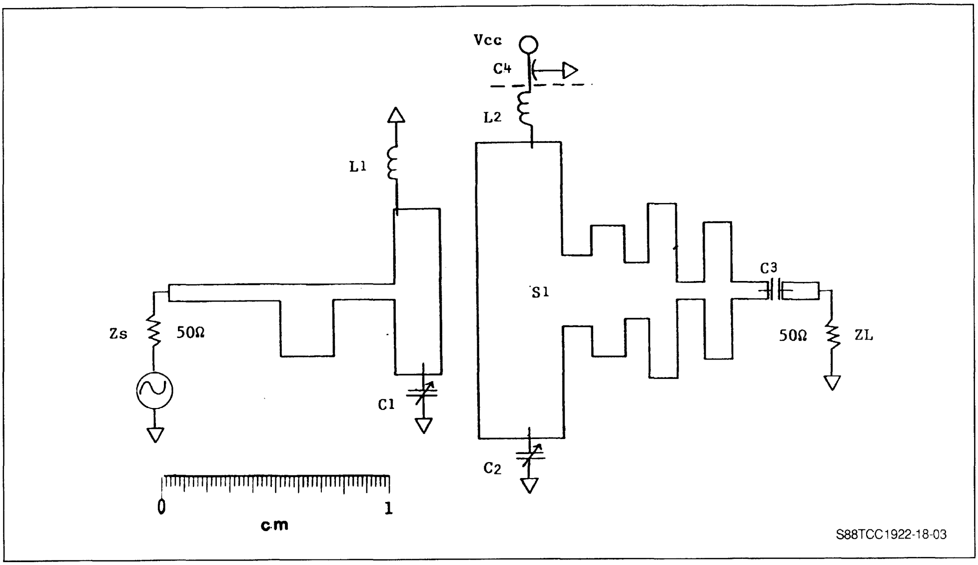
TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE WORKSHEET



FGHZ	ZIN Ω	ZCL Ω
1.9	8.1 + j11.1	4.8 – j3.4
2.0	11.7 + j11.9	3.0 – j4.5
2.2	20.7 + j14.5	2.2 – j3.2

Z_{OUT} = conjugate of the optimum load impedance into which the transistor operates at the specified power out, voltage and frequency

S88TCC1922-18-02

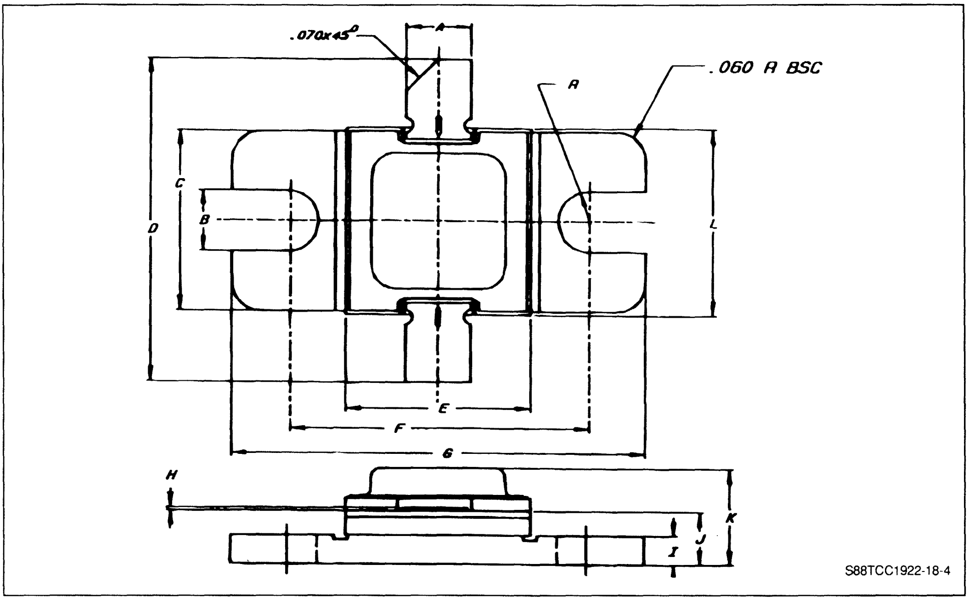


PARTS LIST

ITEM REF.	Description of ITEM
L1	3 Turn Choke # 28 Wire .080" Dia.
L2	3 Turn Choke # 28 Wire .080" Dia.
C1	.4 – 2.5pF Johanson Cap.
C2	.4 – 2.5pF Johanson Cap.
C3	100pF Chip Cap ATC
C4	15.000pF Emi Murata/erie
S1	Epsilam 10 er = 10.2 T = .050" loz Copper
	SMA Launcher CDI (2pieces)
	397 so Fixture Housing
	Heat Sink

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



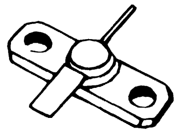
	Minimum Inches/mm	Maximum Inches/mm
A	.135/3.43	.145/3.68
B	.125/3.18 BSC	
C	.380/9.65	.390/9.91
D	.885/22.48	
E	.392/9.96	.402/10.29
F	.645/16.38	.655/16.64

	Minimum Inches/mm	Maximum Inches/mm
G	.895/22.73	.905/22.99
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.105/2.67	.125/3.18
K		.230/5.84
L	.392/9.96	.402/10.29

TCC2001

RF & MICROWAVE TRANSISTORS
MICROWAVE POWER TRANSISTOR FOR CLASS C APPLICATIONS

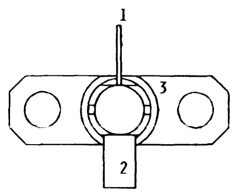
- FREQUENCY 2.0GHz
- POWER OUT 1.0W
- POWER GAIN 2.0dB
- VOLTAGE 28.0V
- HERMETIC STRIPLINE PACKAGE
- ALL GOLD METALLIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL (M151)
hermetically sealed

ORDER CODE	BRANDING
SD1801	2001

PIN CONNECTION



S88TCC2001-01

1 collector
2 emitter
3 base

DESCRIPTION

The TCC2001 is a 28V NPN silicon transistor designed for microwave applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45	V
V_{CEO}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.7	A
P_{DISS}	Total Device Dissipation at + 25°C	7.0	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	25	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

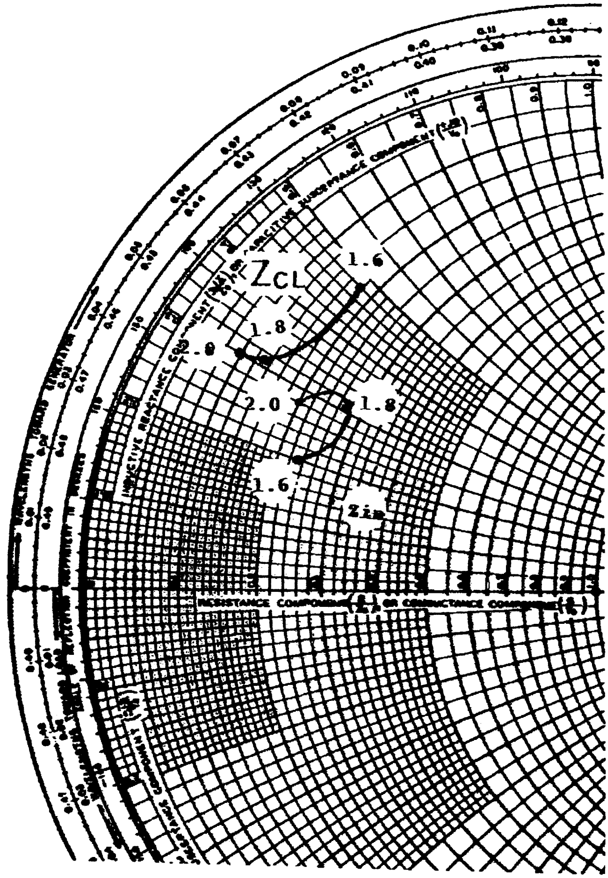
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CBO}	I_C = 1mA			45			V
BV_{EBO}	I_E = 1mA			3.5			V
I_{CBO}	VCB = 28V					.05	mA
h_{FE}	V_{CE} = 5V	I_C = 100mA		15		150	
C_{ob}	V_{CB} = 28V	f = 1MHz	I_E = 0			3.2	PF

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 2.0GHz	Vcc = 28V	Pin = 0.2W	1.0			W
P_{GAIN}	f = 2.0GHz	Vcc = 28V	Pin = 0.2W	7.0			dB
N_c	f = 2.0GHz	Vcc = 28V	Po = 1.0W	35			%

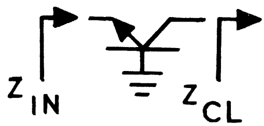
IMPEDANCE DATA (typical values)

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



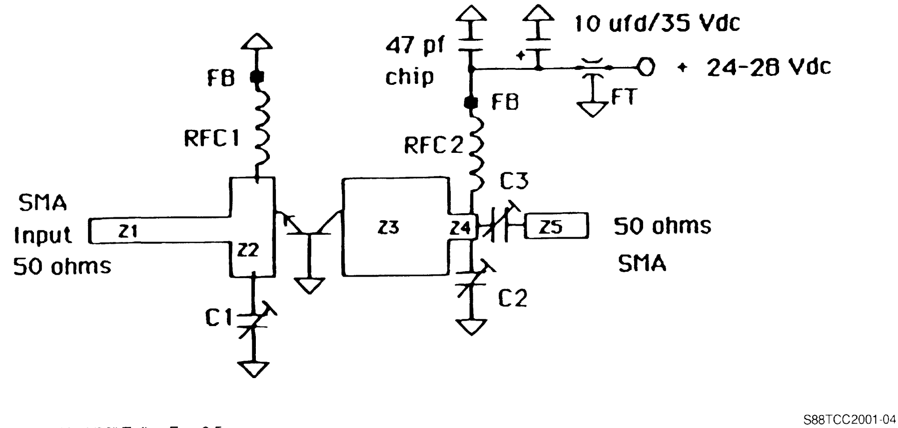
S88TCC2001-02

F GHz	Z IN (Ω)	Z CL (Ω)
1.6	11.6 + j10.2	9.0 + j24.2
1.8	13.7 + j15.5	5.4 + j15.7
2.0	10.2 + j13.9	4.1 + j14.8



S88TCC2001-03

TEST CIRCUIT



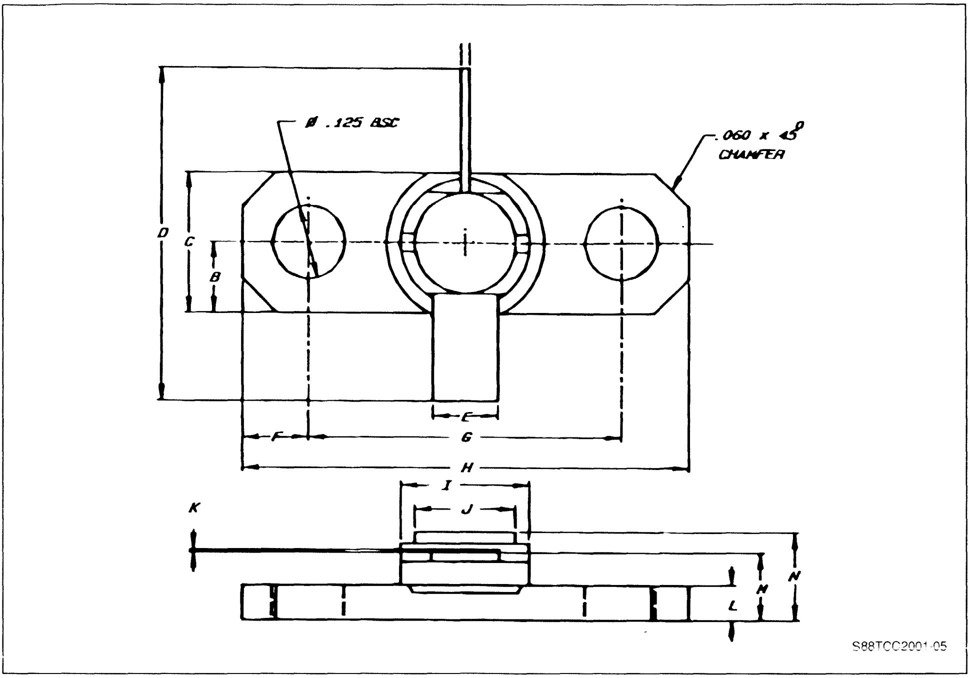
Board material is 1/32" Teflon Er = 2.5

FB MICROMETALS #3B OR AMIDON #FB-43-101 FERRITE BEAD
RFC1, 2 3t, #26, 0.10" ID
C1, 2 0.3pf - 3pf Johanson piston trimmer
C3 3pf Johanson Gigi-trim cap

FT Spectrum Controls, Inc. feedthru cap
#SCI 729-303 (or 001 ufd)
Z1 0.1" X 0.875"
Z2 0.15" X 0.3"
Z3 0.35" X0.55"
Z4 0.1" X 0.15"
Z5 0.080" wide 50Ω line

PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

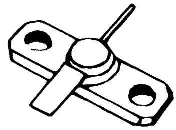
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON
MICROELECTRONICS

TCC2003

RF & MICROWAVE TRANSISTORS
MICROWAVE POWER TRANSISTOR FOR CLASS C APPLICATIONS

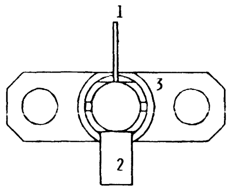
- FREQUENCY 2.0GHz
- POWER OUT 3.0W
- POWER GAIN 7.8dB
- VOLTAGE 28.0V
- HERMETIC STRIPLINE PACKAGE
- ALL GOLD METALLIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL (M151)
hermetically sealed

ORDER CODE	BRANDING
SD1803	2003

PIN CONNECTION



S88TCC2003-01

1 collector
2 emitter
3 base

DESCRIPTION

The TCC2003 is a 28V NPN silicon transistor designed for microwave applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45	V
V_{CEO}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.5	A
P_{DISS}	Total Device Dissipation at + 25°C	10.3	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	8.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

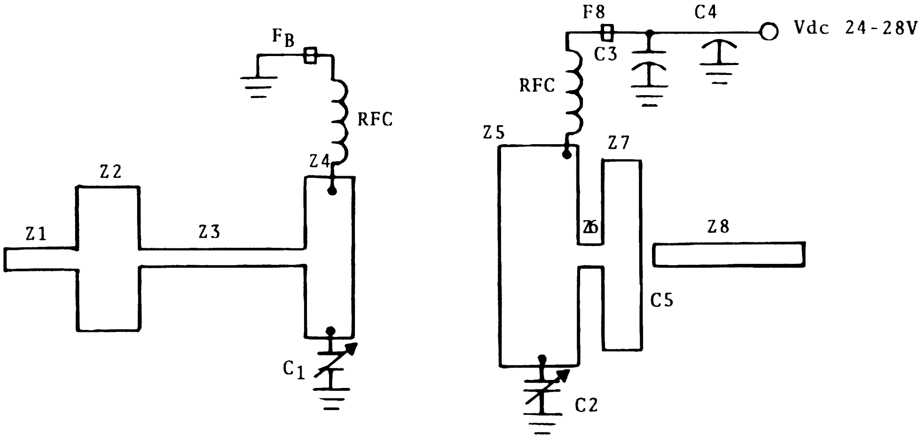
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 2mA		45			V
BV_{EBO}	I_E = 1mA		3.5			V
I_{CBO}	VCB = 28V				500	mA
h_{FE}	V_{CE} = 5V	I_C = 100mA	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 2.0GHz	Vcc = 28V	Pin = 0.5W	3	4		W
P_{GAIN}	f = 2.0GHz	Vcc = 28V	Pin = 0.5W	7.8	9		dB
η_c	f = 2.0GHz	Vcc = 28V	Po = 3.0W	35	40		%
C_{ob}	V_{CB} = 28V	f = 1MHz	I_E = 0			6.5	pF

TEST CIRCUIT

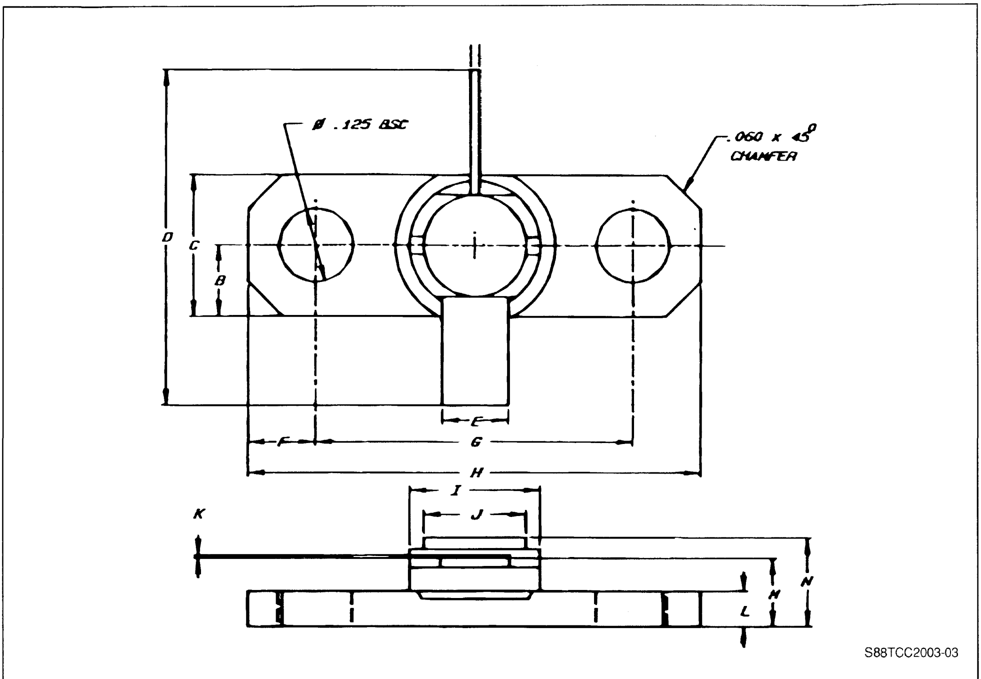


S88TCC2003-02

BOARD MATERIAL	Er = 2.5t = .031"	Z1 .086" 50Ω LINE
		Z2 .580" X .250"
RFC 3 Turns, #26, .1" ID		Z3 .065" X .680"
C1, 2	.4-2.5pf	Z4 .645" X .200"
C3	10μfd/35VDC	Z5 .880" X .315"
C4	Feedthru Cap	Z6 .086" X .100"
C5	Chip Cap 3.6pf	Z7 .760" X .150"
FB	Ferrite Bead	Z8 .086" 50Ω LINE

PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

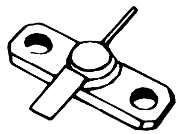
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON MICROELECTRONICS

TCC2005

RF & MICROWAVE TRANSISTORS
MICROWAVE POWER TRANSISTOR FOR CLASS C APPLICATIONS

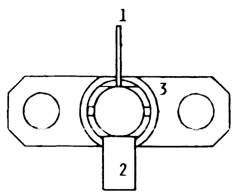
- FREQUENCY 2.0GHz
- POWER OUT 5.0W
- POWER GAIN 7.0dB
- VOLTAGE 28.0V
- HERMETIC STRIPLINE PACKAGE
- ALL GOLD METALLIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL (M151)
hermetically sealed

ORDER CODE	**BRANDING**
SD1805	2005

PIN CONNECTION



S88TCC2005-01

1 collector
2 emitter
3 base

DESCRIPTION

The TCC2005 is a 28V NPN silicon transistor de signed for microwave applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45	V
V_{CEO}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	2.5	A
P_{DISS}	Total Device Dissipation at + 25°C	25	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	7.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

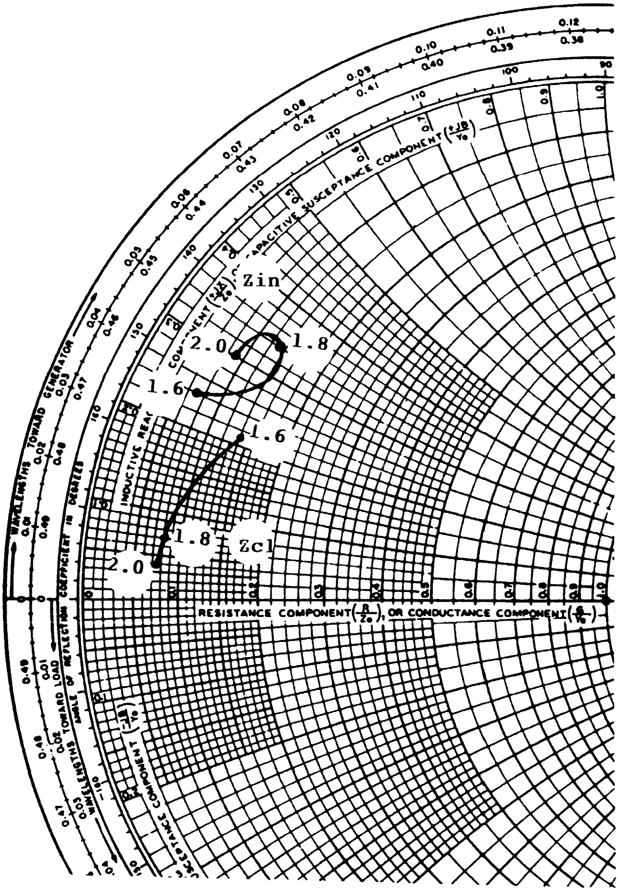
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CBO}	I_C = 2mA			45			V
BV_{EBO}	I_E = 2mA			3.5			V
I_{CBO}	VCB = 28V					0.1	mA
h_{FE}	V_{CE} = 5V	I_C = 100mA		15		150	
C_{ob}	V_{CB} = 28V	f = 1MHz	I_E = 0		5.5	7	PF

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 2.0GHz	Vcc = 28V	Pin = 1.0W	5.0			W
P_{GAIN}	f = 2.0GHz	Vcc = 28V	Pin = 1.0W	7.0			dB
η_C	f = 2.0GHz	Vcc = 28V	Po = 5.0W	35			%

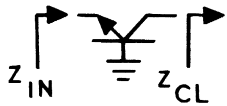
IMPEDANCE DATA (typical values)

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



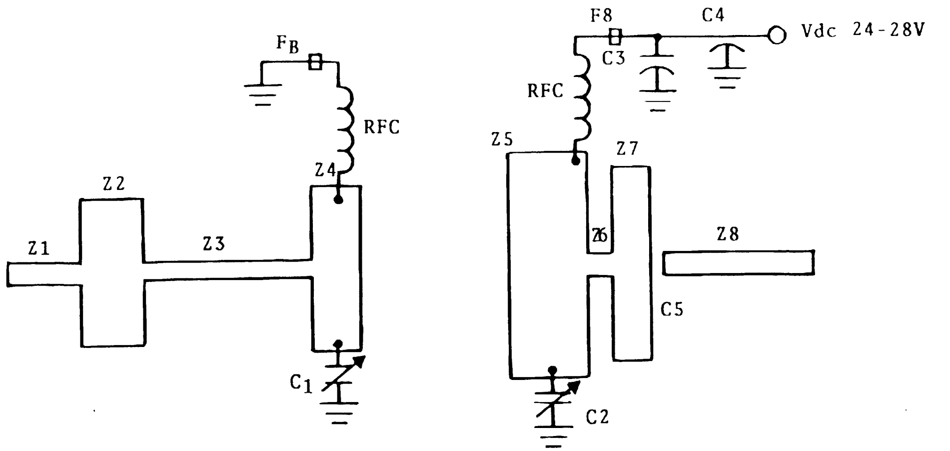
S88TCC2005-02

F GHz	$Z_{IN}(\Omega)$	$Z_{CL}(\Omega)$
1.6	3.4 + j12.2	6.9 + j10.6
1.8	6.5 + j16.8	4.2 + j3.5
2.0	4.6 + j15.2	3.8 + j2.1



S88TCC2005-03

TEST CIRCUIT

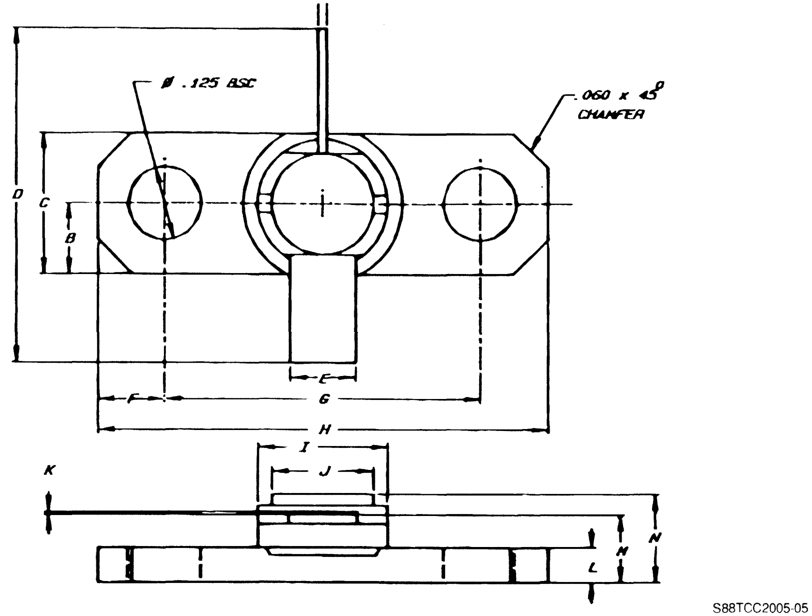


S88TCC2005-04

BOARD MATERIAL	Er = 2.5 t = .031"	Z1 .086" 50ΩLINE
		Z2 .580" X .250"
RFC 3 Turns, #26, .1" ID		Z3 .065" X .680"
C1, 2	.4-2.5pf	Z4 .645" X .200"
C3	10μfd/35VDC	Z5 .880" X .315"
C4	Feedthru Cap	Z6 .086" X .100"
C5	Chip Cap 3.6pf	Z7 .760" X .150"
FB	Ferrite Bead	Z8 .086" 50ΩLINE

PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

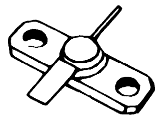
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON
MICROELECTRONICS

TCC2010

RF & MICROWAVE TRANSISTORS
MICROWAVE POWER TRANSISTOR FOR CLASS C APPLICATIONS

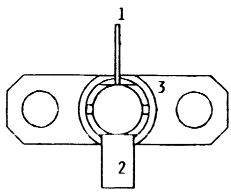
- FREQUENCY 2.0GHz
- POWER OUT 10.0W
- POWER GAIN 9.0dB
- VOLTAGE 28.0V
- HERMETIC STRIPLINE PACKAGE
- ALL GOLD METALLIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL (M151)
hermetically sealed

ORDER CODE	**BRANDING**
SD1810	2010

PIN CONNECTION



S88TCC2010-01

1 collector
2 emitter
3 base

DESCRIPTION

The TCC2010 is a 28V NPN silicon transistor designed for microwave applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45	V
V_{CEO}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	4.4	A
P_{DISS}	Total Device Dissipation at + 25°C	43	W
T_{stg}	Storage Temperature	− 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	4.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

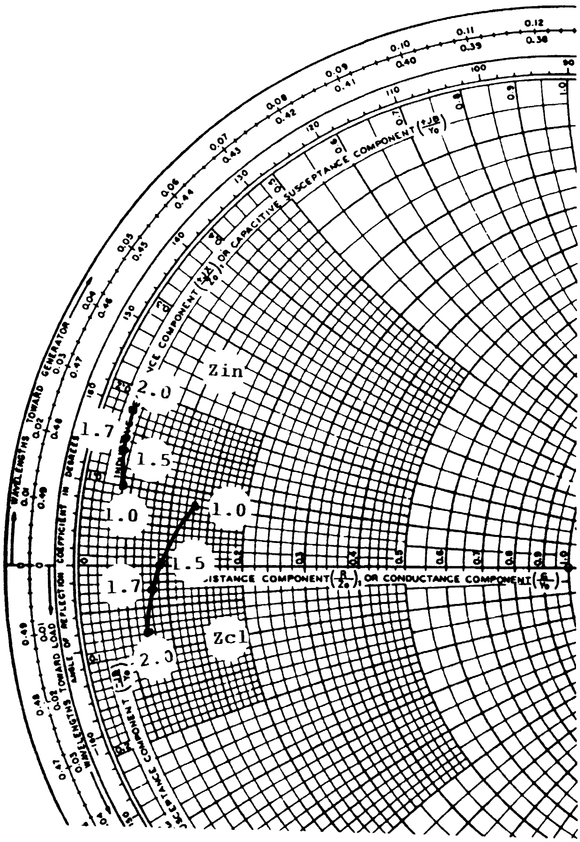
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CBO}	I_C = 4mA			45			V
BV_{EBO}	I_E = 4mA			3.5			V
I_{CBO}	V_{CB} = 28V					5	mA
h_{FE}	V_{CE} = 5V	I_C = 500mA		15		150	
C_{ob}	V_{CB} = 28V	f = 1MHz	I_E = 0			19	pF

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 2.0GHz	V_{CC} = 28V	Pin = 1.25W	10			W
P_{GAIN}	f = 2.0GHz	V_{CC} = 28V	Pin = 1.25W	9.0			dB
N_C	f = 2.0GHz	V_{CC} = 28V	Po = 10.0W	35			%

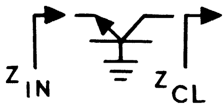
IMPEDANCE DATA (typical values)

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



S88TCC2010-02

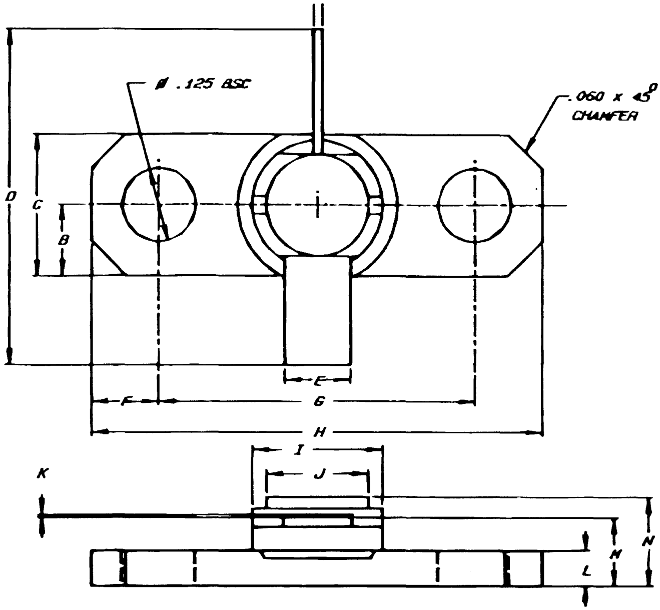
F GHz	Z_{IN} (Ω)	Z_{CL} (Ω)
1.0	1.9 + j4.5	6.3 + j3.9
1.5	1.5 + j6.5	4.5 + j0
1.7	1.5 + j7.2	3.8 – j1.7
2.0	1.5 + j8.3	3.3 – j4.0



S88TCC2010-03

PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

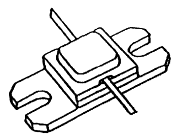
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON
MICROELECTRONICS

TCC2023-6

RF & MICROWAVE TRANSISTORS
MICROWAVE TELECOMMUNICATION APPLICATIONS

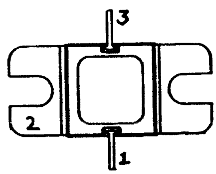
- FREQUENCY 2.0-2.3GHz
- POWER OUT 6.0W
- POWER GAIN 7.8dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2LFL (M155)
hermetic sealed

ORDER CODE	BRANDING
SD1886	2023-6

PIN CONNECTION



S88TCC2023-6-01

1 emitter
2 collector
3 base

DESCRIPTION

The TCC2023-6 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC2023-6 is a 24 Volt device designed to provide 6.0 Watts over the 2.0-2.3GHz band with a minimum gain of 7.8dB.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15	V
V_{CBO}	Collector - Emitter Voltage	45	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	1.9	A
P_{tot}	Total Device Dissipation at + 25°C	18.4	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	9.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

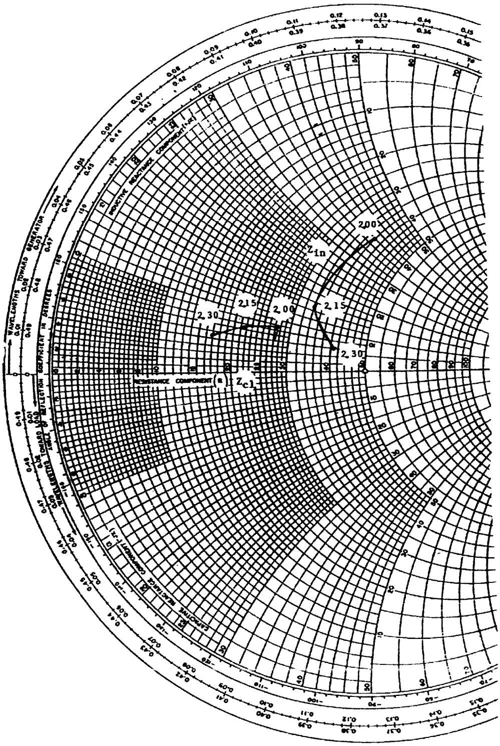
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 2mA	I_B = 0	15			V
BV_{CBO}	I_C = 2mA	V_{BE} = 0	45			V
BV_{EBO}	I_E = 2mA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 24V	V_{BE} = 0			.1	mA
h_{FE}	V_{CE} = 5V	I_C = .1A	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 2.0-2.3GHz	V_{CB} = 24V	P_{IN} = 1.0W	6.0			W
P_G	f = 2.0-2.3GHz	V_{CB} = 24V	P_{IN} = 1.0W	7.8			dB
ηc	f = 2.0-2.3GHz	V_{CB} = 24V	P_{OUT} = 6W	40			%

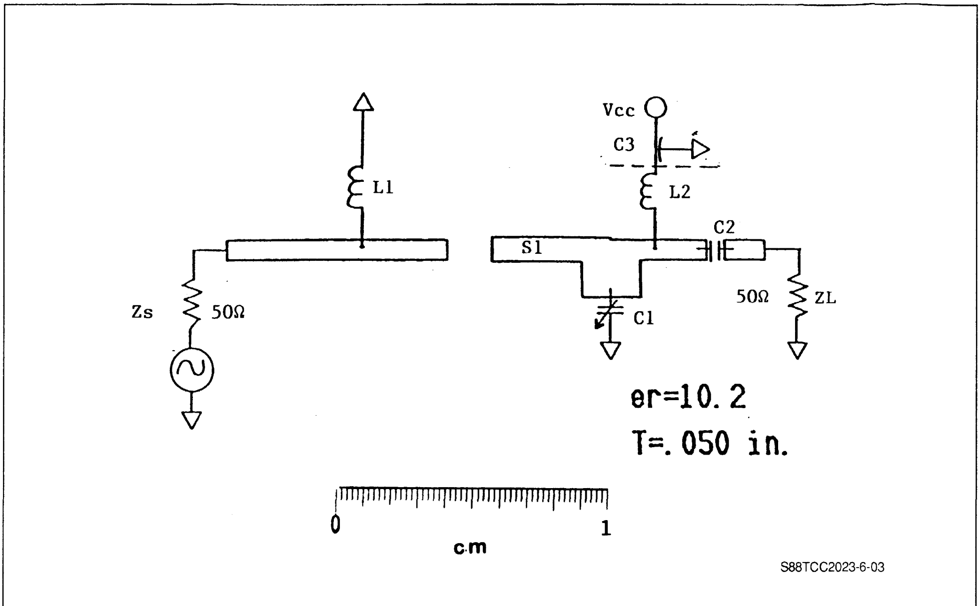
TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



F_{GHz}	$Z_{IN}\Omega$	$Z_{CL}\Omega$
2.0	38 + j39	27.5 + j8.5
2.15	34 + j15	21.5 + j7.5
2.3	41 + j50	17.0 + j5.5

Z_{CL} = the optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

S88TCC2023-6-02

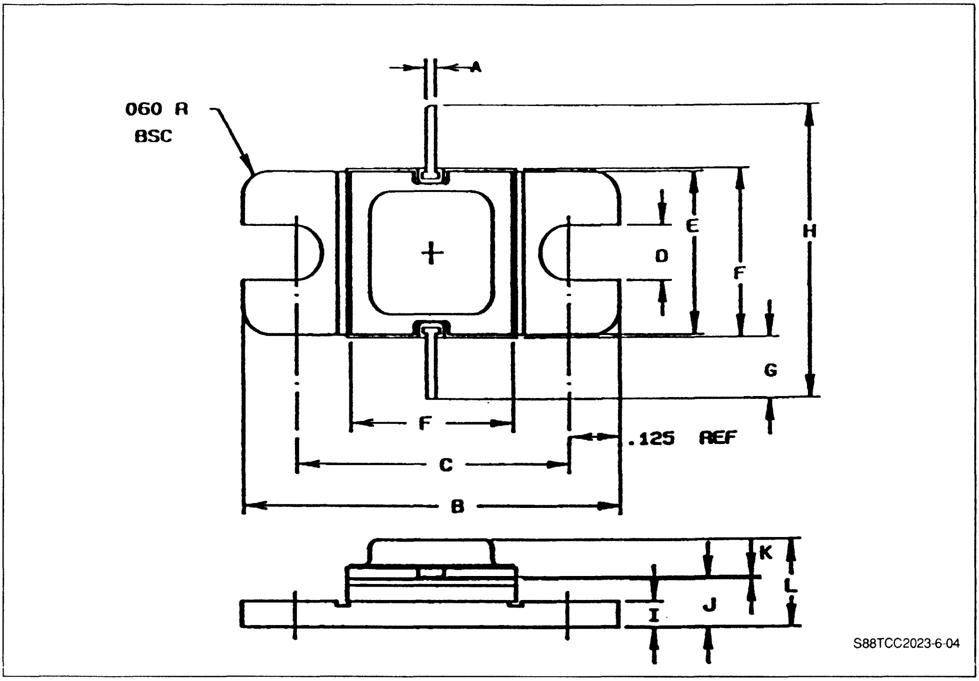


PARTS LIST

ITEM REF.	Descritpion of ITEM
L1	3 Turn Choke #28 ,Wire .080m ID.
L2	3 Turn Choke #28 ,Wire .080m ID.
C1	.4-25pF Johanson Capacitor
C2	100pF Chip Cap. ATC
C3	15,000pF Emi Murata/Erie
S1	Epsilam10 ER = 10.2 H = .050" 1 OZ. CU
	SMA LAUNCHER CDI (2 pieces)
	.397 SQ. FIXTURE HOUSING
	HEAT SINK

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.015/0.38	.025/0.64
B	.890/22.61	.910/23.11
C	.640/16.26	.660/16.76
D	.120/3.05	.130/3.30
E	.380/9.65	.390/9.91
F	.392/9.96	.402/10.29

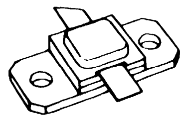
	Minimum Inches/mm	Maximum Inches/mm
G	.240/6.10	.260/6.60
H	.885/22.48	
I	.055/1.40	.065/1.65
J	.110/2.79	.130/3.30
K	.003/0.08	.006/0.15
L	.200/5.08	.200/5.59

SGS-THOMSON
MICROELECTRONICS

TCC2023-16

RF & MICROWAVE TRANSISTORS
MICROWAVE TELECOMMUNICATION APPLICATIONS

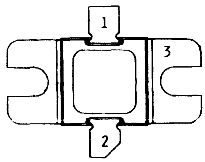
- FREQUENCY 2.0-2.3GHz
- POWER OUT 16.0W
- POWER GAIN 6.0dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2LFL (M147)
hermetic sealed

ORDER CODE	**BRANDING**
SD1887	2023-16

PIN CONNECTION



S88TCC2023-16-01

1 emitter
2 collector
3 base

DESCRIPTION

The TCC2023-16 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC2023-16 is a 28V device designed to provide 16W over the 2.0-2.3GHz band with a minimum gain of 6.0dB.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15	V
V_{CBO}	Collector - Emitter Voltage	45	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	6.1	A
P_{tot}	Total Device Dissipation at + 25°C	58.3	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

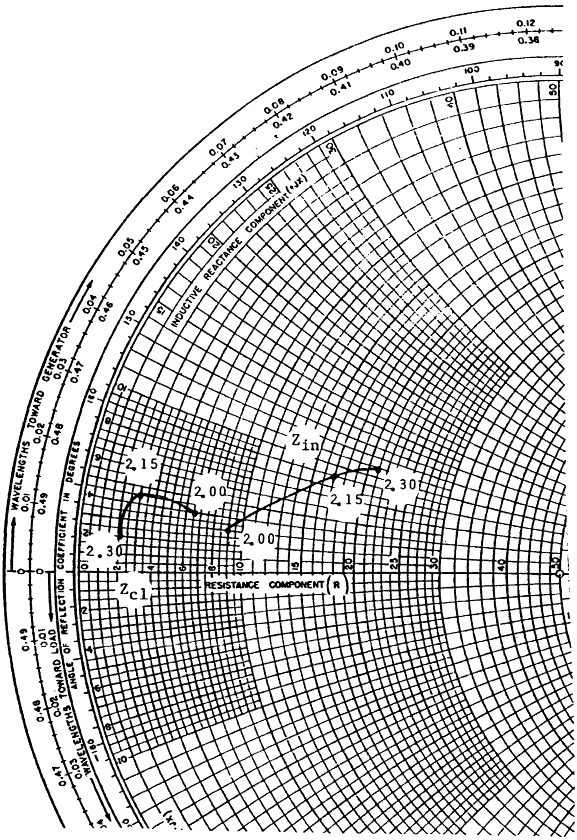
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 8mA	I_B = 0	15			V
BV_{CBO}	I_C = 8mA	V_{BE} = 0	45			V
BV_{EBO}	I_E = 8mA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 24V	V_{BE} = 0			.4	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 2.0-2.3GHz	V_{CB} = 24V	P_{IN} = 4W	16			W
P_G	f = 2.0-2.3GHz	V_{CB} = 24V	P_{IN} = 4W	6			dB
nc	f = 2.0-2.3GHz	V_{CB} = 24V	P_{OUT} = 16W	40			%

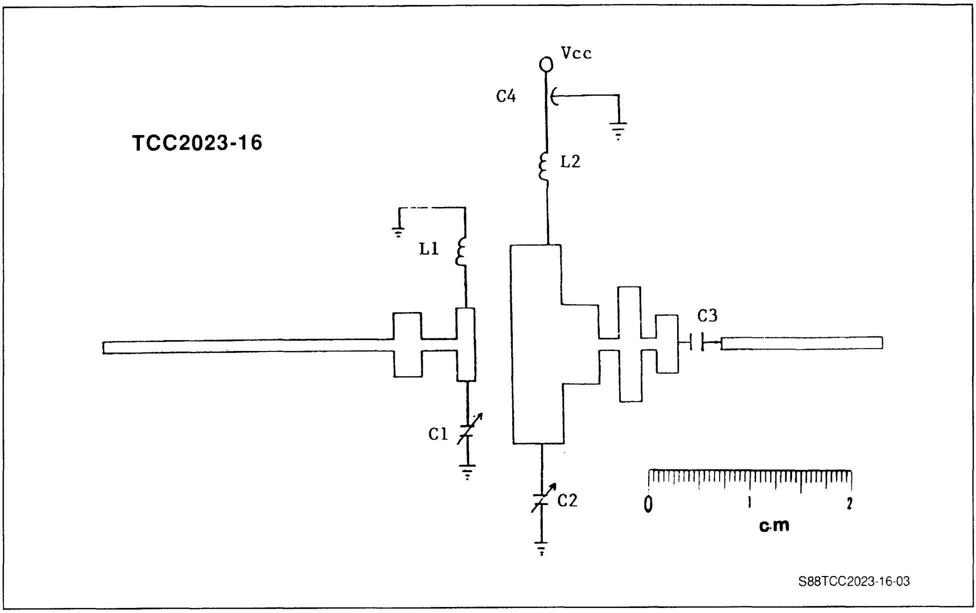
TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



F_{GHZ}	$Z_{IN}\Omega$	$Z_{CL}\Omega$
2.0	9.0 + j3.0	6.7 + j4.0
2.15	17.0 + j9.0	3.0 + j4.5
2.3	21.0 + j11.0	2.1 + j2.0

Z_{cl} = the optimum load impedance into which the transistor operation at the specified power out, voltage and frequency.

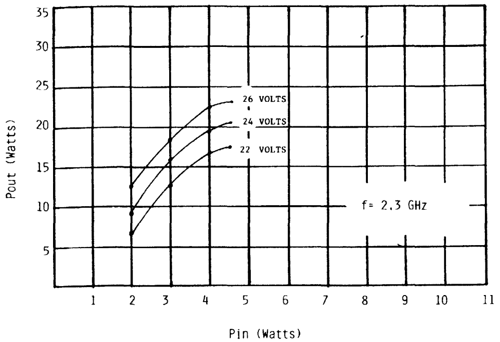
S88TCC2023-16-02



PARTS LIST

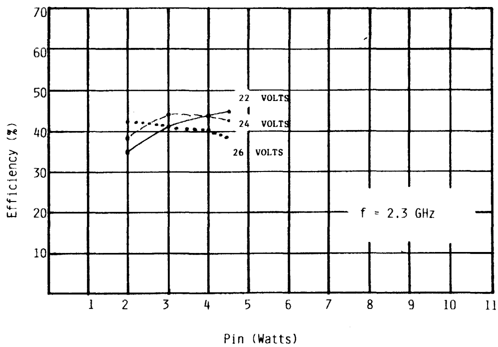
ITEM REF.	Description
L1	2 Turns #26Wire 100# Dia
L2	2 Turns #26Wire 100# Dia
C1	.4-2.5pF Johanson Trimmer Capacitor
C2	.4-2.5pF Johanson Trimmer Capacitor
C3	100pF ATC Chip Capacitor Size A
C4	15.000pF Emi Filter Capacitor (erie)
	Circuit Board Material Epsilam 10
	er 10.2 t = 0.50" loz Copper

P_{OUT} vs. P_{IN} f = 2.3GHz



S88TCC2023-16-04

EFFICIENCY vs. P_{IN} f = 2.3GHz

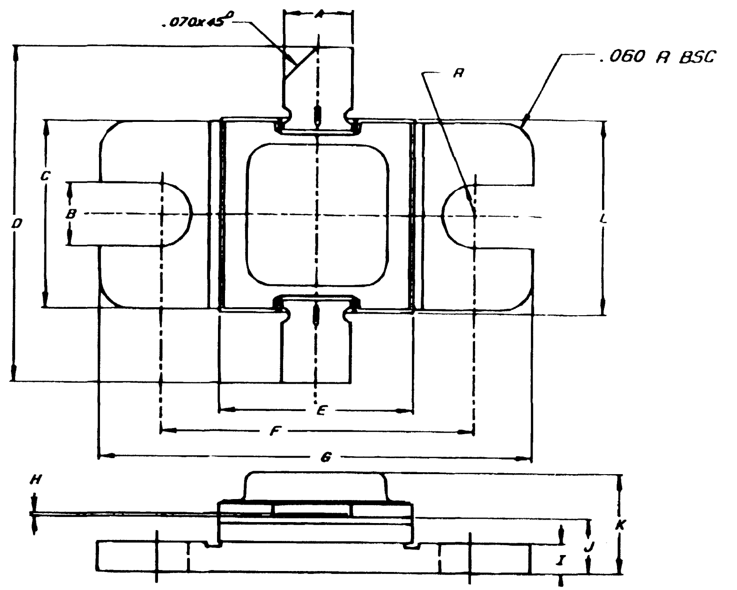


S88TCC2023-16-05

VCC = 22, 24, 26V

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.135/3.43	.145/3.68
B	.125/3.18 BSC	
C	.380/9.65	.390/9.91
D	.885/22.48	
E	.392/9.96	.402/10.29
F	.645/16.38	.655/16.64

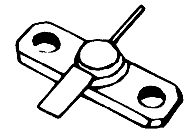
	Minimum Inches/mm	Maximum Inches/mm
G	.895/22.73	.905/22.99
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.105/2.67	.125/3.18
K		.230/5.84
L	.392/9.96	.402/10.29

SGS-THOMSON MICROELECTRONICS

TCC2100

RF & MICROWAVE TRANSISTORS CLASS A MICROWAVE

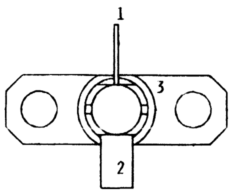
- FREQUENCY 2.0GHz
- POWER OUT .316W
- POWER GAIN 10.5dB
- VOLTAGE 20.0V
- CURRENT 70mA
- CLASS A
- GOLD METALLIZED DIE
- OVERLAY GEOMETRY
- HERMETIC STRIPLINE PACKAGE
- COMMON EMITTER CONFIGURATION



.230 2LFL/FLM (M151)
hermetic sealed

ORDER CODE	BRANDING
SD1851-04	2100

PIN CONNECTION



S88TCC2100-01

1 collector
2 base
3 emitter

DESCRIPTION

The TCC2100 is an NPN silicon transistor designed for high gain linear performance at 2.0GHz. This part uses gold metallized die and polysilicon site ballasting to achieve high reliability and ruggedness. The part can be used for applications such as Telecommunications, Radar, ECM, Space and other commercial and military systems.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CES}	Collector - Emitter Voltage	45	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	.195	A
P_{DISS}	Total Device Dissipation at + 25°C	3.9	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	45	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

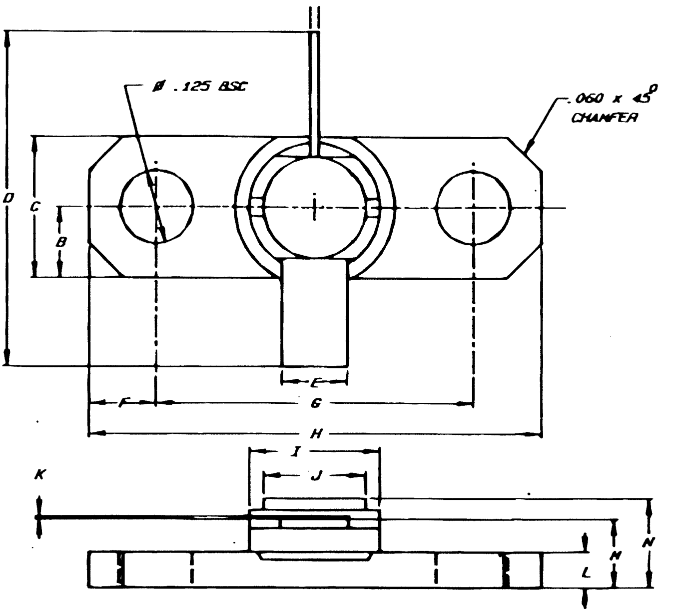
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 10mA		45			V
BV_{CEO}	I_C = 1mA		15			V
BV_{EBO}	I_E = 1mA		3.5			V
I_{CES}	V_{CE} = 40V				1.0	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	20		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 1.0GHz	V_{CE} = 20V	I_C = 70mA	.316			W
P_G	f = 1.0GHz	V_{CE} = 20V	I_C = 70mA	10.5			dB

PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

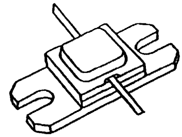
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON
MICROELECTRONICS

TCC2223-3

RF & MICROWAVE TRANSISTORS
MICROWAVE TELECOMMUNICATION APPLICATIONS

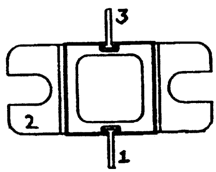
- FREQUENCY 2.2-2.3GHz
- POWER OUT 3.0W
- POWER GAIN 8.5dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2LFL (M155)
hermetic sealed

ORDER CODE	**BRANDING**
SD1879	2223-3

PIN CONNECTION



S88TCC2223-3-01

1 emitter
2 collector
3 base

DESCRIPTION

The TCC2223-3 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC2223-3 is a 24V device designed to provide 2.8W over the 2.2-2.3GHz with a minimum gain of 8.5dB.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15	V
V_{CBO}	Collector - Emitter Voltage	45	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.7	A
P_{tot}	Total Device Dissipation at + 25°C	11.7	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	15	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

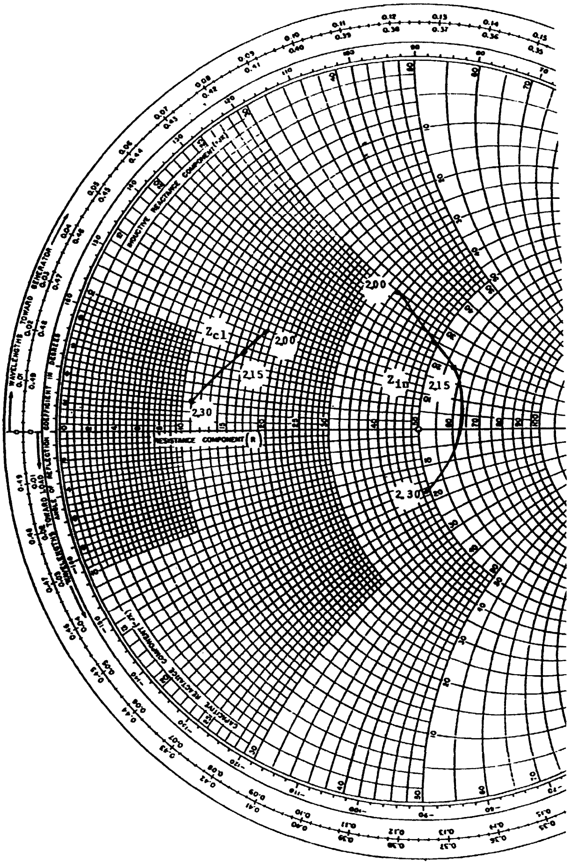
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 1mA	I_B = 0	15			V
BV_{CBO}	I_C = 1mA	V_{BE} = 0	45			V
BV_{EBO}	I_E = 1mA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 24V	V_{BE} = 0			.05	mA
h_{FE}	V_{CE} = 5V	I_C = .1A	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 2.2-2.3GHz	V_{CB} = 24V	P_{IN} = .4W	2.8			W
P_G	f = 2.2-2.3GHz	V_{CB} = 24V	P_{IN} = .4W	8.5			dB
ηc	f = 2.2-2.3GHz	V_{CB} = 24V	P_{OUT} = 2.8W	40			%

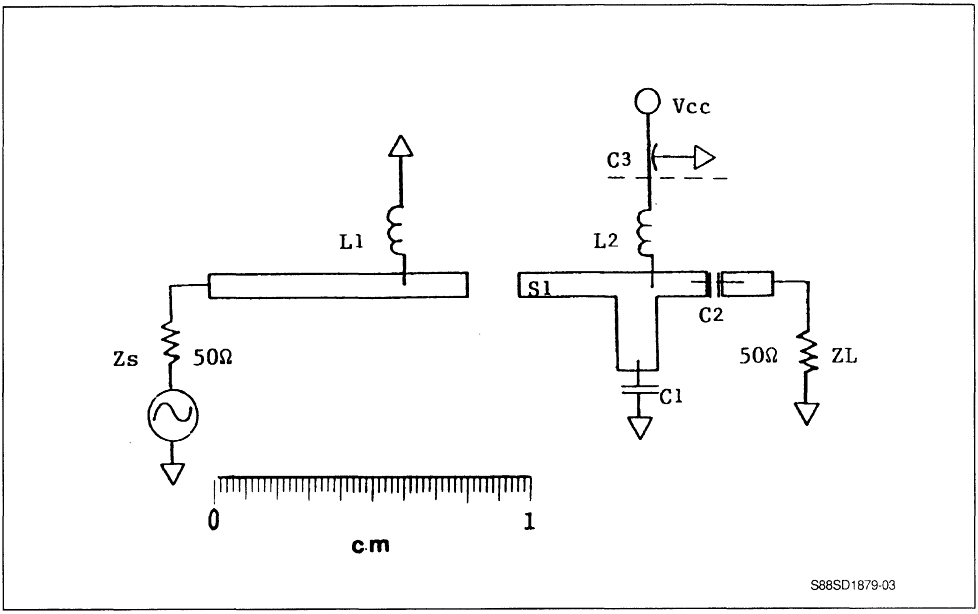
TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



F_{GHZ}	$Z_{IN}\Omega$	$Z_{CL}\Omega$
2.0	35 + j30	18 + j13
2.15	57 + j20	16 + j9
2.3	49 + j17	11 + j3

Z_d = the optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

S88TCC2223-3-02

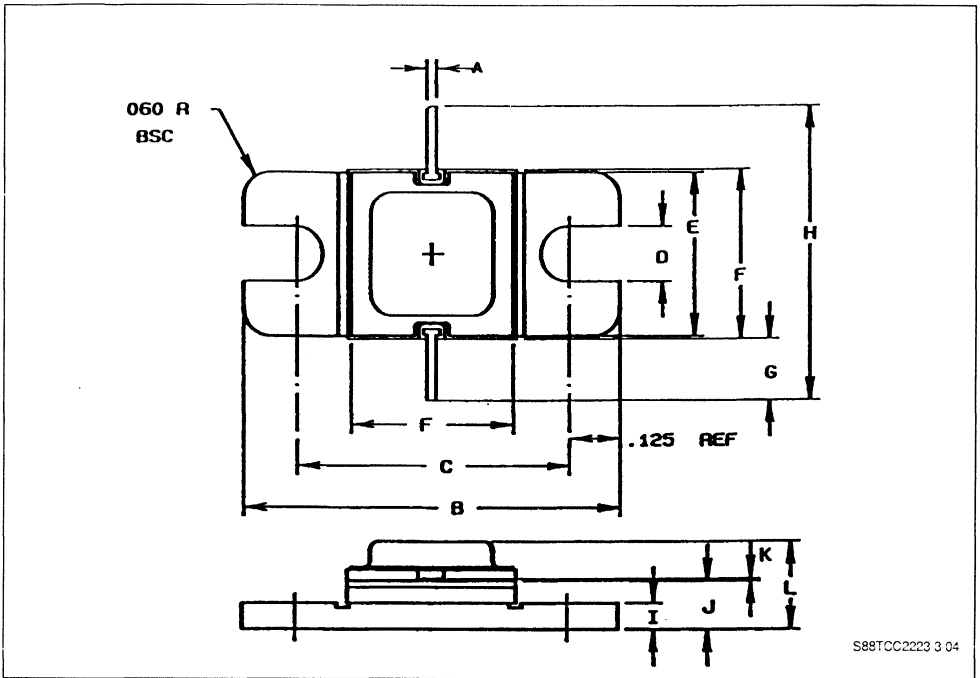


PARTS LIST

ITEM REF.	Description of ITEM
L1	3 Turn Choke #28 Wire .080# Dia.
L2	3 Turn Choke #28 Wire .080# Dia.
C1	.4-2.5pF Johanson Cap.
C2	100pF Chip Cap.
C3	15.000pF Emi Filter Murata/erie
S1	Epsilam 10 er = 10.2 T = .050" 10z cu
	SMA Launcher CDI (2 pieces)
	.397 so Fixture Housing
	Heat Sink

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.015/0.38	.025/0.64
B	.890/22.61	.910/23.11
C	.640/16.26	.660/16.76
D	.120/3.05	.130/3.30
E	.380/9.65	.390/9.91
F	.392/9.96	.402/10.29

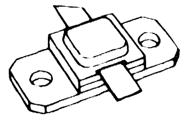
	Minimum Inches/mm	Maximum Inches/mm
G	.240/6.10	.260/6.60
H	.885/22.48	
I	.055/1.40	.065/1.65
J	.110/2.79	.130/3.30
K	.003/0.08	.006/0.15
L	.200/5.08	.220/5.59

SGS-THOMSON
MICROELECTRONICS

TCC2223-10

RF & MICROWAVE TRANSISTORS
MICROWAVE TELECOMMUNICATION APPLICATIONS

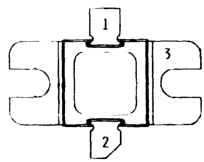
- FREQUENCY 2.2-2.3GHz
- POWER OUT 10.0W
- POWER GAIN 7.0dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2 LFL (M147)
hermetic sealed

ORDER CODE	**BRANDING**
SD1862	2223-10

PIN CONNECTION



S88TCC2223-10-01

1 emitter
2 collector
3 base

DESCRIPTION

The TCC2223-10 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC2223-10 is a 24V device designed to provide 10W over 2.2-2.3GHz band with minimum gain of 7.0dB.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CE}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	4.1	A
P_{tot}	Total Device Dissipation at + 25°C	38.9	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	4.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

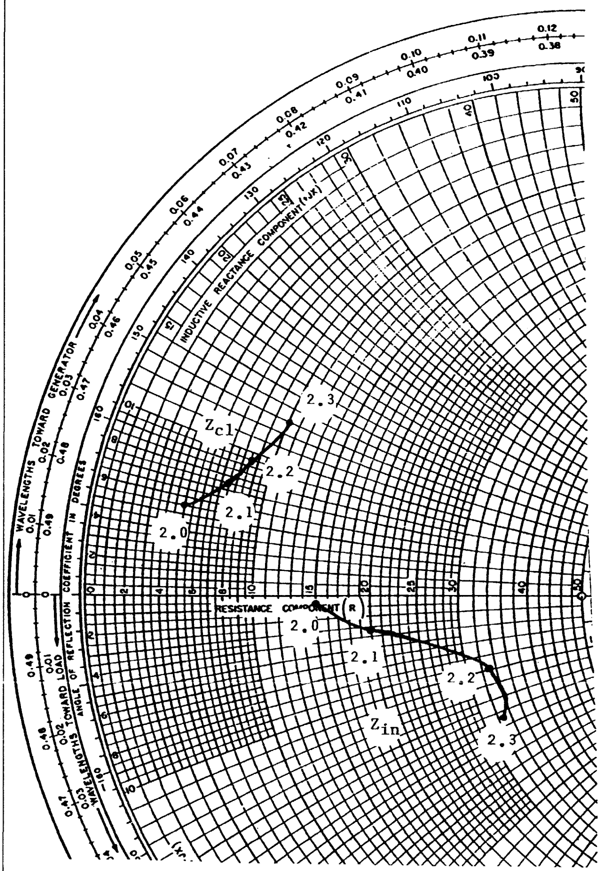
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 4mA	I_B = 0	40			V
BV_{EBO}	I_E = 4mA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 24V	I_E = 0			0.2	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	15		150	

* Pulsed through 25MH Inductor.

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 2.2 – 2.3GHz	V_{CB} = 24V	P_{IN} = 2.0W	10			W
P_G	f = 2.2 – 2.3GHz	V_{CB} = 24V	P_{IN} = 2.0W	7			dB
ηc	f = 2.2 – 2.3GHz	V_{CB} = 24V	P_{OUT} = 10W	40			%

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE WORKSHEET

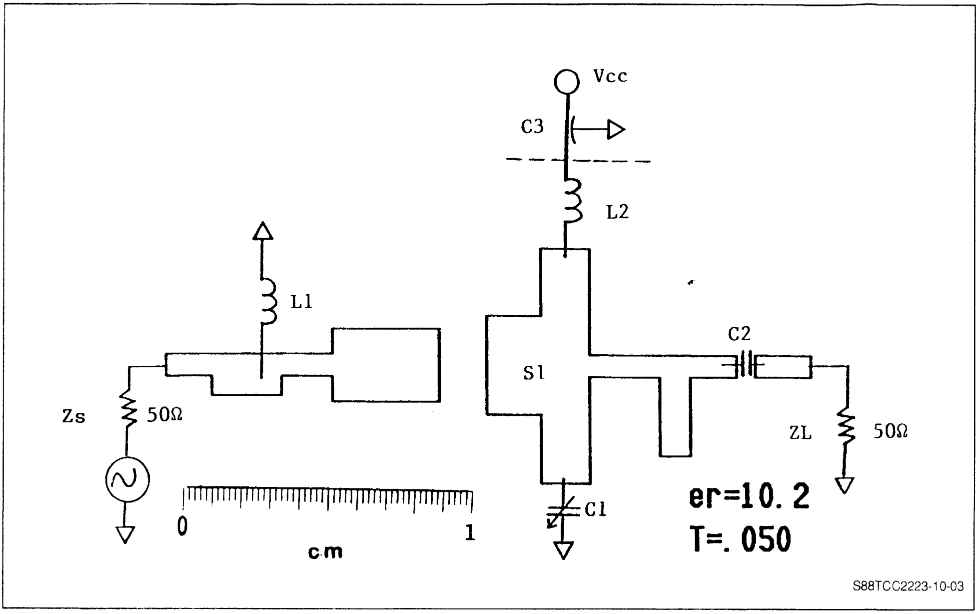


F_{GHZ}	Z_{IN} (Ω)	Z_{CL} (Ω)
2.0	15 – j0.5	5.0 + j5.5
2.1	20 – j3.5	7.5 + j7.5
2.2	33 – j10	8.5 + j9.5
2.3	33 – j17	10.0 + j13

Z_{CL} = The optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

S88TCC2223-10-02

Special conditions : V_{CC} = 24V POWER IN = 2.0W TF = 25°C

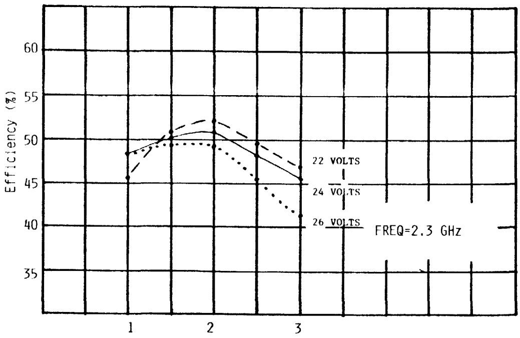


PARTS LIST

ITEM REF.	Description of ITEM
L1	3 Turn # 28 Wire .080" Dia
L2	3 Turn # 28 Wire .080" Dia
C1	.4 – 2.5pF Johanson Capacitor
C2	100pF Chip Capacitor
C3	15.000pF Emi Filter Murata/erie
S1	Epsilam 10 er = 10.2 T = .050" loz Copper
	SMA Launcher CDI (2 pieces)
	.397 so Fixture Housing
	Heat Sink

TYPICAL DATA CURVES WORKSHEET

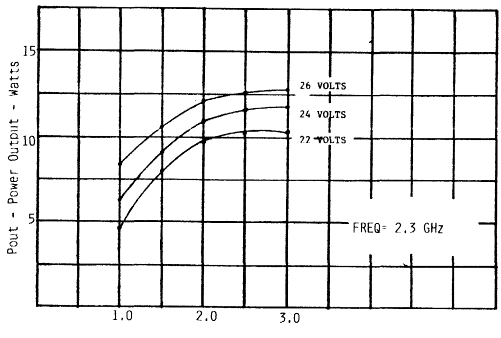
EFFICIENCY vs. Pin



S88TCC2223-10-04

-- V_{CC} = 22V
— V_{CC} = 24V
... V_{CC} = 26V

POWER OUTPUT vs POWER INPUT (Typical)

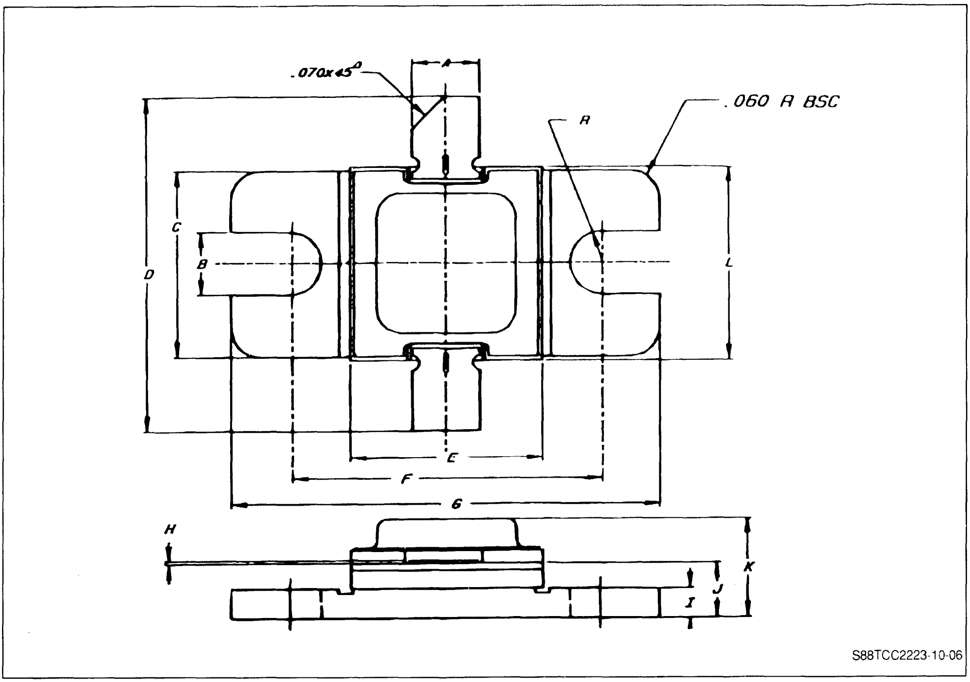


V_{CC} 22/24/26V

S88TCC2223-10-05

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.135/3.43	.145/3.68
B	.125/3.18 BSC	
C	.380/9.65	.390/9.91
D	.885/22.48	
E	.392/9.96	.402/10.29
F	.645/16.38	.655/16.64

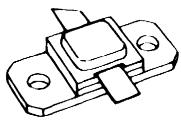
	Minimum Inches/mm	Maximum Inches/mm
G	.895/22.73	.905/22.99
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.105/2.67	.125/3.18
K		.230/5.84
L	.392/9.96	.402/10.29

SGS-THOMSON
MICROELECTRONICS

TCC2223-18

RF & MICROWAVE TRANSISTORS
MICROWAVE TELECOMMUNICATION APPLICATIONS

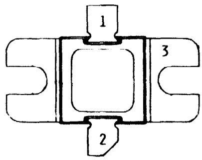
- FREQUENCY 2.2-2.3GHz
- POWER OUT 18.0W
- POWER GAIN 6.5dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2 LFL (M147)
hermetic sealed

ORDER CODE	**BRANDING**
SD1870	2223-18

PIN CONNECTION



S88TCC2223-18-

1 emitter
2 collector
3 base

DESCRIPTION

The TCC2223-18 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC2223-18 is a 24V device designed to provide 18W over 2.2-2.3GHz band with a minimum gain of 6.5dB. The SD1870 is branded 2223-18.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15	V
V_{CBO}	Collector - Emitter Voltage	45	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	6.1	A
P_{tot}	Total Device Dissipation at + 25°C	58.3	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.0	°C/W

February 1989

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

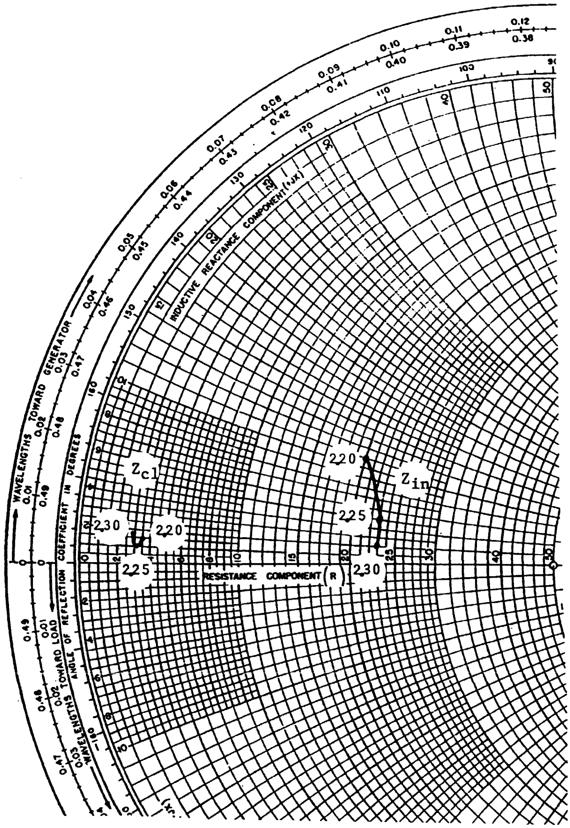
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 8mA	I_B = 0	15			V
BV_{CBO}	I_C = 8mA	V_{BE} = 0	45			V
BV_{EBO}	I_E = 8mA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 24V	V_{BE} = 0			0.4	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 2.2 – 2.3GHz	V_{CB} = 24V	P_{IN} = 4W	18			W
P_G	f = 2.2 – 2.3GHz	V_{CB} = 24V	P_{IN} = 4W	6.5			dB
ηc	f = 2.2 – 2.3GHz	V_{CB} = 24V	P_{OUT} = 18W	40			%

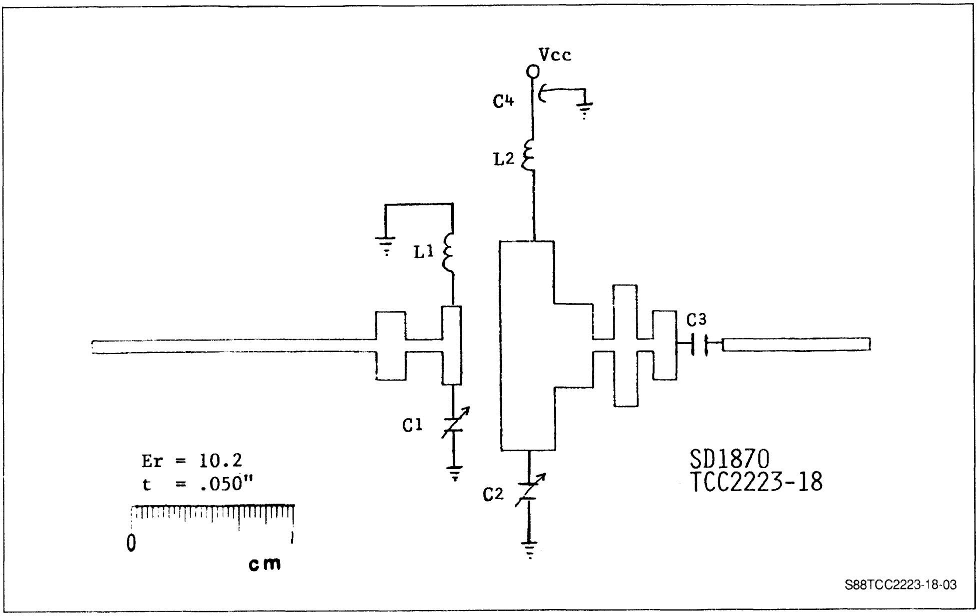
TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE WORKSHEET



F_{GHZ}	Z_{IN} (Ω)	Z_{CL} (Ω)
2.2	20 + j11	3.6 + j1.5
2.25	23 + j5	3.3 – j1.0
2.3	23 + j2	3.2 – j1.6

Z_{CL} = The optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

S88TCC2223-18-02

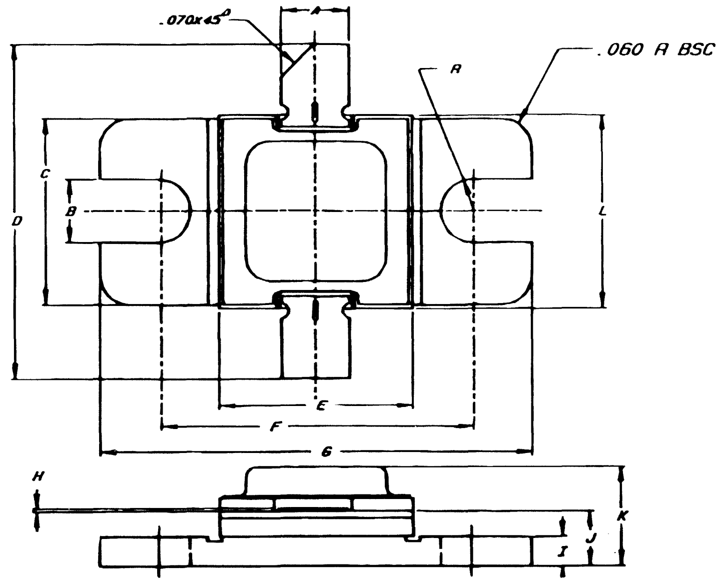


PARTS LIST

ITEM REF.	Description
L1	2 Turns # 20 Wire 100" Dia
L2	2 Turns # 20 Wire 100" Dia
C1	.4 – 2.5pF Johanson Trimmer Capacitor
C2	.4 – 2.5pF Johanson Trimmer Capacitor
C3	100pF ATC Chip Capacitor Size A
C4	15.000pF Emi Filter Capacitor (erie)
	Circuit Board Material Epsilam 10
	er = 10.2 T = .050" loz Copper

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.135/3.43	.145/3.68
B	.125/3.18 BSC	
C	.380/9.65	.390/9.91
D	.885/22.48	
E	.392/9.96	.402/10.29
F	.645/16.38	.655/16.64

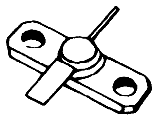
	Minimum Inches/mm	Maximum Inches/mm
G	.895/22.73	.905/22.99
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.105/2.67	.125/3.18
K		.230/5.84
L	.392/9.96	.402/10.29

SGS-THOMSON
MICROELECTRONICS

TCC2301

RF & MICROWAVE TRANSISTORS
MICROWAVE POWER TRANSISTOR FOR CLASS C APPLICATIONS

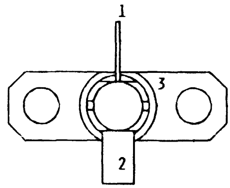
- FREQUENCY 2.3GHz
- POWER OUT 1.0W
- POWER GAIN 10.0dB
- VOLTAGE 22.0V
- ERMETIC STRIPLINE PACKAGE
- ALL GOLD METALLIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL (M151)
hermetically sealed

ORDER CODE	**BRANDING**
SD1813	2301

PIN CONNECTION



S88TCC2301-01

1 collector
2 emitter
3 base

DESCRIPTION

The TCC2301 is a 28V NPN silicon transistor designed for microwave applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CEO}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.7	A
P_{DISS}	Total Device Dissipation at + 25°C	6.7	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	26	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

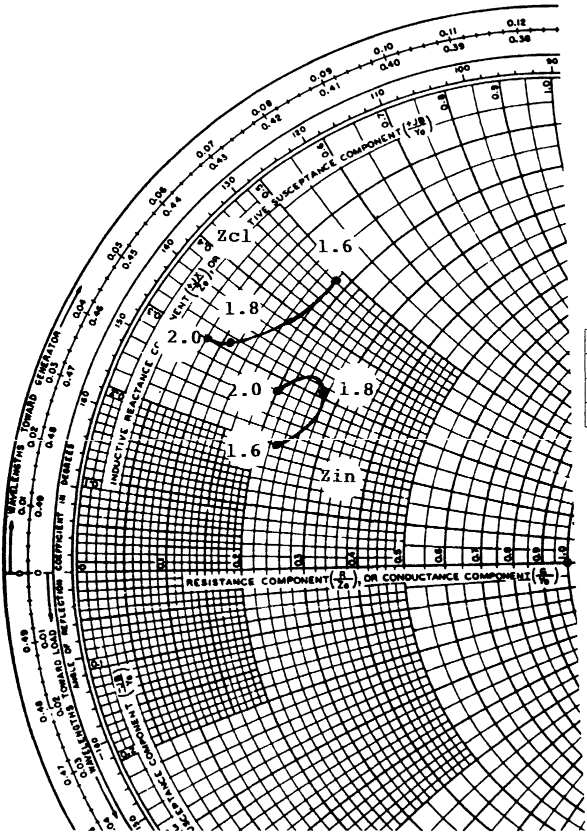
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1mA		40			V
BV_{EBO}	I_E = 1mA		3.5			V
I_{CBO}	VCB = 24V				.05	mA
H_{FE}	V_{CE} = 5V	I_C = 100mA	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 2.3GHz	Vcc = 22V	Pin = 0.1W	1.0			W
P_{GAIN}	f = 2.3GHz	Vcc = 22V	Pin = 0.1W	10.0			dB
N_C	f = 2.3GHz	Vcc = 22V	Po = 1.0W	40			%
C_{ob}	V_{CB} = 28V	f = 1MHz	I_E = 0			3.5	PF

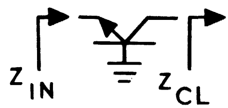
IMPEDANCE DATA (typical values)

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



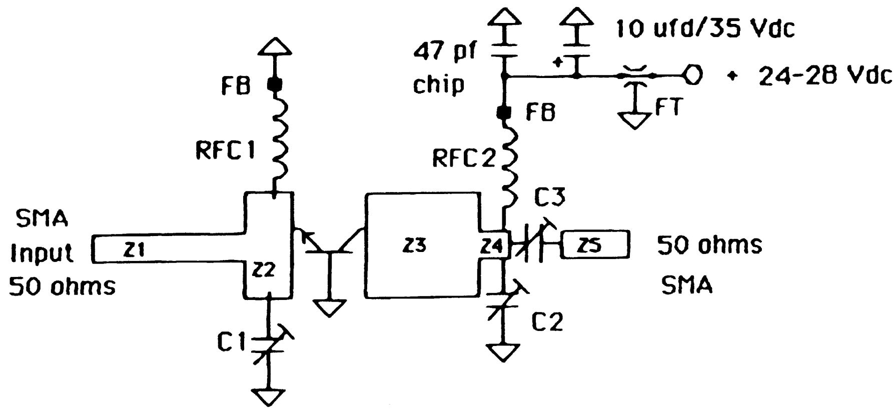
S88TCC2301-02

F GHz	Z_{IN} (Ω)	Z_{CL} (Ω)
1.6	11.6 + j10.2	9.0 + j24.2
1.8	13.7 + j15.5	5.4 + j15.7
2.0	10.2 + j13.9	4.1 + j14.8



S88TCC2301-03

TEST CIRCUIT

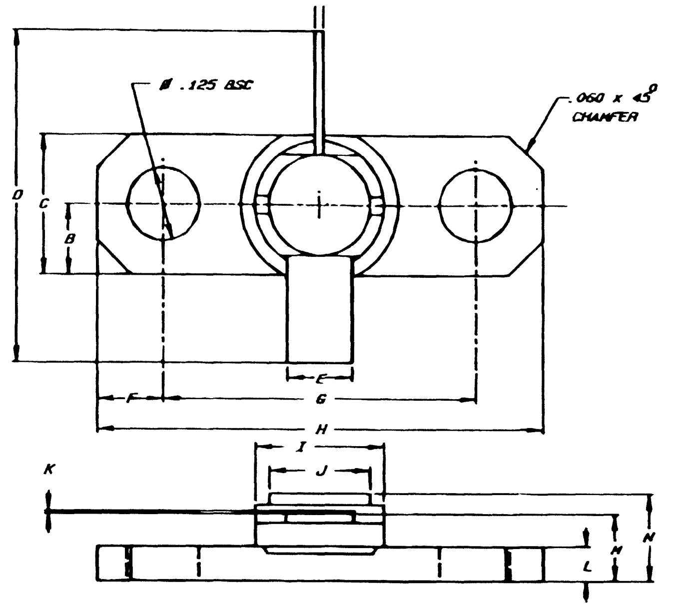


Board material is 1/32" Teflon Er = 2.5

RFC1, 2	3t, #26, 0.10" ID
C1, 2	0.3pf - 3pf Johanson piston trimmer
C3	3pf Johanson Gigi-trim cap
FB	ferrite bead
FT	Spectrum Controls, Inc. feedthru cap # SCI 729-303 (or .001 ufd)
Z1	0.1" X 0.875"
Z2	0.15" X 0.3"
Z3	0.25" X 0.55"
Z4	0.1 X 0.15"
Z5	0.080" wide 50Ω line

PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

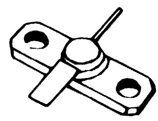
SGS-THOMSON MICROELECTRONICS

TCC2302

RF & MICROWAVE TRANSISTORS

MICROWAVE POWER TRANSISTOR FOR CLASS C APPLICATIONS

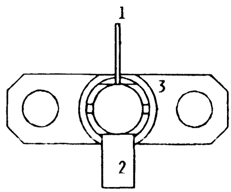
- FREQUENCY 2.3GHz
- POWER OUT 2.0W
- POWER GAIN 9.0dB
- VOLTAGE 20.0V
- HERMETIC STRIPLINE PACKAGE
- ALL GOLD METALLIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL/FLM (M151)
hermetically sealed

ORDER CODE	BRANDING
SD1812	SD1812

PIN CONNECTION



S88TCC2302-01

1 collector
2 emitter
3 base

DESCRIPTION

The TCC2302 is a 28V NPN silicon transistor designed for microwave applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CEO}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	1.1	A
P_{DISS}	Total Device Dissipation at + 25°C	8.8	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	20	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

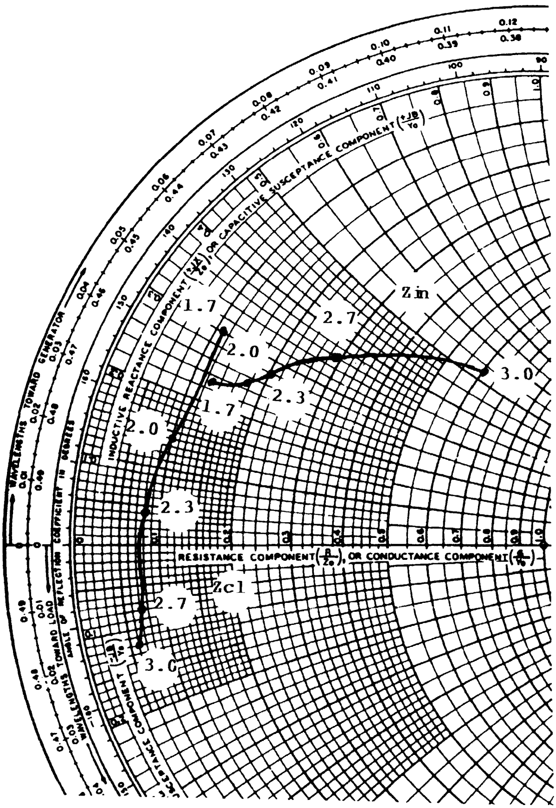
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CBO}	I_C = 1mA			45			V
BV_{EBO}	I_E = 1mA			15			V
I_{CBO}	VCB = 24V					0.5	mA
H_{FE}	V_{CE} = 5V	I_C = 100mA		15		150	
C_{ob}	V_{CB} = 28V	f = 1MHz	I_E = 0			3.5	PF

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 2.3GHz	Vcc = 20V	Pin = 0.25W	2.0			W
P_{GAIN}	f = 2.3GHz	Vcc = 20V	Pin = 0.25W	9.0			dB
N_C	f = 2.3GHz	Vcc = 20V	Po = 2.0W	40			%

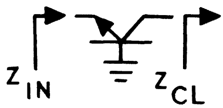
IMPEDANCE DATA (typical values)

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



S88TCC2302-02

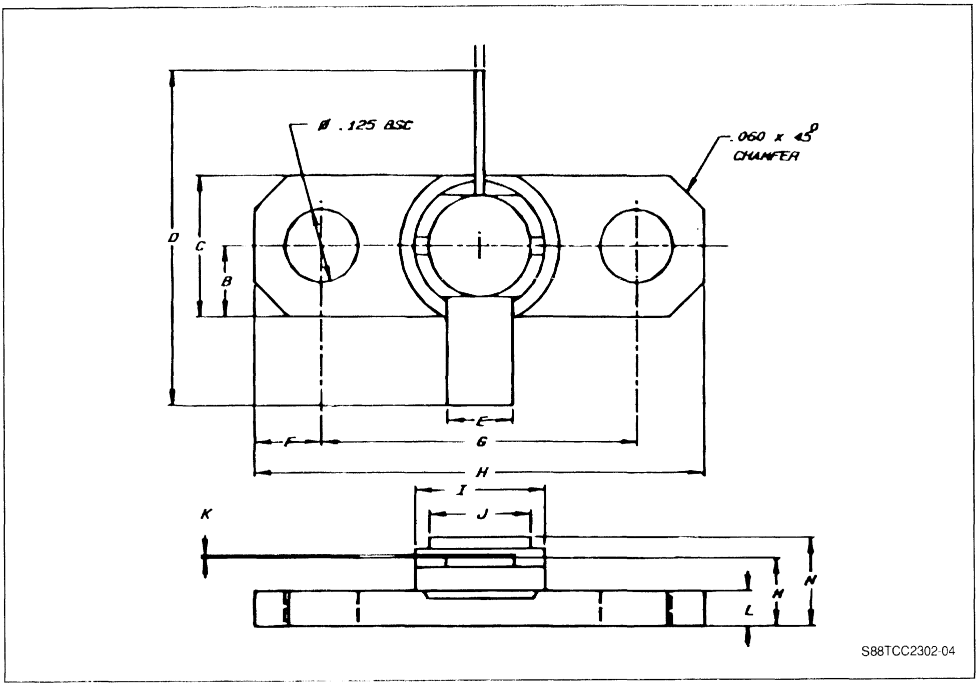
F GHz	$Z_{IN}(\Omega)$	$Z_{CL}(\Omega)$
1.7	6.5 + j11.5	5.5 + j15.0
2.0	8.0 + j12.3	4.8 + j7.0
2.3	9.8 + j14.2	4.2 + j1.8
2.7	14.6 + j18.1	3.7 − j4.2
3.0	30.1 + j26.3	3.2 − J6.2



S88TCC2302-03

PACKAGE MECHANICAL DATA

.230 2LFL/FLM



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

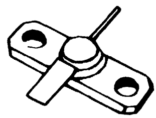
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON
MICROELECTRONICS

TCC2304

RF & MICROWAVE TRANSISTORS
MICROWAVE POWER TRANSISTOR FOR CLASS C APPLICATIONS

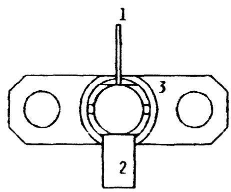
- FREQUENCY 2.3GHz
- POWER OUT 4.0W
- POWER GAIN 9.0dB
- VOLTAGE 20.0V
- HERMETIC STRIPLINE PACKAGE
- ALL GOLD METALLIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL (M151)
hermetically sealed

ORDER CODE	BRANDING
SD1814	2304

PIN CONNECTION



S88TCC2304-01

1 collector
2 emitter
3 base

DESCRIPTION

The TCC2304 is a 28V NPN silicon transistor designed for microwave applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness. Order Part Number SD1814.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CEO}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	1.6	A
P_{DISS}	Total Device Dissipation at + 25°C	12.5	W
T_{stg}	Storage Temperature	– 65 to + 200	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	14	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

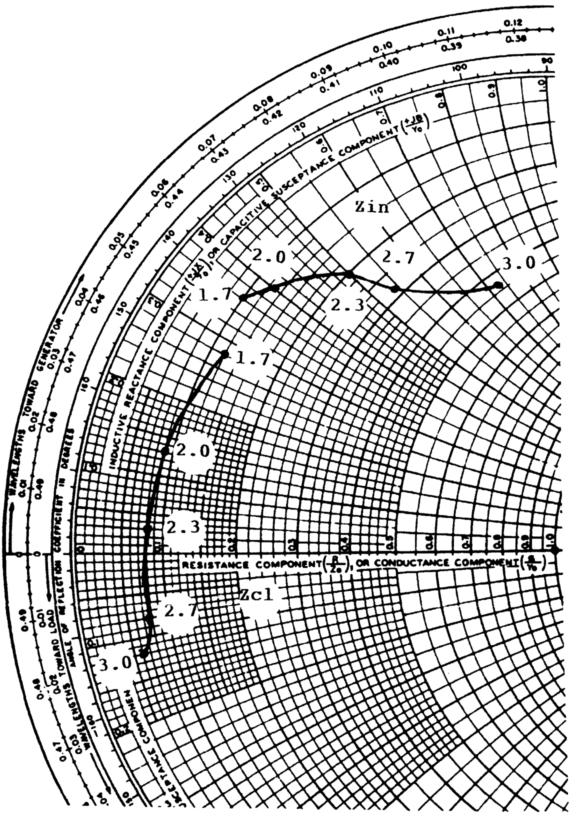
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CBO}	I_C = 2mA			40			V
BV_{EBO}	I_E = 2mA			3.5			V
I_{CBO}	V_{CB} = 24V					0.1	mA
h_{FE}	V_{CE} = 5V	I_C = 100mA		15		150	
C_{ob}	V_{CB} = 28V	f = 1MHz	I_E = 0			5	PF

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 2.3GHz	V_{CC} = 20V	Pin = 0.5W	4.0			W
P_{GAIN}	f = 2.3GHz	V_{CC} = 20V	Pin = 0.5W	9.0			dB
N_C	f = 2.3GHz	V_{CC} = 20V	Po = 4.0W	40			%

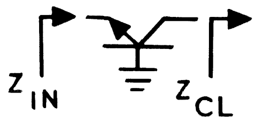
IMPEDANCE DATA (typical values)

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



S88TCC2304-02

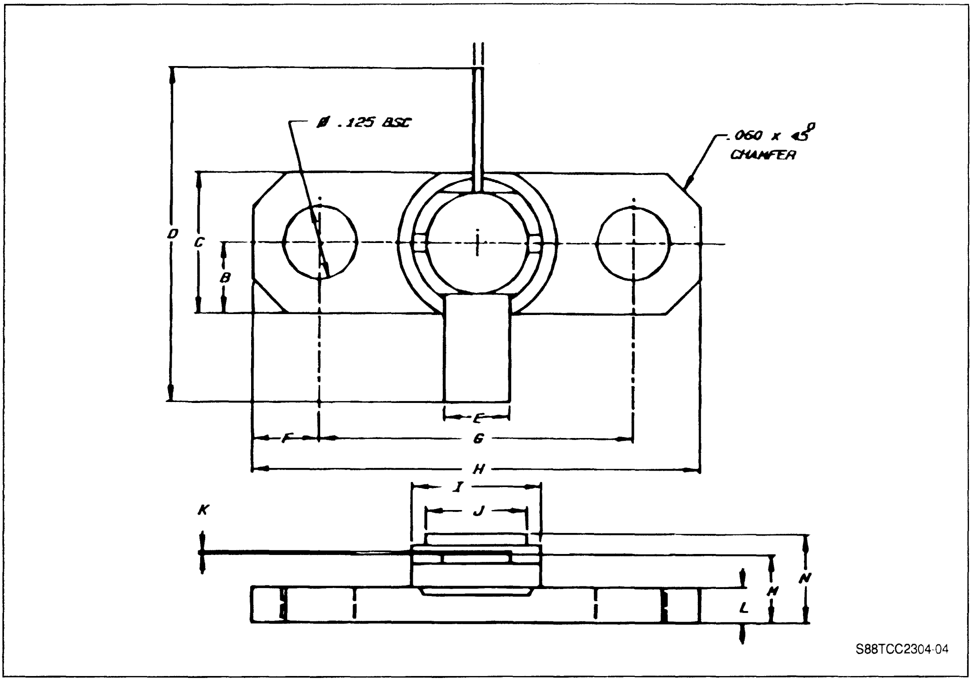
F GHz	Z_{IN} (Ω)	Z_{CL} (Ω)
1.7	4.9 + j18.0	6.0 + j14.0
2.0	6.7 + j20.0	4.4 + j6.5
2.3	10.2 + j25.0	4 0 + j1.7
2.7	14.0 + j27.0	3.8 – j4.2
3.0	22.0 + j37.0	3.2 – j6.2



S88TCC2304-03

PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

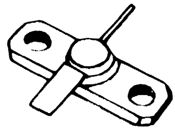
SGS-THOMSON
MICROELECTRONICS

TCC2307

RF & MICROWAVE TRANSISTORS

MICROWAVE POWER TRANSISTOR FOR CLASS C APPLICATIONS

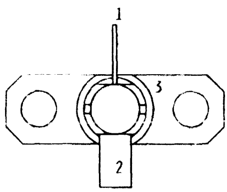
- FREQUENCY 2.3GHz
- POWER OUT 7.0W
- POWER GAIN 8.0dB
- VOLTAGE 22.0V
- HERMETIC TRIPLINE PACKAGE
- ALL GOLD METALLIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL (M151)
hermetically sealed

ORDER CODE	BRANDING
SD1817	SD1817

PIN CONNECTION



1 collector
2 emitter
3 base

DESCRIPTION

The TCC2307 is a 28V NPN silicon transistor designed for microwave applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CEO}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	2.8	A
P_{DISS}	Total Device Dissipation at + 25°C	21.9	W
T_{STG}	Storage Temperature	− 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	8.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

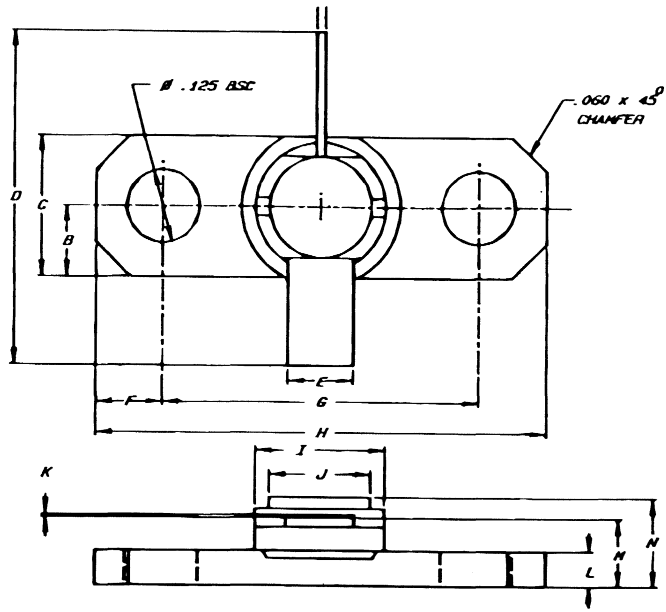
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 4mA		40			V
BV_{EBO}	I_E = 4mA		3.5			V
I_{CBO}	VCB = 24V				0.2	mA
H_{FE}	V_{CE} = 5V	I_C = 500mA	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 2.3GHz	Vcc = 22V	Pin = 1.1W	7.0	7.5		W
P_{GAIN}	f = 2.3GHz	Vcc = 22V	Pin = 1.1W	8.0			dB
η_C	f = 2.3GHz	Vcc = 22V	Po = 7.0W	35	40		%
C_{ob}	V_{CB} = 28V	f = 1MHz	I_E = 0			8.5	PF

PACKAGE MECHANICAL DATA

.230 2LFL



S88TCC2307-02

	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

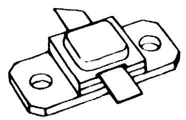
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON
MICROELECTRONICS

TCC2327-15

RF & MICROWAVE TRANSISTORS
MICROWAVE TELECOMMUNICATION APPLICATIONS

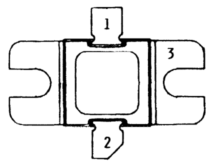
- FREQUENCY 2.3-2.7GHz
- POWER OUT 15.0W
- POWER GAIN 4.0dB
- VOLTAGE 24.0V
- HERMETIC PACKAGE
- ALL GOLD METALLIZED SYSTEM
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- LOW THERMAL RESISTANCE
- COMMON BASE
- BROADBAND PERFORMANCE



.397 x .397 2LFL (M147)
hermetic sealed

ORDER CODE	**BRANDING**
SD1875	2327-15

PIN CONNECTION



S88TCC2327-15-

1 emitter
2 collector
3 base

DESCRIPTION

The TCC2327-15 is an internally input and output matched NPN silicon transistor designed for microwave applications. The device utilizes polysilicon site ballasting with gold metalized die to achieve high reliability and ruggedness. The TCC2327-15 is a 24 Volt device designed to provide 15 Watts over the 2.3-2.7GHz band with a minimum gain of 4.0dB.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector - Base Voltage	15	V
V_{CBO}	Collector - Emitter Voltage	40	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	8.1	A
P_{tot}	Total Device Dissipation at + 25°C	58.3	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	3.0	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

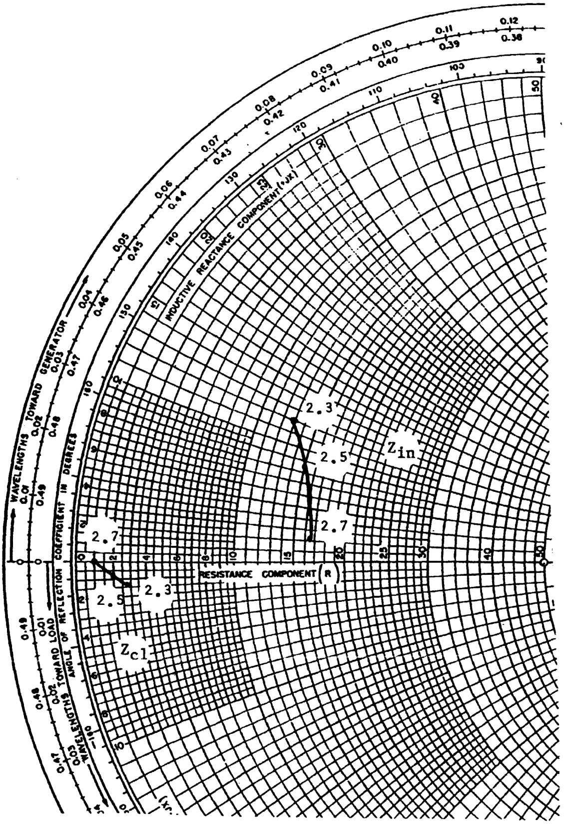
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 8mA	I_B = 0	15			V
BV_{CBO}	I_C = 8mA	V_{BE} = 0	40			V
BV_{EBO}	I_E = 8mA	I_C = 0	3.5			V
I_{CBO}	V_{CB} = 24V	V_{BE} = 0			0.4	mA
h_{FE}	V_{CE} = 5V	I_C = .5A	15		150	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 2.3-2.7GHz	V_{CB} = 24V	P_{IN} = 6W	15			W
P_G	f = 2.3-2.7GHz	V_{CB} = 24V	P_{IN} = 6W	4.0			dB
ηc	f = 2.3-2.7GHz	V_{CB} = 24V	P_{OUT} = 15W	30			%

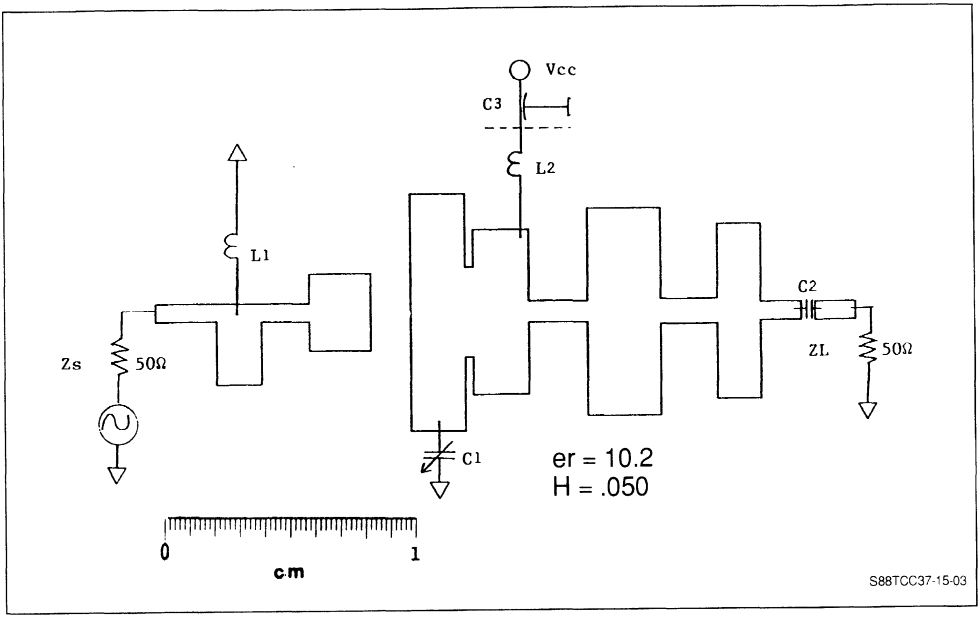
TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



F_{GHz}	$Z_{IN}\Omega$	$Z_{CL}\Omega$
2.3	13 + j12	2.8 – j1.3
2.5	15 + j8.5	2.0 – j0.8
2.7	16.5 + j2.1	1.0 + j0.0

Z_{CL} = the optimum load impedance into which the transistor operates at the specified power out, voltage and frequency.

S88TCC37-15-02

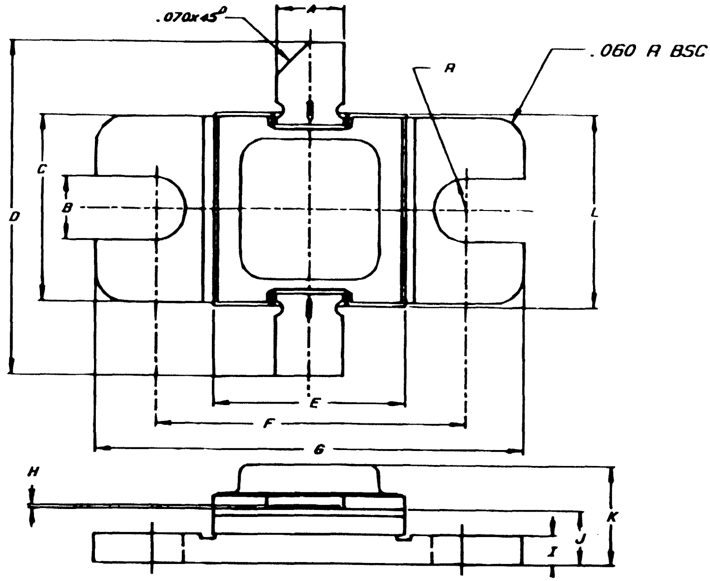


PARTS LIST

ITEM REF	Description of OF ITEM
L1	2 Turn Choke #28 Wire .080# Dia.
L2	2 Turn Choke #28 Wire .080# Dia.
C1	.4-2.5pF Johanson Capacitor
C2	100pF Chip Capacitor ATC
C3	15.000pF Emi Filter
S1	Epsilam 10 er = 10.2 H = .050" I oz cu
	SMA Launcher CDI (2 pieces)
	.397" Fixture Housing
	Heat Sink

PACKAGE MECHANICAL DATA

.397 x .397 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.135/3.43	.145/3.68
B	.125/3.18 BSC	
C	.380/9.65	.390/9.91
D	.885/22.48	
E	.392/9.96	.402/10.29
F	.645/16.38	.655/16.64

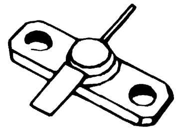
	Minimum Inches/mm	Maximum Inches/mm
G	.895/22.73	.905/22.99
H	.002/0.05	.006/0.15
I	.055/1.40	.065/1.65
J	.105/2.67	.125/3.18
K		.230/5.84
L	.392/9.96	.402/10.29

SGS-THOMSON MICROELECTRONICS

TCC3000

RF & MICROWAVE TRANSISTORS
MICROWAVE POWER TRANSISTOR FOR CLASS C APPLICATIONS

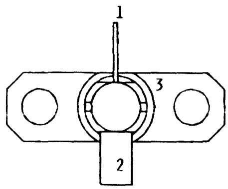
- FREQUENCY 3.0GHz
- POWER OUT .5W
- POWER GAIN 7.0dB
- VOLTAGE 28.0V
- HERMETIC STRIPLINE PACKAGE
- ALL GOLD METALLIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL (M151)
hermetically sealed

ORDER CODE	**BRANDING**
SD1830	83000

PIN CONNECTION



S88TCC3000-01

1 collector
2 emitter
3 base

DESCRIPTION

The TCC3000 is a 28V NPN silicon transistor designed for microwave applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45	V
V_{CEO}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.5	A
P_{DISS}	Total Device Dissipation at + 25°C	3.9	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	45	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

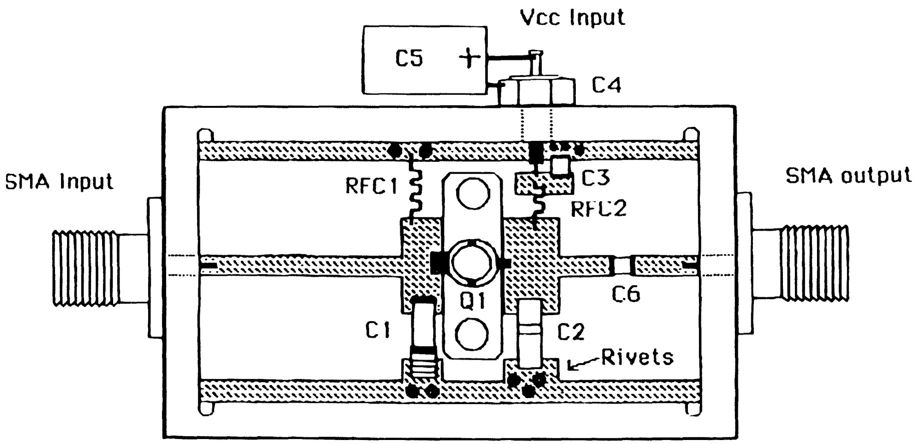
STATIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CBO}	I_C = 1mA			45			V
BV_{EBO}	I_E = 1mA			3.5			V
I_{CBO}	VCB = 24V					0.5	mA
H_{FE}	V_{CE} = 5V	I_C = 50mA		15		150	
C_{ob}	V_{CB} = 28V	f = 1MHz	I_E = 0			3.0	PF

DYNAMIC

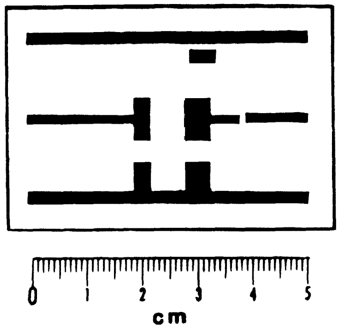
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 3.0GHz	Vcc = 28V	Pin = 0.1W	0.5	0.7		W
P_{GAIN}	f = 3.0GHz	Vcc = 28V	Pin = 0.1W	7.0	8.0		dB
N_C	f = 3.0GHz	Vcc = 28V	Po = 0.5W	30			%

TEST CIRCUIT



Brass housing with board soldered in place

S88TCC3000-02



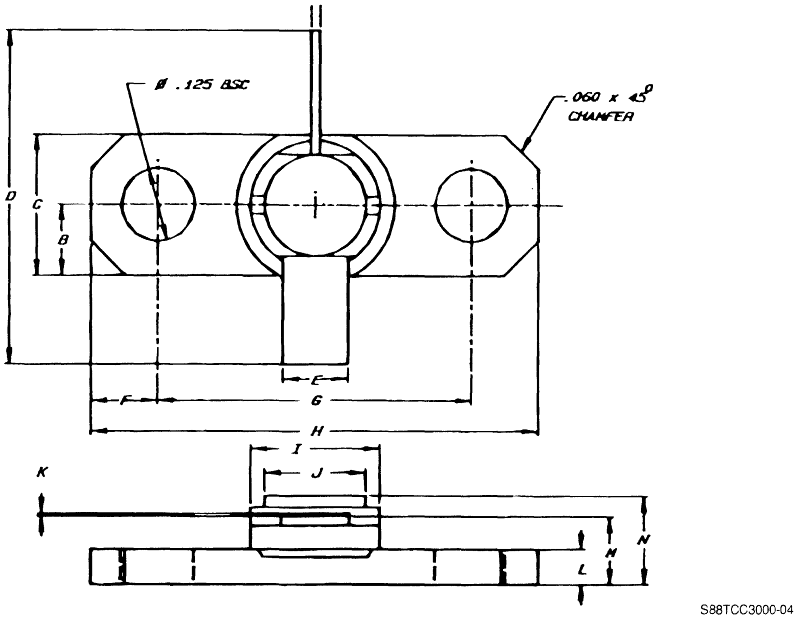
S88TCC300-03

C_1	0.3-3.0pf Johanson
C_2	Johanson #27273
C_3, C_6	10pf Chip Cap
C_4	1000pf FT/EMI Filter
C_5	10µF @ 35V
$RFC_{1,2}$	3 Turns #26 0.1" ID

Circuit Board : Er = 2.55 Teflon
Thickness = 0.032"
Trace Side is Shown
Opposite Side is Unetched

PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.55/14.10	.565/14.35
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57

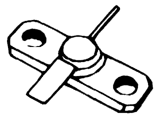
Cont'd		
	Minimum Inches/mm	Maximum Inches/mm
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON
MICROELECTRONICS

TCC3001

RF & MICROWAVE TRANSISTORS
MICROWAVE POWER TRANSISTOR FOR CLASS C APPLICATIONS

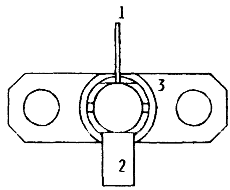
- FREQUENCY 3.0GHz
- POWER OUT 1.0W
- POWER GAIN 7.0dB
- VOLTAGE 28.0V
- HERMETIC STRIPLINE PACKAGE
- ALL GOLD METALLIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL (M151)
hermetically sealed

ORDER CODE	BRANDING
SD1831	83001

PIN CONNECTION



S88TCC3001-01

1 collector
2 emitter
3 base

DESCRIPTION

The TCC3001 is a 28V NPN silicon transistor designed for microwave applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45	V
V_{CEO}	Collector - Emitter Voltage	15	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.5	A
P_{DISS}	Total Device Dissipation at + 25°C	5	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	35	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

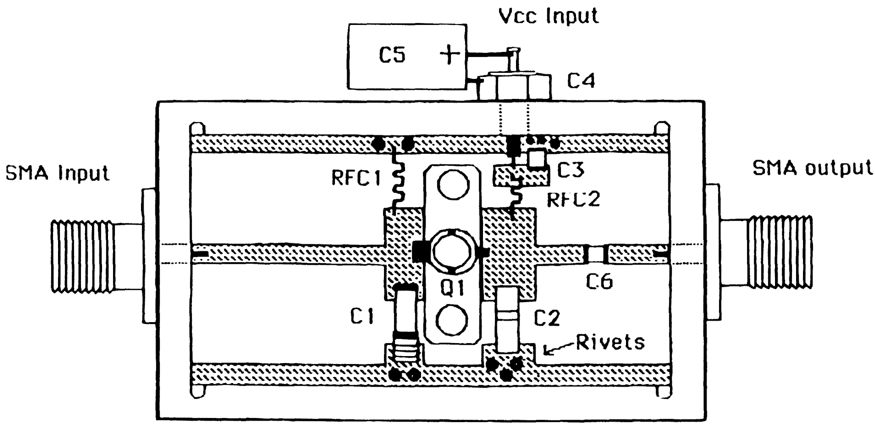
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1mA		45			V
BV_{EBO}	I_E = 1mA		3.5			V
H_{FE}	V_{CE} = 5V	I_C = 100mA	15		150	

DYNAMIC

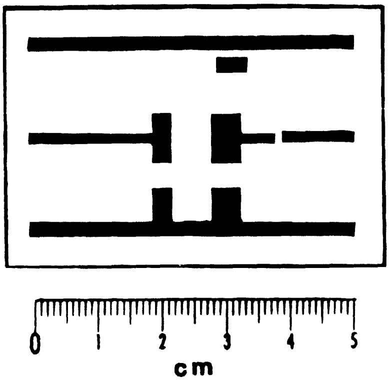
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 3.0GHz	Vcc = 28V	Pin = 0.2W	1.0	1.3		W
P_{GAIN}	f = 3.0GHz	Vcc = 28V	Pin = 0.2W	7.0	8.1		dB
N_C	f = 3.0GHz	Vcc = 28V	Po = 1.0W	35	40		%
C_{ob}	V_{CB} = 28V	f = 1MHz	I_E = 0			3.5	PF

TEST CIRCUIT



Brass housing with board soldered in place

S88TCC3001-02



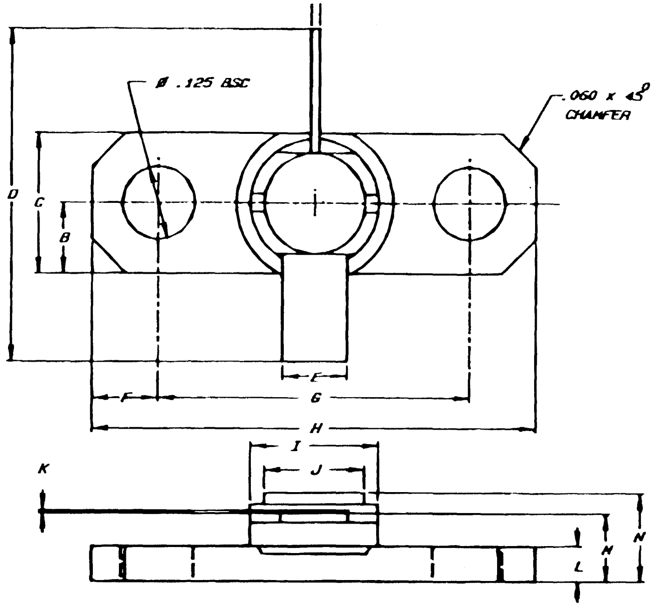
S88TCC3001-03

C_1	0.3-3.0pf Johanson
C_2	Johanson #27273
C_3, C_6	10pf Chip Cap
C_4	1000pf FT/EMI Filter
C_5	10µF @ 35V
$RFC_{1,2}$	3 Turns #26 0.1" ID

Circuit Board : Er = 2.55 Teflon
Thickness = 0.032"
Trace Side is Shown
Opposite Side is Unetched

PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

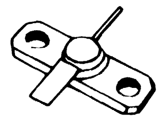
SGS-THOMSON MICROELECTRONICS

TCC3003

RF & MICROWAVE TRANSISTORS

MICROWAVE POWER TRANSISTOR FOR CLASS C APPLICATIONS

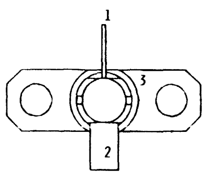
- FREQUENCY 3.0GHz
- POWER OUT 3.0W
- POWER GAIN 5.8dB
- VOLTAGE 28.0V
- HERMETIC STRIPLINE PACKAGE
- ALL GOLD METTALIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL (M151)
hermetic sealed

ORDER CODE	**BRANDING**
SD1833	3003

PIN CONNECTION



S88TCC3003-01

1 collector
2 emitter
3 base

DESCRIPTION

The TCC3003 is a 28V NPN silicon transistor designed for microwave applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness. Order Part Number SD1833.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45	V
V_{CEO}	Collector - Emitter Voltage	16	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.5	A
P_{DISS}	Device Dissipation at + 25°C	10.3	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	8.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

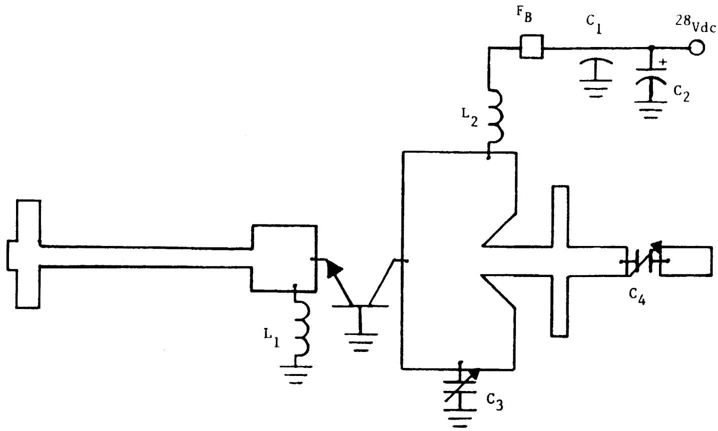
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1mA		45			V
BV_{EBO}	I_E = 1mA		3.5			V
H_{FE}	V_{CE} = 5V	I_C = 100mA	15		150	

DYNAMIC

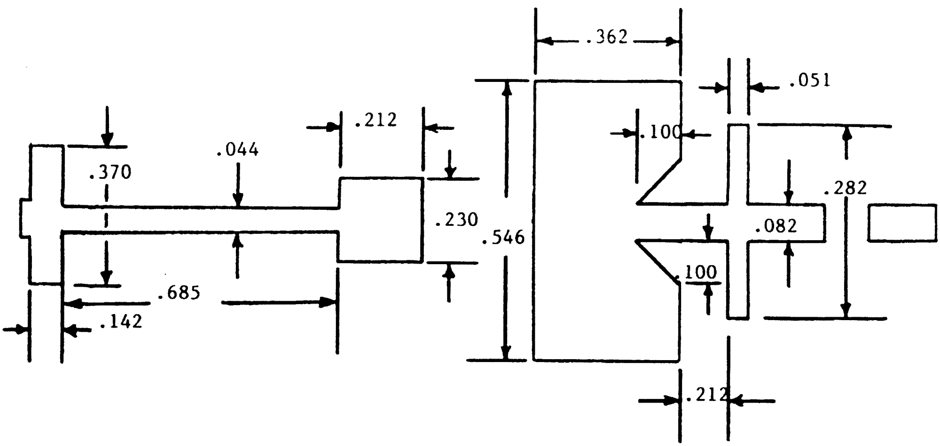
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 3.0GHz	V_{CC} = 28V	Pin = 0.8W	3.0	3.4		W
P_{GAIN}	f = 3.0GHz	V_{CC} = 28V	Pin = 0.8W	5.8	6.3		dB
η_C	f = 3.0GHz	V_{CC} = 28V	Po = 3.0W	30	35		%
C_{ob}	V_{CB} = 28V	f = 1MHz	I_E = 0			5	pF

TEST CIRCUIT



S88TCC3003-02

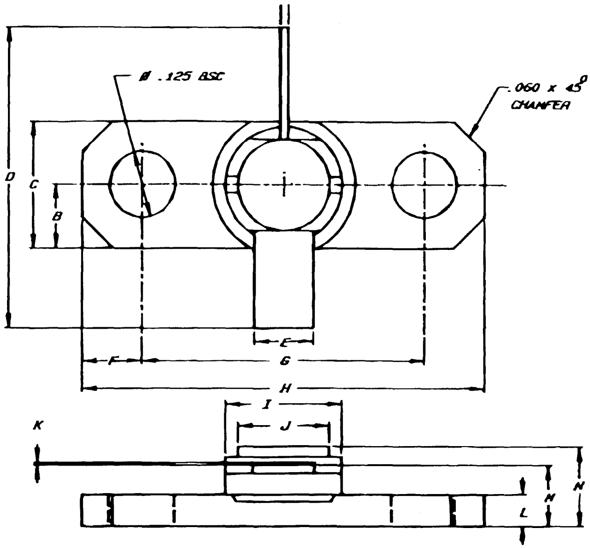
L_1	–	3 1/2 Turns #26AWG 0.100" I.D.
L_2	–	2 1/2 Turns #26AWG 0.100" I.D.
C_1	–	1000pF ATC Chip Cap
C_2	–	10µF @ 35V ELECTROLYTIC
C_3, C_4	–	Johanson Gigatrim #27273
F_B	–	FERRITE BEAD



S88TCC3003-03

PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

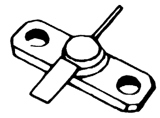
SGS-THOMSON
MICROELECTRONICS

TCC3005

RF & MICROWAVE TRANSISTORS

MICROWAVE POWER TRANSISTOR FOR CLASS C APPLICATIONS

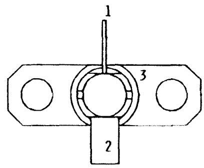
- FREQUENCY 3.0GHz
- POWER OUT 5.0W
- POWER GAIN 4.5dB
- VOLTAGE 28.0V
- HERMETIC STRIPLINE PACKAGE
- ALL GOLD METALLIZED SYSTEM
- POLYSILICON SITE BALLASTING
- OVERLAY DIE GEOMETRY
- HIGH RELIABILITY AND RUGGEDNESS
- COMMON BASE OPERATION



.230 2LFL (M151)
hermetic sealed

ORDER CODE	**BRANDING**
SD1835	3005

PIN CONNECTION



S88TCC3005-01

1 collector
2 emitter
3 base

DESCRIPTION

The TCC3005 is a 28V NPN silicon transistor designed for microwave applications. This device utilizes polysilicon site ballasting with a gold metallized die to achieve high reliability and ruggedness. Order Part Number SD1835.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45	V
V_{CEO}	Collector - Emitter Voltage	16	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.75	A
P_{DISS}	Total Device Dissipation at + 25°C	20	W
T_{STG}	Storage Temperature	– 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(J-C)}$	Junction-case Thermal Resistance	8.5	°C/W

ELECTRICAL CHARACTERISTICS ($T_{case} = 25°C$)

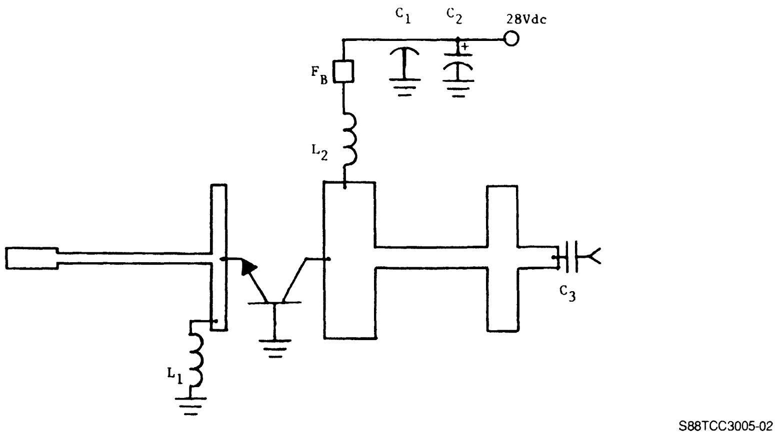
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	$I_C = 2mA$		45			V
BV_{EBO}	$I_E = 2mA$		3.5			V
H_{FE}	$V_{CE} = 5V$	$I_C = 200mA$	15		150	

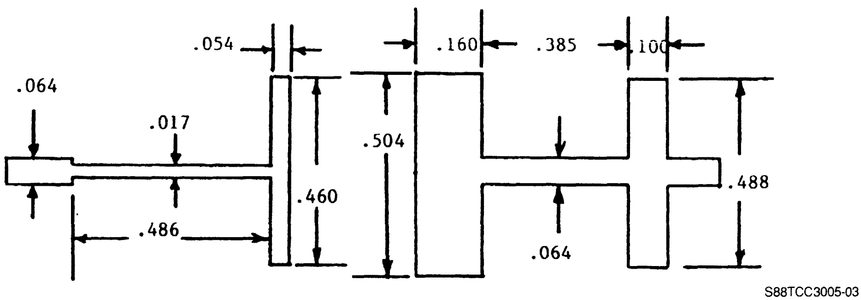
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 3.0GHz	$V_{CC} = 28V$	Pin = 1.6W	5.0	5.5		W
P_{GAIN}	f = 3.0GHz	$V_{CC} = 28V$	Pin = 1.6W	4.5	5.4		dB
η_C	f = 3.0GHz	$V_{CC} = 28V$	Po = 5.0W	30	35		%
C_{ob}	$V_{CB} = 28V$	f = 1MHz	$I_E = 0$			7.5	pF

TEST CIRCUIT

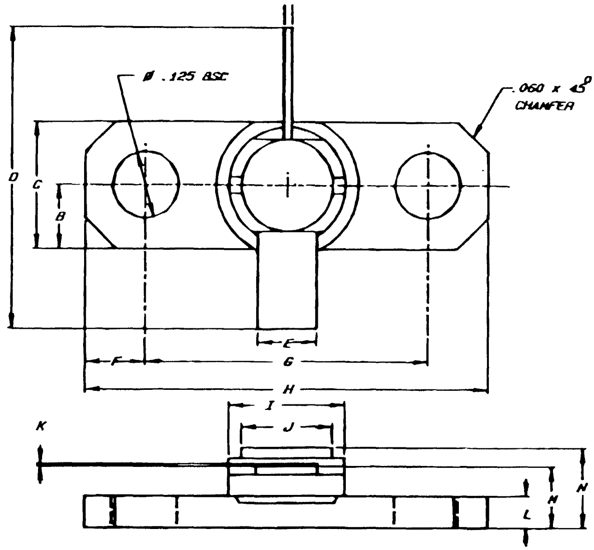


L_1, L_2 – 2 Turns #26AWG 0.100" I.D.
C_1 – 1000pF ATC Chip Cap
C_2 – 10µF @ 35V ELECTROLYTIC
C_3 – 27pF ATC Chip Cap
F_B – FERRITE BEAD



PACKAGE MECHANICAL DATA

.230 2LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

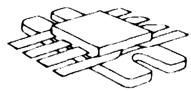
	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32

SGS-THOMSON MICROELECTRONICS

TCC3100

RF POWER TRANSISTORS TV BAND III APPLICATIONS

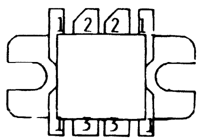
- FREQUENCY 170-230MHz
- POWER OUT 100W
- VOLTAGE 28V
- POWER GAIN 11dB
- CLASS AB PUSH PULL
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION
- INTERNAL INPUT MATCHING



.400 x .425 8LFL (M168)
epoxy sealed

ORDER CODE	**BRANDING**
SD1456-02	TCC3100

PIN CONNECTION



S88TCC3100-01

1 emitter
2 collector
3 base

DESCRIPTION

The TCC3100 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class AB operation in VHF and band III television transmitters and transposers. (order as SD1456)

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	65	V
V_{CEO}	Collector - Emitter Voltage	33	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	16	A
P_{tot}	Total Device Dissipation at 25°C	150	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

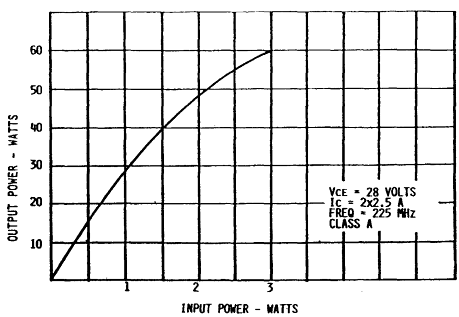
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 50mA		35			V
BV_{CBO}	I_C = 50mA		65			V
BV_{EBO}	I_E = 5mA		3.5			V
h_{FE}	V_{CE} = 20V	I_C = .5A	20	150		

DYNAMIC

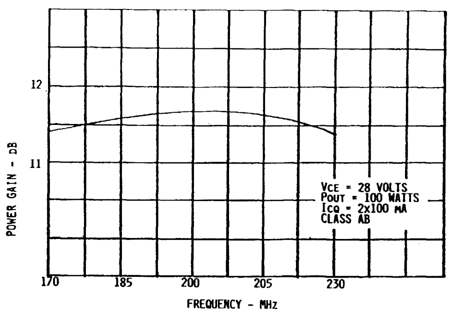
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 225MHz	V_{CE} = 28V	I_C = 2 x 2.5A	28	32		W
P_G	f = 225MHz	V_{CE} = 28V	I_C = 2 x 2.5A	14	15		dB
IMD	f = 225MHz	V_{CE} = 28V	P_{REF} = 28W			– 51	DB
V_{SWR}	f = 225MHz	V_{CE} = 28V	P_O = 28W	∞			
C_{ob}	f = 1MHz	V_{CB} = 28V				80	pF
P_O	F = 225MHz	V_{CE} = 28V	I_{CQ} = 2 x 100MA	100			W
P_G	F = 225MHz	V_{CE} = 28V	I_{CQ} = 2 x 100MA	11			DB
N_C	F = 225MHz	V_{CE} = 28V	I_{CQ} = 2 x 100MA	70			%

OUTPUT POWER VS INPUT POWER



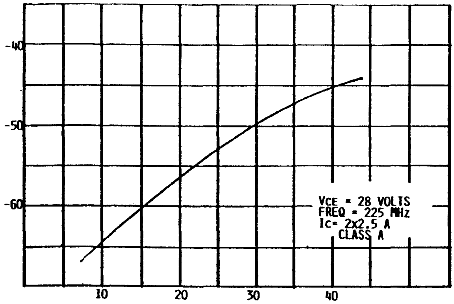
S88TCC3100-02

BROADBAND POWER GAIN VS FREQUENCY



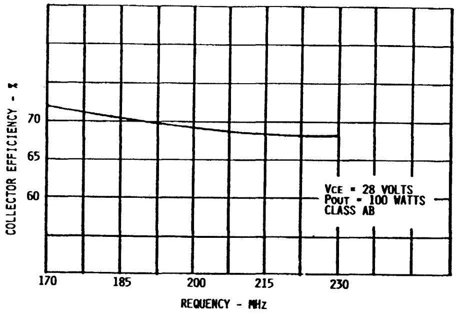
S88TCC3100-03

IMD VS OUTPUT POWER



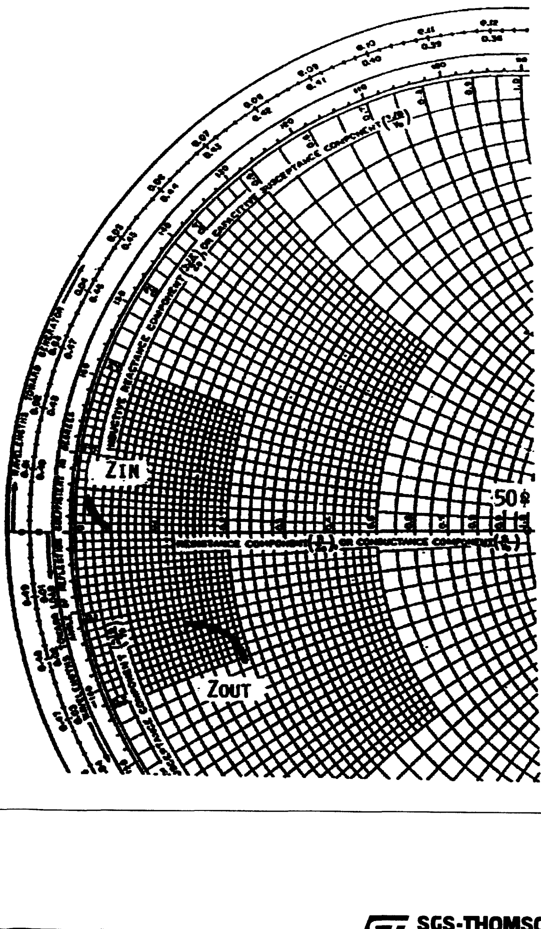
S88TCC3100-04

EFFICIENCY VS FREQUENCY



S88TCC3100-05

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



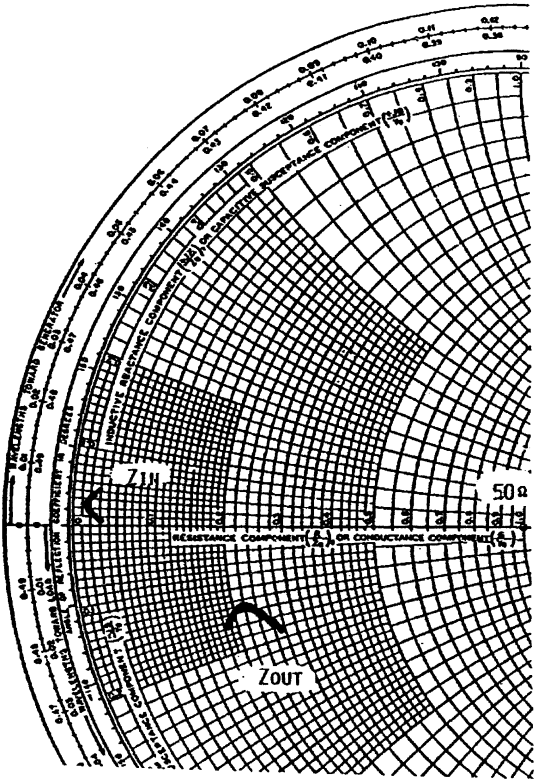
F MHZ	$Z_{IN}(\Omega)$	$Z_{OUT}(\Omega)$
170	1.3 + .6J	9.5 – 10J
200	1 + 1J	9 – 8J
230	0.9 + 1.8J	6.3 – 6.5J

Z_{OUT} = CONJUGATE OF THE OPTIMUM LOAD IMPEDANCE INTO WHICH THE TRANSISTOR OPERATES AT THE SPECIFIED POWER OUT, VOLTAGE AND FREQUENCY.

V_{CE} = 28V
I_{CQ} = 2x100MA
P_{OUT} = 100W
CLASS AB

S88TCC3100-06

TYPICAL SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



F MHZ	$Z_{IN}(\Omega)$	$Z_{OUT}(\Omega)$
170	1.05 + .65J	13.5 − 9J
200	.9 + 1.1J	11 − 6.5J
230	1.25 + 1.8J	9.5 − 7.7J

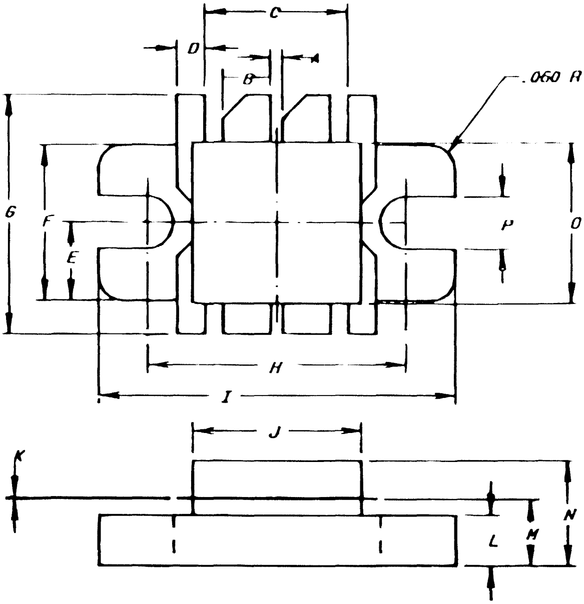
Z_{OUT} = CONJUGATE OF THE OPTIMUM LOAD IMPEDANCE INTO WHICH THE TRANSISTOR OPERATES AT THE SPECIFIED POWER OUT, VOLTAGE AND FREQUENCY.

V_{CE} = 28V
I_C = 2x2.5A
CLASS A

S88TCC3100-07

PACKAGE MECHANICAL DATA

.400 x .425 8LFL



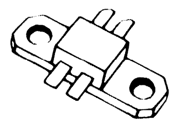
S88TCC3100-08

	Minimum Inches/mm	Maximum Inches/mm
A	.030/0.76 BSC	
B	.115/2.92	.125/3.18
C	.355/9.02	.365/9.27
D	.065/1.65	.075/1.91
E	.192/4.88 BSC	
F	.380/9.65	.390/9.91
G	.735/18.67	.765/19.43
H	.645/16.38	.655/16.64

	Minimum Inches/mm	Maximum Inches/mm
I	.895/22.73	.905/22.99
J	.420/10.67	.430/10.92
K	.003/0.08	.007/0.18
L	.120/3.05	.130/3.30
M	.159/4.04	.175/4.45
N	.250/6.35	.265/6.73
O	.395/10.03	.405/10.29
P	.130/3.30 BSC	

RF POWER TRANSISTORS TV BAND IV AND V APPLICATIONS

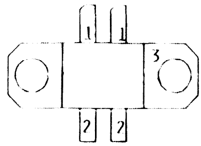
- FREQUENCY 470-860MHz
- POWER OUT 14W
- VOLTAGE 25V
- POWER GAIN 8.5dB
- CLASS AB PUSH PULL
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DIFFUSED EMITTER BALLASTING RESISTORS
- COMMON EMITTER CONFIGURATION
- INTERNAL INPUT MATCHING



.250 x .320 4 LFL (M156)
epoxy sealed

ORDER CODE	BRANDING
SD1732	TDS595

PIN CONNECTION



1 collector
2 base
3 emitter

DESCRIPTION

The TDS595 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity class AB operation in UHF and band IV, V television transmitters and transposers.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	45	V
V_{CEO}	Collector - Emitter Voltage	25	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current (max.)	2 x 2.6	A
P_{tot}	Total Device Dissipation at 25°C	65	W
T_{stg}	Storage Temperature	– 65 to + 150	°C
T_j	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	2.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CEO}	I_C = 40mA		25			V
BV_{CBO}	I_C = 20mA		45			V
BV_{EBO}	I_E = 3mA		4			V
h_{FE}	V_{CE} = 20V	I_C = .5A	10			

DYNAMIC

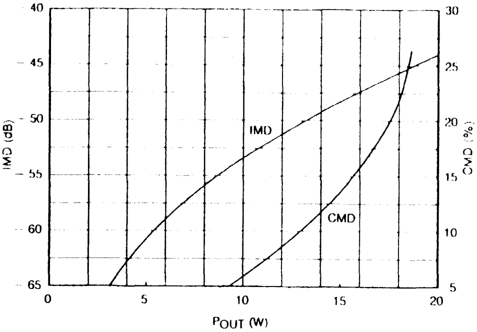
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 860MHz	V_{CE} = 25V	I_C = 2x850MA	14			W
P_G	f = 860MHz	V_{CE} = 25V	I_C = 2x850MA		8.5		dB
IMD**	f = 860MHz	V_{CE} = 25V	I_C = 2x850MA		– 47		DB
CMD***	f = 860MHz	V_{CE} = 25V	I_C = 2x850MA		20		%
C_{ob}	f = 1MHz	V_{CB} = 25V			17.5		pF

** 3 tones test - Vision carrier - 8dB/ref
Sound carrier - 7dB/ref
Sideband carrier - 16dB/ref

*** CMD : Cross modulation distortion of the voltage variation (%) of sound carrier when vision carrier is switched from 0 to –20dB.

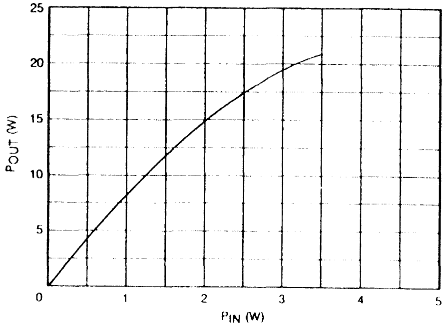
APPLICATION INFORMATION (typical curves)

INTERMODULATION DISTORTION AND CROSS MODULATION DISTORTION VERSUS OUTPUT POWER - TYPICAL VALUES



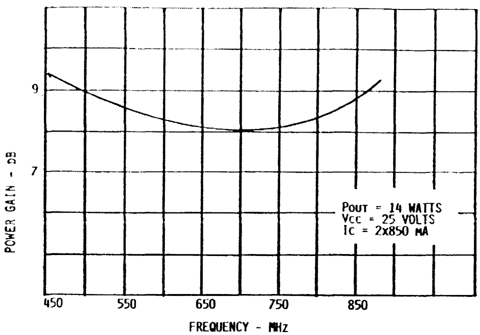
S88TDS595-02

OUTPUT POWER VERSUS INPUT POWER - TYPICAL VALUES



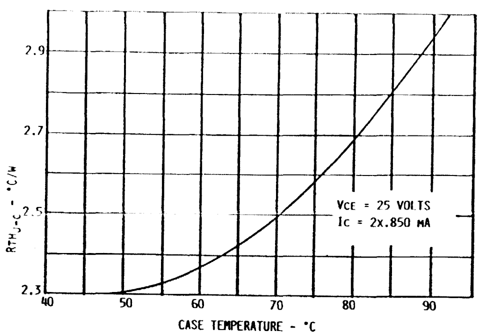
S88TDS595-03

BROADBAND POWER GAIN VS FREQUENCY



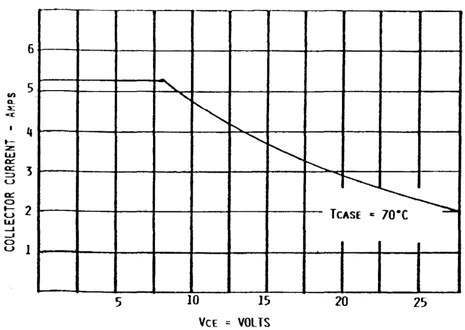
S88TDS595-04

IR SCAN HOT SPOT θJC VS CASE TEMPERATURE



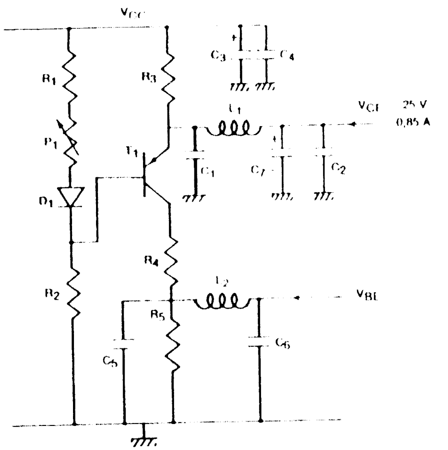
S88TDS595-05

SAFE OPERATING AREA



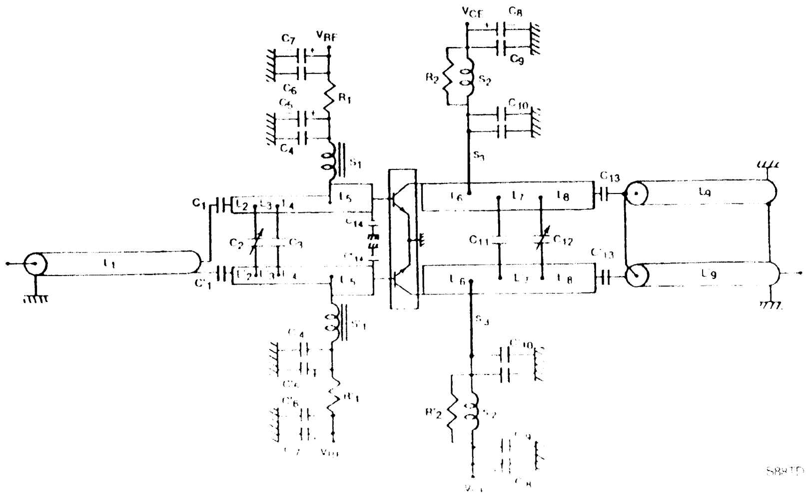
S88TDS595-06

SUPPLY CIRCUIT - CLASS A ADJUSTABLE - (1 by side)



P_1	=	1kΩ
D_1	=	1N 4001
T_1	=	BDX 54 B
R_1	=	56Ω 1/2W
R_2	=	5600Ω 1/2W
R_3	=	2.2Ω 3W
$R_4 = R_5$	=	56Ω 1W
$L_1 = L_2$	=	5turns -wire 5/10 on 3mm internal diameter
$C_1 = C_2 = C_7 = C_5 = C_6$	=	1nF LCC chip +10nF LCC chip
C_3	=	100µF SPRAGUE
C_4	=	10µF SPRAGUE

TEST CIRCUIT

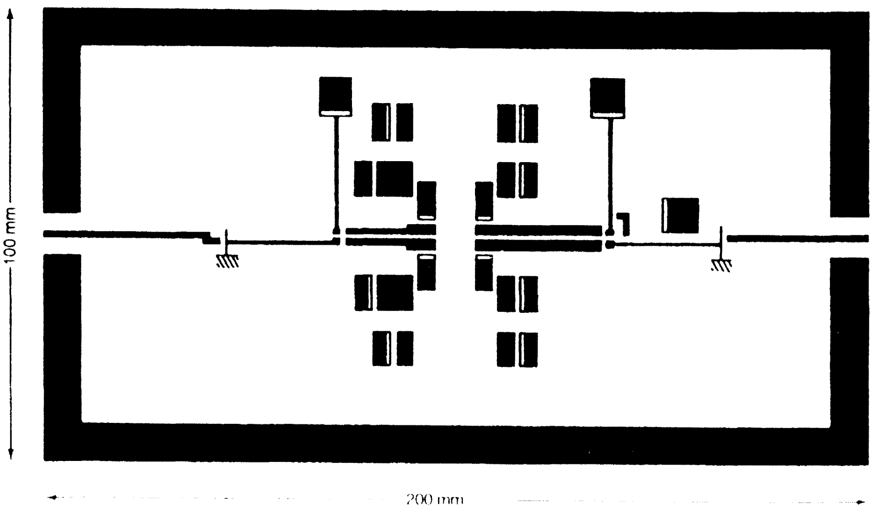


PARTS LIST

$C_1 = C'_1 = C_{13} = C'_{13}$: 68pF - ATC 100A
C_2 : 4.5pF adjustable JOHANSON
C_3 : 4.7 pF - ATC 100A
$C_4 = C'_4 = C_5 = C'_5 = C_9 = C'_9 = C_{10} = C'_{10}$ 100pF ATC 100A + 1nF LCC chip + 10nF LCC chip
$C_6 = C'_6$: 4.7μF - 25V - Tantalum capacitor
$C_7 = C'_7$: 10mF - 25V - Tantalum capacitor
$C_8 = C'_8$: 22mF - 35V - Tantalum capacitor
C_{11} : 4.7pF - ATC 100A
C_{12} : 8pF adjustable JOHANSON
$C_{14} = C'_{14}$: 22pF - ATC 100A

$L_1 = L_9 = L'_9$: 50Ω coaxial wire -O 2.2mm - length 29mm on 70Ω transmission line
$L_2 = L'_2$: 50Ω printed transmission line - length 4mm
$L_3 = L'_3$: 50Ω printed transmission line - length 3mm
$L_4 = L'_4$: 50Ω printed transmission line - length 9.5mm
$L_5 = L'_5$: 39Ω printed transmission line - length 7mm
$L_6 = L'_6$: 39Ω printed transmission line - length 15mm
$L_7 = L'_7$: 39Ω printed transmission line - length 8mm
$L_8 = L'_8$: 39Ω printed transmission line - length 10mm

$R_1 = R'_1$: 4.7Ω - 1/2W
$R_2 = R'_2$: 120Ω - 1/2W
$S_1 = S'_1$: 470nH molded
$S_2 = S'_2$: 5 turns - O wire 5/10 on 3 mm I.D.
$S_3 = S'_3$: O wire 12/10 - lenght 12mm.

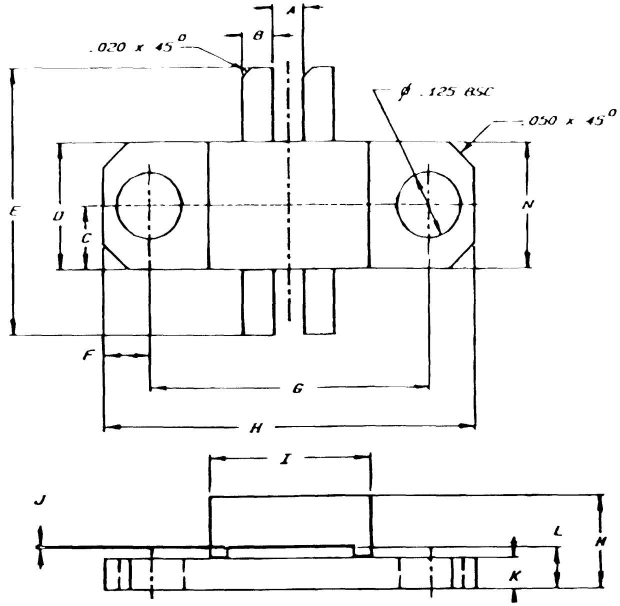


S88TDS595 09

Substrate : teflon fiberglass .30 Mils
Er 2.55

PACKAGE MECHANICAL DATA

.250 x .320 4LFL



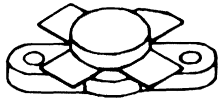
	Minimum Inches/mm	Maximum Inches/mm
A	.060/1.52 BSC	
B	.055/1.40	.065/1.65
C	.124/3.15 BSC	
D	.243/6.17	.253/6.43
E	.635/16.13	.665/16.89
F	.092/2.34 BSC	
G	.555/14.10	.565/14.35

	Minimum Inches/mm	Maximum Inches/mm
H	.739/18.77	.749/19.02
I	.315/8.00	.325/8.26
J	.002/0.05	.006/0.15
K	.055/1.40	.065/1.65
L	.075/1.91	.095/2.41
M		.190/4.83
N	.245/6.22	.255/6.48

TH416

RF & MICROWAVE TRANSISTORS SSB APPLICATIONS

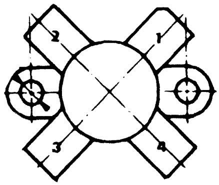
- OPTIMIZED FOR SSB
- FREQUENCY 30 MHz
- VOLTAGE 28 V
- POWER OUT 130 W PEP
- POWER GAIN 12 dB
- IMD – 30 dB
- GOLD METALLIZATION
- COMMON EMITTER



.500 4LFL (M174)
epoxy sealed

ORDER CODE	**BRANDING**
SD1729	TH416

PIN CONNECTION



S88TH416-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The TH416 is a 28 Volt epitaxial silicon NPN planar transistor designed primarily for SSB communications. This device utilizes emitter ballasting to achieve extreme ruggedness under severe operating conditions

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	70	V
V_{CEO}	Collector - Emitter Voltage	35	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	12	A
P_{tot}	Total Power Dissipation	175	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	1	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

Symbol	Test Conditions		Value Min.	Value Typ.	Value Max.	Unit
BV_{CES}	I_C = 50 mA	V_{BE} = 0	70			V
BV_{CEO}	I_C = 100 mA	I_B = 0	35			V
BV_{EBO}	I_E = 20 mA	I_C = 0	4			V
I_{CES}	V_{CE} = 35 V	V_{BE} = 0			20	mA
h_{FE}	V_{CE} = 5 V	I_C = 7 A	18		50	

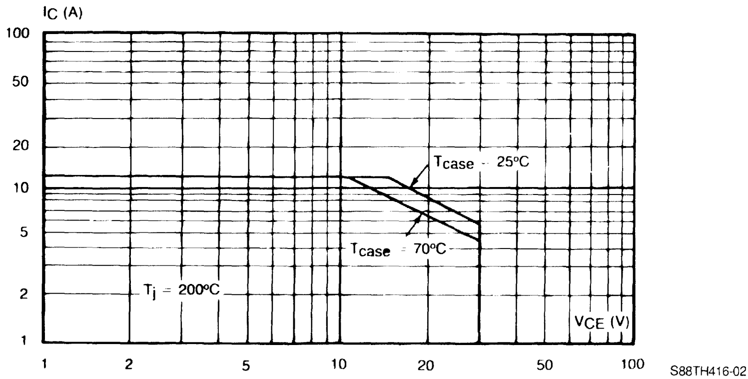
DYNAMIC

Symbol	Test Conditions			Value Min.	Value Typ.	Value Max.	Unit
P_O	f = 30 MHz	V_{CE} = 28 V	I_{cq} = 150 mA	130			WPEP
G_P	f = 30 MHz	V_{CE} = 28 V	I_{cq} = 150 mA	12			dB
IMD	f = 30 MHz	V_{CE} = 28 V	I_{cq} = 150 mA			– 30	dB
C_{ob}	f = 1 MHz	V_{EB} = 28 V			220		pF

APPLICATION INFORMATION

TYPICAL CURVES

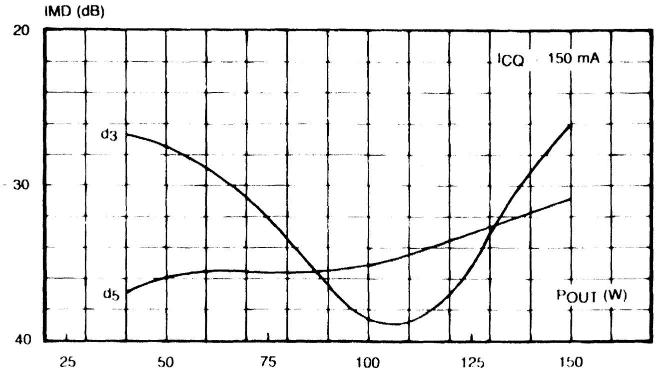
Figure 1 : Safe Operating Area.



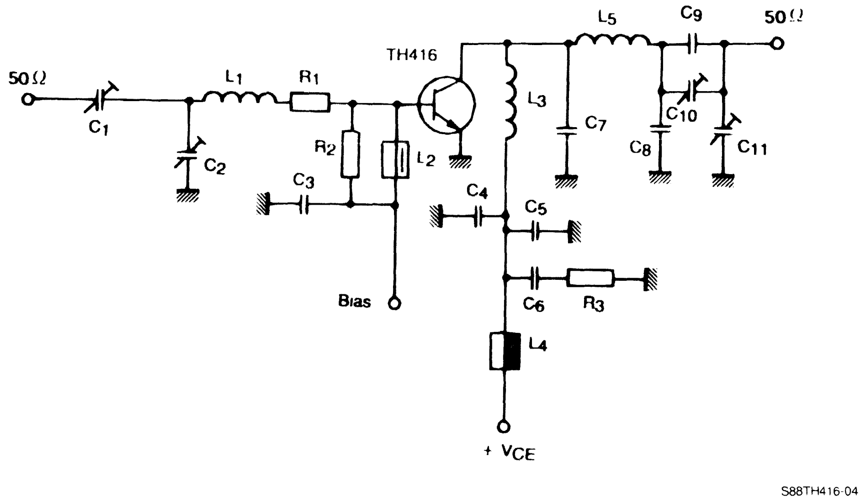
APPLICATION INFORMATION

TYPICAL CURVES

Figure 2 : Intermodulation Distortion versus Output Power.



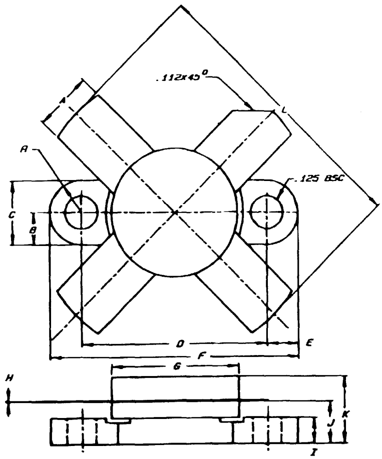
TEXT FIXTURE



C_1	= 20 - 120 pF	C_{11}	= 360 pF
C_2	= 50 - 300 pF	L_1	= 88 nH
C_3	= C_4 = 3.9 nF	L_2	= 22 μH choke coil
C_5	= 100 nF	L_3	= L_5 = 80 nH
C_6	= 2.2 μF	L_4	= Ferrox cube choke coil
C_7	= 2 x 180 pF in parallel	R_1	= 0.55 Ω
C_8	= 3 x 56 pF and 33 pF in parallel	R_2	= 27 Ω
C_9	= 4 x 56 pF and 68 pF in parallel	R_3	= 4.7 Ω
C_{10}	= 360 pF		

PACKAGE MECHANICAL DATA

.500 4LFL



Dimensions in millimeters
S88 TH5416-05

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

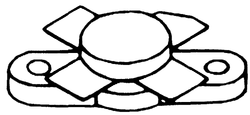
	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

SGS-THOMSON
MICROELECTRONICS

TH430

RF & MICROWAVE TRANSISTORS
SSB APPLICATIONS

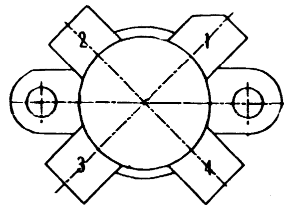
- OPTIMIZED FOR SSB
- FREQUENCY 30 MHz
- VOLTAGE 50 V
- POWER OUT 250 W PEP
- POWER GAIN 15.5 dB
- I_{MD} –30 dB
- GOLD METALLIZATION
- COMMON EMITTER



.550 4LFL (M177)
epoxy sealed

ORDER CODE	BRANDING
SD1728	TH430

PIN CONNECTION



S88TH430-01

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The TH430 is a 50 v epitaxial silicon NPN planar transistor designed primarily for SSB and VHF communications. This device utilizes emitter ballasting for improved ruggedness and reliability.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector – Base Voltage	110	V
V_{CEO}	Collector – Emitter Voltage	55	V
V_{EBO}	Emitter – Base Voltage	4	V
I_C	Collector Current	40	A
P_{tot}	Total Power Dissipation	330	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th\ (j-c)}$	Junction-case Thermal Resistance	0.4	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 200 mA	V_{BE} = 0	110			V
BV_{CEO}	I_C = 200 mA	I_B = 0	55			V
BV_{EBO}	I_B = 20 mA	I_C = 0	4			V
I_{CEO}	V_{CE} = 30 V	I_C = 0			10	mA
h_{FE}	V_{CE} = 6 V	I_C = 10 A	15		80	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 30 MHz	V_{CE} = 50 V	I_{cq} = 150 mA	250			W PEP
G_P	f = 30 MHz	V_{CE} = 50 V	I_{cq} = 150 mA	14.5			dB
IMD*	f = 30 MHz	V_{CE} = 50 V	I_{cq} = 150 mA			– 30	dB
C_{ob}	f = 1 MHz	V_{CB} = 50 V			320	360	pF

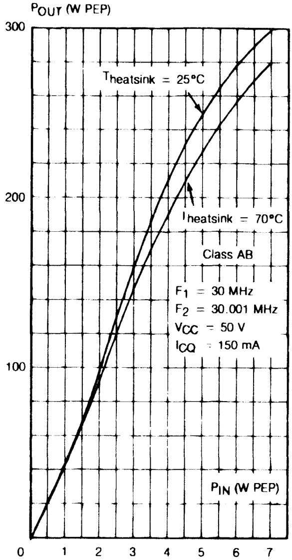
* two tone method.
in class C ; Gp min 13.5 dB, eff 65 %
at 30 MHz.
; Gp min 10 dB, eff 57 %
at 70 MHz.

APPLICATION INFORMATION

TYPICAL CURVES

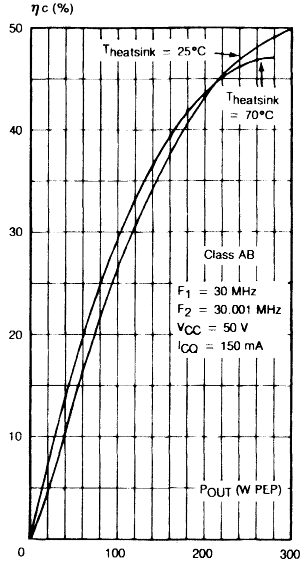
CLASS AB

Figure 1 : Output Peak Envelope Power versus Input Power.



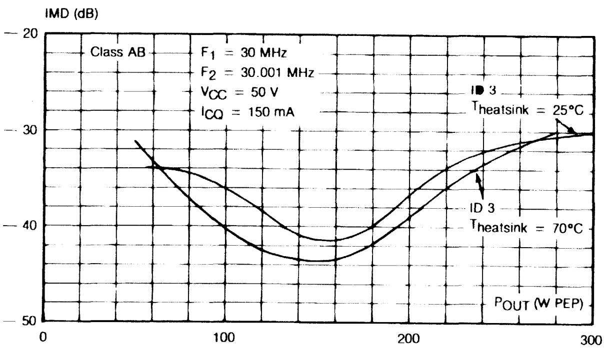
S88TH430-02

Figure 2 : Collector Efficiency versus Output Peak Envelope Power.



S88TH430-03

Figure 3 : Intermodulation Distortion versus Output Peak Envelope Power.

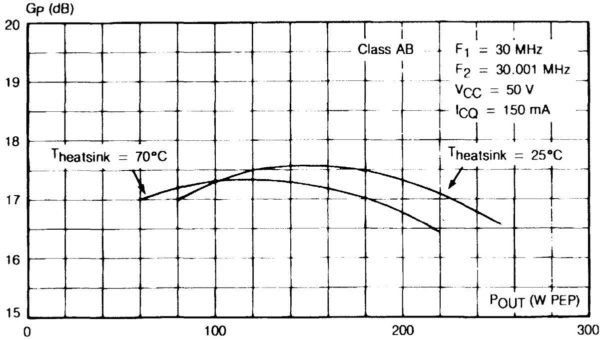


S88TH430-04

APPLICATION INFORMATION

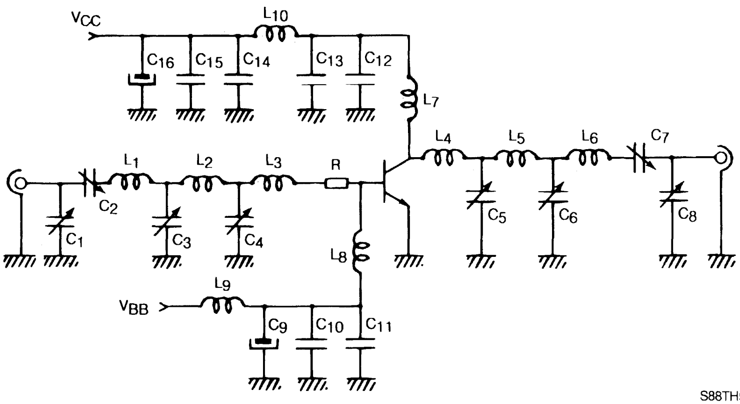
TYPICAL CURVES

Figure 4 : Power Gain versus Output Power Envelope Power.



S88TH430-05

TEST CIRCUIT SSB - CLASS AB - 30 MHz



S88TH5430-06

L_1	=	5 turns Ø 10 mm - 1.3 mm wire - Length 15 mm
L_2	=	2 turns Ø 12 mm - 2 mm wire Lenght 8 mm
L_3	=	1 turn Ø 12 mm - 2 mm wire - Length 5 mm
L_4	=	Hair pin copper foil 20 x 5 mm
L_5	=	1 turn Ø 12 mm - 2 mm wire - Length 8 mm
L_6	=	5 turns Ø 8 mm - 1.3 mm wire - Length 18 mm
L_7	=	3 turns Ø 8 mm - 1.3 mm wire - Length 15 mm
L_8	=	CHOKE COIL
L_9	=	CHOKE COIL
L_{10}	=	CHOKE COIL
R	=	0.25 Ω*

C_1	=	ARCO 429
C_2	=	ARCO 4615
C_3	=	ARCO 4213
C_4	=	ARCO 4611
C_5	=	ARCO 4611
C_6	=	ARCO 4213
C_7	=	ARCO 4611
C_8	=	ARCO 427
C_9	=	470 µF - 40 V
C_{10}	=	100 nF - 63 V
C_{11}	=	1 nF
C_{12}	=	10 nF
C_{13}	=	1 nF
C_{14}	=	100 nF - 63 V
C_{15}	=	1 nF
C_{16}	=	220 µF - 63 V.

* 4 Resistors 1 Ω 0.5 W in parallel.

APPLICATION INFORMATION

TYPICAL CURVES

CLASS C . F = 30 MHz

Figure 5 : Output Power versus Input Power.

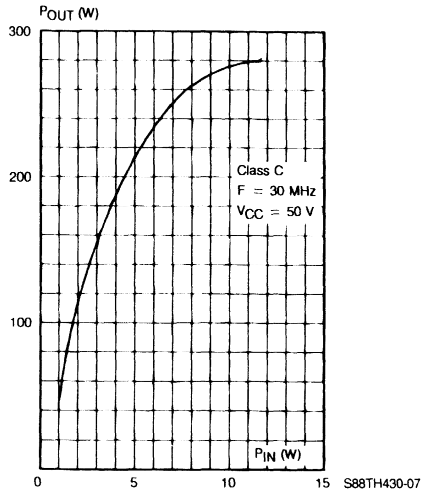
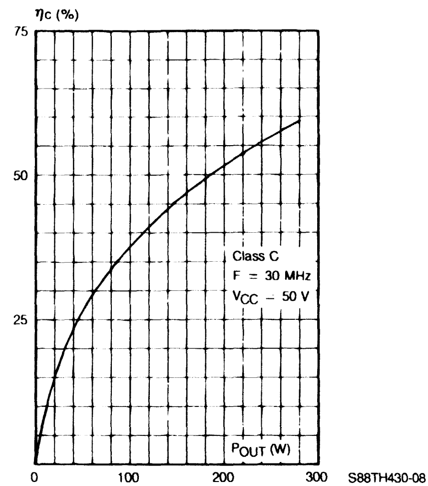


Figure 6 : Collector Efficiency versus Output Power.



CLASS C . F = 70 MHz

Figure 7 : Output Power versus Input Power.

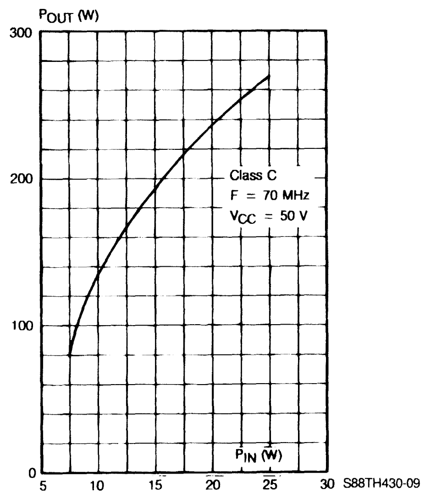
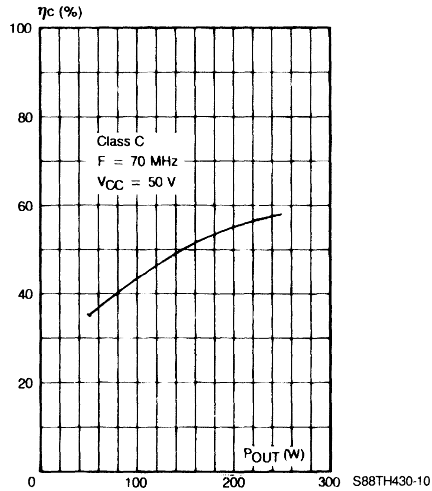


Figure 8 : Collector Efficiency versus Output Power.



APPLICATION INFORMATION

TYPICAL CURVES

Figure 9 : Collector-base Capacitance versus Collector-base Voltage.

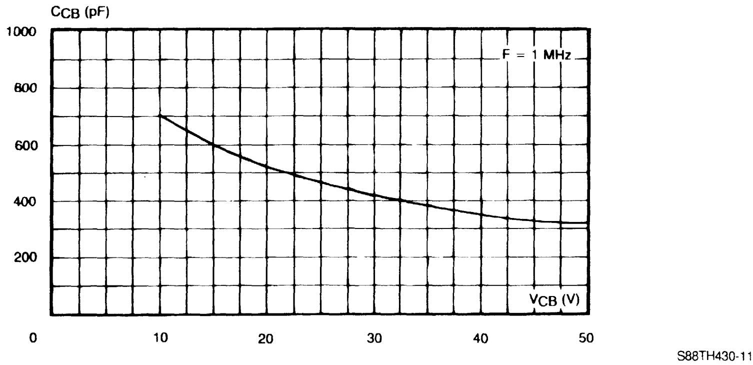
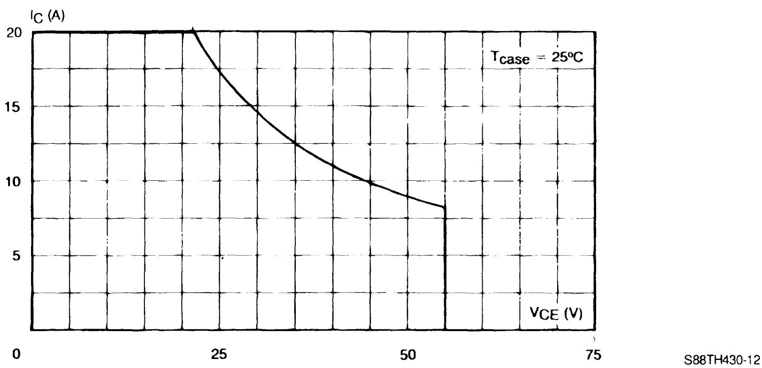
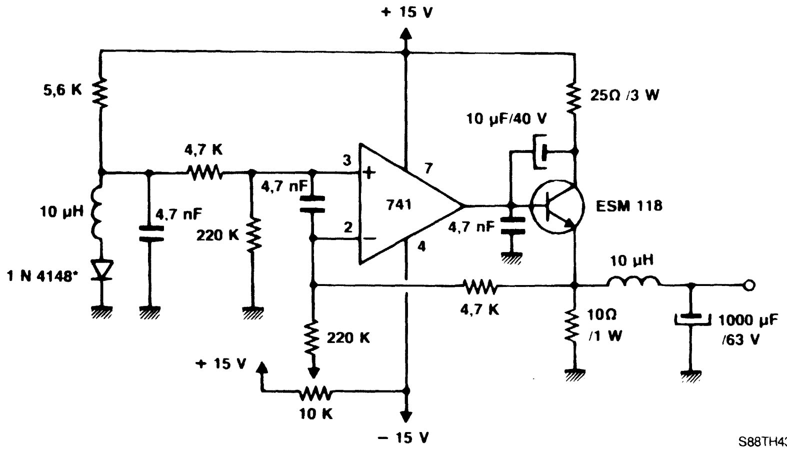


Figure 10 : DC Safe Operating Area.



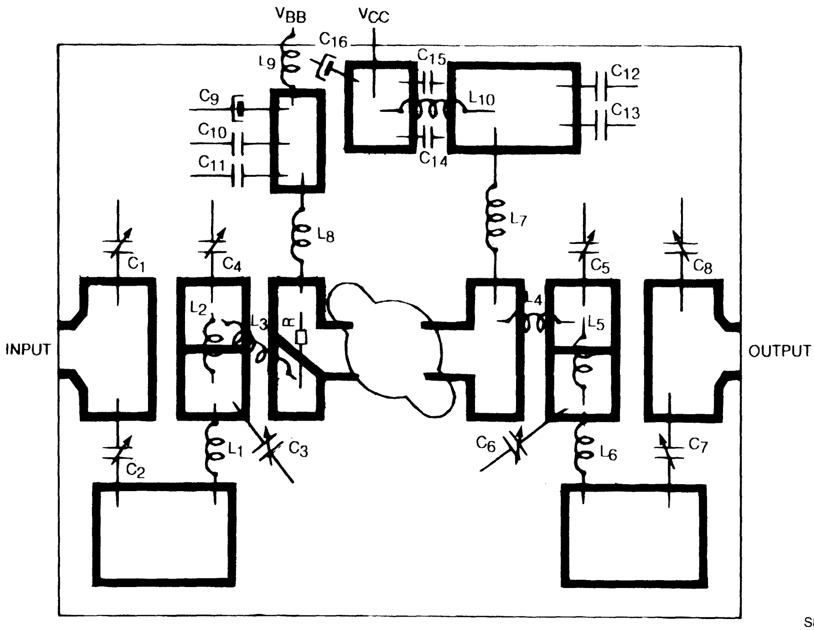
BIAS CIRCUIT



S88TH430-13

* Diode mechanically tied to the heatsink of the test amplifier.

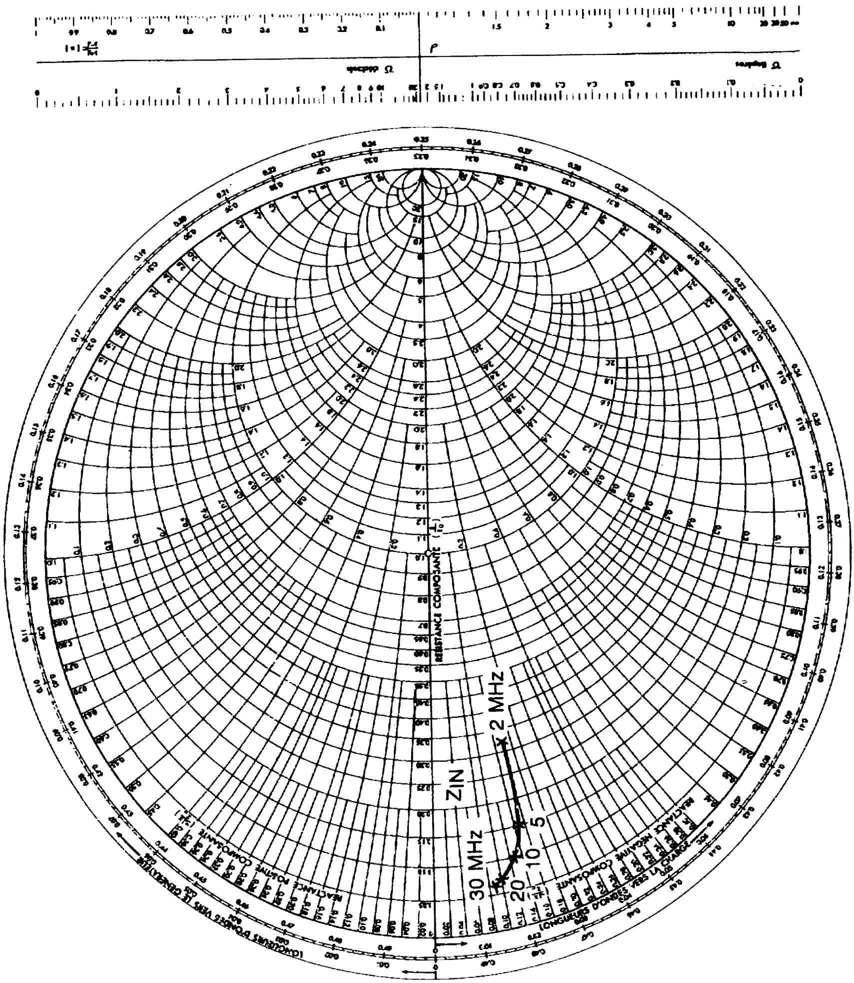
MOUNTING CIRCUIT



S88TH430-14

IMPEDANCES DATAS (typical)

Figure 11 : Series Equivalent Impedance.

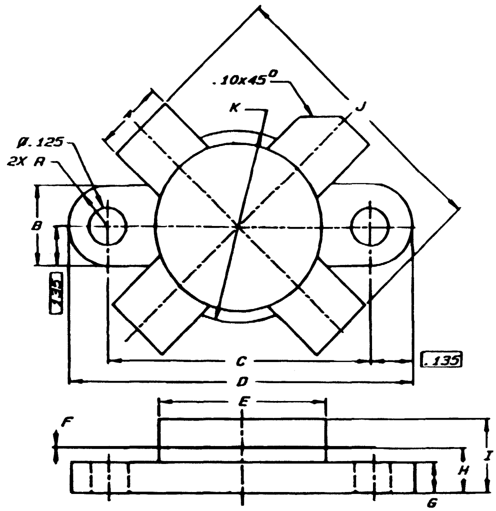


S88TH430-15

V_{CC} = 50 V
I_{CQ} = 150 mA
P_{OUT} = 250 W PEP.

PACKAGE MECHANICAL DATA

.550 4LFL



	Minimum Inches/mm	Maximum Inches/mm
A	.225/5.72	.235/5.97
B	.265/6.73	.275/6.96
C	.860/21.84	.870/22.10
D	1.130/28.70	1.140/28.96
E	.545/13.84	.555/14.10
F	.003/0.08	.007/0.18

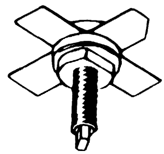
	Minimum Inches/mm	Maximum Inches/mm
G	.100/2.54	.118/3.00
H	.150/3.81	.170/4.32
I		.280/7.11
J	1.080/27.43	1.120/28.45
K	.625/15.88	.635/16.13

SGS-THOMSON MICROELECTRONICS

TH513

RF & MICROWAVE TRANSISTORS SSB APPLICATIONS

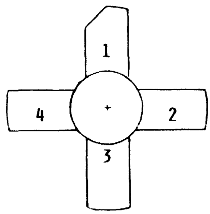
- OPTIMIZED FOR SSB
- FREQUENCY 30 MHz
- VOLTAGE 50 V
- POWER OUT 75 W
- POWER GAIN 14 dB
- IMD –30 dB
- GOLD METALLIZATION
- COMMON EMITTER



.380 4LSTUD (M135)
epoxy sealed

ORDER CODE	**BRANDING**
SD1733	TH513

PIN CONNECTION



S88TH513-01

1 emitter
2 base
3 emitter
4 collector

DESCRIPTION

The TH513 is a 28 V epitaxial silicon NPN planar transistor designed primarily for SSB and VHF communications. This device utilizes emitter ballasting for improved ruggedness and reliability.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	110	V
V_{CEO}	Collector - Emitter Voltage	55	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	3.25	A
P_{tot}	Total Power Dissipation	27	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100 mA	V_{BE} = 0	110			V
BV_{CEO}	I_C = 200 mA	I_B = 0	55			V
BV_{EBO}	I_E = 10 mA	I_C = 0	4			V
h_{FE}	V_{CE} = 6 V	I_C = 1.4 A	19		50	

DYNAMIC

Class AB

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
η_C	f = 30 MHz	V_{CC} = 50 V	P_o = 75 W	37			%
G_P	f = 30 MHz	V_{CC} = 50 V	P_o = 75 W	14			dB
IMD	f = 30 MHz	V_{CC} = 50 V	P_o = 75 W			– 30	dB
C_{ob}	f = 1 MHz	V_{CE} = 50 V				100	pF

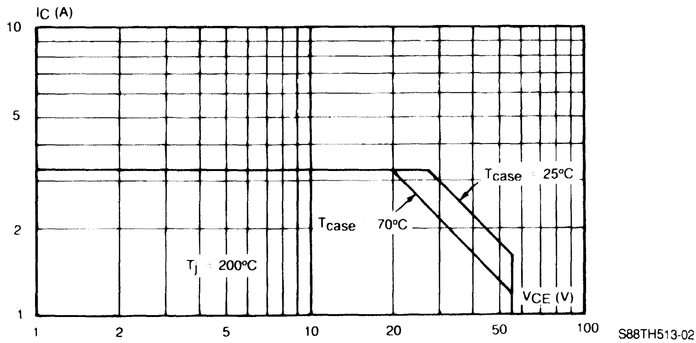
Class A

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
G_P	f = 30 MHz	V_{CC} = 40 V	P_o = 15 W	14			dB
IMD	f = 30 MHz	V_{CC} = 40 V	P_o = 15 W			– 40	dB

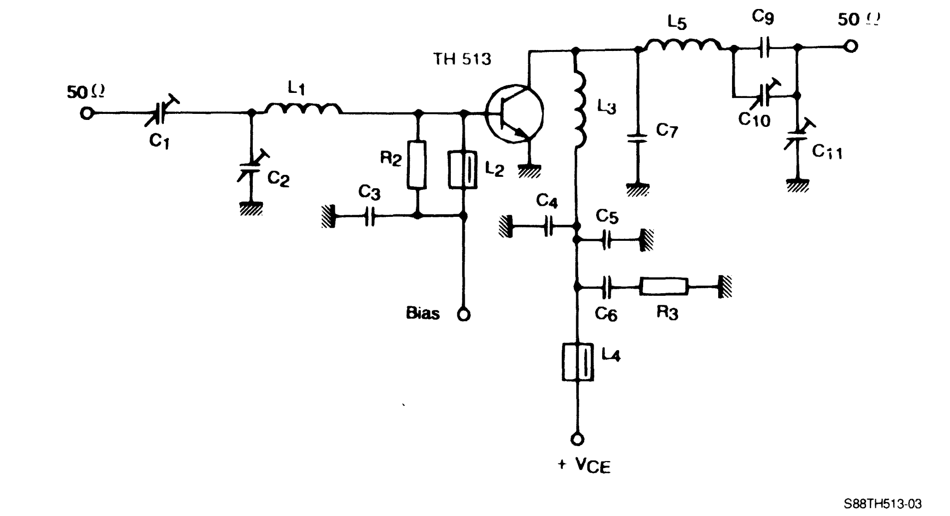
Class B

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
G_P	f = 70 MHz	V_{CC} = 50 V	P_o = 75 W	10			dB

Safe Operating Area.

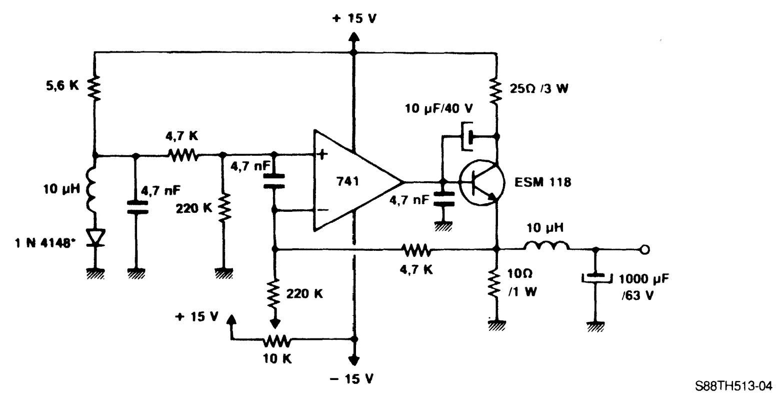


TEST CIRCUIT : SSB CLASS AB



C_1	=	20 - 500 pF	C_{11}	=	20 - 500 pF
C_2	=	50 - 500 pF	L_1	=	3 turns (ϕwire 1.5 mm) - int. diam 7 mm - pitch 2.5 mm
C_3	=	C_4 = 3.9 nF	L_2	=	22 μH choke coil
C_5	=	100 nF	L_3	=	4 turns (ϕwire 1.5 mm) - int. diam 10 mm - pitch 2.5 mm
C_6	=	2.2 μF	L_4	=	Ferrox cube choke coil
C_7	=	56 pF	L_5	=	7 turns (ϕwire 1.5 mm) - int. diam 12 mm - pitch 2.5 mm
C_9	=	100 pF	R_2	=	33 Ω
C_{10}	=	20 - 150 pF	R_3	=	4.7Ω

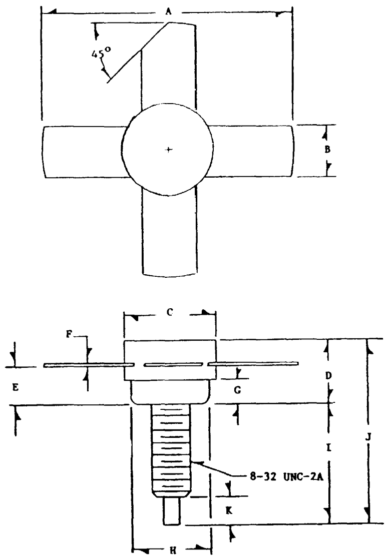
BIAS CIRCUIT



* Diode mechanically tied to the heatsink of the test amplifier.

PACKAGE MECHANICAL DATA

. 380 4LSTUD



* Outputs must not be bent, cut or used in this area.

Dimensions in millimeters
S88 TH513-05

	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

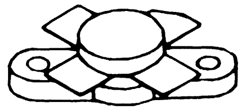
	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130

SGS-THOMSON
MICROELECTRONICS

TH560

RF & MICROWAVE TRANSISTORS SSB APPLICATIONS

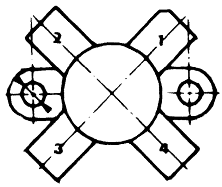
- OPTIMIZED FOR SSB
- FREQUENCY 30 MHz
- VOLTAGE 28 V
- POWER OUT 220 W PEP
- POWER GAIN 13dB
- IMD – 30dB
- EFFICIENCY 40 %
- GOLD METALLIZATION
- COMMON EMITTER



.500 4LFL (M174)
epoxy sealed

ORDER CODE	BRANDING
SD1730	TH560

PIN CONNECTION



1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The TH560 is a 28V epitaxial silicon NPN planar transistor designed primarily for SSB and VHF communications. This device utilizes emitter ballasting for improved ruggedness and reliability.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	70	V
V_{CEO}	Collector - Emitter Voltage	35	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	16	A
P_{tot}	Total Power Dissipation	200	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.7	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100 mA	V_{BE} = 0	70			V
BV_{CEO}	I_C = 200 mA	I_B = 0	35			V
BV_{EBO}	I_E = 20 mA	I_C = 0	4			V
I_{CES}	V_{CE} = 35 V	I_E = 0			5	mA
h_{FE}	V_{CE} = 5 V	I_C = 7 A	15		50	

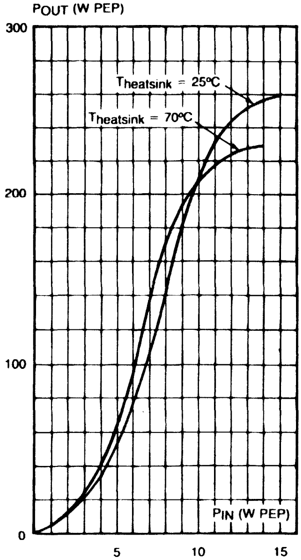
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
G_P	f = 30 MHz	V_{CE} = 28 V	I_{cq} = 750 mA	12	13		dB
IMD*	f = 30 MHz	V_{CE} = 28 V	I_{cq} = 750 mA			– 30	dB
C_{ob}	f = 1 MHz	V_{EB} = 28 V	I_E = 0		450		pF
η_C	f = 30 MHz			40	45		%
VSWR*	(output)	V_{CE} = 28 V	I_{cq} = 750 mA		∞ : 1		

* at P_O = 220 W PEP.

APPLICATION INFORMATION

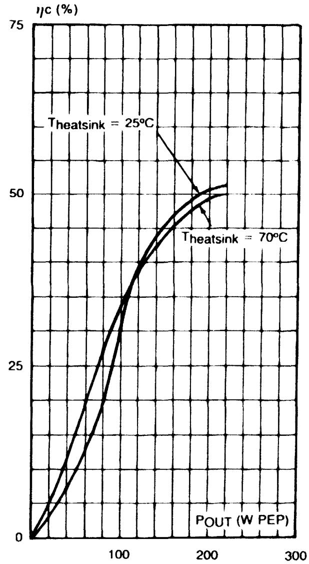
Output peak Envelope Power versus Input Power



S88TH560-02

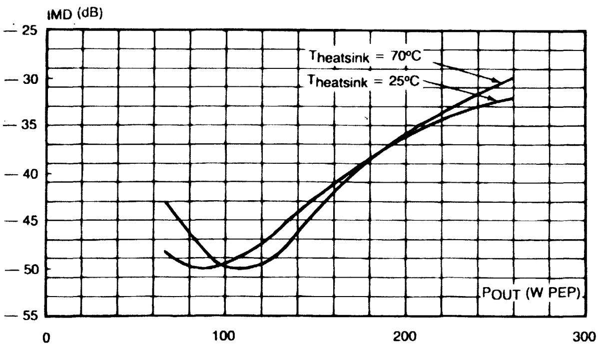
TYPICAL CURVES

Collector Efficiency versus Output Peak Envelope Power.



S88TH560-03

Intermodulation Distortion versus Output Peak Envelope Power.

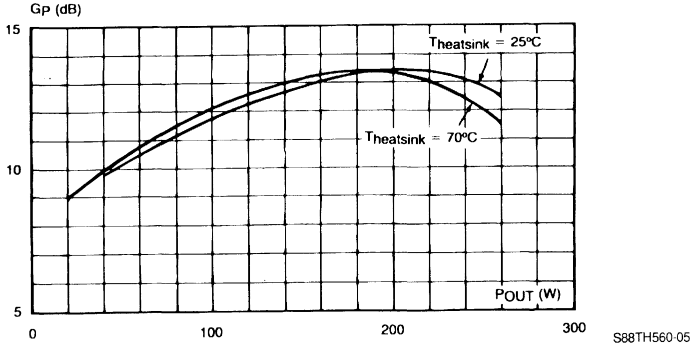


S88TH560-04

APPLICATION INFORMATION

TYPICAL CURVES

Power Gain versus Output Power.



IMPEDANCES DATAS (typical)

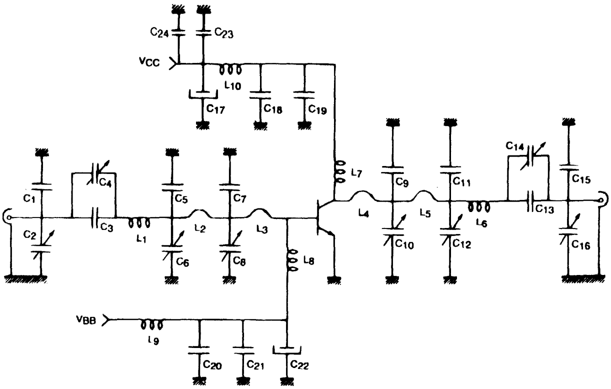
Series input impedance :

$Z_{IN} = 1.15 + j\,0.41\ \Omega$.

Series Load Impedance :

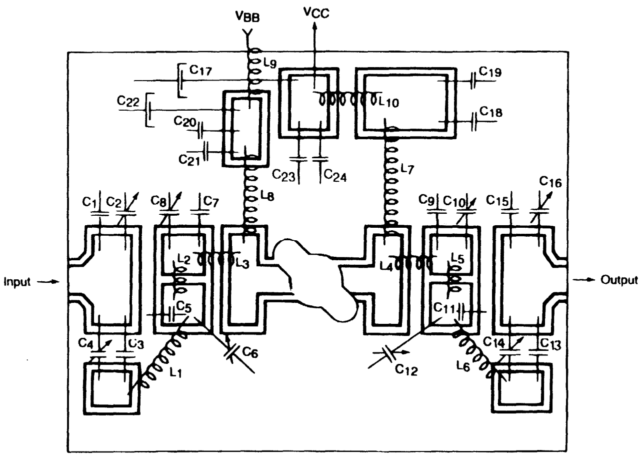
$Z_L = 1.25 + j\,1.92\ \Omega$.

TEST FIXTURE



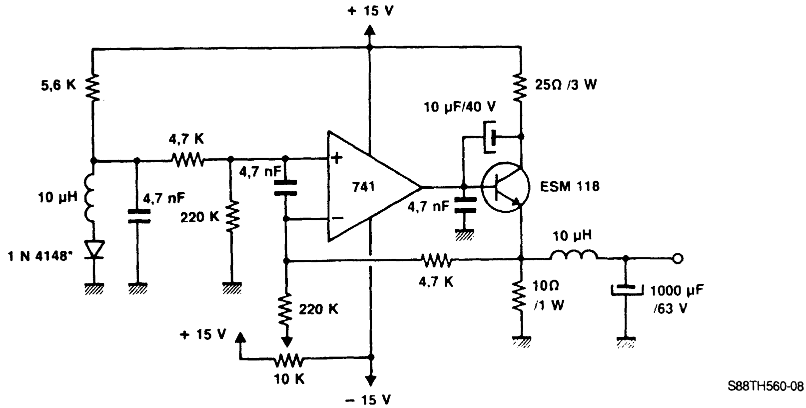
S88TH560-06

C_1	=	180 pF	C_{18}	=	10 nF
C_2	=	ARCO 428	C_{19}	=	1 nF
C_3	=	820 pF	C_{20}	=	100 nF 63 V
C_4	=	ARCO 428	C_{21}	=	1 nF
C_5	=	680 pF	C_{22}	=	470 µF 40 V
C_6	=	ARCO 428	C_{23}	=	1 nF
C_7	=	1.2 nF	C_{24}	=	100 nF 63 V
C_8	=	ARCO 428	L_1	=	3 turns ϕ 10 mm - 1.3 mm wire - length = 10 mm
C_9	=	1.5 nF	L_2	=	Hair pin Copper foil 40 x 5 mm - 0.2 mm thick
C_{10}	=	ARCO 428	L_3	=	Hair pin Copper foil 10 x 5 mm - 0.2 mm thick
C_{11}	=	1.2 nF	L_4	=	Hair pin Copper foil 10 x 5 mm - 0.2 mm thick
C_{12}	=	ARCO 428	L_5	=	Hair pin Copper foil 40 x 5 mm - 0.2 mm thick
C_{13}	=	680 pF	L_6	=	5 turns ϕ 10 mm - 1.3 mm wire - length = 15 mm
C_{14}	=	ARCO 428	L_7	=	3 turns ϕ 10 mm - 1.3 mm wire - length = 25 mm
C_{15}	=	180 pF	L_8	=	CHOC
C_{16}	=	ARCO 428	L_9	=	CHOC
C_{17}	=	470 µF 40 V	L_{10}	=	CHOC



S88TH560-07

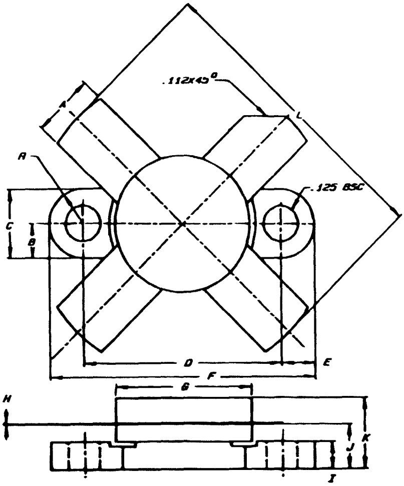
BIAS CIRCUIT



* Diode mechanically tied to the heatsink of the test amplifier.

PACKAGE MECHANICAL DATA

.500 4LFL



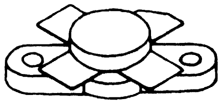
S88TH560-09

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

RF & MICROWAVE TRANSISTORS SSB APPLICATIONS

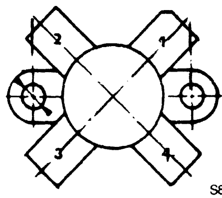
- OPTIMIZED FOR SSB
- FREQUENCY 30 MHz
- VOLTAGE 50 V
- POWER OUT 220 W PEP
- POWER GAIN 13 dB
- I_{MD} : –30 dB
- EFFICIENCY 40 %
- GOLD METALLIZATION
- COMMON EMITTER



.500 4LFL (M174)
epoxy sealed

ORDER CODE	**BRANDING**
SD1731	TH562

PIN CONNECTION



1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The TH562 is a 50V epitaxial silicon NPN planar transistor designed primarily for SSB and VHF communications. This device utilizes emitter ballasting for improved ruggedness and reliability.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector – Base Voltage	110	V
V_{CEO}	Collector – Emitter Voltage	55	V
V_{EBO}	Emitter – Base Voltage	4	V
I_C	Collector Current	12	A
P_{tot}	Total Power Dissipation	200	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th\ (j-c)}$	Junction-case Thermal Resistance	0.7	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

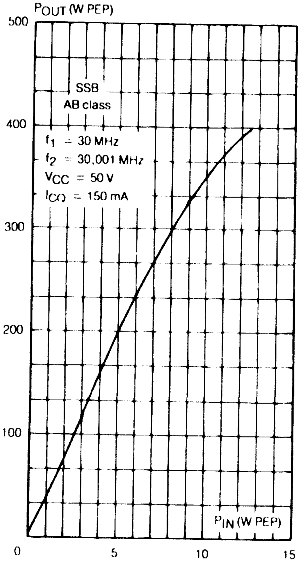
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 200 mA	V_{BE} = 0	110			V
BV_{CEO}	I_C = 200 mA	I_B = 0	55			V
BV_{EBO}	I_E = 20 mA	I_C = 0	4			V
I_{CES}	V_{CE} = 55 V	V_{BE} = 0			10	mA
h_{FE}	V_{CE} = 6 V	I_C = 10 A	15		80	

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_O	f = 30 MHz	V_{CE} = 50 V	I_{cq} = 150 mA	220			W PEP
G_P	f = 30 MHz	V_{CE} = 50 V	I_{cq} = 150 mA	13	16		dB
IMD	f = 30 MHz	V_{CE} = 50 V	I_{cq} = 150 mA			– 30	dB
η_C	f = 30 MHz	V_{CE} = 50 V	I_{cq} = 150 mA	40	50		%
C_{ob}	f = 1 MHz	V_{CB} = 50 V			330		pF

APPLICATION INFORMATION

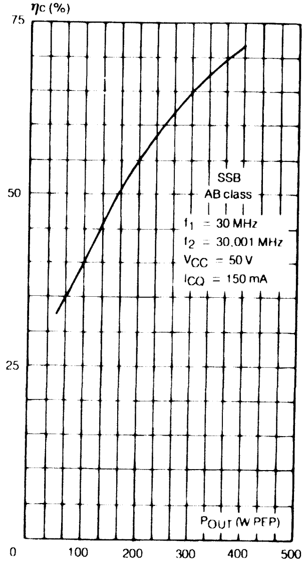
Figure 1 : Output peak Envelope Power versus Input Power.



S88TH562-02

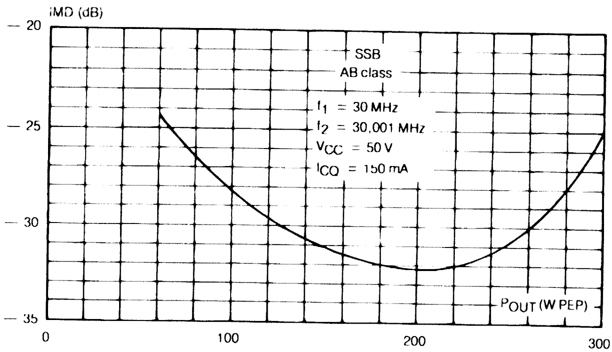
TYPICAL CURVES

Figure 2 : Collector Efficiency versus Output Peak Envelope Power.



S88TH562-03

Figure 3 : Intermodulation Distortion versus Output Peak Envelope Power.



S88TH562-04

APPLICATION INFORMATION

TYPICAL CURVES

Figure 4 : Power Gain versus Output Peak Envelope Power.

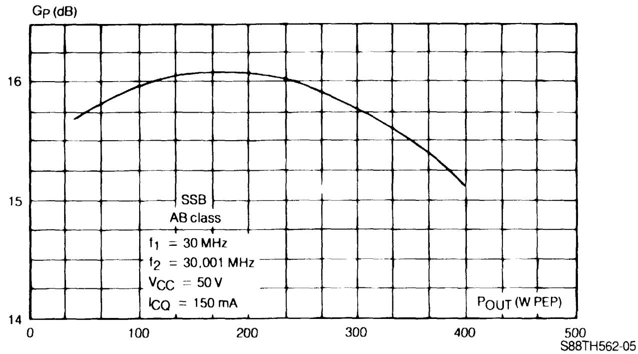
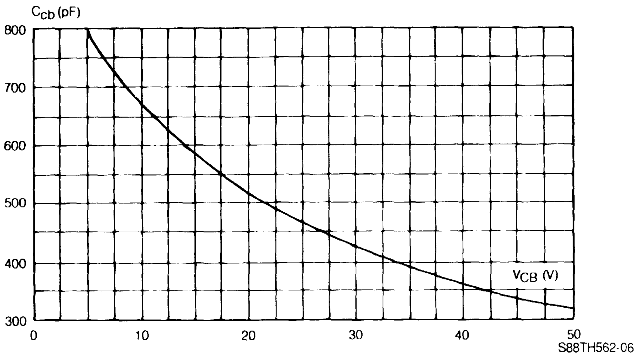
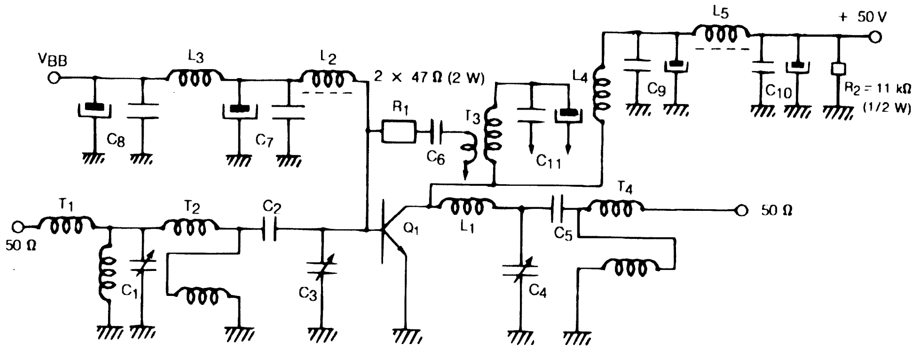


Figure 5 : Collector-base Capacitance versus Collector-emitter Voltage.



TEST CIRCUIT



S88TH562-07

Parts list (rf amplifier)

Capacitors :

C_1 : ARCO 426 + 220 pF + 330 pF chips
C_2 : 2 x 10 nF chips
C_3 : ARCO 4615 + 2.2 nF + 2 x 1nF LCC + 4.7 nF + 560 pF chips
C_4 : ARCO 4213 + 330 pF chip
C_5 : 10 nF chip
C_6 : 3 x 10 nF chips
C_7, C_8, C_9, C_{10}, C_{11} : 1 nF + 10 nF + 100 nF + 4.7 µF - 63 V + 100 µF - 63 V.

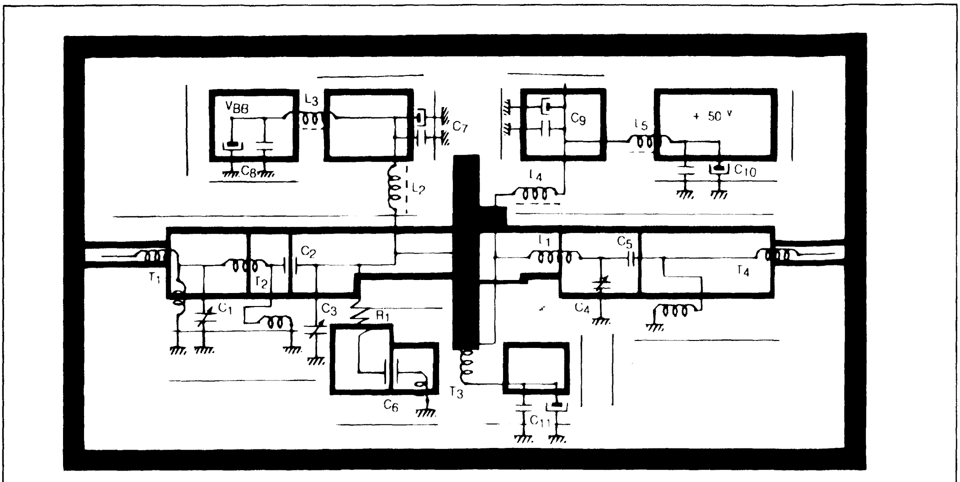
Inductors :

L_1 : 3 turns of $12/10^e$ unenameled wire Ø = 7.1 = 13
L_2, L_3 : 8 turns of $55/100^e$ enameled wire on ferrite core PHILIPS 4C6 97170 (9 x6 x3)
L_4 : 10 turns of $12/10^e$ enameled wire Ø = 8.1 = 20
L_5 : 7 turns of $12/10^e$ enameled wire on ferrite core PHILIPS 4C6 97180.

Transformers :

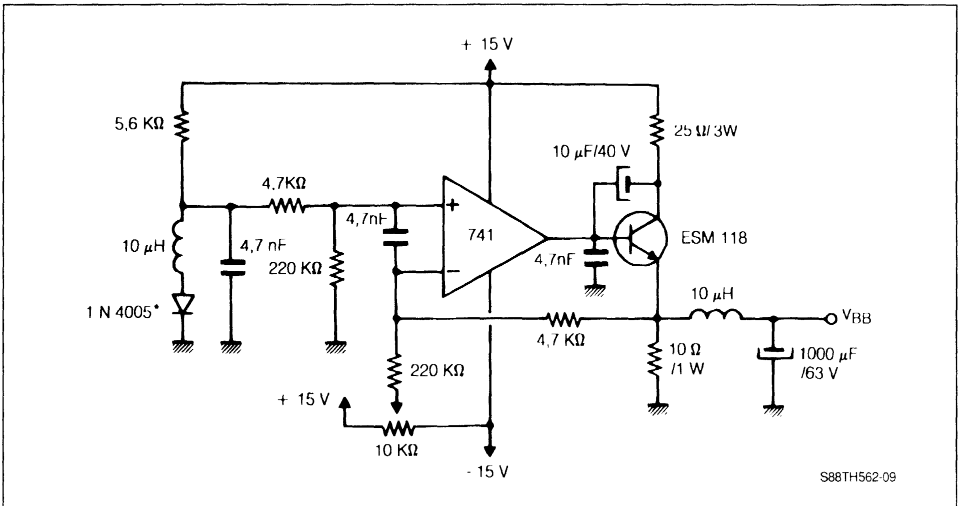
T_1 : 6 : 3.5 impedance transformer on toroïd PHILIPS 4C6 97180
T_2 : Twisted pair 4 : 1 transformer - 4 turns made with $10/10^e$ enameled in one tore PHILIPS 4C6 97180
T_3 : Feedback transformer
Primary : 2 turns of $10/10^e$ enameled wire
Secondary : 8 turns of $10/10^e$ enameled wire
T_4 : Twisted pair 4 : 1 transformer - 4 turns of bifilar twisted $12/10^e$ wires on ferrite core PHILIPS 4C6 97200.

MOUNTING CIRCUIT



S88TH562-08

BIAS CIRCUIT

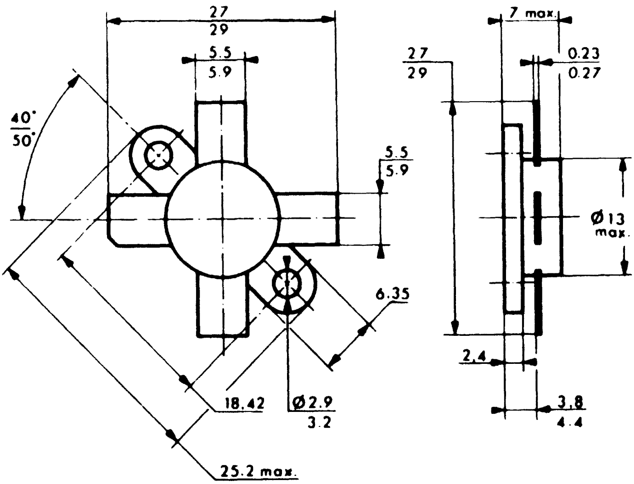


S88TH562-09

* Diode mechanically tied to the heatsink of the test amplifier.

PACKAGE MECHANICAL DATA

.500 4LFL



S88TH562-10

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

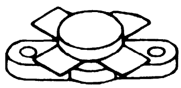
	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

SGS-THOMSON MICROELECTRONICS

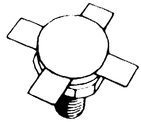
THA15
THX15

RF & MICROWAVE TRANSISTORS SSB APPLICATIONS

- OPTIMIZED FOR SSB
- FREQUENCY 30 MHz
- VOLTAGE 50 V
- POWER OUT 150 W PEP
- POWER GAIN 14 dB
- IMD – 30 dB
- GOLD METALLIZATION
- COMMON EMITTER



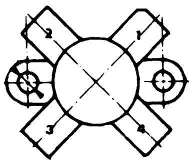
.500 4LFL (M174)
epoxy sealed



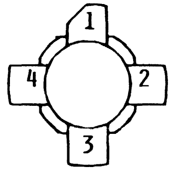
.550 4LSTUD (M164)
epoxy sealed

ORDER CODE	BRANDING
SD1726	THA15
SD1727	THX15

PIN CONNECTION



S88THA15-01



S88THX15-02

1 collector
2 emitter
3 base
4 emitter

DESCRIPTION

The THA15/THX15 are 50 V epitaxial silicon NPN planar transistors designed primarily for SSB communications. These devices utilize emitter ballasting to achieve extreme ruggedness under severe operating conditions.

Device	Package
THA15	.500 4LFL
THX15	.550 4LSTUD

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	110	V
V_{CEO}	Collector - Emitter Voltage	55	V
V_{EBO}	Emitter - Base Voltage	4	V
I_C	Collector Current	10	A
P_{tot}	Total Power Dissipation	233	W
T_{stg}	Storage Temperature	– 65 to 150	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-case Thermal Resistance	0.75	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 100 mA	V_{BE} = 0	110			V
BV_{CEO}	I_C = 100 mA	I_B = 0	55			V
BV_{EBO}	I_E = 10 mA	I_C = 0	4			V
I_{CES}	V_{CE} = 60 V	V_{BE} = 0			5	mA
h_{FE}	V_{CE} = 6 V	I_C = 1.4 A	15		50	

DYNAMIC

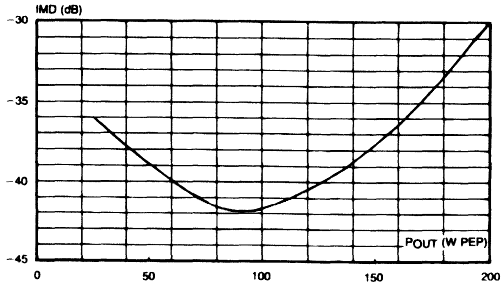
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_o	f = 30 MHz	V_{CE} = 50 V	I_{cq} = 100 mA	150			WPEP
G_P	f = 30 MHz	V_{CE} = 50 V	I_{cq} = 100 mA	14			dB
IMD	f = 30 MHz	V_{CE} = 50 V	I_{cq} = 100 mA			– 30	dB
C_{ob}	f = 1 MHz	V_{CB} = 50 V			185	220	pF

Notes : THA15 and THX15 are also usable in class A at 40 V and in class C at 50 V. In those conditions typical performances are respectively.
. P_O : 30 Watt PeP/Gp : 14 dB/IMD : - 40 dB
. P_O : 150 W CW/Gp : 9 dB.

APPLICATION INFORMATION

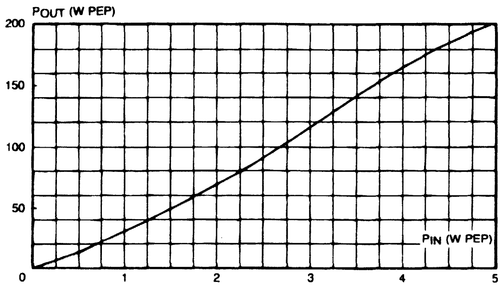
TYPICAL CURVES

Intermodulation Distortion versus Output Peak Envelope Power.



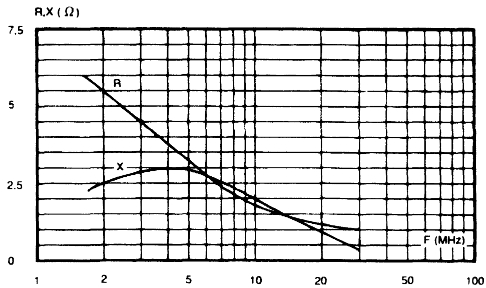
S88THA/THX15-03

Output Peak Envelope Power versus Input Power.



S88THA/THX15-04

Input Impedance versus Frequency.

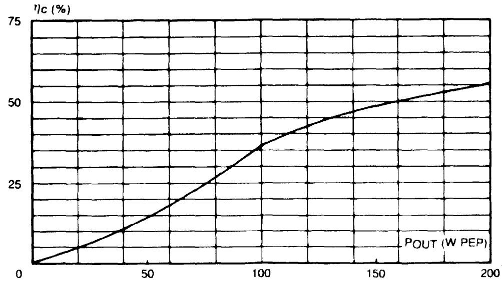


S88THA/THX15-05

APPLICATION INFORMATION

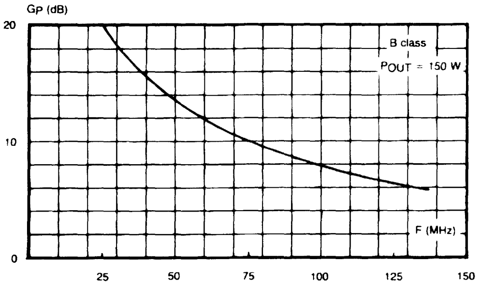
TYPICAL CURVES

Collector Efficiency versus Ourput Peak Envelope Power.



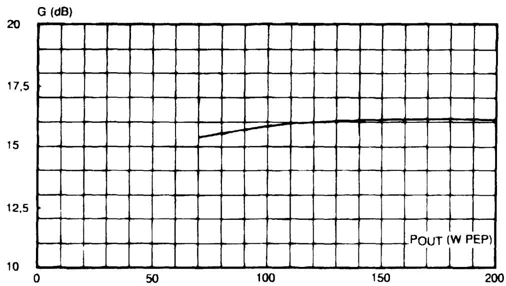
S88THA/THX15-06

Power Gain versus Frequency.



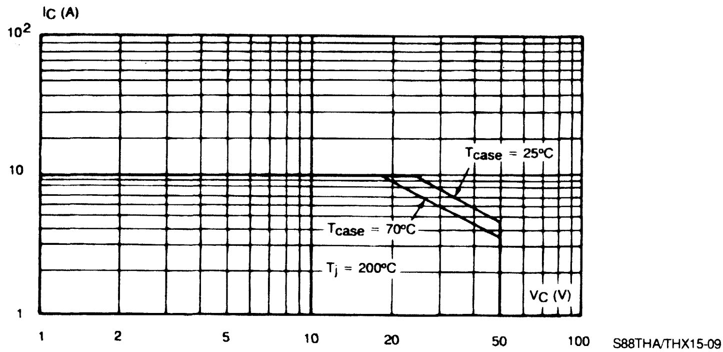
S88THA/THX15-07

Power Gain versus Output Peak Envelope Power.

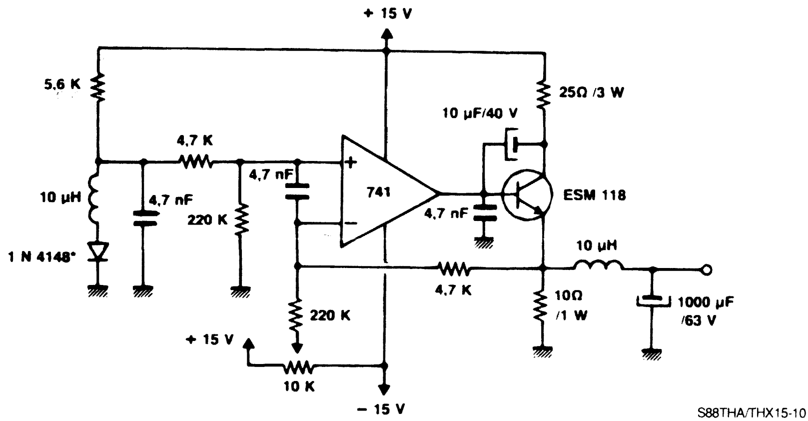


S88THA/THX15-08

Figure 7 : Safe Operating Area.

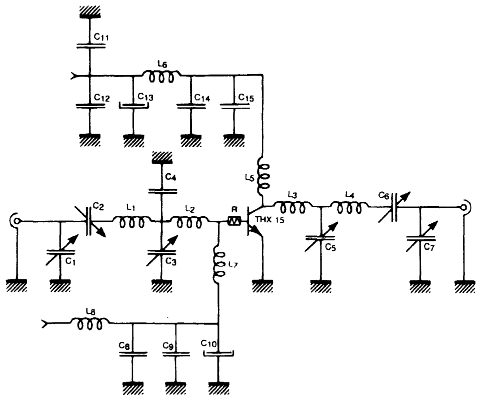


BIAS CIRCUIT



* Diode mechanically tied to the heatsink of the test amplifier.

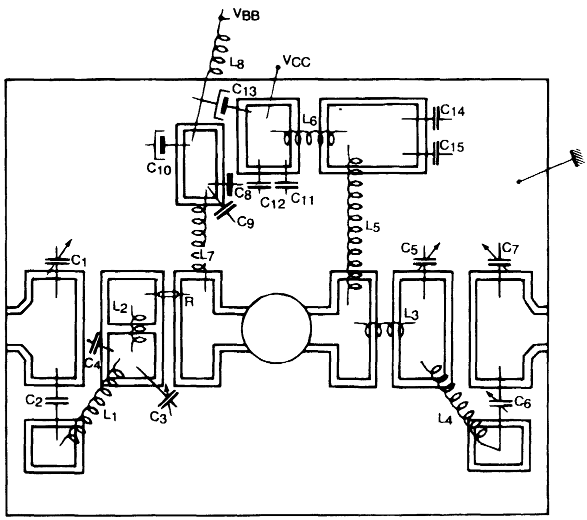
TEST CIRCUIT - CLASS AB - 30 MHz



S88THA/THX15-11

C_1	=	ARCO 427	C_{13}	=	220 µF 63 V
C_2	=	ARCO 4611	C_{14}	=	10 nF
C_3	=	ARCO 4615	C_{15}	=	1 nF
C_4	=	220 pF	L_1	=	5 turns φ 8 mm - 1.3 wire - Length = 15 mm
C_5	=	ARCO 4215	L_2	=	Hair pin Copper foil 20 x 5 mm - 0.2 thick
C_6	=	ARCO 4215	L_3	=	1 turn φ 10 mm - 1.3 wire - Length = 8 mm
C_7	=	ARCO 426	L_4	=	6 turns φ 8 mm - 1.3 wire - Length = 25 mm
C_8	=	100 nF 63 V	L_5	=	4 turns φ 12 mm - 2 mm wire - Length = 25 mm
C_9	=	1 nF	L_6	=	choc
C_{10}	=	470 µF 40 V	L_7	=	choc
C_{11}	=	1 nF	L_8	=	choc
C_{12}	=	100 nF 63 V	R	=	0.6 Ω

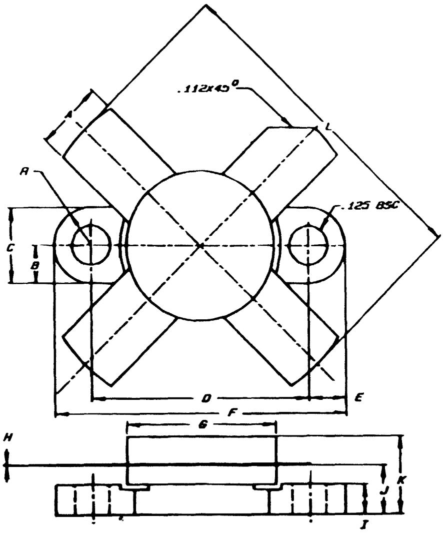
MOUNTING CIRCUIT - CLASS AB - 30 MHz



S88THA/THX15-12

PACKAGE MECHANICAL DATA

.500 4LFL



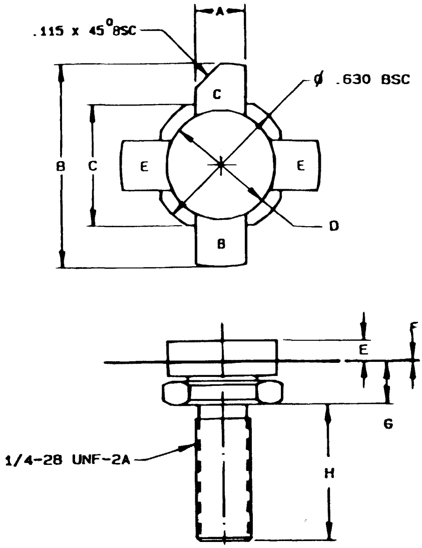
S88THA15-13

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.125/3.18 BSC	
C	.245/6.22	.255/6.48
D	.720/18.28	.730/18.54
E	.112/2.85 BSC	
F	.945/24.00	.955/24.26

	Minimum Inches/mm	Maximum Inches/mm
G	.495/12.57	.505/12.83
H	.003/0.08	.007/0.18
I	.090/2.29	.110/2.79
J	.160/4.06	.175/4.45
K		.270/6.86
L		1.050/26.67

PACKAGE MECHANICAL DATA

.550 4LSTUD



S88THX15-14

	Minimum Inches/mm	Maximum Inches/mm
A	.220/5.59	.230/5.84
B	.800/20.32	1.020/25.91
C	.545/13.84	.551/14.00
D	.495/12.57	.505/12.83
E	.085/2.16	.100/2.54
F	.003/0.08	.007/0.18
G	.185/4.70	.198/5.03
H	.497/12.62	.530/13.46

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Cover design by Keit Koppel, Segrate, Italy
Typesetting and layout on Desk Top Publishing
by AZIMUT, Hénin Bt., France
Printed by Garzanti, Cernusco S./N., Italy

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