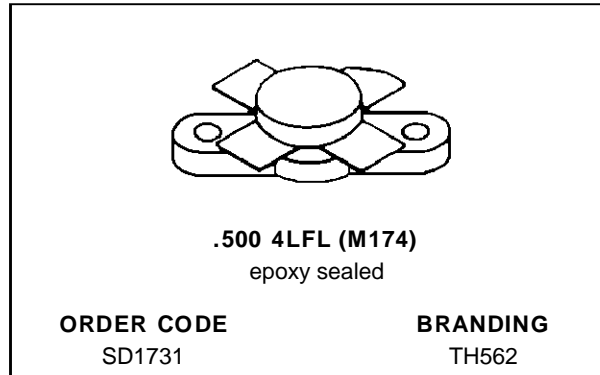


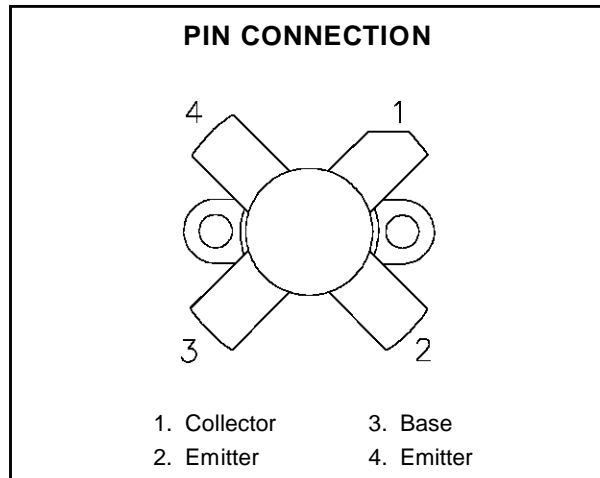
## RF & MICROWAVE TRANSISTORS HF SSB APPLICATIONS

- OPTIMIZED FOR SSB
- 30 MHz
- 50 VOLTS
- EFFICIENCY 40%
- COMMON EMITTER
- GOLD METALLIZATION
- P<sub>OUT</sub> = 220 W PEP WITH 13 dB GAIN



### DESCRIPTION

The SD1731 is a 50 V epitaxial silicon NPN planar transistor designed primarily for SSB communications. This device utilizes emitter ballasting for improved ruggedness and reliability.



### ABSOLUTE MAXIMUM RATINGS (T<sub>case</sub> = 25°C)

Symbol	Parameter	Value	Unit
V <sub>CBO</sub>	Collector-Base Voltage	110	V
V <sub>CEO</sub>	Collector-Emitter Voltage	55	V
V <sub>EBO</sub>	Emitter-Base Voltage	4.0	V
I <sub>C</sub>	Device Current	20	A
P <sub>DISS</sub>	Power Dissipation (T <sub>heatsink</sub> ≤ 25°C)	233	W
T <sub>J</sub>	Junction Temperature	+200	°C
T <sub>STG</sub>	Storage Temperature	- 65 to +150	°C

### THERMAL DATA

R <sub>TH(j-c)</sub>	Junction-Case Thermal Resistance	0.55	°C/W
R <sub>TH(c-s)</sub>	Case-Heatsink Thermal Resistance	0.2	°C/W

## ELECTRICAL SPECIFICATIONS

STATIC ( $T_{\text{case}} = 25^{\circ}\text{C}$ )

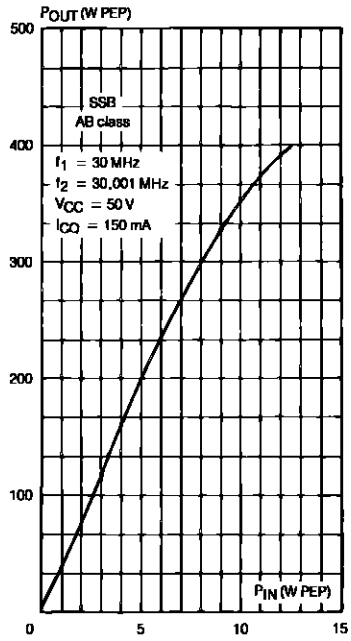
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
$BV_{CBO}$	$I_C = 200 \text{ mA}$	$I_E = 0 \text{ mA}$	110	—	—	V
$BV_{CEO}$	$I_C = 200 \text{ mA}$	$I_B = 0 \text{ mA}$	55	—	—	V
$BV_{EBO}$	$I_E = 20 \text{ mA}$	$I_C = 0 \text{ mA}$	4.0	—	—	V
$I_{CEO}$	$V_{CE} = 30 \text{ V}$	$I_E = 0 \text{ mA}$	—	—	5	mA
$I_{CES}$	$V_{CE} = 55 \text{ V}$	$I_E = 0 \text{ mA}$	—	—	10	mA
$h_{FE}$	$V_{CE} = 6 \text{ V}$	$I_C = 10 \text{ A}$	15	—	80	—

DYNAMIC ( $T_{\text{heatsink}} = 25^{\circ}\text{C}$ )

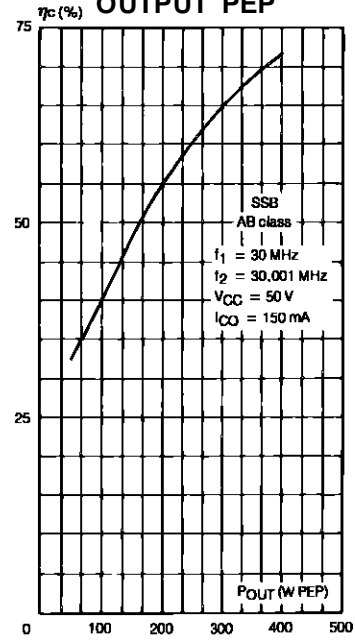
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
$P_{OUT}$	$f = 30 \text{ MHz}$	$V_{CE} = 50 \text{ V}$	$I_{CQ} = 150 \text{ mA}$	220	—	—	W
$G_P^*$	$P_{OUT} = 220 \text{ W PEP}$	$V_{CE} = 50 \text{ V}$	$I_{CQ} = 150 \text{ mA}$	13	—	—	dB
$IMD^*$	$P_{OUT} = 220 \text{ W PEP}$	$V_{CE} = 50 \text{ V}$	$I_{CQ} = 150 \text{ mA}$	—	—	-30	dBc
$\eta_c^*$	$P_{OUT} = 220 \text{ W PEP}$	$V_{CE} = 50 \text{ V}$	$I_{CQ} = 150 \text{ mA}$	40	—	—	%
$C_{OB}$	$f = 1 \text{ MHz}$	$V_{CB} = 50 \text{ V}$		—	330	—	pf

## TYPICAL PERFORMANCE

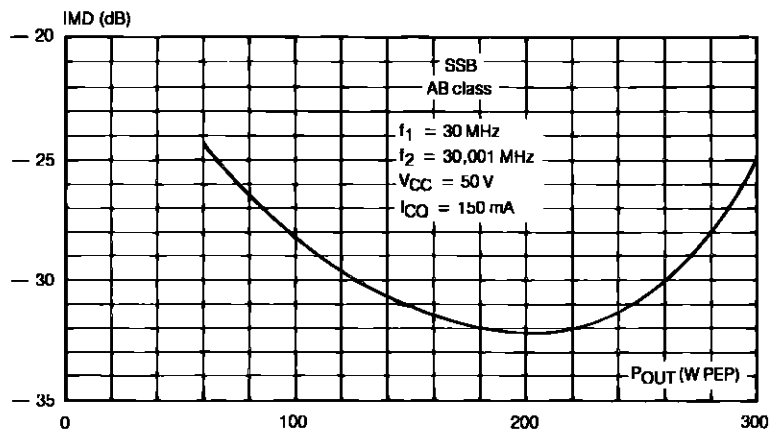
POWER OUTPUT PEP vs POWER INPUT



COLLECTOR EFFICIENCY vs POWER OUTPUT PEP

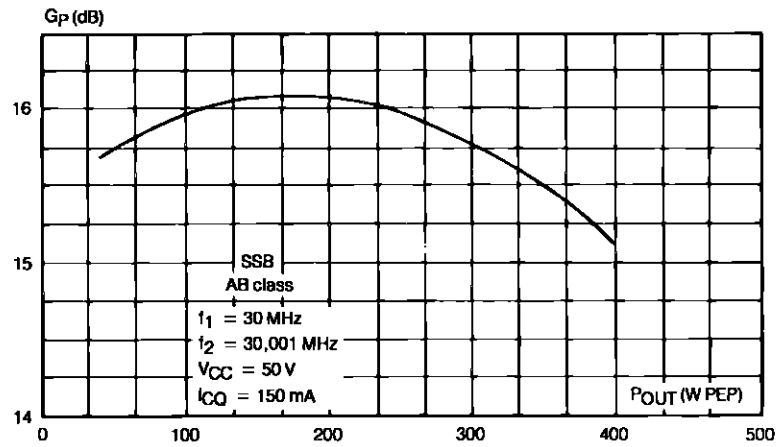


INTERMODULATION DISTORTION vs POWER OUTPUT PEP

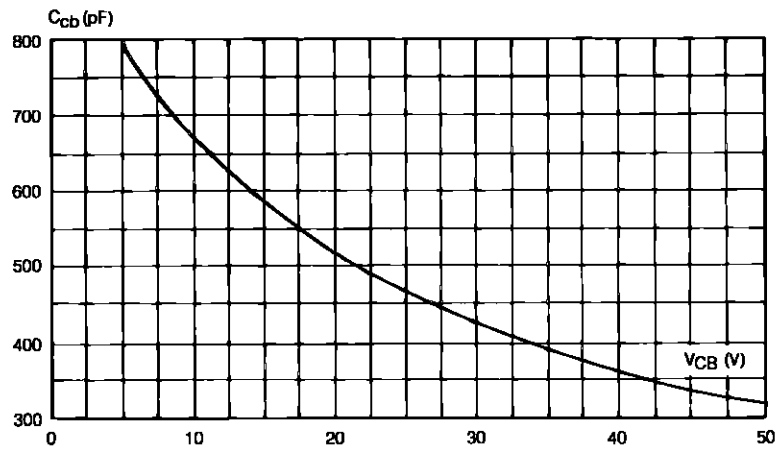


## TYPICAL PERFORMANCE

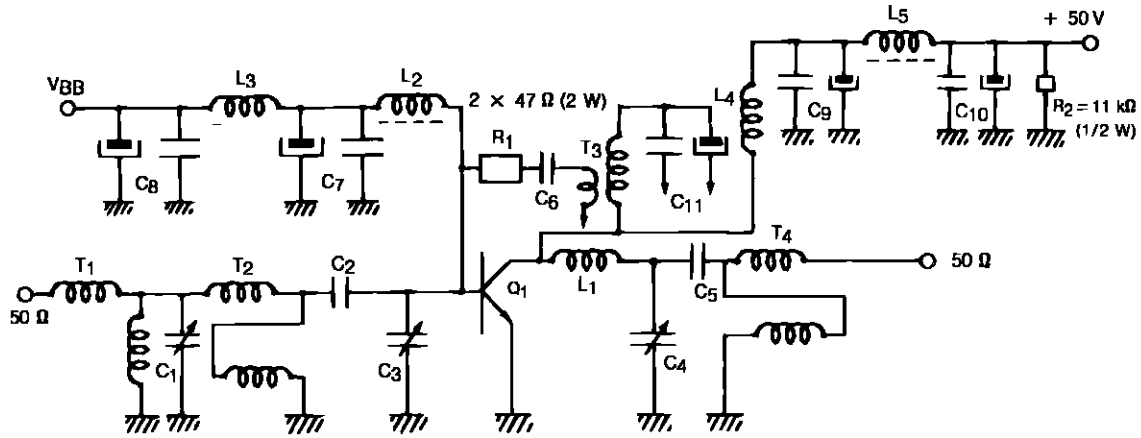
POWER GAIN vs POWER OUTPUT PEP



COLLECTOR BASE CAPACITANCE vs COLLECTOR EMITTER VOLTAGE

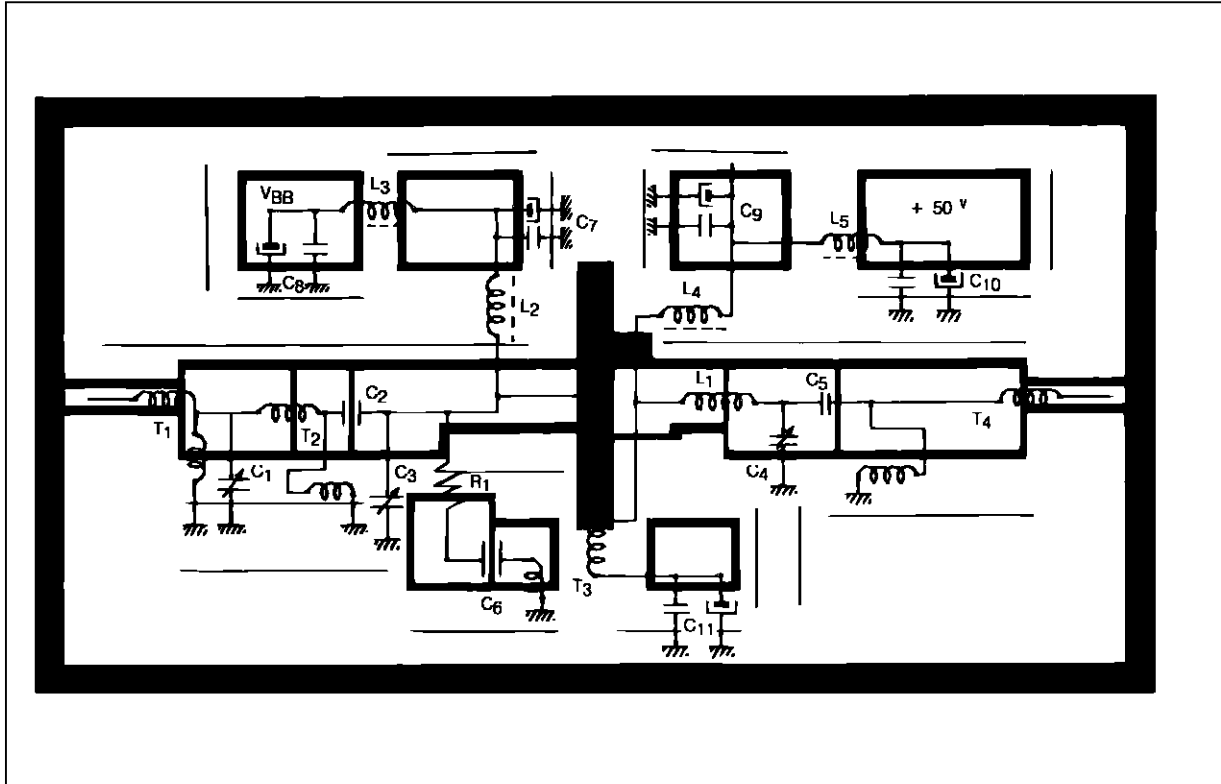


## TEST CIRCUIT

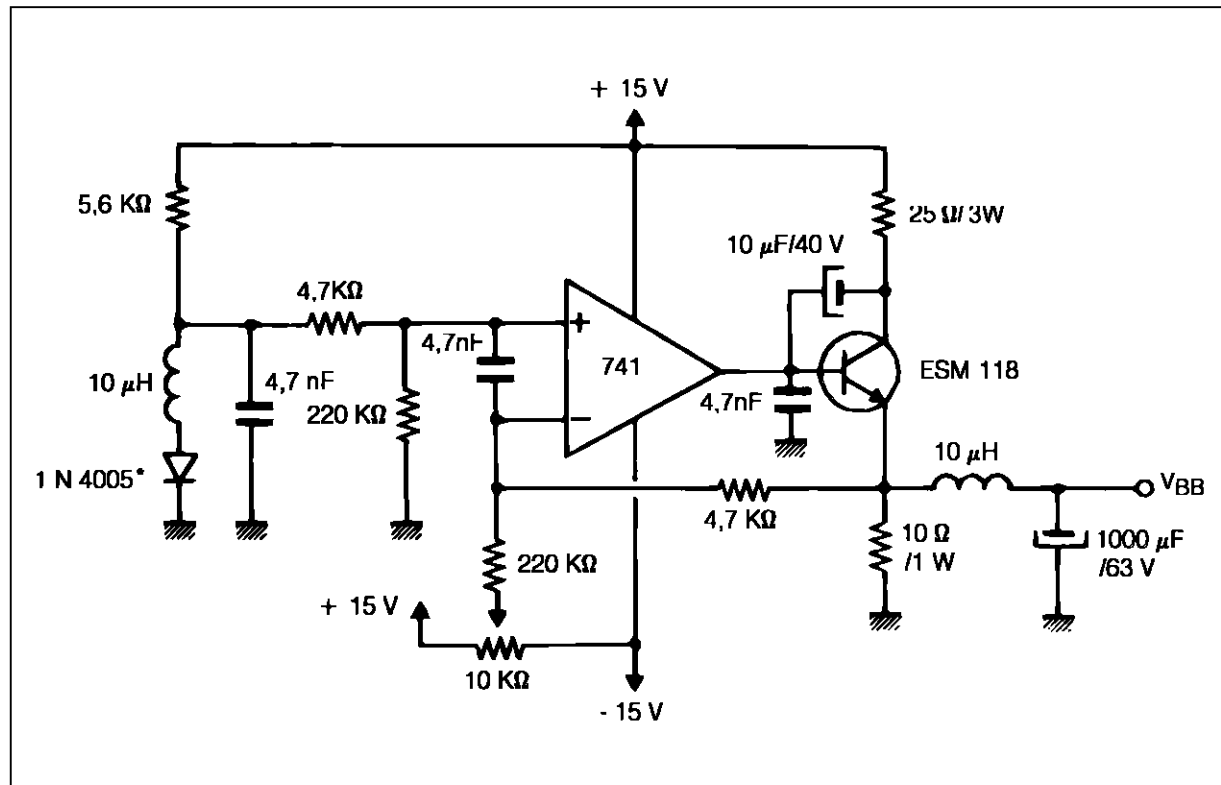


- |             |                                                                                  |    |                                                                                                           |
|-------------|----------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------------------------------|
| C1          | : Arco 426 + 220pF + 330pF Chips                                                 | L4 | : 10 Turns of 1.2mm Enameled Wire, Diameter 8.1mm, Length 20mm                                            |
| C2          | : 2 x 10nF Chips                                                                 | L5 | : 7 Turns of 1.2mm Enameled Wire on Ferrite Core Phillips 4C6 97180                                       |
| C3          | : Arco 4615 + 2.2nF + 2 x 1nF LCC + 4.7nF + 560pf Chips                          | T1 | : 6:3.5 Impedance Transformer on toriod Phillips 4C6 97180                                                |
| C4          | : Arco 4213 + 330pF Chip                                                         | T2 | : Twisted Pair 4:1 Transformer, 4 Turns Made with 1.0mm Enameled on toriod Phillips 4C6 97180             |
| C5          | : 10nF Chip                                                                      | T3 | : Feedback Transformer                                                                                    |
| C6          | : 3 x 10nF Chips                                                                 |    | Primary: 2 Turns of 1mm Enameled Wire                                                                     |
| C7, C8, C9, |                                                                                  |    | Secondary: 8 Turns of 1mm Enameled Wire                                                                   |
| C10, C11    | : 1nF + 10nF + 100nF + 4.7μF, 63V + 100μF, 63V                                   | T4 | : Twisted Pair 4:1 Transformer, 4 Turns of bifilar Twisted 1.2mm Wires on Ferrite Core Phillips 4C6 97200 |
| L1          | : 3 Turns of 1.2mm Unenameled Wire Diameter, 7.1mm, Length 13mm                  |    |                                                                                                           |
| L2, L3      | : 8 Turns of 0.55mm Enameled Wire on Ferrite Core Phillips 4C6 97170 (9 x 6 x 3) |    |                                                                                                           |

## MOUNTING CIRCUIT

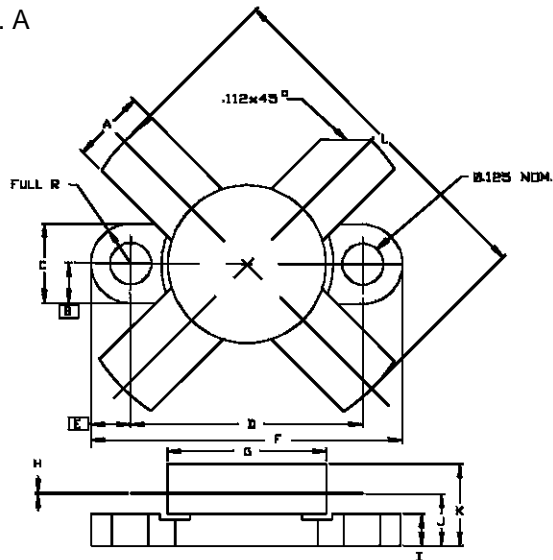


## BIAS CIRCUIT



## PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0174 rev. A



SGS-THOMSON MICROELECTRONICS		CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm		
A	.220/5,59	.230/5,84	K	.280/7,11
B	.125/3,18		L	1.050/26,67
C	.245/6,22	.255/6,48		
D	.720/18,28	.730/18,54		
E	.125/3,18			
F	.970/24,64	.980/24,89		
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		

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