RF & MICROWAVE SEMICONDUCTORS & MODULES

CATALOGUE
1990 - 1991

Philips Components

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Philips Components is one of the largest manufacturers and suppliers of RF and microwave products in the world. Our strength, however, lies not only in our size and the security of supply this guarantees, it lies also in our international character, based on a worldwide network of National Organizations. Organizations that operate within national boundaries with national interests at heart, yet with access to international resources, in both production and in research and development. Organizations that can therefore offer the broadest, most advanced product range, manufactured in the latest technologies, using the most up-to-date, most reliable production processes.

Our strength lies also in our long tradition of applications support. A tradition that over the years has led to many long and fruitful associations with a whole range of customers in both the professional and consumer fields. Customers who now take it for granted that when they choose Philips Components as a supplier, they get more than just the products, they also get 100% support from a company committed to providing a service second to none.

In the following pages you'll find our complete range of RF and microwave products. Intended principally as a designers' first selection guide, the tables give only the most important parameters, or at least, those that feature prominently when design criteria are being considered.

To aid selection, the product-range tables are preceded by a cross-reference guide giving Philips equivalents to all major industry-standard types and the pages where these equivalents are to be found, and the final chapter gives technical drawings of all our encapsulations.

Used in conjunction with our Data Handbooks SC01, SC04, SC07, SC08 SC09, SC14 and SC15 (which give more detailed information), this catalogue provides RF-circuit designers with a ready means of selecting the most appropriate RF components for their designs.

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BFQ54T	BFQ54T	5-6
BFQ63	BFQ63	5-6
BFQ65	BFQ65	5-7
BFQ66	BFQ66	5-7
BFQ67	BFQ67	5-7
BFQ68	BFQ68	5-6, 5-8
BFQ70	BFP90A	5-5
BFQ71	BFP90A	5-5
BFQ72	BFP91A	5-5
BFQ73	BFP96	5-5
BFQ73S	BFP96	5-5
BFQ74	BFQ66	5-7
BFQ77	BFQ33C	5-7
BFQ135	BFQ135	5-7
BFQ136	BFQ136	5-6
BFQ149	BFQ149	5-6
BFQ161	BFQ161	5-9
BFQ162	BFQ162	5-9
BFQ163	BFQ163	5-9
BFQ231	BFQ231	5-9
BFQ231A	BFQ231A	5-9
BFQ232	BFQ232	5-9
BFQ232A	BFQ232A	5-9
BFQ233	BFQ233	5-9
BFQ233A	BFQ233A	5-9
BFQ234	BFQ234	5-9
BFQ235	BFQ235	5-9
BFQ235A	BFQ235A	5-9
BFQ251	BFQ251	5-9
BFQ251A	BFQ251A	5-9
BFQ252	BFQ252	5-9
BFQ252A	BFQ252A	5-9
BFQ253	BFQ253	5-9
BFQ253A	BFQ253A	5-9
BFQ254	BFQ254	5-9
BFQ255	BFQ255	5-9
BFQ255A	BFQ255A	5-9
BFQ262	BFQ262	5-9
BFQ262A	BFQ262A	5-9
BFQ263	BFQ263	5-9
BFQ263A	BFQ263A	5-9
BFQ265	BFQ265	5-9
BFQ265A	BFQ265A	5-9
BFQ268	BFQ268	5-9
BFQ270	BFQ270	5-7
BFR30	BFR30	3-3
BFR31	BFR31	3-3
BFR53	BFR53	5-3
BFR64	BFR64	5-3
BFR65	BFR65	5-3
BFR90A	BFR90A	5-6, 8-8
BFR91A	BFR91A	5-6, 8-8
BFR92	BFR92	4-2, 5-6
BFR92A	BFR92A	4-2, 5-6
BFR93	BFR93	4-2, 5-6
BFR93A	BFR93A	4-2, 5-6
BFR93A	BFR93A	4-2, 5-6
BFR94	BFR94	5-3
BFR95	BFR95	5-3, 5-9
BFR96S	BFR96S	5-6, 8-10
BFR106	BFR106	5-6
BFR134	BFR134	5-7
BFS17	BFS17	4-2, 5-3
BFS17A	BFS17A	4-2, 5-3
BFS22A	BFS22A	8-5
BFS23A	BFS23A	8-6
BFT24	BFT24	5-3
BFT25	BFT25	5-3
BFT25A	BFT25A	5-7
BFT46	BFT46	3-3
BFT92	BFT92	5-6
BFT93	BFT93	5-6
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BFU309	BFU309	3-3
BFU310	BFU310	3-3
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BFW11	BFW11	3-3
BFW12	BFW12	3-3
BFW13	BFW13	3-3
BFW16A	BFW16A	5-3
BFW17A	BFW17A	5-3
BFW30	BFW30	5-3
BFW92	BFW92	5-3
BFW92A	BFW92A	5-3

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BFW93	BFW93	5-3
BFY90	BFY90	5-3
BGD102	BGD102	7-3
BGD102E	BGD102E	7-3
BGD104	BGD104	7-3
BGD104E	BGD104E	7-3
BGD106	BGD106	7-3
BGD108	BGD108	7-3
BGD502	BGD502	7-3
BGD504	BGD504	7-3
BGD506	BGD506	7-3
BGD508	BGD508	7-3
BGD885	BGD885	7-4
BGE85A	BGE85A	7-2
BGE88	BGE88	7-2
BGE885	BGE885	7-4
BGE887	BGE887	7-4
BGX885	BGX885	7-4
BGY32	BGY32	8-13
BGY33	BGY33	8-13
BGY35	BGY35	8-13
BGY36	BGY36	8-13
BGY43	BGY43	8-13
BGY46A	BGY46A	8-13
BGY46B	BGY46B	8-13
BGY47A	BGY47A	8-13
BGY47F	BGY47F	8-13
BGY49A	BGY49A	8-13
BGY49B	BGY49B	8-13
BGY50	BGY50	7-2
BGY51	BGY51	7-2
BGY52	BGY52	7-2
BGY53	BGY53	7-2
BGY54	BGY54	7-2
BGY55	BGY55	7-2
BGY56	BGY56	7-2
BGY57	BGY57	7-2
BGY58A	BGY58A	7-2
BGY59	BGY59	7-2
BGY60	BGY60	7-2
BGY61	BGY61	7-4
BGY65	BGY65	7-4
BGY67	BGY67	7-4
BGY67A	BGY67A	7-4
BGY80	BGY80	7-2
BGY81	BGY81	7-2
BGY82	BGY82	7-2
BGY83	BGY83	7-2
BGY84	BGY84	7-2
BGY84H	BGY84H	7-2
BGY85	BGY85	7-2
BGY85H	BGY85H	7-2
BGY86	BGY86	7-2
BGY87	BGY87	7-2
BGY87B	BGY87B	7-2
BGY88	BGY88	7-2
BGY89	BGY89	7-2
BGY91A	BGY91A	8-14
BGY91B	BGY91B	8-14
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BGY95B	BGY95B	8-14
BGY96A	BGY96A	8-14
BGY96B	BGY96B	8-14
BGY110A	BGY110A	8-14
BGY110B	BGY110B	8-14
BGY110D	BGY110D	8-14
BGY110E	BGY110E	8-14
BGY110F	BGY110F	8-14
BGY112A	BGY112A	8-13
BGY112B	BGY112B	8-13
BGY112C	BGY112C	8-13
BGY112D	BGY112D	8-13
BGY113A	BGY113A	8-13
BGY113B	BGY113B	8-13
BGY113C	BGY113C	8-13
BGY145A	BGY145A	8-13
BGY145B	BGY145B	8-13
BGY145C	BGY145C	8-13
BGY580	BGY580	7-3
BGY581	BGY581	7-3
BGY582	BGY582	7-3
BGY583	BGY583	7-3
BGY584	BGY584	7-3
BGY584A	BGY584A	7-3
BGY585	BGY585	7-3
BGY585A	BGY585A	7-3
BGY586	BGY586	7-3
BGY587	BGY587	7-3
BGY587B	BGY587B	7-3
BGY588	BGY588	7-3
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BLF147	BLF147	8-11
BLF175	BLF175	8-11
BLF177	BLF177	8-11
BLF221	BLF221	8-11
BLF225	BLF225	8-11
BLF241	BLF241	8-11
BLF242	BLF242	8-11, 8-12
BLF244	BLF244	8-11, 8-12
BLF245	BLF245	8-11, 8-12
BLF245B	BLF245B	8-11
BLF246B	BLF246B	8-11
BLF246	BLF246	8-11
BLF248	BLF248	8-11
BLF256B	BLF256B	8-11
BLF277	BLF277	8-11
BLF278	BLF278	8-11

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BLF348	BLF348	8-12
BLF368	BLF368	8-12
BLF378	BLF378	8-12
BLF521	BLF521	8-12
BLF522	BLF522	8-12
BLF543	BLF543	8-12
BLF544	BLF544	8-12
BLF544B	BLF544B	8-12
BLF545	BLF545	8-12
BLF546	BLF546	8-12
BLF547	BLF547	8-11
BLF548	BLF548	8-12
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BLT80	BLT80	8-8
BLT90/SL	BLT90/SL	8-8
BLT91/SL	BLT91/SL	8-8
BLT92/SL	BLT92/SL	8-8
BLT93/SL	BLT93/SL	8-8
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BLU30/12	BLU30/12	8-7
BLU30/28	BLU30/28	8-7
BLU45/12	BLU45/12	8-7
BLU50	BLU50	8-7
BLU51	BLU51	8-7
BLU52	BLU52	8-7
BLU53	BLU53	8-7
BLU56	BLU56	8-7
BLU60/12	BLU60/12	8-7
BLU60/28	BLU60/28	8-7
BLU86	BLU86	8-8
BLU97	BLU97	8-7
BLU98	BLU98	8-8
BLU99	BLU99	8-7, 8-8
BLU99/SL	BLU99/SL	8-8
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BLV11	BLV11	8-3, 8-4, 8-5
BLV12	BLV12	8-5
BLV20	BLV20	8-3, 8-6
BLV21	BLV21	8-3, 8-4, 8-6, 8-9
BLV25	BLV25	8-9
BLV30	BLV30	8-10
BLV30/12	BLV30/12	8-5
BLV31	BLV31	8-10
BLV32F	BLV32F	8-10
BLV33	BLV33	8-10
BLV33F	BLV33F	8-10
BLV36	BLV36	8-10
BLV37	BLV37	8-10
BLV38	BLV38	8-10
BLV45/12	BLV45/12	8-5
BLV75/12	BLV75/12	8-5
BLV57	BLV57	8-10
BLV59	BLV59	8-10
BLV80/28	BLV80/28	8-9
BLV90	BLV90	8-8
BLV90/SL	BLV90/SL	8-8
BLV91	BLV91	8-8
BLV91/SL	BLV91/SL	8-8
BLV92	BLV92	8-8
BLV93	BLV93	8-8
BLV94	BLV94	8-8
BLV95	BLV95	8-8
BLV96	BLV96	8-8
BLV97	BLV97	8-8
BLV97CE	BLV97CE	8-8
BLV98	BLV98	8-8
BLV98CE	BLV98CE	8-8
BLV99R	BLV99	8-8
BLV100	BLV100	8-8
BLV101A	BLV101A	8-8
BLV101B	BLV101B	8-8
BLV102	BLV102	8-8
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BLW30	BLW30	8-5
BLW31	BLW31	8-5
BLW32	BLW32	8-10
BLW33	BLW33	8-10
BLW34	BLW34	8-10
BLW50F	BLW50F	8-3, 8-4
BLW60	BLW60	8-4, 8-5
BLW60C	BLW60C	8-4, 8-5
BLW76	BLW76	8-4, 8-9
BLW77	BLW77	8-4, 8-6
BLW78	BLW78	8-3, 8-4, 8-6, 8-9
BLW79	BLW79	8-5, 8-7
BLW80	BLW80	8-5, 8-7
BLW81	BLW81	8-5, 8-7
BLW82	BLW82	8-7
BLW83	BLW83	8-3, 8-4
BLW84	BLW84	8-6
BLW85	BLW85	8-4, 8-5
BLW86	BLW86	8-3, 8-4, 8-6, 8-9
BLW87	BLW87	8-3, 8-4, 8-5
BLW89	BLW89	8-7
BLW90	BLW90	8-7, 8-9
BLW91	BLW91	8-7
BLW95	BLW95	8-4
BLW96	BLW96	8-3, 8-4
BLW97	BLW97	8-4

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BLX13C	BLX13C	8-3, 8-4	CA2800H	BGY85	7-2
BLX14	BLX14	8-4	CA2840	BGY56	7-2
BLX15	BLX15	8-4	CA2840H	BGY56	7-2
BLX39	BLX39	8-3, 8-4, 8-6, 8-9	CA2842	BGY56	7-2
BLX65	BLX65	8-7	CA2842H	BGY56	7-2
BLX65E	BLX65E	8-7	CA2876	BGY86	7-2
BLX65ES	BLX65ES	8-7	CA3100	BGY52	7-2
BLX67	BLX67	8-7	CA3101	BGY54	7-2
BLX68	BLX68	8-7	CA3200	BGY53	7-2
			CA3201	BGY55	7-2
BLX69A	BLX69A	8-7	CA3302	BGY88	7-2
BLX91A	BLX91A	8-7	CA3600	BGY58A	7-2
BLX92A	BLX92A	8-7	CA4101	BGY84	7-2
BLX93A	BLX93A	8-7	CA4201	BGY85	7-2
BLX94A	BLX94A	8-7	CA4411	BGY61	7-4
BLX94C	BLX94C	8-7	CA4412	BGY61	7-4
BLX95	BLX95	8-7	CA4418	BGY65	7-4
			CA4422	BGY67	7-4
BLX96	BLX96	8-10	CA4424	BGY67A	7-4
BLX97	BLX97	8-10	CA5101	BGY86A	7-2
BLX98	BLX98	8-10	CA5170	BGY84	7-2
BLY87A	BLY87A	8-3, 8-5	CA5180	BGY82	7-2
BLY87C	BLY87C	8-3, 8-5	CA5201	BGY85A	7-2
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BLY92C	BLY92C	8-3, 8-4, 8-6	CA5700	BGY89	7-2
BLY93A	BLY93A	8-6	CA6101	BGY584A	7-3
BLY93C	BLY93C	8-6	CA6170	BGY584	7-3
BLY94	BLY94	8-6	CA6201	BGY585A	7-3
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CA2100	BGY52	7-2	CD2088	BLW33	8-10
CA2101	BGY52	7-2	CD2089	BLV31	8-10
CA2200	BGY53	7-2	CD2505	BLV30	8-10
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CA2300	BGY56	7-2	CD2810	BLW33	8-10
CA2301	BGY57	7-2	CD2811	BLW33	8-10
CA2418	BGY65	7-4	CD2812	BLW33	8-10
CA2422	BGY67	7-4	CD2813	BLW33	8-10

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CD5916	BLW89	8-7
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CD5946	BLW81	8-5, 8-7
CD1605	BLX94A	8-7
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CG125C	BFQ66	5-7
CG127	BFQ66	5-7
CG127A	BFQ66	5-7
CG127B	BFQ66	5-7
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DU2840S	BLF245	8-11, 8-12
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HXTR5103	LBE2003S	9-2
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J309	J309	3-3
J310	J310	3-3
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LBE2009S	LBE2009S	9-2
LCE2003S	LCE2003S	9-2
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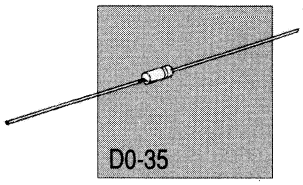
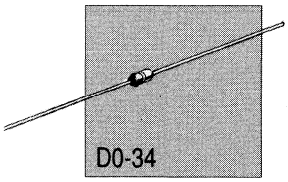
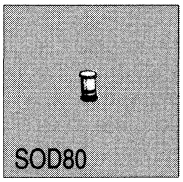
RF DIODES

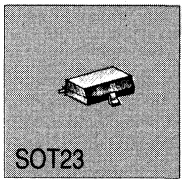


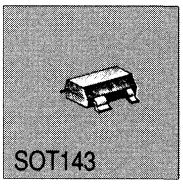
We offer a wide range of RF diodes including:

- **variable capacitance (varicap) diodes** for AM and FM radio and TV tuning
- **Schottky-barrier diodes** primarily for mixers
- **RF band-switching diodes**
- **detection diodes** in both conventional and SMD encapsulation.



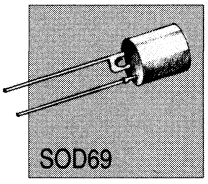


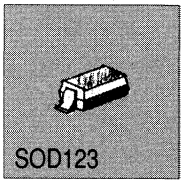


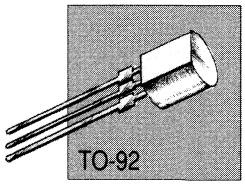


Our range of variable capacitance diodes consists of single diodes for AFC applications, and of matched sets for super-heterodyne receiving systems. The introduction of these diodes into tuning systems signalled a major first for Philips - *first in the world to introduce electronic tuning to radio and TV systems.* Principal features of these diodes are their exceptionally small frequency deviation (practically independent of signal voltage) due chiefly to a precisely-controlled doping profile, and their extremely smooth C/V characteristic.

Finally, in common with all the products listed in this brochure, our diode range is heavily supported by extensive applications know-how developed from our long experience in RF products.







RF DIODES *continued*

VARIABLE-CAPACITANCE DIODES

- wide variety of tuning ranges
- low leakage current
- smooth/well-controlled C_d range
- conventional and SMD envelopes available

For more technical details see our handbook SC01

type number	C_d @ V_R (pF) (V)	tuning range: C_d over ratio	voltage range V_1 (V)	to V_2 (V)	r_s max (Ω)	matched sets $\Delta \frac{Cmax}{Cmin}$ <3%	envelope
Automatic frequency control							
BB119	15.3-19.0 10	>1.3	4	10	1.5	no	DO-35
BB417	2.2- 2.4 15	2-5	4	15	1.2	no	DO-34
AM radio tuning							
BB112	17-29 8.5	>18	1	8.5	1.5	yes	SOD69
BB130	12-21 28	>23	1	28	2	yes	SOD69
BB212[1]	<22 8.0	>22.5	0.5	8	2.5	no	TO-92
FM radio tuning							
BB204B[1]	typ. 14.0 30	2.5-2.8	3	30	0.4	no	TO-92
BB804[1]	42 - 47.5 8	1.65-1.75	2	8	typ.0.25	no	SOT23
VHF tuning							
BB219	2.6-3.2 28	12-15	1	28	0.9	yes	SOD80
BB240	2.3-2.7 28	>14	0.5	28	1.0	yes	SOD80
BB241	2.6-3.0 28	>21	0.5	28	2.0	yes	SOD80
BB249	4.0-5.0 28	8-10	1	28	0.6	yes	SOD80
▶ BB619	2.4-2.9 28	>12.5	1	28	typ. 0.7	yes	SOD123
▶ BB620	2.9-3.4 28	19.5-25	1	28	typ. 1.3	yes	SOD123
BB809	4.0-5.0 28	8-10	1	28	0.6	yes	DO-34
BB909A	2.6-3.0 28	12-15	1	28	0.9	yes	DO-34
BB909B	2.8-3.2 28	12-15	1	28	0.9	yes	DO-34
BB910	2.3-2.7 28	>14	0.5	28	1.0	yes	DO-34
BB911	2.6-3.0 28	>21	0.5	28	2.0	yes	DO-34
BBY40	3.8-4.8 28	8-12	1	28	0.7	no	SOT23
BBY42	2.4-3.0 28	12-16	1	28	1.0	no	SOT23
UHF tuning							
BB215	1.8-2.2 28	>7.6	1	28	typ. 0.63	yes	SOD80
BB405B	1.8-2.2 28	>7.6	1	28	0.75	yes	DO-34
BBY31	1.8-2.8 25	typ. 9.7	1	28	1.2	no	SOT23
BBY62[1]	1.8-2.8 28	9.7	1	28	1.2	no	SOT143
▶ BB515	1.85-2.25 28	8-9.6	1	28	typ. 0.5	yes	SOD123
SHF/SAT-TV tuning							
BBY39[2]	1.6-2.0 28	>8.0	1	28	1.2	no	SOT23
▶ BB811	0.85-1.2 28	7.8-9.5	1	28	typ. 1.0	yes	SOD123

[1] double diode

[2] common cathode double diode

SCHOTTKY-BARRIER DIODES

Primarily intended for mixing applications.

type number	V_R @ I_F (mV)	(mA)	r_s @ I_F and f (Ω)	(mA)	(kHz)	C_d @ V_R (pF)	(V)	max V_R (V)	max I_F (mA)	envelope
BA480	280	1	15	5	1	1.2	0.2	4	30	DO-34
BA481	450	1	13	5	1	1.1	0	4	30	DO-34

RF BAND-SWITCHING DIODES

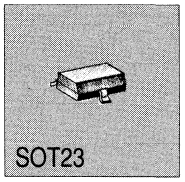
type	r_s @ I_F and f (Ω)	(mA)	(MHz)	C_d @ V_R and f (pF)	(V)	(MHz)	max V_R (V)	max I_F (mA)	envelope
AM Radio									
BA223	1.5	10	1	3.5	6	1	20	50	DO-34
BA423	1.2	10	1	2.5	3	1	20	50	DO-34
BA423L	1.2	10	1	2.5	3	1	20	50	SOD80
VHF applications									
BA482	0.7	3	200	1.2	3	100	35	100	DO-35
BA483	1.2	3	200	1.0	3	100	35	100	DO-35
BA484	1.2	3	200	1.6	3	100	35	100	DO-35
▶ BA582	0.55	3	200	0.85	3	100	35	100	SOD123
BA682	0.7	3	200	1.5	3	1	35	100	SOD80
BA683	1.2	3	200	1.2	3	1	35	100	SOD80
BAT18	0.7	5	200	1.0	20	1	35	100	SOT23

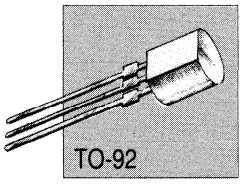
DETECTION DIODE

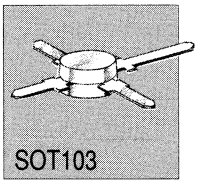
type	V_F @ I_F (mV)	(μA)	C_d @ V_R and f (pF)	(V)	(MHz)	max V_R (V)	max I_F (mA)	envelope
BA231	360-420	10	1.2	0	1	50	200	DO-35

SMALL-SIGNAL FIELD-EFFECT TRANSISTORS

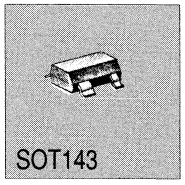
We are one of the world's leading suppliers of small-signal transistors and one of the few offering a complete range of small-signal FETs in both conventional and surface-mount execution. Many of the products in our range have been specifically developed for HF applications and are the result of our ongoing R&D programme. A programme that guarantees you the very latest technologies and the very best in quality and reliability.


SOT23


TO-92


SOT103

What's more, thanks to our massive manufacturing resources with production facilities strategically located worldwide, we can offer continuity of supply and a highly competitive pricing structure.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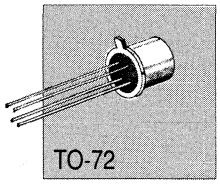

TO-72

SMALL-SIGNAL FIELD-EFFECT TRANSISTORS *continued*

JUNCTION FETS

These are for applications in the VHF range. Principal features of these products are their low noise, high transfer conductance and their high input impedance, the latter, in particular, minimizing signal losses and helping to simplify circuit design.

N-CHANNEL JUNCTION FIELD-EFFECT TRANSISTORS

type number	ratings		characteristics							envelope	remarks
	V_{DSS} max	I_G max	I_{DSS} min	I_{DSS} max	g_{os} typ @1 kHz	$\|y_{fs}\|$ min @1 kHz	C_{rss} typ.	C_{iss} typ	F typ		
	(V)	(mA)	(mA)	(mA)	(μS)	(mS)	(pF)	(pF)	(dB)		
BF245A/0	30	10	0.5	2.1	25	3.0	1.1	4	1.5	TO-92	DC, LF and HF appl.
BF245A	30	10	2	6.5	25	3.0	1.1	4	1.5	TO-92	DC, LF and HF appl.
BF245B	30	10	6	15	25	3.0	1.1	4	1.5	TO-92	DC, LF and HF appl.
BF245C	30	10	12	25	25	3.0	1.1	4	1.5	TO-92	DC, LF and HF appl.
BF247A	25	10	30	80		8.0	3.5	11		TO-92	VHF and UHF appl.
BF247B	25	10	60	140		8.0	3.5	11		TO-92	VHF and UHF appl.
BF247C	25	10	110	250		8.0	3.5	11		TO-92	audio switching
BF256A	30	10	3	7	25	4.5	0.7	2	7.5	TO-92	VHF and UHF appl.
BF256B	30	10	6	13	25	4.5	0.7	2	7.5	TO-92	VHF and UHF appl.
BF256C	30	10	11	18	25	4.5	0.7	2	7.5	TO-92	VHF and UHF appl.
BF410A	20	10	0.7	3	60[1]	2.5	0.4[1]	5[1]	1.5	TO-92	RF stages FM portables
BF410B	20	10	2.5	7	80[1]	4.0	0.4[1]	5[1]	1.5	TO-92	RF stages car radios
BF410C	20	10	6	12	100[1]	6.0	0.4[1]	5[1]	1.5	TO-92	RF stages mains radios
BF410D	20	10	10	18	120[1]	7.0	0.4[1]	5[1]	1.5	TO-92	mixer stages
BF510	20	10	0.7	3	60[1]	2.5	0.4	5	1.5	SOT23	RF stages FM portables
BF511	20	10	2.5	7	80[1]	4.0	0.4	5	1.5	SOT23	RF stages car radios
BF512	20	10	6	12	100[1]	6.0	0.4	5	1.5	SOT23	RF stages mains radios
BF513	20	10	10	18	120[1]	7.0	0.4	5	1.5	SOT23	mixer stages
BF545A/0	30	10	0.5	2.1	25	3.0	1.1	4	1.5	SOT23	DC, LF and HF appl.
BF545A	30	10	2	6.5	25	3.0	1.1	4	1.5	SOT23	DC, LF and HF appl.
BF545B	30	10	6	15	25	3.0	1.1	4	1.5	SOT23	DC, LF and HF appl.
BF545C	30	10	12	25	25	3.0	1.1	4	1.5	SOT23	DC, LF and HF appl.
J308	25	10	12	60	200[1]	8	2.5	5	1.5	TO-92	VHF/UHF amplifiers
J309	25	10	12	60	150[1]	10	2.5	5	1.5	TO-92	VHF/UHF amplifiers
J310	25	10	24	60	200[1]	8	2.5	5	1.5	TO-92	VHF/UHF amplifiers
PMBFJ308	25	10	12	60	200[1]	8	2.5	5	1.5	SOT23	VHF/UHF amplifiers
PMBFJ309	25	10	12	30	150[1]	10	2.5	5	1.5	SOT23	VHF/UHF amplifiers
PMBFJ310	25	10	24	60	200[1]	10	2.5	5	1.5	SOT23	VHF/UHF amplifiers

[1] max value

N-CHANNEL JUNCTION FIELD-EFFECT TRANSISTORS *continued*

type number	ratings		characteristics							envelope	remarks
	V_{DSS} max	I_G max	I_{DSS} min	I_{DSS} max	g_{os} typ @1 kHz	$\|y_{fs}\|$ min @1 kHz	C_{rss} typ. @1 kHz	C_{iss} typ @1 kHz	F typ @1 kHz		
	(V)	(mA)	(mA)	(mA)	(μS)	(mS)	(pF)	(pF)	(dB)		
BFW10	30	10	8	20	85[1]	3.5	0.8	5	2.5	TO-72	broad band up to 300 MHz and differential amplifiers
BFW11	30	10	4	10	50[1]	3.0	0.8	5	2.5	TO-72	
BFW12	30	10	1	5	30[1]	2.0	0.8	5		TO-72	
BFW13	30	10	0.2	1.5	10[1]	1.0	0.8	5		TO-72	
2N3822	50	10	2	10		3.0	3.0	6	5	TO-72	general purpose VHF appl.
2N3823	30	10	4	20		3.2	2.0	6	2.5	TO-72	industrial IF/RF VHF appl.
BFR30	25	5	4	10	40[1]	1.0	1.5[1]	4		SOT23	low-level general purpose amplifiers
BFR31	25	5	1	5	20[1]	1.5	1.5[1]	4		SOT23	
BFT46	25	5	0.2	1.5	10[1]	1.0	1.5[1]	4		SOT23	general purpose amplifiers
BFU308	25	10	12	60	200[1]	8	2.5	5	1.5	TO-18	VHF/UHF amplifiers
BFU309	25	10	12	30	150[1]	10	2.5	5	1.5	TO-18	VHF/UHF amplifiers
BFU310	25	10	24	60	200[1]	10	2.5	5	1.5	TO-18	VHF/UHF amplifiers
2N4416	30	10	5	15	50[1]	4.5	0.8	4	2	TO-72	VHF/UHF amplifiers
PMBF4416	30	10	5	15	50[1]	4.5	0.8	4	2	SOT23	VHF/UHF amplifiers
PN4416	30	10	5	15	50[1]	4.5	0.8	4	2	TO-92	VHF/UHF amplifiers

[1] max value

SMALL-SIGNAL FIELD-EFFECT TRANSISTORS *continued*

MOSFETS

These are for applications in the VHF and UHF ranges, primarily in RF input stages, mixers and VHF and UHF amplifiers. All our MOSFETs are available in both conventional and surface-mount execution, allowing circuit designers to satisfy a whole range of design criteria. Their principal features are their low input capacitance, high transfer conductance and low noise.

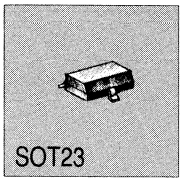
DUAL-GATE N-CHANNEL MOSFETS

	SOT103	SOT143
VHF	BF964S	BF994S
	BF965	BF997
	BF981	BF991
	BF982	BF992
	BF988	BF998
UHF	BF960	BF989
	BF966S	BF996S
	BF980A	BF990A
	BF988	BF998

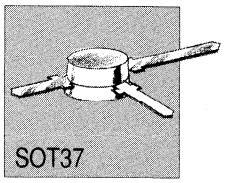
type number	ratings V_{DS} (V)	ratings I_D (mA)	characteristics I_{DSS} min (mA)	characteristics I_{DSS} max (mA)	characteristics $-V_{(P)G1-S}$ max (V)	characteristics $\lvert y_{fs} \rvert$ @ 1 kHz min (mS)	characteristics C_{is} typ. (pF)	characteristics C_{os} typ. (pF)	characteristics F typ (dB)	envelope	remarks
BF960	20	20	2	20	2.7	9.5	1.8	0.9	2.8	SOT103	UHF
BF964S	20	30	4	20	2.5	15	2.5	1.0	1.0	SOT103	VHF
BF965	20	30	2	20	2.5	15	2.5	1.0	1.0	SOT103	VHF
BF966S	20	30	4	20	2.5	15	2.3	0.8	1.8	SOT103	UHF
BF980A	18	30	-	-	1.3	18	2.6	1.1	2.0	SOT103	UHF
BF981	20	20	4	25	2.5	10	2.1	1.1	1.0	SOT103	VHF
BF982	20	40	-	-	1.3	20	4.0	2.0	1.2	SOT103	VHF
BF988	12	30	2	18	2.5	24[1]	2.1	1.05	1.0	SOT103	VHF/UHF
BF989	20	20	2	20	2.7	9.5	1.8	0.9	2.8	SOT143	UHF
BF990A	18	30	-	-	1.3	18	2.6	1.1	2.0	SOT143	UHF
BF991	20	20	4	25	2.5	10	2.1	1.1	0.7	SOT143	VHF
BF992	20	40	-	-	1.3	20	4.0	2.0	1.2	SOT143	VHF
BF994S	20	30	4	20	2.5	15	2.5	1.0	1.0	SOT143	VHF
BF996S	20	30	4	20	2.5	15	2.3	0.8	1.8	SOT143	UHF
BF997	20	30	2	20	2.5	15	2.5	1.0	1.0	SOT143	VHF
BF998	12	30	2	18	2.5	24[1]	2.1	1.05	1.0	SOT143	VHF/UHF

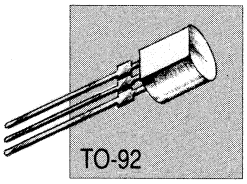
[1] typical value

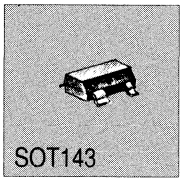
TUNER TRANSISTORS


SOT23

We offer a wide range of bipolar transistors (both npn and pnp) for use in VHF, UHF and SATV tuners. Transistors are available for mixer, oscillator and for input amplifier functions.


SOT37

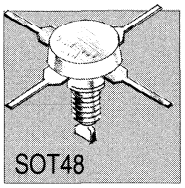

TO-92

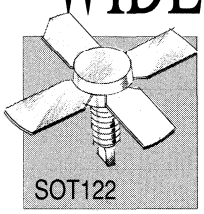

SOT143

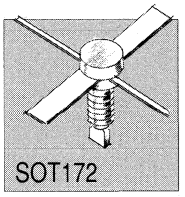
TUNER TRANSISTORS *continued*

type number	polarity	ratings			characteristics[1)]					envelope
		V_{CEO} (V)	I_C (mA)	P_{tot} (mW)	f_T (GHz)	F (dB)	@ f (MHz)	G_{UM} (dB)	@ f (MHz)	
BF498	npn	20	20	300	550	2.5	200	30	100	TO-92
BF506	pnp	20	25	250	350	5	200	17.5	200	TO-92
BF569N	pnp	35	30	250	900	4.5	800	16.7	800	SOT23
BF579	pnp	20	25	300	1350	4.5	800	16	800	SOT23
BF660	pnp	30	25	300	650	-	-	-	-	SOT23
BF747	npn	20	50	150	1200	4.5	100	20	100	SOT23
BF748	npn	20	50	500	1200	4.5	100	20	100	TO-92
BF926	pnp	20	25	250	350	5	200	17.5	200	TO-92
BF970N	pnp	35	30		900	4.5	800	16.7	800	SOT37
BF979	pnp	20	30	140	1350	4.5	800	16	800	SOT37
BFG67	npn	10	50	300	7500	2.5	2000	11	2000	SOT143
BFR92A	npn	15	25	300	5000	1.8	800	15.5	800	SOT23
BFR93A	npn	12	35	300	5000	1.6	800	14	800	SOT23
BFS17	npn	15	50	300	1300	4.5	500	-	-	SOT23
BFS17A	npn	15	25	300	2800	2.5	800	13.5	800	SOT23

WIDEBAND TRANSISTORS


SOT48


SOT122


SOT172

We've been designing and manufacturing wideband transistors for over 25 years, catering for both the consumer and professional ends of the market. With advanced designs, expertise in process technologies, assembly know-how and applications experience we're second to none. And being the world's largest electronic components manufacturer with factories worldwide, we offer continuity of supply and short delivery times.

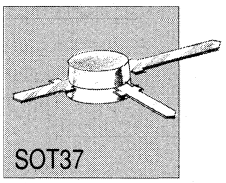
Since we started designing and producing wideband transistors, we've scored some notable firsts. For example, we were the first in the world to produce wideband RF transistors with a transition frequency of 1.5 GHz, and our latest transistors have transition frequencies up to 12 GHz. With sub-micron features and a five micron emitter pitch, our 12 GHz transistors have reached the limits of performance allowed by current lithographic techniques.

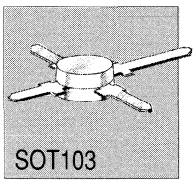
Our transistors can be classified into three groups:

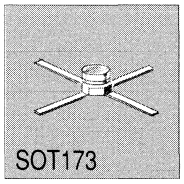
- **first generation** with transition frequencies up to 3.5 GHz
- **second generation** with transition frequencies up to 6 GHz
- **third generation** with transition frequencies up to 12 GHz

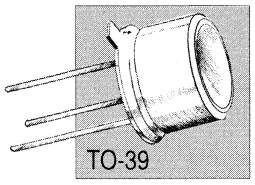
Each generation is the result of our on-going development programme which has produced transistor dies with ever finer structures and shallower diffusions and implantations. The second and third generations, in particular, are characterized by high transition frequency, low noise and high gain.

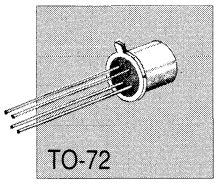
We also have a range of CRT driver transistors which as far as their technology is concerned, fall into the second generation. However, for convenience, we include them here in a second section.

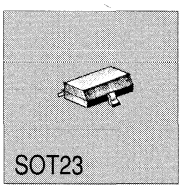

SOT37

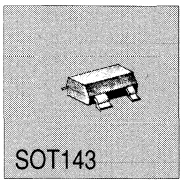

SOT103

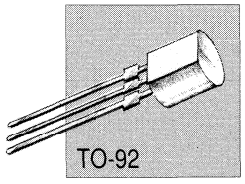

SOT173

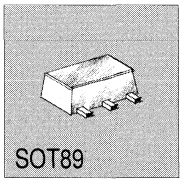

TO-39

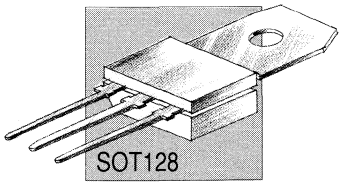

TO-72

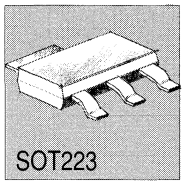

SOT23

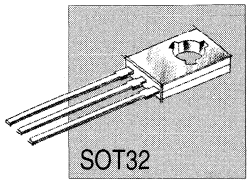

SOT143


TO-92


SOT89


SOT128


SOT223


SOT32

WIDEBAND TRANSISTORS *continued*

FIRST-GENERATION NPN WIDEBAND TRANSISTORS (f_T UP TO 3.5 GHz)

f_T/I_C characteristic, see chart page 5.8		envelope								
		metal can		plastic			surface mount			
	polarity	TO-39	TO-72	TO-92	SOT37	SOT48	SOT23	SOT89	SOT143	SOT223
(1)	npn				BFT24		BFT25			
-	npn			MPSH10			PMBTH10			
	pnp			MPSH81			PMBTH81			
-	pnp						PMBT3640			
(18)	npn			BF748			BF747			
(2)	npn		BFY90	BF689K BF763	BFW92		BFS17			
(3)	npn				BFW92A		BFS17A		BFG17A	
(4)	npn		BFW30		BFW93		BFR53			
(5)	npn	BFW16A				BFR64		BFQ17		BFG16A
	npn	BFW17A				BFR65				
(6)	npn	BFR95				BFR94				

FIRST-GENERATION NPN WIDEBAND TRANSISTORS (f_T UP TO 3.5 GHz) *continued*

type number	ratings			characteristics[1]					envelope
	V_{CEO} (V)	I_C (mA)	P_{tot} (mW)	f_T (GHz)	F (dB)	@ f (MHz)	G_{UM}[2] (dB)	@ f (MHz)	
BF689K	15	25	360	1.8	3	200	16	200	TO-92
BF763	15	25	500	1.8	5	800	-	-	TO-92
▶ BF747	20	50	300	1.2	-	-	13	500	SOT23
▶ BF748	20	50	500	1.2	-	-	11	500	TO-92
▶ BFG16A	25	150	1000	1.5	-	-	10	500	SOT223
BFG17A	15	25	300	2.8	2.5	800	15.5	800	SOT143
BFQ17	25	150	1000	1.2	-	-	16 (6.5)	200	SOT89
BFR53	10	50	250	2.0	5	500	22 (10.5)	200	SOT23
BFR64	25	200	3500	1.2	6	200	16[3] (6.5[3])	200	SOT48
BFR65	25	400	5000	1.2	-	-	19[3] (4.5[3])	200	SOT48
BFR94	25	150	3500	3.5	5	500	13.5	500	SOT48
BFR95	25	150	1500	3.5	9	200	13.5	500	TO-39
BFS17	15	25	250	1.3	4.5	500	-	-	SOT23
BFS17A	15	25	300	2.8	2.5	800	13.5	800	SOT23
BFT24	5	2.5	30	2.3	3.8	500	17	500	SOT37
BFT25	5	6.5	50	2.3	3.8	500	18	500	SOT23
BFW16A	25	150	1500	1.2	<6	200	16[3] (6.5[3])	200	TO-39
BFW17A	25	150	1500	1.1	-	-	16[3]	200	TO-39
BFW30	10	50	250	1.6	<5	500	21 (7.5)	200	TO-72
BFW92	15	25	190	1.6	4	500	23[3] (11[3])	200	SOT37
BFW92A	15	25	200	2.8	2.5	800	13	800	SOT37
BFW93	10	50	190	1.7	<5	500	22 (10.5)	200	SOT37
BFY90	15	25	200	1.4	2.5	200	23[3] (8[3])	200	TO-72
▶ MPSH10	25	-	350	>0.65	-	100	-	-	TO-92
▶ MPSH81	20	-	350	>0.60	-	100	-	-	TO-92
▶ PMBTH10	25	-	300	>0.65	-	100	-	-	SOT23
▶ PMBTH81	20	-	300	>0.60	-	100	-	-	SOT23
▶ PMBT3640	12	80	300	>0.50	-	100	-	-	SOT23

[1] typical values
[2] values in parentheses are measured at 800 MHz
[3] G_p

WIDEBAND TRANSISTORS *continued*

SECOND-GENERATION WIDEBAND TRANSISTORS (f_T UP TO 6 GHz)

f_T/I_C characteristic, see chart page 5.8		envelope								
		metal can	plastic		ceramic		surface mount			
	polarity	TO-72	SOT37	SOT103	SOT122	SOT173	SOT23	SOT89	SOT143	SOT223
(7)	npn	BFQ53	BFR90(A)	BFG90A		BFP90A	BFR92(A)		BFG92A(X)	
	pnp	BFQ52	BFQ51	BFG51		BFQ51C	BFT92			
(8)	npn	BFQ22S	BFR91(A)	BFG91A		BFP91A	BFR93(A)		BFG93A(X)	BFG94
(9)	pnp	BFQ24	BFQ23	BFG23		BFQ23C	BFT93			
(10)	npn	BFQ63	BFR96(S)	BFG96		BFP96	BFR106	BFQ19		BFG97
	pnp	BFQ32M	BFQ32(S)	BFG32		BFQ32C		BFQ149		BFG31
(11)	npn		BFQ34T	BFG34				BFQ18A		BFG35
	pnp		BFQ54T	BFG54						BFG55
(11)	npn				BFQ34					
	pnp				BFQ54					
(12)	npn				BFQ68					
	pnp									
(13)	npn				BFQ136					
	pnp									

SECOND-GENERATION WIDEBAND TRANSISTORS (f_T UP TO 6 GHz) *continued*

type number	polarity	ratings			characteristics[1]						envelope
		V_{CEO} (V)	I_C (mA)	P_{tot} (mW)	f_T (GHz)	linear[2] V_{out} (mV)	F (dB)	@ f (MHz)	G_{UM} (dB)	@ f (MHz)	
BFG23	pnp	12	35	180	5	400	3.7	800	14.5	800	SOT103
▶ BFG31	pnp	15	100	1000	5	600	-	-	12	800	SOT223
BFG32	pnp	15	75	700	4.5	500	4.3	800	13.5	800	SOT103
BFG34	npn	18	150	1000	4	750	2.3	800	14.5	800	SOT103
BFG35	npn	18	150	1000	4	750	-	-	12	800	SOT223
BFG51	pnp	15	25	180	5	150	3.4	800	16.5	800	SOT103
BFG54	pnp	18	150	1000	4	-	-	-	-	-	SOT103
▶ BFG55	pnp	18	150	1000	4	750	-	-	11	800	SOT223
BFG90A	npn	15	25	180	5	150	2.4	800	19	800	SOT103
BFG91A	npn	12	35	300	6	425	2.3	800	17.5	800	SOT103
▶ BFG92A(X)	npn	15	25	300	5	-	2.4	800	17.5	800	SOT143
▶ BFG93A(X)	npn	12	35	300	6	-	2.3	800	17	800	SOT143
▶ BFG94	npn	12	60	700	6	500	2.3	800	15	800	SOT223
BFG96	npn	15	150	700	5	700	3.7	800	15	800	SOT103
BFG97	npn	15	150	700	5	700	3.7	800	12	800	SOT223
BFP90A	npn	15	30	250	5	150	2.4	800	19.5	800	SOT173
BFP91A	npn	12	50	350	6	425	2.3	800	18.5	800	SOT173
BFP96	npn	15	100	500	5	700	3.7	800	15	800	SOT173
BFQ18A	npn	15	150	1000	3.6	700	-	-	-	-	SOT89
BFQ19	npn	15	75	500	5	700	3.3	500	11.5	500	SOT89
BFQ22S	npn	12	35	150	5	300	1.9	500	16	500	TO-72
BFQ23	pnp	12	35	180	5	300	2.4	500	16.5	500	SOT37
BFQ23C	pnp	12	50	350	5	400	3.7	800	15	800	SOT173
BFQ24	pnp	12	35	150	5	300	2.4	500	15	500	TO-72
BFQ32	pnp	15	75	500	4.2	500	3.8	500	14	500	SOT37
BFQ32C	pnp	15	100	500	4.5	500	4.3	800	13	800	SOT173
BFQ32M	pnp	15	75	250	4.5	-	2.3	500	11	500	TO-72
BFQ32S	pnp	15	100	700	4.5	600	4.3	800	10	800	SOT37
BFQ34	npn	18	150	2250	4	1200	8	500	16.5	500	SOT122
BFQ34T	npn	18	150	1000	3.7	750	-	-	19.5	300	SOT37
BFQ51	pnp	15	25	180	5	150	2.4	800	18	500	SOT37
BFQ51C	pnp	15	30	250	5	150	2.5	800	16.5	800	SOT173
BFQ52	pnp	15	25	150	5	150	2.7	500	17	500	TO-72
BFQ53	npn	15	25	150	5	150	2.4	500	18	500	TO-72

[1] typical values

[2] at a d_{im} of –60 dB, measured according to DIN45004B par. 6.3: 3-tone test

WIDEBAND TRANSISTORS *continued*

SECOND-GENERATION WIDEBAND TRANSISTORS (f_T UP TO 6 GHz) *continued*

type number	polarity	ratings			characteristics[1]						envelope
		V_{CEO} (V)	I_C (mA)	P_{tot} (mW)	f_T (GHz)	linear[2] V_{out} (mV)	F (dB)	@ f (MHz)	G_{UM} (dB)	@ f (MHz)	
BFQ54	pnp	18	150	2250	4	950	-	-	16.5	500	SOT122
BFQ54T	pnp	18	150	1000	4	-	-	-	18	300	SOT37
BFQ63	npn	15	75	250	4.5	500	2.3	500	11.5	500	TO-72
BFQ68	npn	18	300	4500	4	1600	-	-	13	800	SOT122
BFQ136	npn	18	600	9000	4	2500	-	-	12.5	800	SOT122
BFQ149	pnp	15	75	500	5	-	3.75	500	12	500	SOT89
BFR90A	npn	15	25	180	5	150	2.4	800	15	800	SOT37
BFR91A	npn	12	35	300	6	425	2.3	800	14	800	SOT37
BFR92A	npn	15	25	200	5	150	2.4	800	15	800	SOT23
BFR93A	npn	12	35	250	5	425	2.3	800	14	800	SOT23
BFR96S	npn	15	100	700	5	700	4	800	11.5	800	SOT37
BFR106	npn	15	100	350	4	250	3.6	800	11.5	800	SOT23
BFT92	pnp	15	25	200	5	150	2.7	500	18	500	SOT23
BFT93	pnp	12	35	200	5	300	2.4	500	16.5	500	SOT23

[1] typical values

[2] at a d_{im} of -60 dB, measured according to DIN45004B par. 6.3: 3-tone test

THIRD-GENERATION NPN WIDEBAND TRANSISTORS (f_T UP TO 12 GHz)

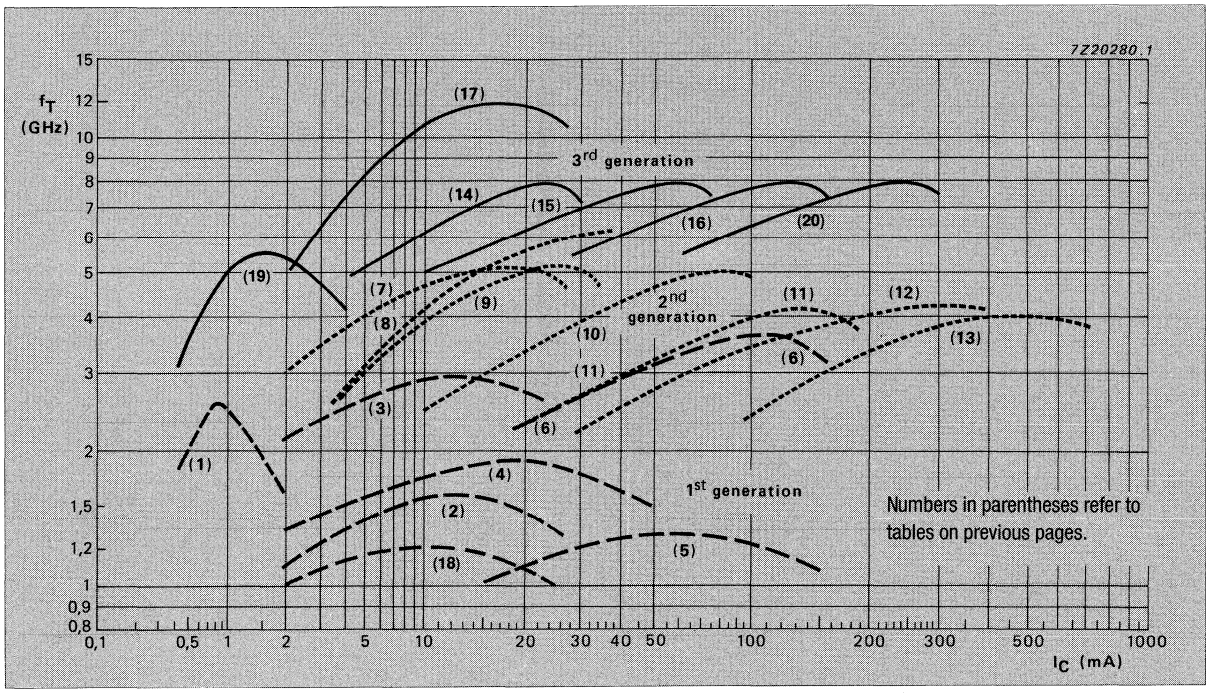
f_T/I_C characteristic, see chart page 5.8	envelope						
	plastic		ceramic		surface mount		
	SOT37	SOT103	SOT172	SOT173	SOT23	SOT143	SOT223
(14)	BFQ65	BFG65		BFQ66	BFQ67	BFG67(X)	
(15)		BFG195				BFG197(X)	BFG198
(16)	BFR134	BFG134	BFQ135				BFG135
(17)				BFQ33C		BFG33(X)	
(19)					BFT25A	BFG25AX	
(20)			BFQ270[2]				

type number	ratings			characteristics[1]					envelope
	V_{CEO} (V)	I_C (mA)	P_{tot} (mW)	f_T @ 2 GHz (GHz)	F @ 2 GHz (dB)	G_{UM} (dB)	V_{CE} (V)	I_C (mA)	
▶ BFG25AX	5	6.5	50	5	1.8[2]	-	1	0.5	SOT143
BFG33(X)	7	20	140	12	3.0	12	5	14	SOT143
BFG65	10	50	300	7.5	3	10.5	8	15	SOT103
▶ BFG67(X)	10	50	300	7.5	2.5	11	8	15	SOT143
BFG134	18	150	1000	7.5	-	8	10	100	SOT103
BFG135	18	150	1000	7.5	-	12[2]	10	100	SOT223
BFG195	10	100	700	7.5	1.4[2]	11.0	8	50	SOT103
▶ BFG197(X)	10	100	300	7.5	1.4[2]	11.0	6	50	SOT143
BFG198	10	100	700	7.5	-	15[2]	8	50	SOT223
BFQ33C	7	20	140	12	3.0	12.5	5	14	SOT173
BFQ65	10	50	300	7.5	3	8	8	15	SOT37
BFQ66	10	50	350	7.5	3	11.5	8	15	SOT173
BFQ67	10	50	300	7.5	3	8	8	15	SOT23
BFQ135	18	150	2250	7.5	-	14[2]	8	120	SOT172
BFR134	18	150	1000	7.5	-	12[2]	10	100	SOT37
▶ BFQ270	18	270	5400	6	-	-	-	-	SOT172
▶ BFT25A	5	6.5	50	5	1.8[2]	-	1	0.5	SOT23

[1] typical values
[2] at 800 MHz

WIDEBAND TRANSISTORS – SELECTION CHART

This chart shows three generations of wideband transistor, and combined with tables on the previous pages, serves as a quick selection guide for the circuit designer. Suitable line-ups can also be derived from the chart. All values of transition frequency f_T, and collector current, I_C, are typical.

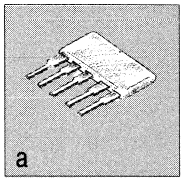


CRT DRIVER TRANSISTORS

application area	envelope				
	SOT32 (TO-126)	TO-39	SOT172	SOT128 (TO-202)	TO-92
npn cascode driver	BFQ162	BFR95 BFQ163			BFQ161
npn buffer or low-current output	BFQ232 BFQ232A	BFQ233 BFQ233A	BFQ234	BFQ235 BFQ235A	BFQ231 BFQ231A
pnp buffer	BFQ252 BFQ252A	BFQ253 BFQ253A	BFQ254	BFQ255 BFQ255A	BFQ251 BFQ251A
npn high-current output	BFQ262 BFQ262A	BFQ263 BFQ263A	BFQ268	BFQ265 BFQ265A	

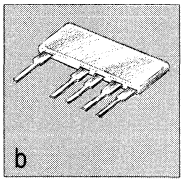
type number	$-V_{CBO}$ max (V)	$-V_{CEO}$ max (V)	I_C max (mA)	h_{FE} min	C_{CB} max (pF)	T_j (°C)	f_T min (MHz)	envelope
BFQ162	20	10	500	25	4.2	175	1000	SOT32
BFQ232	100	65	300	20	2.0	175	1000	SOT32
BFQ232A	115	95	300	20	2.0	175	800	SOT32
BFQ252	100	65	300	20	2.5	175	1000	SOT32
BFQ252A	115	95	300	20	2.5	175	800	SOT32
BFQ262	100	65	400	15	2.0	175	1000	SOT32
BFQ262A	115	95	400	15	2.0	175	800	SOT32
BFQ163	20	10	500	25	4.5	200	1000	TO-39
BFQ233	100	65	300	20	2.0	200	1000	TO-39
BFQ233A	115	95	300	20	2.0	200	800	TO-39
BFQ253	100	65	300	20	2.5	200	1000	TO-39
BFQ253A	115	95	300	20	2.5	200	800	TO-39
BFQ263	100	65	400	15	2.0	200	1000	TO-39
BFQ263A	115	95	400	15	2.0	200	800	TO-39
BFR95	30	25	150	30	2.0	200	3000	TO-39
BFQ234	100	65	300	20	2.0	200	1000	SOT172A1
BFQ254	100	65	300	20	2.5	200	1000	SOT172A1
BFQ268	100	65	400	15	2.0	200	1000	SOT172A1
BFQ235	100	65	300	20	2.0	175	800	SOT128
BFQ235A	115	95	300	20	2.0	175	800	SOT128
BFQ255	100	65	300	20	2.0	175	800	SOT128
BFQ255A	115	95	300	20	2.0	175	800	SOT128
BFQ265	100	65	400	15	2.5	175	800	SOT128
BFQ265A	115	95	400	15	2.5	175	800	SOT128
BFQ161	20	10	500	25	4	175	1000	TO-92
BFQ231	100	65	300	20	1.7	175	1000	TO-92
BFQ231A	115	95	300	20	1.7	175	800	TO-92
BFQ251	100	65	300	20	1.7	175	1000	TO-92
BFQ251A	115	95	300	20	1.7	175	800	TO-92

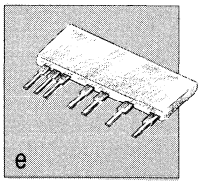
HYBRID WIDEBAND AMPLIFIERS

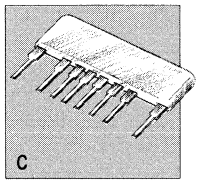


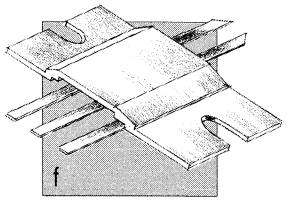
We offer a complete range of two-stage and three-stage thin-film hybrid amplifier modules for masthead boosters in antenna systems, preamplifiers and trunk amplifiers in MATV systems, and UHF/VHF instrumentation amplifiers. Principal features of these modules include:

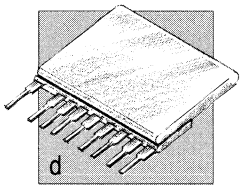
- flat frequency response from 40 to 860 MHz - usable from 10 MHz to 1.2 GHz
- gains from 12 to 28 dB
- 75 Ω input and output impedance - unconditionally stable under any source/load mismatch

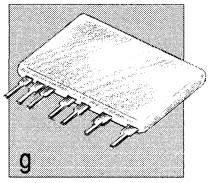


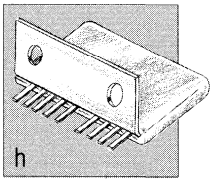












HYBRID WIDEBAND AMPLIFIERS *continued*

GENERAL-PURPOSE HYBRID AMPLIFIERS

type number	supply current (mA)	stages	gain (dB)	noise figure (dB)	output at 1 dB gain comp (dBm)	3rd-order intercept point (dBm)	V_o rms[1] (dBμV)	V_{out} d_{im}=-60 dB (DIN 45004) (dBμV)	max VSWR[2] input	max VSWR[2] output	package outline[4]
12 V supply – "low noise" – CECC											
OM2045	11.5	1	12	3.6	+5.4	+17.2	99	76	2.0	1.4	Fig.a
OM2050	18	2	18	5.2	+6.7	+18.2	100	81	1.5	1.9	Fig.b
OM2060	56	3	23	5.4	+13.4	+25.2	107	87	1.4	1.6	Fig.c
OM2061	51	3	28	4.4	+13.4	+25.2	107	86	1.5	1.7	Fig.c
▶ OM2063	52	3	29	3.6		+23.2	105	85	2.3	1.4	Fig.c
▶ OM2064	52	3	28	4.0		+23.2	105		1.3	1.5	Fig.c
OM2070	100	3	28	4.8	+20.8	+30.2	112	95	2.3	1.9	Fig.d
12 V supply – "high level"											
▶ OM2046	61	1	10	8.4		+32.2	114		1.5	1.5	Fig.a[5] [6]
▶ OM2070B	100	3	30	4.8		+30.2	112	95	2.3	1.9	Fig.d
▶ OM2080	180	3	27	7.0		+36.2	118	110	1.5	1.5	Fig.d[5] [6]
12 V supply – CECC											
OM345	11.5	1	12	5.5	+5.4	+15.2	97	75	2.0	1.4	Fig.a
OM350	18	2	18	6.0	+6.7	+16.2	98	81	1.5	1.9	Fig.b
OM360	56	3	23	7.0	+13.4	+23.2	105	86	1.4	1.6	Fig.c
OM361	51	3	28	6.0	+13.4	+23.2	105	85	1.5	1.7	Fig.c
OM370	100	3	28	7.0	+20.8	+29.2	111	95	2.3	1.9	Fig.d
12 V supply "satellite band" – 10 - 2000 MHz											
▶ OM926	28	2	18	6.5			101		1.7	1.7	Fig.b
▶ OM956		3	22	8.0			108		1.7	1.7	Fig.c[6]
24 V supply											
OM320	33	2	15.5	5.5			92		2.2	2.5	Fig.e
OM321	33	2	15.5	6.0			98		2.5	2.0	Fig.e
OM335	35	3	27	5.5			99		1.9	3.2	Fig.e
OM322	60	2	15	7.0			103		1.7	1.7	Fig.f
OM336	65	3	22	7.0			105		1.4	1.6	Fig.g
OM339	66	3	28	6.0			107		1.5	1.5	Fig.g
OM323[3]	100	2	15	9.0			111		1.9	2.3	Fig.h
OM337	115	3	26	9.8			113		2.3	1.8	Fig.h

[1] measured at -60 dB intermodulation distortion to DIN45004, par.6.3, 3-tone

[2] the typical maximum VSWR occurring in the frequency range 40- 860 MHz, for a sample connected to a 75 Ω line

[3] also available as A version without internal collector coil and blocking capacitor

[4] for detailed envelope specs see section 10; reference is type number

[5] for 40 - 50 MHz frequency range

[6] subject to modification

HYBRID VIDEO AMPLIFIERS

VIDEO PREAMPLIFIER (DIRECT DRIVE OF VIDEO AMPLIFIERS)

type number	supply (V)	input signal peak-peak (V)	max gain (Vo/Vi)	gain control (dB)	clamping	rise & fall times (ns)	output DC load (mA)	package outline	remarks
OM3016	12	0.7	4 (+ video)	> 40 dB (non-linear)	internal	≤ 1.8	limited by 0.47 µF output capacitor	SIL(2-10)	B & W high resolution
▶ OM3026[2]	12	0.7 (+ video)	5	> 40 dB (linear)	external DC input for feedback clamp	≤ 1.8	up to 20	SIL(1-11)	colour high resolution

VIDEO OUTPUT AMPLIFIERS

type number	supply (V)	total power dissipation (W)	voltage gain[3] (Vo/Vi)	external load resistance (Ω)	output signal[3] peak-peak (V)	rise & fall times[1] (ns)	package outline	remarks
OM925	65-100	≤ 4.5	20	400	50	≤ 4	DIL (2x4) heatsink on top	for 64 kHz line frequency monitors
▶ OM975	65-100	≤ 10	20	-	50	≤ 2.5	DIL (2x4) heatsink on top	for highest-resolution monitors
▶ OM976	80	≤ 8	18	-	40	≤ 2.6	SIL (90°) heatsink on bottom	for high-resolution monitors

LINE UPS

application	preamp stage	output stage		
B & W high resolution	OM3016	OM925	OM975	
colour high resolution	OM3026	OM925	OM975	OM976

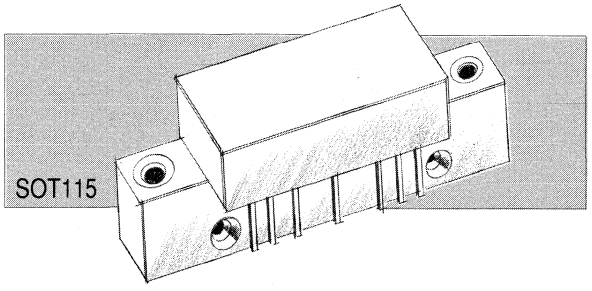
[1] with 8.5 pF load
[2] subject to modification
[3] typical value

CATV AMPLIFIER MODULES

CATV-system designers demand a lot from their hardware, particularly from the amplifier modules that must continually meet ever more stringent requirements. Requirements that our CATV amplifier modules, thanks to their advanced hybrid thin-film circuits, have always met with ease. Circuits that right from the start were acclaimed for their exceptionally low distortion and broad bandwidths. Circuits with an excellent reliability record. And circuits that, in all other respects too, were outstanding. Their low noise, excellent matching and flat response have more than met the requirements of the most demanding CATV systems. And when you add their ability to withstand high RF input voltages and supply transients, you see why our CATV amplifier modules have rapidly become regarded as a standard in CATV.

Nothing stands still, however, and our ongoing development programme has now led to even higher performance and tighter specs than ever before, culminating in our new power doublers, CATV modules containing two specially modified circuits in a standard CATV encapsulation, providing twice the output power with no increase in distortion.

Other improvements are just as significant. Increased bandwidths, closer tolerances and even higher reliability. Everything that the most advanced CATV systems could require - meeting the most demanding requirements of all major broadcasting authorities worldwide.



CATV AMPLIFIER MODULES *continued*

	power gain (dB)	(dB)	slope (cable equivalent) (dB)	flat-ness (dB)	return loss (input/ output) (dB)	output voltage (dBmV)	2nd order beat (dB)	com-posite triple beat (dB)	cross-modu-lation (dB)	noise figure (dB)	total DC current consump-tion (mA)	
40 to 300 MHz range												
	@ 50 MHz			*max*	*min*	*min* [1]	*max*	[2] *32 chs*	[2] *32 chs*	*max*	*typ*	*max*
BGY50	12.5 ± 0.4		0.2 - 0.8	± 0.2	20	61	–71[3]	–65	–60	7.0	160	180
BGY51	12.5 ± 0.4		0.2 - 0.8	± 0.2	20	63.5	–73[3]	–67	–65	8.0	200	220
BGY52	16.4 ± 0.4		0 - 1	± 0.1	20	61	–71[3]	–65	–60	6.0	160	180
BGY53	16.4 ± 0.4		0 - 1	± 0.1	20	63.5	–73[3]	–67	–65	7.0	200	220
BGY54	17.0 ± 0.4		0 - 1	± 0.1	20	61	–71[3]	–65	–60	6.0	160	180
BGY55	17.0 ± 0.4		0 - 1	± 0.1	20	63.5	–73[3]	–67	–65	7.0	200	220
BGY56	22.0 ± 0.6		0 - 1	± 0.2	20	61.5	–64[3]	–64	–59	6.0	160	180
BGY57	22.0 ± 0.6		0 - 1	± 0.2	20	64	–66[3]	–66	–62	7.0	200	220
BGY58	33.0 ± 1.0		0.5 - 1.5	± 0.3	20	64	–68[3]	–67	–65	6.0	320	340
BGY58A[5]	34.0 ± 1.0		0.5 - 1.5	± 0.3	20	64	–70[3]	–67	–65	6.0	320	340
BGY59	38.5 ± 1.0		0 - 1.5	± 0.3	18	64	–68[3]			6.0	320	340
BGY60[6]	33.5 ± 1.0		0.5 - 1.5	± 0.3	18	64	–66[3]	–67	–65	6.0	320	340
40 to 450 MHz range												
	@ 50 MHz	*@ 450 MHz*		*max*	*min* [7]	*min* [8]	*max*	*max* [10] *60 chs*	*max* [11] *60 chs*	*max*	*typ*	*max*
BGE85A	18.4 ± 1.0	-	0.3 - 1.5	± 0.2	15.5[12]	60.5	–72[9]	-	-	7.0	200	230
BGE88	34.5 ± 1.5	-	0.5 - 2.5	± 0.3	15.5[12]	60	–70[9]	-	-	6.0	290	330
BGY80	12.5 ± 0.5	12.5 - 14.0	0.2 - 1.5	± 0.2	18	61.5	–72[4]	–54	–59	7.5	180	200
BGY81	12.5 ± 0.5	12.5 - 14.0	0.2 - 1.5	± 0.2	18	64	–74[4]	–61	–62	8.0	220	240
▶ BGY82	14 ± 0.5	> 14.5	0.2 - 1.5	± 0.2	18	61.5	–72[4]	–55	–56	7.0	180	200
▶ BGY83	14 ± 0.5	> 14.5	0.2 - 1.5	± 0.2	18	64	–74[4]	–59	–59	8.0	220	240
BGY84	17.0 ± 0.5	17.3 - 18.8	0.5 - 1.5	± 0.2	18	60	–70[9]	–55	–57	6.5	180	200
BGY85	17.0 ± 0.5	17.3 - 18.8	0.5 - 1.5	± 0.2	18	62.5	–70[9]	–58	–60	7.0	220	240
BGY84A	18.4 ± 0.4	18.7 - 20.2	0.3 - 1.5	± 0.2	18	60	–72[9]	–55	–58	6.5	180	200
BGY85A	18.4 ± 0.4	18.7 - 20.2	0.3 - 1.5	± 0.2	18	62.5	–72[9]	–59	–61	7.0	220	240
BGY84H[13]	14.6 - 16.2	20.0 - 21.0	4.7 - 5.5	± 0.2[13]	18	61.5	–72[9]	–63[14]	–63[15]	7.0	220	240
BGY85H[13]	14.6 - 16.2	20.0 - 21.0	4.7 - 5.5	± 0.2[13]	18	62.5	–72[9]	–65[14]	–65[15]	7.0	220	240
BGY86	22.0 ± 0.5	21.7 - 23.5	0 - 1.5	± 0.2	18	61.5	–68[4]	–54	–51	6.0	180	200
BGY87	22.0 ± 0.5	21.7 - 23.5	0 - 1.5	± 0.2	18	64	–72[4]	–58	–55	6.5	220	240
▶ BGY87B	27.0 ± 0.8	> 27.5	0.5 - 2.5	± 0.4	18	64	–70[4]	–60	–60	6.0	320	340
BGY88	34.5 ± 1.0	35.0 - 37.0	0.5 - 2.5	± 0.3	18	62	–70[9]	–58	–59	6.0	320	340
▶ BGY89	38.0 ± 1.0	> 37	0 - 2.5	± 0.4	18	63	–70[9]	–58	–58	5.5	320	340

	power gain		slope (cable equivalent)	flatness	return loss (input/output)	output voltage	2nd order beat	composite triple beat	cross-modulation	noise figure	total DC current consumption	
	(dB)	(dB)	(dB)	(dB)	(dB)	(dBmV)	(dB)	(dB)	(dB)	(dB)	(mA)	
40 to 450 MHz range power doublers												
	@ 50 MHz	*@ 450 MHz*		*max*	*min*	*min* 8)	*max* 9)	*max* 10) *60 chs*	*max* 11) *60 chs*	*max*	*typ*	*max*
BGD102	18.5 ± 0.5	19.2 - 21.2	0.5 - 2.5	± 0.3	18	-	–73	–65	–67	7.0	415	435
BGD104	20.0 ± 0.5	20.5 - 22.5	0.5 - 2.5	± 0.3	18	-	–73	–64	–66	7.0	415	435
BGD102E	18.5 ± 0.5	19.2 - 21.2	0.5 - 2.0	± 0.3	18 7)	65	–73	–65	–67	7.0	415	435
BGD104E	20.0 ± 0.5	20.5 - 22.5	0.5 - 2.0	± 0.3	18 7)	64.5	–73	–64	–66	7.0	415	435
▶ BGD106	22.0 ± 0.5	>22.1	0 - 2.0	± 0.3	18 7)	66.5	–72	–63	–61	6.5	415	435
▶ BGD108	36.0 ± 1.0	>37.0	0.5 - 2.0	± 0.4	18 7)	67	–73	–65	–65	7.0	600	625
40 to 550 MHz range												
	@ 50 MHz	*@ 550 MHz*		*max*	*min*	*min* 16)	*max* 17)	*max* 18) *77 chs*	*max* 19) *77 chs*	*max*	*typ*	*max*
BGY580	12.5 ± 0.5	12.5 - 14.5	0.5 - 2.0	± 0.2	18 7)	59	–70	–52	–59	8.5	180	200
BGY581	12.5 ± 0.5	12.5 - 14.5	0.5 - 2.0	± 0.2	18 7)	61.5	–72	–56	–62	9.0	220	240
▶ BGY582	14.0 ± 0.5	> 14.5	0.2 - 1.5	± 0.2	18 7)	59	–70	–55	–58	7.5	180	200
▶ BGY583	14.0 ± 0.5	> 14.5	0.2 - 1.5	± 0.2	18 7)	61.5	–72	–59	–61	8.5	220	240
BGY584	17.2 ± 0.5	17.8 - 19.0	0.5 - 2.0	± 0.2	18 7)	59	–68	–55	–59	7.0	180	200
BGY585	17.2 ± 0.5	17.8 - 19.0	0.5 - 2.0	± 0.2	18 7)	61.5	–70	–59	–62	8.0	220	240
BGY584A	18.2 ± 0.5	18.8 - 20.0	0.5 - 2.0	± 0.2	18 7)	59	–70	–55	–59	7.0	180	200
BGY585A	18.2 ± 0.5	18.8 - 20.0	0.5 - 2.0	± 0.2	18 7)	61.5	–72	–59	–62	8.0	210	240
BGY586	22.0 ± 0.5	22.0 - 24.0	0.2 - 1.5	± 0.2	18 7)	58	–62	–53	–53	6.5	180	200
BGY587	22.0 ± 0.5	22.0 - 24.0	0.2 - 1.5	± 0.2	18 7)	60.5	–66	–57	–57	7.0	220	240
▶ BGY587B	27.0 ± 0.8	> 27.5	0.5 - 2.5	± 0.4	18 7)	61.5	–68	–57	–62	6.5	320	340
BGY588	34.5 ± 1.0	35.0 - 37.0	0.4 - 2.5	± 0.3	16	61	–68	–57	–59	6.5	320	340
40 to 550 MHz range power doublers												
	@ 50 MHz	*@ 550 MHz*		*max*	*min*	*min* 16)	*max* 17)	*max* 18)	*max* 19)	*max*	*typ*	*max*
BGD502	18.5 ± 0.5	18.8 - 20.8	0.2 - 2.2	± 0.3	18	64	–72	–65	–68	8.0	415	435
BGD504	20.0 ± 0.5	20.2 - 22.2	0.2 - 2.2	± 0.3	18	63.5	–70	–64	–67	8.0	415	435
▶ BGD506	22.0 ± 0.5	>22.1	0 - 2.0	± 0.3	18	62.5	–68	–62	–63	7.0	415	435
▶ BGD508	36.0 ± 1.0	>37.0	0.5 - 2.5	± 0.4	16	63	–70	–63	–65	7.5	600	625

CATV AMPLIFIER MODULES *continued*

	power gain (dB)	(dB)	slope (cable equivalent) (dB)	flatness (dB)	return loss (input/output) (dB)	output voltage (dBmV)	2nd order beat (dB)	composite triple beat (dB)	cross-modulation (dB)	noise figure (dB)	total DC current consumption (mA)	
40 to 860 MHz range												
	@ 50 MHz			*max*	*min*	*min* [22] *min* [23]	*max.* [24]			*max*	*typ*	*max*
▶ BGE885	17.0 ± 0.5		0.2 - 1.2	± 0.5	14[30]	- 59	–53	-	-	8.0	220	240
BGX885	17.0 ± 0.5		0.2 - 1.2	± 0.5	20[21]	61 60	–53	-	-	8.0	220	240
40 to 860 MHz range power doublers (VB) = +20 V)												
	@ 50 MHz				*max*	*min* [22] *min* [23]	*min* [24]			*max*		*max*
▶ BGD885[20]	17.3 ± 1		0.2 - 1.6	± 0.5	20[21]	63 62	–53	-	-	8.0	-	480[31]
470 to 860 MHz range												
	@ 50 MHz			*max*						*max*		*max*
▶ BGE887	23 ± 1		–0.5 - +0.5[32]	± 0.3	12/17[33]	60.5[23]				8.5		280
Reverse amplifiers: 5 to 200 MHz range												
	@ 10 MHz			*max*	*min*	*min* [25] *min* [26]	*max* [27]	*max* [28] *22 chs*	*max* [29] *22 chs*	*max*	*typ*	*max*
BGY61	13.0 ± 0,5		–0.2 - +0.5	± 0.2	20	67 64	–72	–68	–61	7.0	200	230
BGY65	18.5 ± 0,5		–0.2 - +0.5	± 0.2	20	67 64	–72	–68	–61	5.5	200	230
BGY67	22.0 ± 0,5		–0.2 - +0.5	± 0.2	20	67 64	–67	–67	–60	5.5	200	230
BGY67A	24.0 ± 0,5		–0.2 - +0.5	± 0.2	20	67 64	–67	–67	–59	5.5	200	230

General remarks

- Source and load impedance of all devices = 75 Ω
- Characteristics of all devices specified at T_{mb} = 30 °C
- Characteristics of all devices measured at 24 V DC supply
- For more information, please consult the relevant data sheet

Not for new designs

Notes

1) intermodulation distortion = –60 dB (DIN 45004, para. 6.3 : 3 tone)
$V_p = V_o$, f_p = 287.25 MHz, $V_q = V_o$–6dB, f_q = 294.25 MHz, V_r = Vo–6dB, f_r = 296.25 MHz;
measured at $f_{(p+q-r)}$ = 285.25 MHz

2) measured at 295.25 (ch W) V_o = 46 dBmV

3) V_o = 50 dBmV, f_p = 55.25 MHz (ch 2); V_o = 50 dBmV, f_q = 211.25 MHz (ch13); measured at $f_{(p+q)}$ = 266.5 MHz (in ch R)

4) V_o = 46 dBmV, f_p = 55.25 MHz (ch 2); V_o = 46 dBmV, f_q = 391.25 MHz (ch H13);
measured at $f_{(p+q)}$ = 446.5 MHz (in ch H22)

5) frequency range 40 to 330 MHz

6) interstage amplifier module

7) min 20 dB from 40 to 80 MHz;
min 19 dB from 80 to 160 MHz;
min 18 dB from 160 to 450 MHz (550 MHz)

8) as 1) but with f_p = 440.25 MHz, f_q = 447.25 MHz, f_r = 449.25 MHz, $f_{(p+q-r)}$ = 438.25 MHz

9) V_o = 46 dBmV, f_p = 55.25 MHz (ch 2); V_o = 46 dBmV, f_q = 391.5 MHz (ch H5);
measured at $f_{(p+q)}$ = 398.5 MHz (in ch H22)

10) measured at 445.25 MHz (ch H22)
with V_o = 46 dBmV

11) measured at 55.25 MHz (ch 2) with V_o = 46 dBmV

12) min 20 dB from 40 to 80 MHz; min 18.5 dB from 80 to 160 MHz; min 17 dB from 160 to 320 MHz;
min 15.5 dB from 320 to 450 MHz

13) high slope pre-emphasis, for details see data sheet

14) 36 channels; measured at 433.25 MHz (ch H20) with V_o = 46 dBmV

15) as 11) but with 36 channels

16) as 1) but with f_p = 540.25 MHz, f_q = 547.25 MHz, f_r = 549.25 MHz, $f_{(p+q-r)}$= 538.25 MHz

17) V_o = 44 dBmV, f_p = 55.25 MHz (ch 2); V_o = 44 dBmV, f_q = 493.25 MHz (ch 18);
measured at $f_{(p+q)}$ = 584.25 (in ch 27)

18) measured at 547.25 MHz (ch 27) with V_o = 44 dBmV

19) measured at 55.25 MHz (ch 2) with V_o = 44 dBmV

20) provisional data/advance information

21) measured at 40 MHz, max decrease 1.5 dB/octave up to 800 MHz; from 800 to 860 MHz, min return loss is 10 dB

22) as 1) but with f_p = 341.25 MHz, f_q = 348.25 MHz, f_r = 350.25 MHz, $f_{(p+q-r)}$ = 339.25 MHz

[23] as 1) but with f_p = 851.25 MHz, f_q = 858.25 MHz, f_r = 860.25 MHz, $f_{(p+q-r)}$ = 849.25 MHz

[24] V_o = 59 dBmV, f_p = 350 MHz; V_o = 59 dBmV, f_q = 400 MHz;
measured at $f_{(p+q)}$ = 750 MHz

[25] as 1) but with f_p = 35.25 MHz, f_q = 42.25 MHz, f_r = 44.25, $f_{(p+q-r)}$ = 33.25 MHz

[26] as 1) but with f_p = 187.25 MHz, f_q = 194.25 MHz, f_r = 196.25 MHz, $f_{(p+q-r)}$ = 185.25 MHz

[27] V_o = 50 dBmV, f_p = 83.25 MHz; V_o = 50 dBmV, f_q = 109.25 MHz;
measured at 192.5 MHz

[28] measured at 175.25 MHz (ch 7) with V_o = 50 dBmV

[29] measured at 55.25 MHz (ch 2) with V_o = 50 dBmV

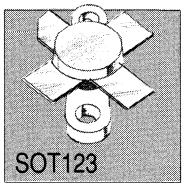
[30] Ret loss in/out: 40 - 450 MHz, > 14 dB; 450 - 860 MHz, > 10 dB

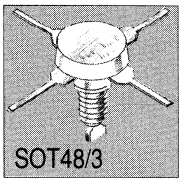
[31] V_B = 20 V

[32] Δ gain

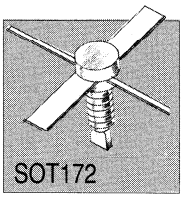
[33] Ret loss 470 - 860 MHz, S11 min 12 dB, S22 min 17 dB

RF POWER TRANSISTORS & MODULES


SOT123


SOT48/3

With more than 20 years' experience in the design, development and manufacture of RF power transistors and modules, we can offer you state-of-the-art solutions to all your RF power needs. Our range of fixed/mobile radio and transposer/transmitter transistors is just about the widest available, with frequencies from 150 kHz to 1.5 GHz, output powers from 100 mW to 300 W and in over twenty encapsulations.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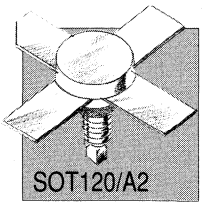
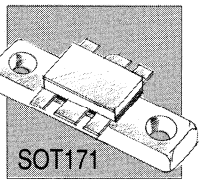

SOT120/A2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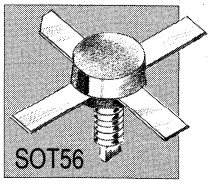
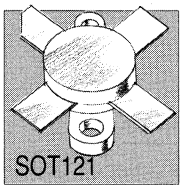
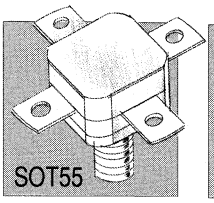

SOT56


SOT121

Foremost in our range are still our bipolar products, which offer all the advantages of an established technology: well understood operating principles, proven production methods and a life-test and performance history extending back many years.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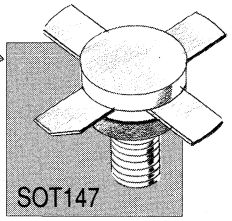
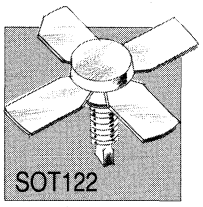
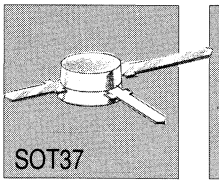

SOT147


SOT122

Interdigitated base-emitter designs, advanced manufacturing techniques and a modern effective quality-control procedure, guarantee the reliability and superior performance of these modern bipolar transistors.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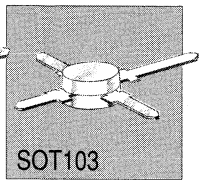
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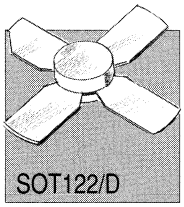
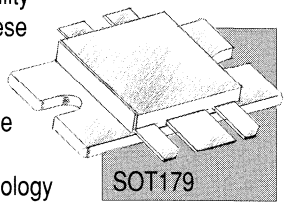
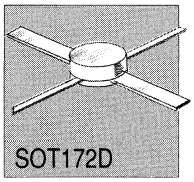

SOT122/D


SOT179

In addition, we offer an extensive range of transistors in the latest PowerMOS technology, a technology that has now established itself in the field of RF power for its reliability and the outstanding robustness of its products.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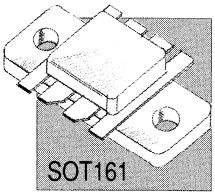
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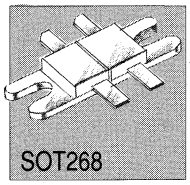
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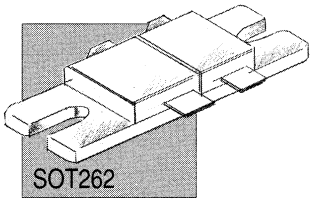
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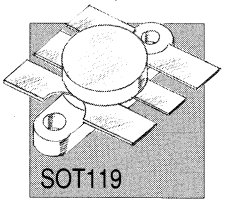
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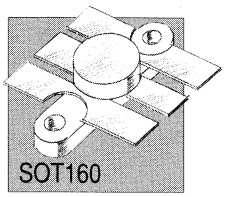
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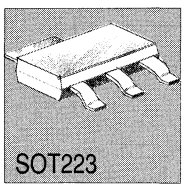
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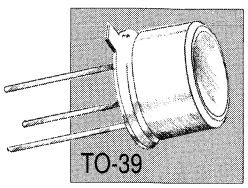
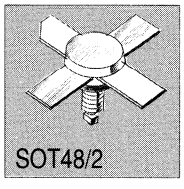
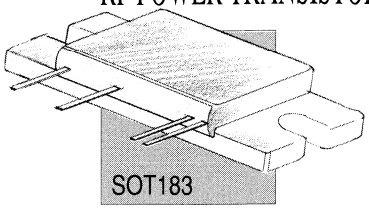
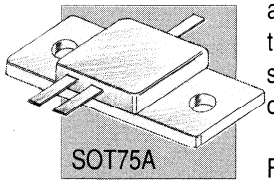
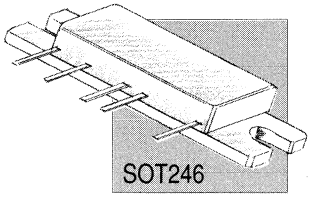

TO-39


SOT48/2

RF POWER TRANSISTORS & MODULES *continued*

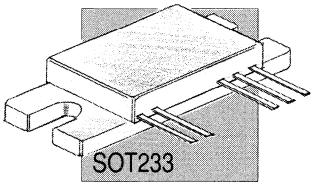


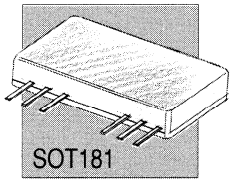


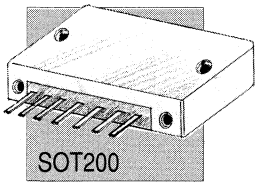


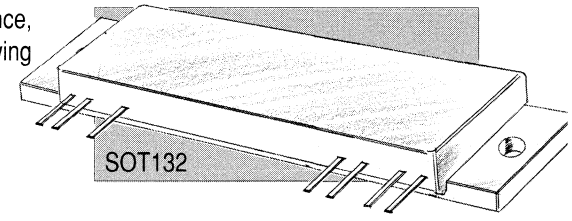
Besides discrete transistors, our range includes RF power modules intended primarily for civil and mobile communication systems. Not only do these modules save you considerable effort in amplifier design (since we've already done the designing for you), they also give better HF performance since by optimizing system layout, we can keep dimensions to a minimum.

Finally, drawing on our long experience in RF power and on the immense resources of our Application Laboratories, we can offer you a host of recommended line-ups and a wealth of applications know-how. Know-how to enable you to optimize your system to the full, and to take maximum advantage of the high-performance, hi-rel products listed in the following pages.









BIPOLAR RF TRANSMITTING TRANSISTORS

HF SINGLE SIDEBAND (1.6 - 30 MHz) BIPOLAR TRANSISTORS

- Very wide range of devices with supply voltages ranging from 12 V up to 50 V
- Class A and Class AB operation
- Wide choice of envelopes
- For more details see handbook SC08
- For recommended line-ups see page 8-15
- For HF SSB MOSFETs see page 8-11

type number	load power PEP (W)	power gain (dB)	supply voltage V_{CE} (V)	envelope
Class A intermodulation distortion: d_3, d_5 < –40 dB				
BLV10	1	18	12	SOT123
BLY87A	1	18	12	SOT48/2
BLY87C	1	18	12	SOT120
BLV20	1.3	20	26	SOT123
BLY91A	1.3	20	26	SOT48/2
BLY91C	1.3	20	26	SOT120
BLV11	2	18	12	SOT123
BLY88A	2	18	12	SOT48/2
BLY88C	2	18	12	SOT120
BLV21	2.5	20	26	SOT123
BLY92A	2.5	20	26	SOT48/2
BLY92C	2.5	20	26	SOT120
BLW87	6	18	12	SOT123
BLY89A	6	18	12	SOT56
BLY89C	6	18	12	SOT120
BLX13	8	18	26	SOT56
BLX13C	8	20	26	SOT120
BLW83	10	20	26	SOT123
BLX39	15	20	26	SOT120
BLW50F	16	19.5	45	SOT123
BLW86	17	22	26	SOT123
BLW78	35	19.5	26	SOT123
BLW96	50	19	40	SOT121

RF POWER TRANSISTORS & MODULES *continued*

SINGLE SIDEBAND (1.6 - 30 MHz) TRANSISTORS - *continued*

type number	load power PEP (W)	power gain (dB)	supply voltage V_{CE} (V)	envelope
Class AB intermodulation distortion: d_3, d_5 < –30dB				
BLV11	10	18	13.5	SOT123
BLY88A	10	18	13.5	SOT48/2
BLY88C	10	18	13.5	SOT120
BLV21	10	20	28	SOT123
BLY92A	10	20	28	SOT48/2
BLY92C	10	20	28	SOT120
BLW87	15	18	13.5	SOT123
BLY89A	15	18	13.5	SOT56
BLY89C	15	18	13.5	SOT120
BLW83	25	20	28	SOT123
BLX13	25	18	28	SOT56
BLX13C	25	20	28	SOT120
BLW85	30	19.5	12.5	SOT123
BLW60	30	19.5	12.5	SOT56
BLW60C	30	19.5	12.5	SOT120
BLX39	37.5	19	28	SOT120
BLW86	42.5	19	28	SOT123
BLX14	50	13	28	SOT55
BLW50F	65	18	50	SOT123
BLW99	80	12.5	12.5	SOT121
BLW76	80	13	28	SOT121
BLW78	100	19	28	SOT121
BLW77	130	12	28	SOT121
BLX15	150	14	50	SOT55
BLW95	160	14	50	SOT121
BLW97	175	11.5	28	SOT121
BLW96	200	13.5	50	SOT121

VHF 25 - 175 MHz BIPOLAR TRANSISTORS

- Available type range comprises devices specified at supply voltages of 7.5 V and 9.6 V (portable), 12.5 to 13.5 V (mobile) and 28 V (base stations)
- For VHF amplifier modules see page 8-13
- For VHF MOSFETs see page 8-11
- For recommended line-up see page 8-15

type number	load power @ 175 MHz (W)	power gain @ 175 MHz (dB)	supply voltage (V)	envelope
Class B 7.5 - 9.6 V supply voltage (portable mobile)				
2N4427	0.7	8	7.5	TO-39/1
BFQ42	1.5	8.4	7.5	TO-39/1
BFQ43	3	9.4	7.5	TO-39/3
BLW29	9	7.4	7.5	SOT120
Class B 12.5 - 13.5 V supply voltage (car mobile)				
2N4427	1	10	12.5	TO-39/1
BFQ42	2	11	13.5	TO-39/1
BLW79	2	13.5	12.5	SOT122
BFQ43	4	12	13.5	TO-39/3
BFQ43S	4	12	13.5	TO-39/3
BFS22A	4	8	13.5	TO-39/1
BLW80	4	25	12.5	SOT122
BLV10	8	9	13.5	SOT123
BLY87A	8	9	13.5	SOT48/2
BLY87C	8	12	13.5	SOT120
BLW81	10	13.5	12.5	SOT122
BLV11	15	8	13.5	SOT123
BLW29	15	10	13.5	SOT120
BLY88A	15	8.0	13.5	SOT48/2
BLY88C	15	8	13.5	SOT120
BLW87	25	6	13.5	SOT123
BLY89A	25	6	13.5	SOT56
BLY89C	25	6	13.5	SOT120
BLW31	28	9	13.5	SOT120
BLV30/12	30	8.2	13.5	SOT119
▶ BLW30	30	10	12.5	SOT120
▶ BLV12	30	9	12.5	SOT123
BLW60	45	5	12.5	SOT56
BLW60C	45	5	12.5	SOT120
BLW85	45	4.5	12.5	SOT123
BLV45/12	45	6.5	12.5	SOT119
BLV75/12	75	6.5	12.5	SOT119

RF POWER TRANSISTORS & MODULES *continued*

VHF 25 - 175 MHz BIPOLAR TRANSISTORS - *continued*

type number	load power @ 175 MHz (W)	power gain @ 175 MHz (dB)	supply voltage (V)	envelope
Class B 28 V base stations				
2N3866	1	10	28	TO-39/1
2N3553	2.5	10	28	TO-39/1
BFS23A	4	10	28	TO-39/1
BLV20	8	12	28	SOT123
BLY91A	8	12	28	SOT48/2
BLY91C	8	12	28	SOT120
BLV21	15	10	28	SOT123
BLY92A	15	10	28	SOT48/2
BLY92C	15	10	28	SOT120
BLW84	25	9	28	SOT123
BLY93A	25	9	28	SOT56
BLY93C	25	9	28	SOT120
BLW86	45	7.5	28	SOT123
BLX39	45	7.5	28	SOT120
BLY94	50	7	28	SOT55
BLV80/28	80	6.5	28	SOT121
BLW78[1)]	100	6	28	SOT121
BLW77[2)]	130	7.5	28	SOT121

[1)] load power and power gain measured at 150 MHz

[2)] load power and power gain measured at 87.5 MHz

UHF 400 - 512 MHz BIPOLAR TRANSISTORS

- Available type range comprises devices specified at 7.5 - 9.6 - 12.5 - 28 V supply
- For UHF modules see page 8-13
- For recommended line-up see 8-15
- For additional device data see handbook SC08

type	load power @ 470 MHz (W)	power gain @ 470 MHz (dB)	supply voltage (V)	envelope
Class B 7.5 V supply; portable modile				
▶ BLT50	1.2	10.5	7.5	SOT223
Class B 12.5 V supply; car mobile				
2N4427	0.4	10	12.5	TO-39/1
▶ BLU56	1	12	12.5	SOT223
BLX65E	2	9	12.5	TO-39/3
BLX65ES	2	6	12.5	TO-39/3
BLX65	2	6	12.5	TO-39/1
BLW79	2	9	12.5	SOT122
BLX67	2.5	8.5	12.5	SOT48/3
▶ BLU11/SL	2.5	10	12.5	SOT122D
BLW80	4	8	12.5	SOT122
BLU99	5	10.5	12.5	SOT122
BLU97	7	9	12.5	SOT122
BLX68	7	5	12.5	SOT48/3
BLW81	10	6	12.5	SOT122
▶ BLU15/12	15	7.8	12.5	SOT122
BLU20/12	20	6.5	12.5	SOT119
BLX69A	20	4	12.5	SOT48/2
BLU30/12	30	5.7	12.5	SOT119
BLU45/12	45	4.8	12.5	SOT119
BLU60/12	60	4.4	12.5	SOT119
Class B 28 V base stations				
2N3866	1	10	28	TO-39/1
BLX91A	1	11	28	SOT48/3
BLW89	2	12	28	SOT122
BLX92A	2.5	11	28	SOT48/3
BLW90	4	11	28	SOT122
BLX93A	7	8.5	28	SOT48/3
BLW91	10	9	28	SOT122
BLX94A	25	6	28	SOT48/2
BLX94C	25	6.5	28	SOT122
▶ BLU30/28	30	8	28	SOT119
▶ BLU60/28	60	7	28	SOT119
BLX95	40	6.5	28	SOT56

RF POWER TRANSISTORS & MODULES *continued*

SHF 900 MHz BIPOLAR TRANSISTORS

- Available type range comprises devices specified at 7.5, 9.6, 12.5 and 28 V supply
- For SHF modules see page 8-14
- For additional device data see handbook SC08
- For recommended line-ups see page 8-15

type number	load power @ 900 MHz (W)	power gain @ 900 MHz (dB)	supply voltage (V)	envelope
Class B 7.5 - 9.6 V supply portable mobile				
BFR90A	0.075	7.5	7.5	SOT37
BFG90A	0.075	9.5	7.5	SOT103
BFR91A	0.16	7	7.5	SOT37
BFG91A	0.16	9	7.5	SOT103
BLU98	0.5	6.8	7.5	SOT103
▶ BLT80	0.8	6	7.5	SOT223
BLV90	0.75	7	9.6	SOT172
BLV90/SL	1	7	9.6	SOT172D
BLV91	1.5	6.6	9.6	SOT172
BLV91/SL	1.5	6.6	9.6	SOT172D
BLV92	3	7.3	9.6	SOT171
BLT90/SL	0.75	7	7.5	SOT172D
BLT91/SL	1.5	7.5	7.5	SOT172D
BLT92/SL	3	7	7.5	SOT122D
BLT93/SL	6	5.5	7.5	SOT122D
Class B 12.5 V car mobile				
BLU98	0.5	8	12.5	SOT103
▶ BLU86	1	7	12.5	SOT223
BLV90	1	7.5	12.5	SOT172
BLV90/SL	1	7.5	12.5	SOT172D
BLV91	2	6.5	12.5	SOT172
BLV91/SL	2	6.5	12.5	SOT172D
BLU99	4	7	12.5	SOT122
BLU99/SL	4	7	12.5	SOT122D
BLV92	4	7.5	12.5	SOT171
BLV93	8	6.5	12.5	SOT171
BLV94	15	6	12.5	SOT171
BLV95	22	5.5	12.5	SOT171
Class B 24 V base stations				
BLV99	2	9	24	SOT172
▶ BLV100	8	8[2)]	24	SOT171
BLV98	14	8.5	24	SOT171
▶ BLV98CE	15	7.5[2)]	24	SOT171
▶ BLV97	30	7	24	SOT171
▶ BLV97CE	35	7[2)]	24	SOT171
▶ BLV101A	50	8.5[1)]	26	SOT273
▶ BLV101B	50	7.5[2)]	26	SOT273
▶ BLV102	100	7	26	SOT262

[1)] at 900 MHz
[2)] at 960 MHz

FM BROADCAST 87 - 108 MHz BIPOLAR TRANSISTORS

- For recommended line-ups see page 8-15
- For RF power MOSFETs see page 8-11 and 8-12
- For additional device data see handbook SC08

type number	load power @ 108 MHz (W)	power gain @ 108 MHz (dB)	supply voltage (V)	envelope
Class B				
2N3866	1.8	10	28	TO-39/1
BLW90	4	20	28	SOT122
BLV21	15	10	28	SOT123
BLW86[1)]	45	7.5	28	SOT123
BLX39	45	7.5	28	SOT120
BLV80/28	80	10	28	SOT121
BLW76	80	8	28	SOT121
BLW78	100	6	28	SOT121
BLV25	175	10	28	SOT119
BLV37	250	10	28	SOT179

[1)] load power and power gain measured at 175 MHz

RF POWER TRANSISTORS & MODULES *continued*

TV TRANSPOSER/TRANSMITTER TRANSISTORS

- A range of types specified in class A or AB for TV bands I, III, IV, V
- For recommended line ups see page 8-15
- For RF power MOSFETs see page 8-11 and 8-12
- For additional device details see handbook SC08

type number	output power P_o sync (W)	@ d_{im} (dB)	output power (W) P_o–1dB	power gain (dB)	supply voltage (V)	envelope
Class A Bands I (41 - 68 MHz) & III (174 - 230 MHz)						
BLV30	1.5	–60	-	18	25	SOT122
BLV31	5	–58	-	15	25	SOT122
BLV32F	10	–55	-	16	25	SOT160
BLV33F	16	–55	-	13.5	25	SOT119
BLV33	19	–55	-	9	25	SOT147
Class AB Bands I (41 - 68 MHz) & III (174 - 230 MHz)						
BLV30	-	-	10	15	28	SOT122
BLV31	-	-	20	12	28	SOT122
BLV32F	-	-	30	13	28	SOT160
BLV33F	-	-	85	10.5	28	SOT119
BLV33	-	-	90	6.5	28	SOT147
BLV36	-	-	115	11	28	SOT161
BLV38	-	-	225	9.0	35	SOT179
Class A Bands IV & V 470 - 860 MHz						
BFR96S	0.12	–60	-	10	25	SOT37
BFR96S	0.12	–60	-	10	25	SOT37
BFQ34	0.3	–60	-	11	25	SOT122
BLW32	0.5	–60	-	11	25	SOT122
BLX96	0.5	–60	-	6	25	SOT48
BFQ68	0.7	–60	-	10	25	SOT122
BLW33	1	–60	-	10	25	SOT122
BLX97	1	–60	-	5.5	25	SOT48
BLW34	1.8	–60	-	9	25	SOT122
BLW98	3.5	–60	-	6.5	25	SOT122
BLX98	3.5	–60	-	5	25	SOT48/2
BLV57	6	–60	-	8	25	SOT161
Class AB Bands IV & V 470 - 860 MHz						
BLV57	-	-	30	6.5	25	SOT161
BLV59	-	-	30	7	25	SOT171

RF POWER MOS TRANSISTORS

These are the latest transistors in our RF power range. With their immunity from second breakdown and long life they're ideal for the most demanding applications in the avionics, military and semi-military areas.

type number	P_L (W)	V_{DS} (V)	G_p (dB)	envelope
HF SSB class AB (f = 28 MHz, d3/d5 < -30dB, 28 V & 50 V supply)				
BLF145	30	28	20[1)]	SOT123
BLF175	30	50	23	SOT121
BLF246	80	28	20[1)]	SOT121
BLF147	150	28	17	SOT121
BLF177	150	50	20	SOT121
HF SSB class A (f = 1.5 - 30 MHz, d3/d5 < -40dB, 28 V & 50 V supply)				
BLF242	2	28	23[1)]	SOT123
BLF244	4	28	23[1)]	SOT123
BLF145	8	28	24	SOT123
BLF175	8	50	24	SOT123
BLF246	20	28	23[1)]	SOT121

type number	P_L (W)	V_{DS} (V)	f (MHz)	G_p (dB)	envelope
VHF base stations (f = 25 - 175 MHz, class B operation, 28 V & 50 V supply)					
▶ BLF241	3	28	175	14[1)]	SOT5/11
BLF242	5	28	175	13	SOT123
BLF244	15	28	175	13	SOT123
BLF245	30	28	175	13	SOT123
▶ BLF245B	30	28	175	14	SOT279
BLF175	30	50	108	19[1)]	SOT121
▶ BLF246B	60	28	175	14	SOT161
BLF246	80	28	108	16	SOT121
BLF147	150	28	108	13[1)]	SOT121
BLF177	150	50	108	20[1)]	SOT121
▶ BLF277	150	50	108	20[1)]	SOT119
▶ BLF248	300	28	175	15[1)]	SOT262
BLF278	300	50	108	20	SOT262
VHF mobile transmitters (f = 25 - 175 MHz, class B operation, 12.5 V supply)					
BLF221	2	12.5	175	10	TO-39/3
▶ BLF241	2	12.5	175	10	SOT5/11
BLF244	6	12.5	175	15[1)]	SOT123
BLF245	12	12.5	175	12[1)]	SOT123
▶ BLF225	30	12.5	175	8.5	SOT123

[1)] typical values

RF POWER TRANSISTORS & MODULES *continued*

RF POWER MOS TRANSISTORS-*continued*

type number	P_L (W)	V_{DS} (V)	f (MHz)	G_p (dB)	envelope
UHF base stations (f = 100 - 500 MHz, class B operation, 28 V supply)					
BLF521	2	12.5	500	10	SOT172D
BLF522	5	12.5	500	10	SOT171
BLF543	10	28	500	12	SOT171
BLF544	20	28	500	11	SOT171
▶ BLF544B	20	28	500	11	SOT268
BLF545	40	28	500	11	SOT268
▶ BLF546	80	28	500	11	SOT268
BLF548	150	28	500	9	SOT262
UHF base stations (f= 225 - 400 MHz, class B operation, 28 V supply)					
BLF242	5	28	400	13[1]	SOT123
BLF244	15	28	400	11[1]	SOT123
BLF245	30	28	400	10[1]	SOT123
UHF base stations (f= 860 - 960 MHz, class B operation, 28 V supply)					
BLF543	10	28	960	8[1]	SOT171
BLF544	20	28	960	7[1]	SOT171

type number	Po sync (W)	V_{DS} (V)	f (MHz)	G_p (dB)	d_{im} (dB)	I_D (mA)	envelope
TV transposers (band 3, f = 174 -230 MHz, class A operation, 28 V supply)							
▶ BLF346	27[3]	28	225	13[2]	-52	3000	SOT119
▶ BLF348	67[3]	28	225	11[2]	-52	2 x 4600	SOT262
TV transmitters (band 3, f = 174 - 230 MHz, class AB operation)							
BLF368	300[2]	32	225	12	-	2 x 250	SOT262
BLF378	250[2]	50	225	14	-	2 x 500	SOT262

[1] typical values
[2] at 1 dB power gain compression
[3] typical value at heatsink temperature of 70 °C

RF POWER AMPLIFIER MODULES

These are intended primarily for civil communication systems, specifically VHF/UHF mobile radio systems and UHF/SHF cellular radio, where their use significantly eases circuit design.

Principal features of these modules are their outstanding HF performance (thanks to their optimized circuit layout) and their excellent reliability.

type number	frequency band (MHz)	output power (W)	power gain (dB)	supply voltage (V)	efficiency %	envelope
VHF portable						
▶ BGY112A	68-88	7.0	38.5	7.2	40	
▶ BGY112B	132-156	7.0	38.5	7.2	40	
▶ BGY112C	146-174	7.0	38.5	7.2	40	
▶ BGY112D	174-210	7.0	38.5	7.2	40	
VHF car mobile						
BGY43	148 - 174	13	19.4	12.5	40	SOT132B
BGY32	68 - 88	18	22.6	12.5	40	SOT132B
BGY33	80 - 108	18	22.6	12.5	40	SOT132B
BGY35	132 - 156	18	20.8	12.5	40	SOT132B
BGY36	148 - 174	18	20.8	12.5	40	SOT132B
▶ BGY145A	68 - 88	29	22.9	12.5	37	SOT183
▶ BGY145B	146 - 174	28	19.7	12.5	40	SOT183
▶ BGY145C	174 - 200	27	19.5	12.5	40	SOT183
UHF portable						
BGY46A	400 - 440	1.4	15.0	9.6		SOT181
BGY46B	430 - 470	1.4	15.0	9.6		SOT181
BGY47A	400 - 470	2	16.0	7.5		SOT181
BGY47F	400 - 470	3.2	18.0	9.6		SOT181
▶ BGY113A	400 - 440	7.0	38.5	7.5	40	
▶ BGY113B	430 - 470	7.0	38.5	7.5	40	
▶ BGY113C	460 - 512	7.0	38.5	7.5	40	
UHF car mobile						
BGY49A	400 - 440	20	21.2	12.5	35	SOT132D
BGY49B	440 - 470	20	21.2	12.5	35	SOT132D

RF POWER TRANSISTORS & MODULES *continued*

RF POWER AMPLIFIER MODULES-*continued*

type number	frequency band (MHz)	output power (W)	power gain (dB)	supply voltage (V)	efficiency %	envelope
SHF portable						
BGY110A	824 - 849	1.2	30.8	6.0	40	SOT246
BGY110B	872 - 905	1.2	30.8	6.0	40	SOT246
▶ BGY110D	824 - 849	1.7	32.3	7.2	39	SOT246
▶ BGY110E	872 - 905	1.7	32.3	7.2	39	SOT246
▶ BGY110F	890 - 915	1.7	32.3	7.2	39	SOT246
BGY95A	824 - 849	2.2	20.4	7.5	35	SOT200
BGY95B	890 - 915	2.2	20.4	7.5	35	SOT200
BGY96A	824 - 849	2.5	21.0	9.6	35	SOT200
BGY96B	890 - 915	2.5	21.0	9.6	35	SOT200
SHF car mobile						
BGY91A	806 - 890	6	23.0	12.5	30	SOT233
BGY91B	870 - 950	6	23.0	12.5	30	SOT233
BGY92C	890 - 915	10	20.0	12.5	35	SOT233

RF POWER TRANSISTORS AND MODULES - RECOMMENDED LINE-UPS

The line-ups listed here are the result of our many years' experience dealing with and solving customer problems and of the ongoing activities of our Applications Laboratory. Please contact us if you're unable to find exactly what you require in the following tables.

SSB TRANSMITTERS (1.5 MHz - 30 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_L (PEP) (W)	supply voltage (V)	stud S flange F
Bipolar						
30	BLY87C[1]	2 x BLY89C		30	13	S
30	BLV10[1]	2 x BLW87		30	13	F
50	BLY88C[1]	2 x BLW60C		50	13	S
50	BLV11[1]	2 x BLW85		50	13	F
100	BLY89C[1]	4 x BLW60C		100	13	S
100	BLW87[1]	4 x BLW85		100	13	F
140	2 x BLW87[1]	2 x BLW99		150	13	F
50	BLY91C[1]	2 x BLX13C		50	28	S
50	BLV20[1]	2 x BLW83		50	28	F
150	BLW83[1]	2 x BLW76		150	28	F
250	2 x BLW83[1]	2 x BLW77		250	28	F
220	2 x BLW86[1]	2 x BLW97		300	28	F
500	2 x BLW86	4 x BLW77		450	28	F
680	2 x BLW78[1]	4 x BLW97		600	28	F
3002 x BLX13C[2]		2 x BLX15		250	50	S
3002 x BLW83[2]		2 x BLW96		350	50	F
6002 x BLX39[2]		4 x BLX15		500	50	S
6002 x BLW50F[1]		4 x BLW95		500	50	F
40BLY91C[2]		2 x BLW78[2]	8 x BLX15	1000	50	S/F
40BLV20[2]		4 x BLW50F	8 x BLW96	1200	50	F
PowerMOS						
15	BLF244[1]	2 x BLF246		150	28	
30	BLF145[1]	2 x BLF147		300	28	
60	BLF246[1]	4 x BLF147		550	28	
15	BLF244[1] [2]	2 x BLF177		300	50	
10	BLF175[1]	4 x BLF177		550	50	
20	2 x BLF175[1]	8 x BLF177		1000	50	

[1] Class A operation
[2] 28 V supply in class A operation

RF POWER TRANSISTORS & MODULES *continued*

MOBILE TRANSMITTERS (68 MHz-87.5 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_L (W)	supply voltage (V)	stud S flange F
Bipolar						
20	2N4427	BLY87C		8	13	S
20	2N4427	BLV10		8	13	F
35	2N4427	BLW29		14	13	S
10	BSX190	BLY32		18	13	F
70	BFQ42	BLW31		28	13	S
160	BFQ43	BLW60C		45	13	S
160	BFQ43	BLW85		45	13	F
190	BLV10	BLV75/12		75	13	F
PowerMOS						
15	BLF221	BLF245		12	12.5	
25	BLF221	BLF225		25	12.5	

BASE STATIONS (68 MHz - 87.5 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_L (W)	supply voltage (V)	stud S flange F
Bipolar						
65	BFS23A	BLY93C		25	28	S
65	BFS23A	BLW84		25	28	F
125	BLX92A	BLX39		50	28	S
15	2N3866	BLV21	BLW78	100	28	F
50	2N3866[2)]	BLY93C[2)]	BLX15	150	50	S
50	2N3866[2)]	BLW84[2)]	BLW95	150	50	F
PowerMOS						
30	BLF241	BLF245		30	28	
80	BLF242	BLF246		80	28	
150	BLF244	BLF147		150	28	

[1)] Class A operation

[2)] 28 V supply in class A operation

FM BROADCAST TRANSMITTERS (87.5 MHz - 108 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_L (W)	supply voltage (V)	stud S flange F
Bipolar						
100	BLW90	BLX39		50	28	S
40	2N3866	BLV21	BLW78	100	28	F
100	BLW90	BLW86	2 x BLV25	300	28	F
500	BLV21	BLW78	2 x BLV37	500	28	F
600	BLV21	BLV25	4 x BLV37	1000	28	F
PowerMOS						
240	BLF244	BLF248		300	28	
120	BLF244[2)]	BLF278		300	50	
240	BLF244[2)]	2 x BLF278		550	50	
320	BLF175	4 x BLF278		1000	50	

AM AIRCRAFT TRANSMITTERS (118 MHz - 136 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_L (W)	supply voltage (V)	stud S flange F
Bipolar						
110	BLX92A	BLY93C		6	13/28	S
240	BLY91C	BLX39		12	13/28	S
240	BLV20	BLW86		12	13/28	F
100	BLX92A	BLY93C	BLW78	25	13/28	S/F
100	BLX92A	BLW84	BLW78	25	13/28	S/F

AM AIRCRAFT TRANSMITTERS (100 MHz - 400 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_L (W)	supply voltage (V)	stud S flange F
Bipolar						
40	BLX91A	2 x BLW90	2 x BLX94C	40	28	S
120	BLX91A	2 x BLX93A	2 x BLU30/28	60	28	S/F
500	BLW90	2 x BLX94C	2 x BLU60/28	120	28	S/F
PowerMOS						
30	BLF521[4)]	BLF522[4)]	BLF545	40	28	
25	BLF521[4)]	BLF543	BLF546	80	28	
100	BLF521[4)]	BLF544	BLF548	150	28	

[2)] 28 V supply in class A operation
[4)] V_{DS} = 12.5 V

RF POWER TRANSISTORS & MODULES *continued*

PORTABLE AND MOBILE TRANSMITTERS (132 MHz - 174 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_L (W)	supply voltage (V)	stud S flange F
Bipolar						
40	2N4427	BFQ43		2	7.5	-
100	2N4427	BLY87C		8	13	S
100	2N4427	BLV10		8	13	F
125	BFQ42	BLW29		14	13	S
150	BGY36			18	13	F
200	BFQ43	BLW30		30	12.5	S
200	BFQ43	BLV12		30	12.5	F
250	BFQ43	BLW31		28	13	S
100	2N4427	BLW29	BLV45/12	45	13	S/F
115	BGY43	BLV45/12		45	13	F
120	BFQ42	BLW29	BLV75/12	75	13	S/F
PowerMOS						
100	BLF221	BLF245		12	12.5	
150	BLF522	BLF225		25	12.5	

BASE STATIONS (132 MHz - 174 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_L (W)	supply voltage (V)	stud S flange F
Bipolar						
200	BLY91C	BLY93C		25	28	S
200	BLV20	BLW84		25	28	F
25	2N3866	BLY91C	BLX39	50	28	S
25	2N3866	BLV20	BLW86	50	28	F
200	BFS23A	BLY93C	2 x BLX39	100	28	S
200	BFS23A	BLW84	2 x BLW86	100	28	F
PowerMOS						
120	BLF241	BLF245		30	28	
220	BLF242	BLF246		80	28	
70	BLF241	BLF245		150	28	

TV TRANSPOSERS (BAND III: 174 MHz - 230 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	4th stage	P_0 sync (W)	P_0 sat (V)	supply voltage (V)
Bipolar							
6	BGY55	2 x BLV31			10	10	25
7	BLV30	2 x BLV32F			20	20	25
3	BGY55	2 x BLV31	2 x BLV33		30	40	25
6	BLV30	2 x BLV33F	4 x BLV33		60	75	25
2	BGY55	2 x BLV31	4 x BLV33	8 x BLV33	100	140	25
PowerMOS							
5	BLF242[3]	2 x BLF244[3]	BLF348		40	60	28
12	BLF244[3]	2 x BLF245[3]	2 x BLF348		75	115	28
20	BLF244[3]	2 x BLF346	4 x BLF348		140	220	28

TV TRANSMITTERS (BAND III: 174 MHz - 230 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_0 sync (W)	supply voltage (V)
Bipolar					
8	BGY55	2 x BLV31	2 x BLV33F	130	28
10	BLV30	2 x BLV32F	2 x BLV38	225	25/28/35
35	BLV30	2 x BLV33F	4 x BLV38	420	25/28/35
75	2 x BLV30	4 x BLV33F	8 x BLV38	800	25/28/35
PowerMOS					
50	BLF242[3]	2 x BLF244[3]	BLF368	300	32
100	BLF242[3]	2 x BLF245[3]	2 x BLF368	550	32
160	BLF242[3]	2 x BLF346	2 x BLF368	1000	32
50	BLF242[2] [3]	2 x BLF175[3]	6 x BLF378	1250	50

[2] 28 V supply in class A operation

[3] Recommended types based on typical behaviour. Bipolar alternatives are BLV30, BLV31, BLV32F

RF POWER TRANSISTORS & MODULES *continued*

PORTABLE AND MOBILE TRANSMITTERS (400 MHz - 512 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_L (W)	supply voltage (V)	stud S flange F
Bipolar						
15	BFR96	BLW79	BLW80	2	7.5	S
45	BLV90	BLU99		3	7.5	S
15	BFR96S	BLU99	BLW81	10	13	S
250	BLU99	BLU15/12		15	12.5	S
400	BLU99	BLU20/12		20		S/F
280	BLU99	BLU20/12	BLU45/12	45	13	S/F
400	BLU99	BLU20/12	BLU60/12	60	13	S/F

BASE STATIONS (400 MHz - 470 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_L (W)	supply voltage (V)	stud S flange F
Bipolar						
40	BLX91A	BLW91	BLX94C	30	28	S
220	BLW90	BLX94C	BLU60/28	60	28	S/F
60	BLX91A	BLX93A	BLU30/28	30	28	S/F
PowerMOS						
35	BLF521[4]	BLF522[4]	BLF545	40	28	
40	BLF521[4]	BLF543	BLF546	80	28	
150	BLF521[4]	BLF544	BLF548	150	28	

TV TRANSPOSERS (BAND IV/V: 470 MHz - 860 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	4th stage	P_0 sync (W)	P_0 sat (V)	supply voltage (V)
Bipolar							
5	BFQ34	BFQ68	2 x BFQ68		1.4	1.4	15
6	BLW32	BLW33	2 x BLW34		4.4	5.7	25
2	BLW32	BLW33	2 x BLW34	2 x BLW98	8	8	25
3	BLW32	BLW33	2 x BLW34	2 x BLV57	13	15	25
10	BFQ68	2 x BLW34	2 x BLW98	4 x BLV57	23	30	25
14	BFQ68	2 x BLW34	2 x BLV57	8 x BLV57	38	60	25

[4] V_{DS} = 12.5 V

TV TRANSMITTERS (BAND IV/V: 470 MHz - 860 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	4th stage	P_0 sync (W)	supply voltage (V)
Bipolar						
12	BFR96S	BFQ68	2 x BLW34	2 x BLV59	60	28
30	BFQ34	2 x BLW33	2 x BLV57	4 x BLV59	120	28
80	BFQ68	2 x BLW34	4 x BLV57	8 x BLV59	240	28

MOBILE TRANSMITTERS (860 MHz - 960 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	4th stage	P_L (W)	supply voltage (V)	stud S flange F
Bipolar							
60	BLV98	BLV91	BLV93		8	13	S/F
100	BLV90	BLV92	BLV94		15	13	S/F
50	BLV98	BLV91	BLV93	BLV95	22	13	S/F

BASE STATIONS (860 MHz - 960 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_L (W)	supply voltage (V)	stud S flange F
Bipolar						
240	BLV99	BLV98CE	BLV101A/B	50	24	S/F
600	BLV100	BLV97CE	2 x BLV101A/B	100	24	F

PORTABLE TRANSMITTERS (860 - 960 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_L (W)	supply voltage (V)	stud S flange F
Bipolar						
5	BFG90A	BFG96	BLT91/32	1.5	7.5	-
15	BFG91A	BLT90/32	BLT92/32	3	7.5	-

RF POWER TRANSISTORS & MODULES *continued*

AM AIRCRAFT TRANSMITTERS (108 MHz - 144 MHz)

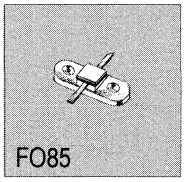
input power (mW)	1st stage	2nd stage	P_L (W)	supply voltage (V)
PowerMOS				
100	BLF242	BLF246	20	28
80	BLF244	BLF147	35	28
120	BLF242[2]	BLF278	75	50

MILITARY COMMUNICATION TRANSMITTERS (25 MHz - 110 MHz)

input power (mW)	1st stage	2nd stage	3rd stage	P_L (W)	supply voltage (V)
PowerMOS					
150	BLF242	2 x BLF244	-	12	12.5
500	BLF244[1]	2 x BLF245	-	60	28
100	BLF242[1]	BLF245[1]	2 x BLF246	150	28

[1] Class A operation
[2] 28 V supply in class A operation

MICROWAVE TRANSISTORS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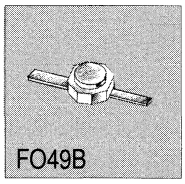
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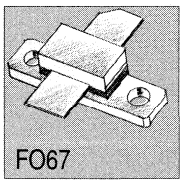
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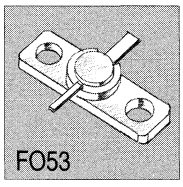
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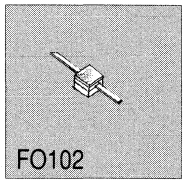
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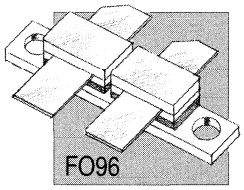
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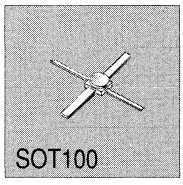
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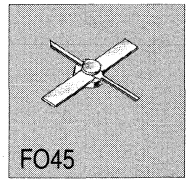
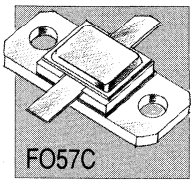

FO45

Drawing on our long experience of broadband systems, particularly in the aerospace and military fields, and of the stringent requirements that such systems must satisfy, we can offer an extensive range of professional-standard microwave transistors for applications up to 5 GHz. Applications such as CW communication links, point-to-point communication and pulsed-power radar. As a leading innovator in these areas, we've been in on the ground floor of many of the most significant developments of the past, the most recent being the move of radar systems to solid-state. Anticipating this move, we initiated a major development programme and can now offer a complete range of solid-state microwave products for this application.

Moreover, as well as our standard product range, we can offer a fast, flexible service in customized products. Based on cascaded products from our standard range with specially developed input and output circuitry, these customized products offer the twin benefits of optimized performance and an established reliability record. And like our standard products, they can be delivered to the most stringent aerospace and military requirements.

Finally, we can also supply naked chips for hybrid-circuit designers.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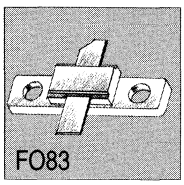
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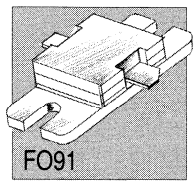
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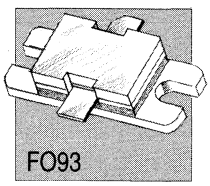
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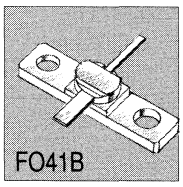
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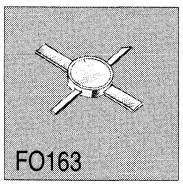
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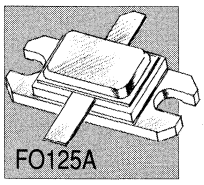
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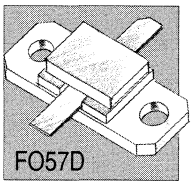
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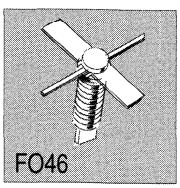

FO46

MICROWAVE TRANSISTORS *continued*

CONTINUOUS POWER TYPES

CLASS-A MEDIUM POWER

type number	f (GHz)	V_{CE} (V)	I_C (mA)	P_{L1} [2] (mW)	G_{po} [3] (dB)	envelope
▶ LEE1015T	1	20	200	1500[1]	14[1]	SOT122
▶ LTE1015T	1	20	200	1500[1]	14[1]	FO41B
LBE2003S	2	18	30	200	10	FO45
LCE2003S	2	18	30	200	10	FO46
LUE2003S	2	18	30	200	10	FO163
LBE2009S	2	18	110	700	9	FO45
LCE2009S	2	18	110	700	9	FO46
LUE2009S	2	18	110	700	9	FO163
LTE21009R	2.1	16	150	1000[1]	8.5[1]	FO41B
LTE21015R	2.1	16	250	1500	8.5	FO41B
LTE21025R	2.1	16	400	2800[1]	7.8[1]	FO41B
LWE2015R	2.3	16	250	1200	7.5	FO93
LWE2025R	2.3	16	400	2000	7	FO93
LAE4001R	4	15	25	85	8.5	SOT100
LAE4002S	4	18	30	126	7.5	SOT100
LTE4002S	4	18	30	200[1]	8[1]	FO41B
LTE42005S	4.2	18	110	450	6.6	FO41B
LTE42008R	4.2	16	250	800	7	FO41B
LTE42012R	4.2	16	400	1000	6	FO41B

CLASS-A HIGH POWER (WIDEBAND)

type number	f (GHz)	V_{CE} (V)	I_C (A)	P_{L1} [2] (mW)	G_{po} [3] (dB)	envelope
LZ1418E100R	1.4 to 1.8	16	2	9	10	FO57C
LZE18100R	1.8	16	2	10[1]	11[1]	FO57C
LV1721E50R	1.7 to 2.1	16	1.1	5	7	FO83
LV2024E45R	2.0 to 2.4	16	1.1	4	6	FO83
LVE21050R	2.1	16	1.1	5.5[1]	8[1]	FO83
LV2327E40R	2.3 to 2.7	16	1	4	7	FO83
LV2931E50R	2.9 to 3.1	16	1	4.5	6	FO83B

[1] typical values
[2] load power for 1 dB compressed power gain
[3] low-level power gain associated with PL1

TRANSISTOR CHIPS[4]

type number	f (GHz)	V_{CE} (V)	I_C (A)	P_{L1} [1)2)] (mW)	G_{po} [1)3)] (dB)	dimensions (mm)
OP186	4	18	30	250	11	0.37 x 0.37
OP213	4	15	25	110	9.5	0.32 x 0.32
OP214	4.2	16	125	470	7.5	0.37 x 0.47
OP221	2	18	110	900	9.8	0.37 x 0.37
OP222	2	16	1100	5000	8	0.65 x 2.6
OP238	3	18	330	1700	6.5	0.47 x 0.47
▶ OP255	2	8	5	F=2 dB	10	0.32 x 0.32

CLASS-C MEDIUM POWER

type number	f (GHz)	V_{CC} (V)	P_L (W)	G_p (dB)	n_C (%)	envelope
PTB23001X	2	24	1	7	45	FO41B
PTB23003X	2	24	3	8.75	45	FO41B
PTB23005X	2	24	5	9.2	50	FO41B
PTB32001X	3	24	1.3	8	35	FO41B
PTB32003X	3	24	2.5	8	35	FO41B
PTB32005X	3	24	4.5	8	35	FO41B
PTB42001X	4.2	24	0.8	5	28	FO41B
PTB42002X	4.2	24	1.6	5	28	FO41B
PTB42003X	4.2	24	2.5	5	28	FO41B
PVB42004X	1	24	13[1)]	11[1)]	60[1)]	FO83
	2	24	10[1)]	10[1)]	48[1)]	
	3	24	7.5[1)]	8.8[1)]	30[1)]	
	4	24	4[1)]	6[1)]	25[1)]	

[1)] typical values
[2)] load power for 1 dB compressed power gain
[3)] low-level power gain associated with PL1
[4)] thickness: 180 mm back metallization: gold (collector) top metallization: gold (emitter, base)
packaging: anti-static waffle-type carrier

MICROWAVE TRANSISTORS *continued*

CLASS-C HIGH POWER

type number	f (GHz)	V_{CC} (V)	P_L (W)	G_p (dB)	n_C (%)	envelope
PZ1418B15U	1.4 to 1.8	28	12.5	7	38	FO57C
PZ1418B30U	1.4 to 1.8	28	27	7.3	38	FO57C
PZB16035U	1.6	28	35	8	45	FO57C
▶ PXB16050U	1.6	28	45	8.5	45	FO91
PZ1721B12U	1.7 to 2.1	28	12	6.8	35	FO57C
PZ1721B25U	1.7 to 2.1	28	25	7	35	FO57C
PZ2024B10U	2.0 to 2.4	28	9	5.6	35	FO57C
PZ2024B20U	2.0 to 2.4	28	20	6	35	FO57C
PZ2327B15U	2.3 to 2.7	28	15	7	40	FO57D

OSCILLATOR POWER TRANSISTORS

type number	f (GHz)	V_{CC} (V)	IC (mA)	PL (mW)	envelope
PPC5001T	5	20	200	450[1)]	FO102
PQC5001T	5	20	200	450[1)]	FO85

[1)] typical values

PULSED POWER TYPES

RADAR PULSED POWER TRANSISTORS

type number	f (GHz)	V_{CC} (V)	t_{on} (µs)	δ (%)	P_L (W)	G_p dB	n_c (%)	envelope
L-band								
RZ1214B35Y	1.2 to 1.4	50	150	5	35	7	30	FO57C
	1.2 to 1.4	50	300	10	40[1]	7[1]	35[1]	
RZ1214B65Y	1.2 to 1.4	50	150	5	70	7	35	FO57C
	1.2 to 1.4	50	300	10	80[1]	7[1]	30[1]	
▶ RX1214B130Y	1.2 to 1.4	50	150	5	130[1]	7[1]	40[1]	FO91
▶ RX1214B170Y	1.2 to 1.4	50	150	5	190[1]	6.7[1]	42[1]	FO91
RX1214B150W	1.2 to 1.4	50	1000	10	135	6.5	35	FO91
	1.2 to 1.4	50	150	5	220[1]	8[1]	45[1]	
RX1214B300Y	1.2 to 1.4	50	150	5	250	7	35	FO91
	1.2 to 1.4	50	300	10	300[1]	7.5[1]	35[1]	
S-band								
▶ RZ2731B16W	2.7 to 3.1	40	100	10	15	6	32	FO57D
▶ RZ2731B32W	2.7 to 3.1	40	100	10	30	6	32	FO57D
▶ RZ2731B48W	2.7 to 3.1	40	100	10	45	6	32	FO57D
RZ2731B60W	2.7 to 3.1	40	100	10	60	6	35	FO57D
RX2731B90W	2.7 to 3.1	40	100	10	90	6	35	FO125A
RV3135B5X	3.1 to 3.5	24	100	10	4	4.3	30	FO83
▶ RZ3135B14W	3.1 to 3.5	40	100	10	13	5.5	30	FO57D
▶ RZ3135B28W	3.1 to 3.5	40	100	10	27	5.5	30	FO57D
▶ RZ3135B42W	3.1 to 3.5	40	100	10	40	5.5	30	FO57D
RZ3135B50W	3.1 to 3.5	40	100	10	50	5.2	30	FO57D
RX3034B70W	3.0 to 3.4	40	100	10	70	5.4	30	FO125A

[1] typical values

MICROWAVE TRANSISTORS *continued*

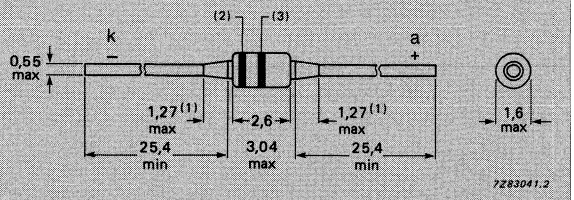
AVIONICS PULSED POWER TRANSISTORS

type number	f (GHz)	V_{CC} (V)	t_{on} (µs)	δ (%)	P_L (W)	G_p (dB)	η_c (%)	envelope
MRB11175Y	1.09	50	10	1	175	7.5	35	FO67
MRB11350Y	1.09	50	10	1	350	7	30	FO67
MSB11900Y	1.09	50	10	1	800	7	30	FO96
RZB12050Y	1.09	50	100	10	35	7	30	FO57C
RZB12100Y	1.09	50	100	10	80	7	30	FO57C
RZB12250Y	1.09	50	100	10	200	7	30	FO57C
RXB12350Y	1.09	50	100	10	300	7	30	FO91
▶ MZ0912B50Y	0.96 to 1.215	50	10	10	50	7	42	FO57C
▶ MZ0912B100Y	0.96 to 1.215	50	10	10	100	7	42	FO57C
	1.03 to 1.09	50	300[1]	10	125[2]	8[2]	50[2]	
▶ MX0912B250Y	0.96 to 1.215	50	10	10	235	7	42	FO91
	1.03 to 1.09	50	300[1]	10	280[2]	8[2]	48[2]	
▶ MX0912B350Y	0.96 to 1.215	50	10	10	325	7	40	FO91
	1.03 to 1.09	50	300[1]	10	350[2]	8[2]	48[2]	

[1] pulse burst; 1 µs on, 1 µs off.
[2] typical values

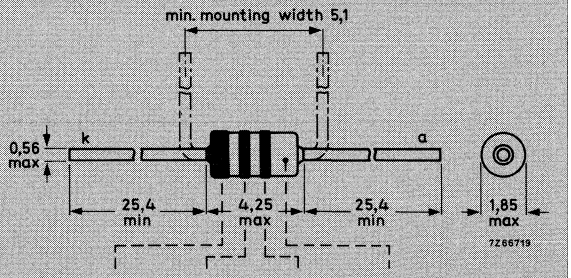
ENVELOPE SPECIFICATIONS

DO-34

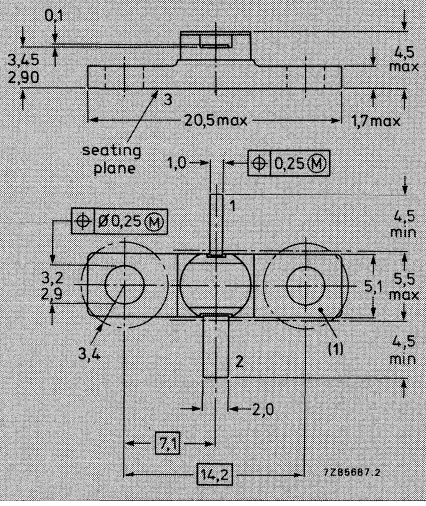


(1) Lead diameter in this zone uncontrolled

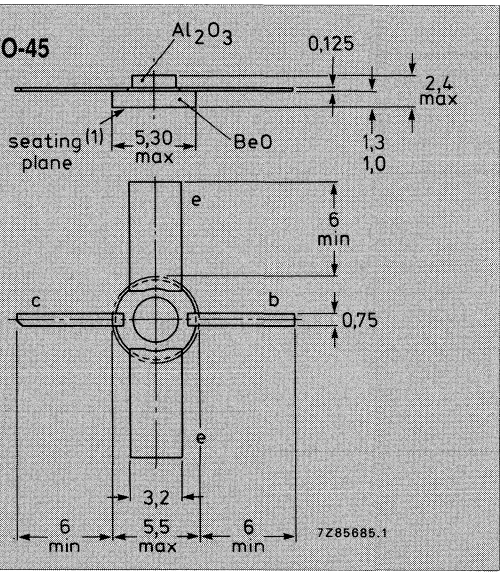
DO-35



FO-41B



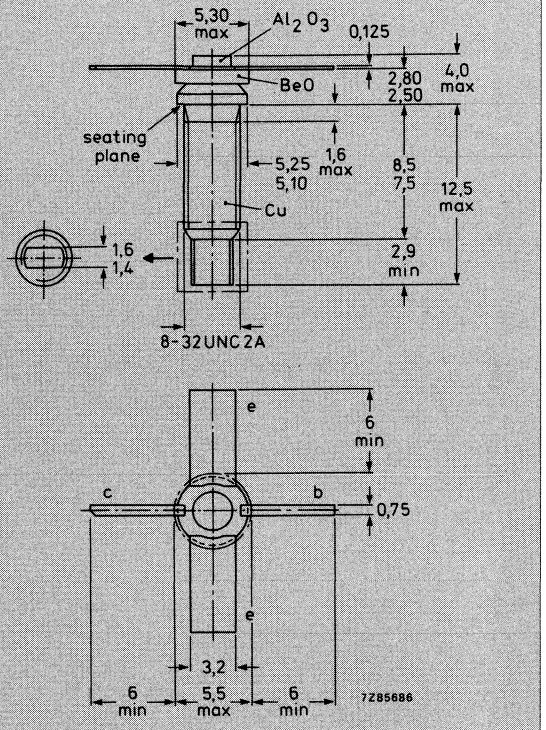
FO-45



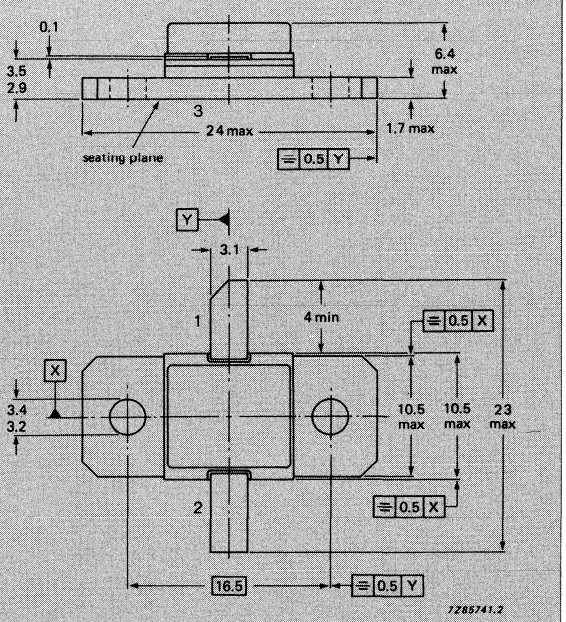
(dimensions in mm)

ENVELOPE SPECIFICATIONS *continued*

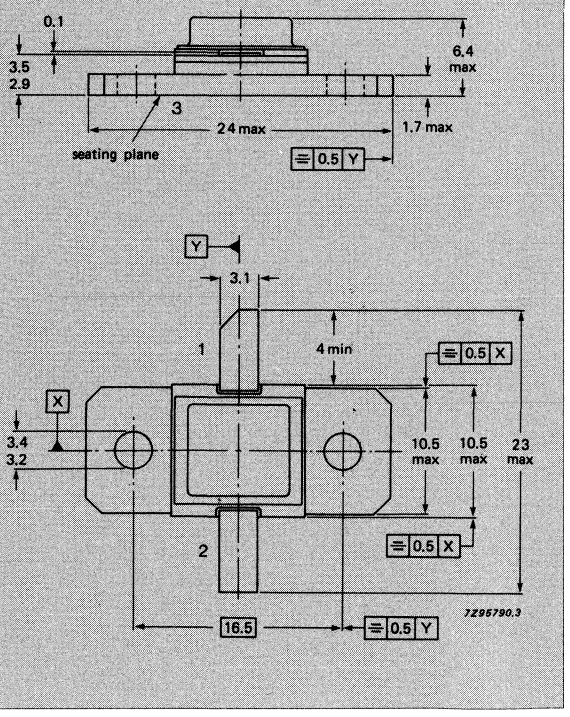
FO-46



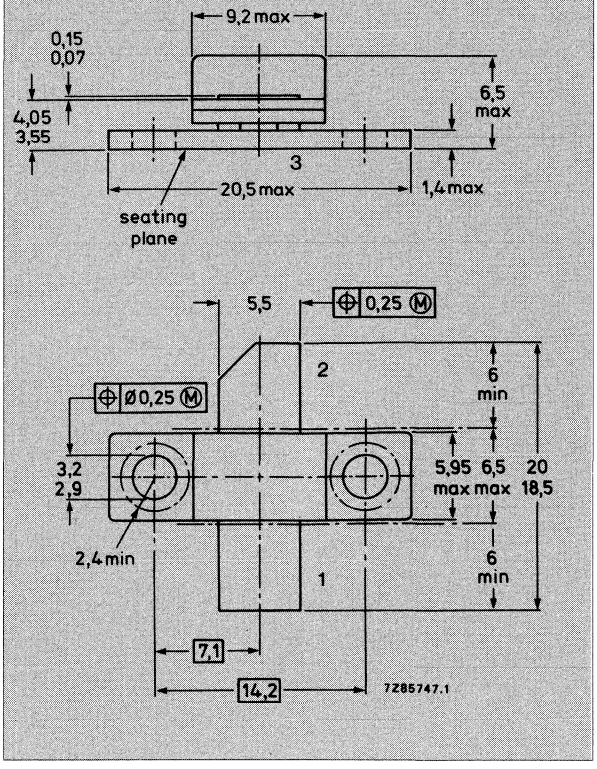
FO-57C



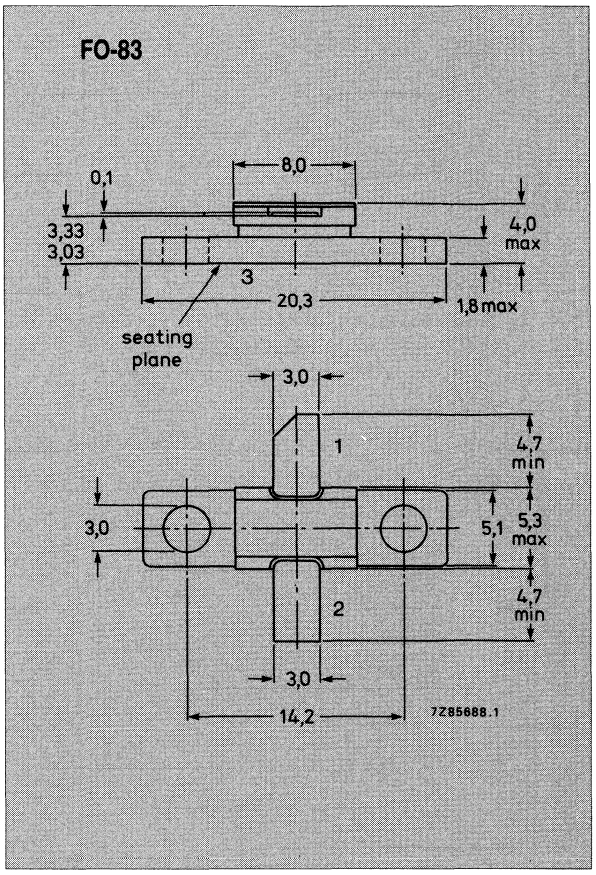
FO-57D



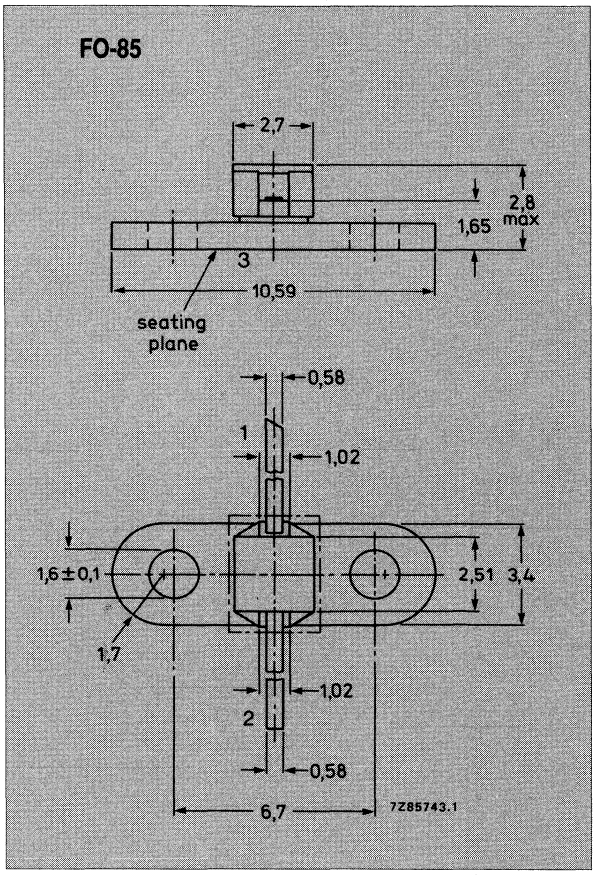
FO-67



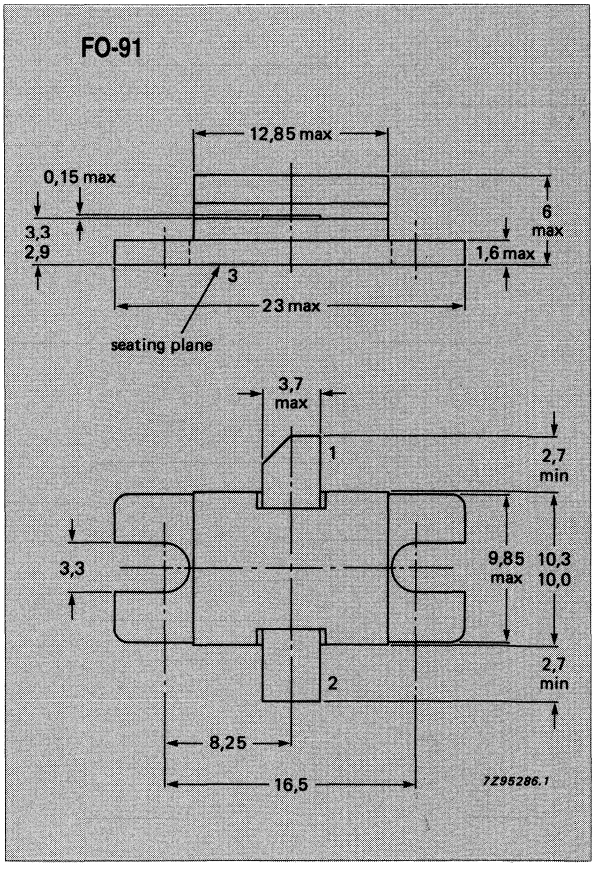
FO-83



FO-85



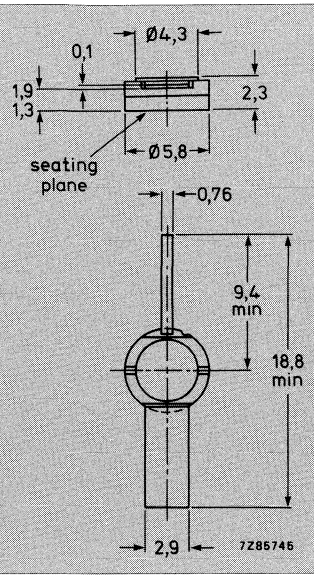
FO-91



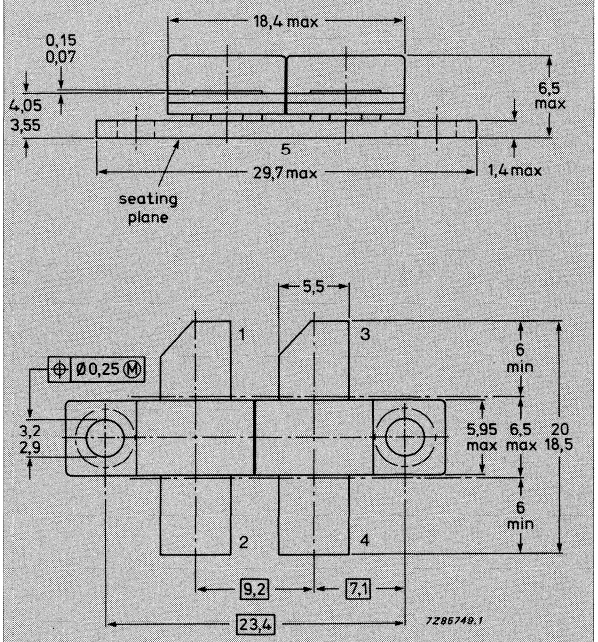
(dimensions in mm)

ENVELOPE SPECIFICATIONS *continued*

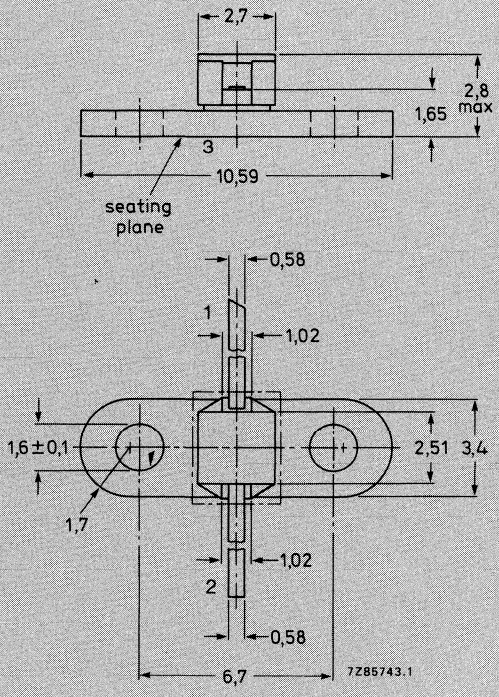
FO-93



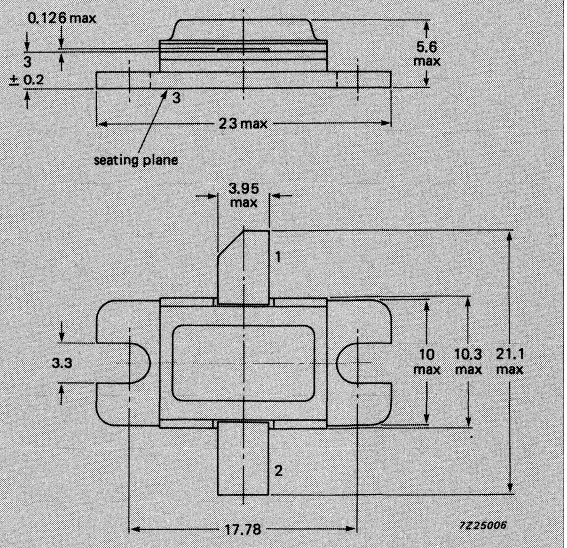
FO-96



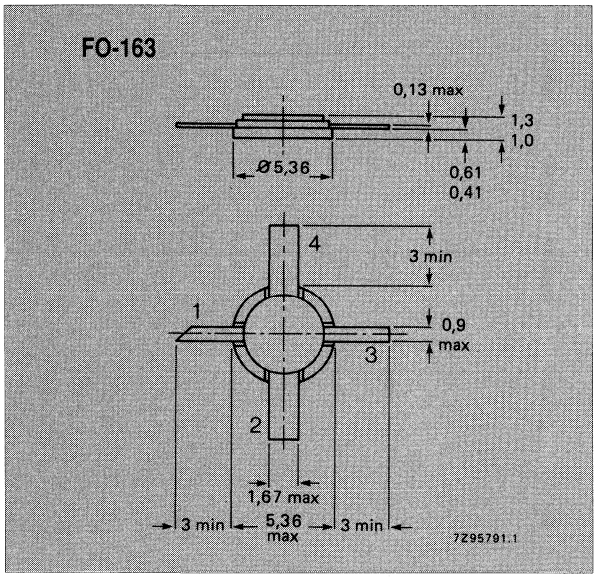
FO-102



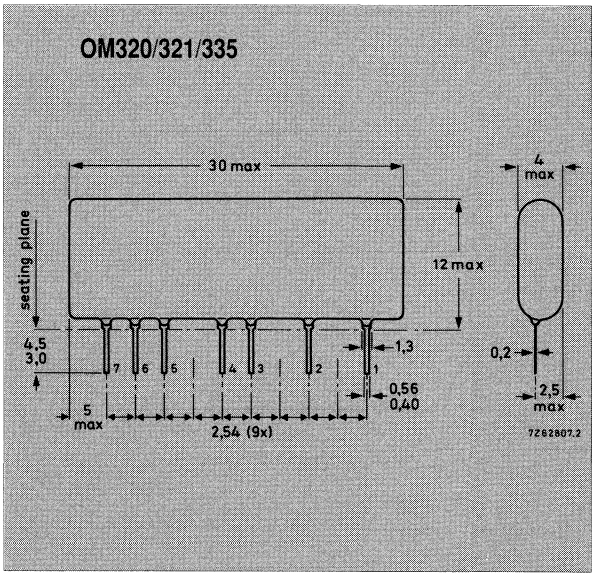
FO-125



FO-163



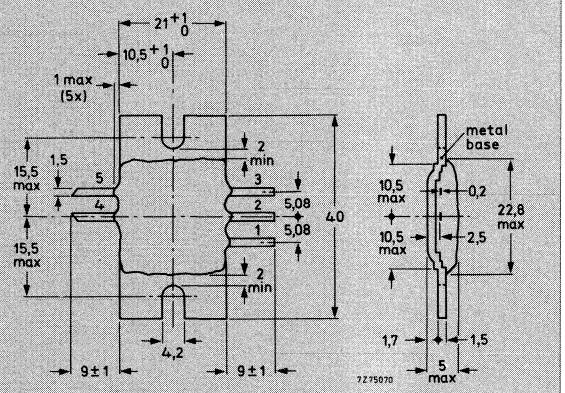
OM320/321/335



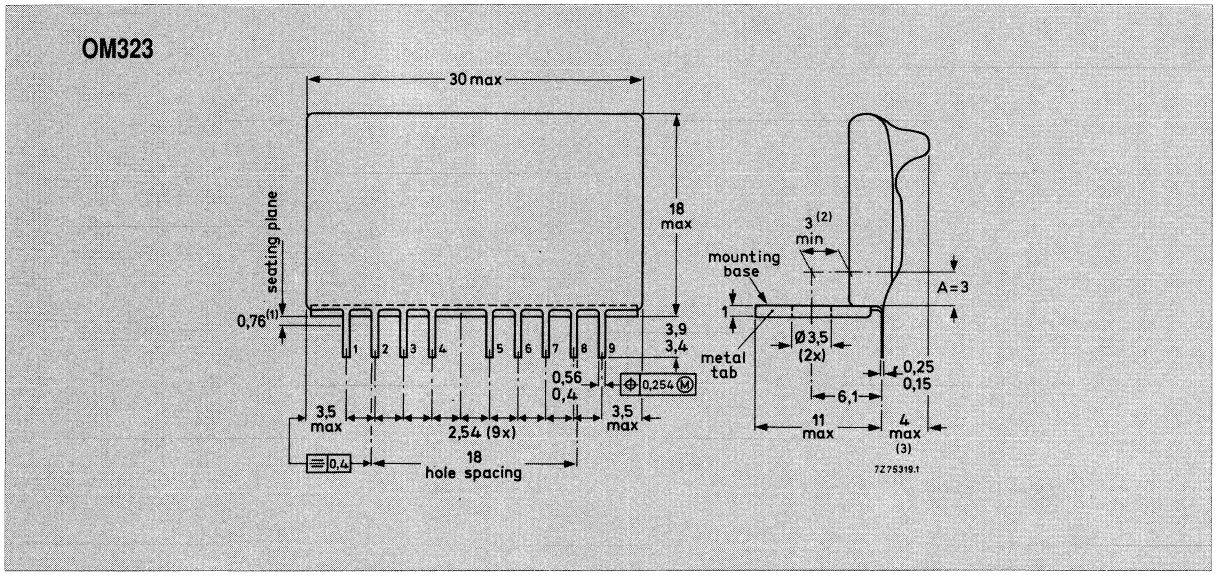
(dimensions in mm)

ENVELOPE SPECIFICATIONS *continued*

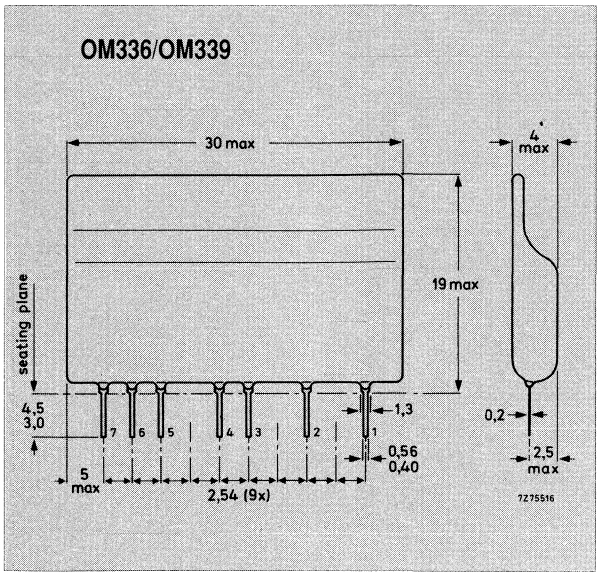
OM322



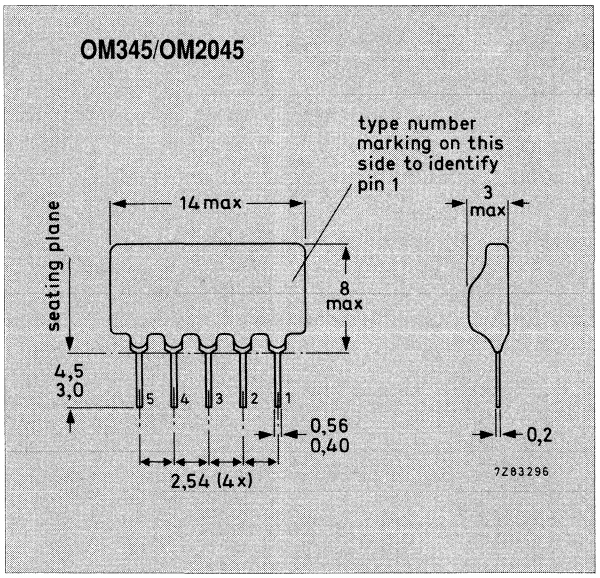
OM323



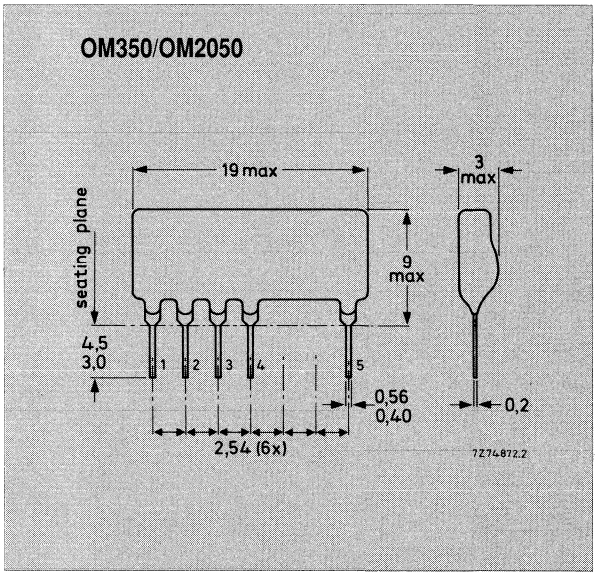
OM336/OM339



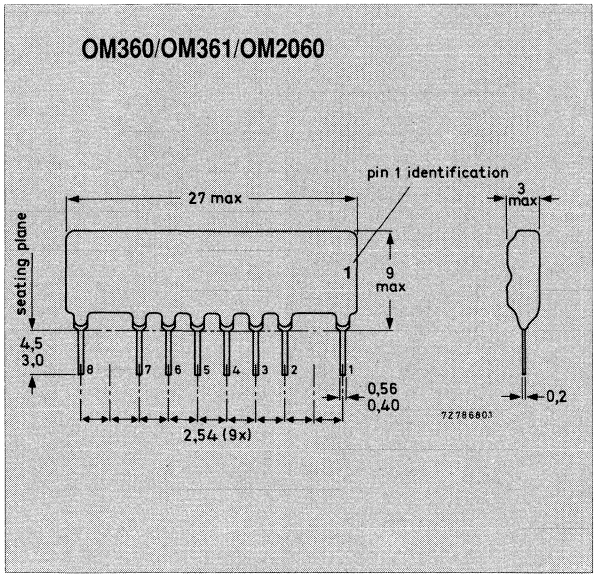
OM345/OM2045



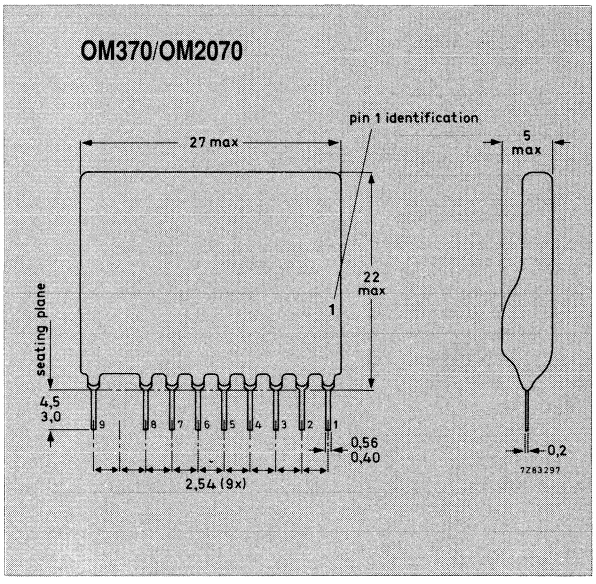
OM350/OM2050



OM360/OM361/OM2060



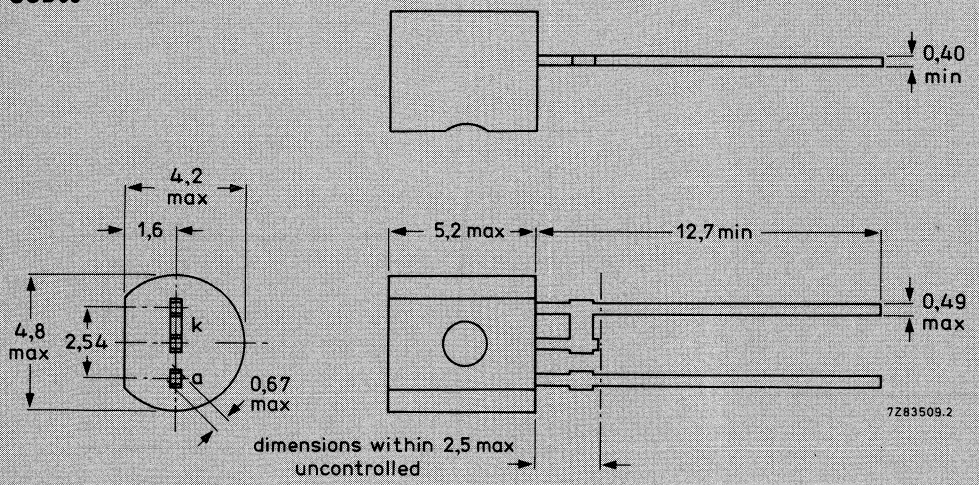
OM370/OM2070



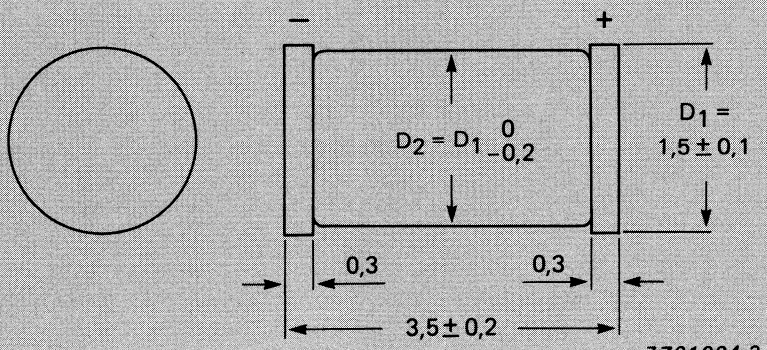
(dimensions in mm)

ENVELOPE SPECIFICATIONS *continued*

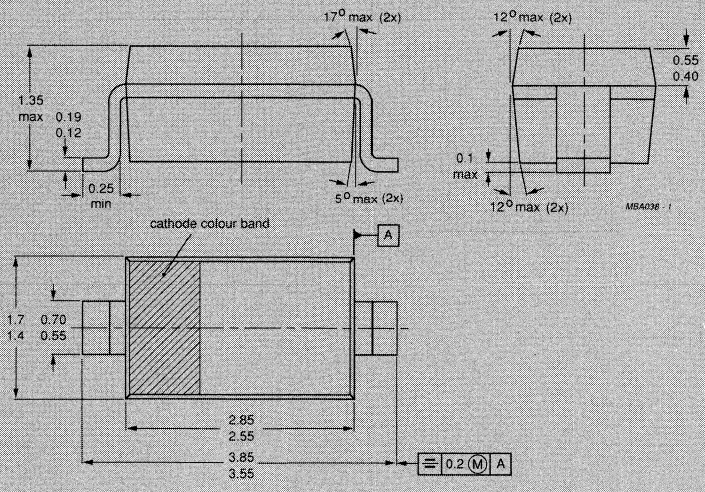
SOD69



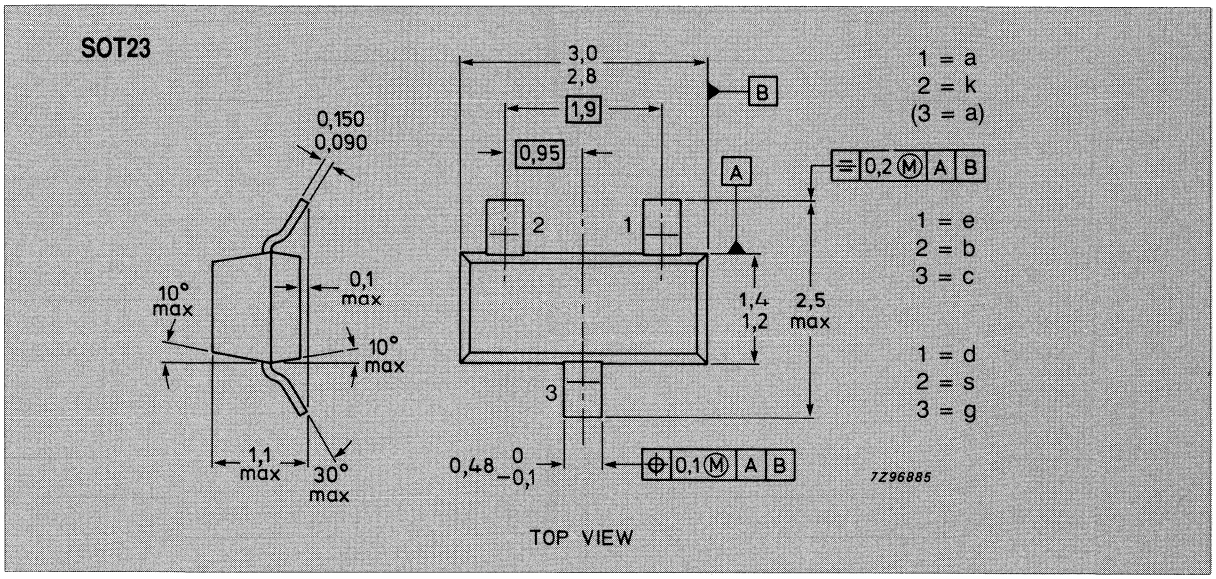
SOD80



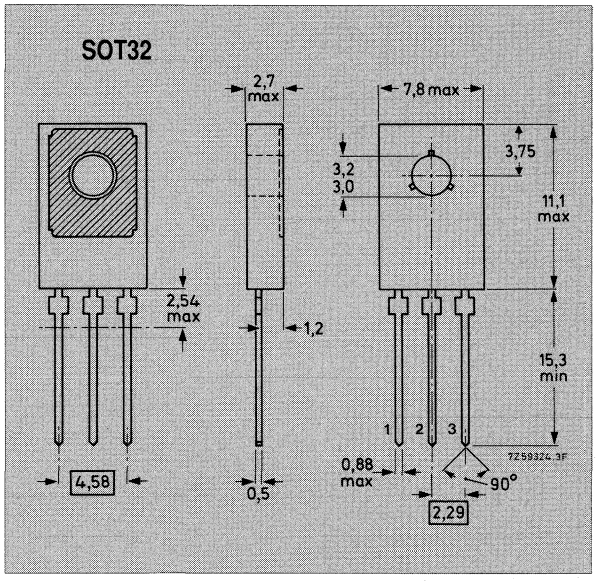
SOD123



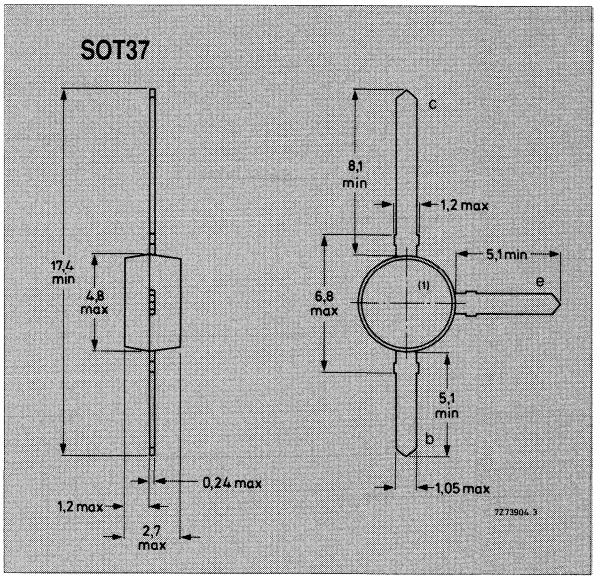
SOT23



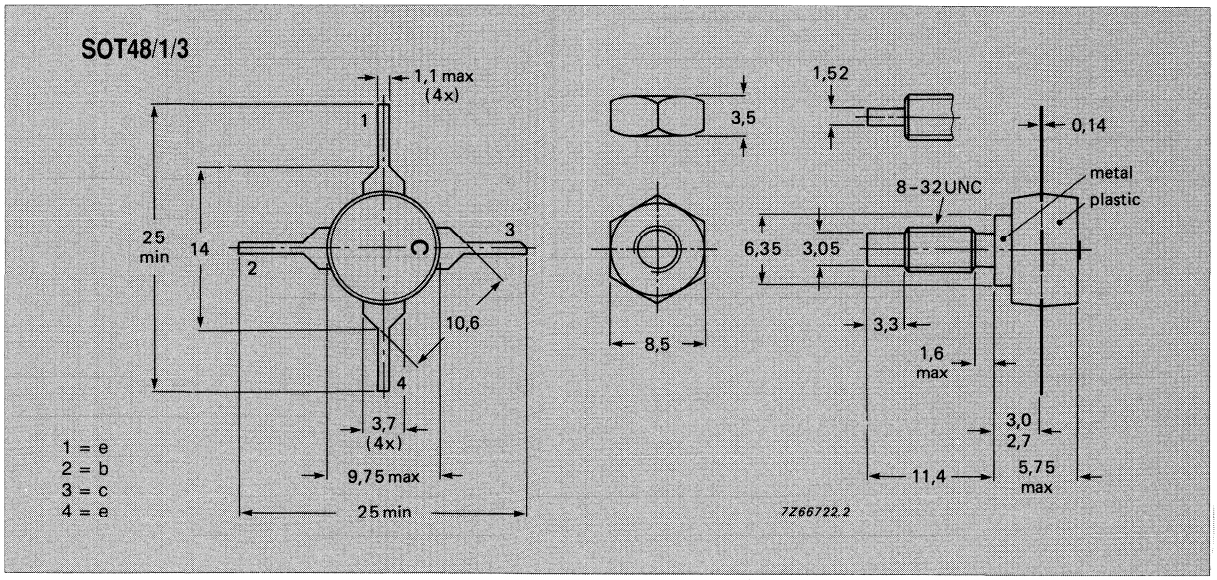
SOT32



SOT37



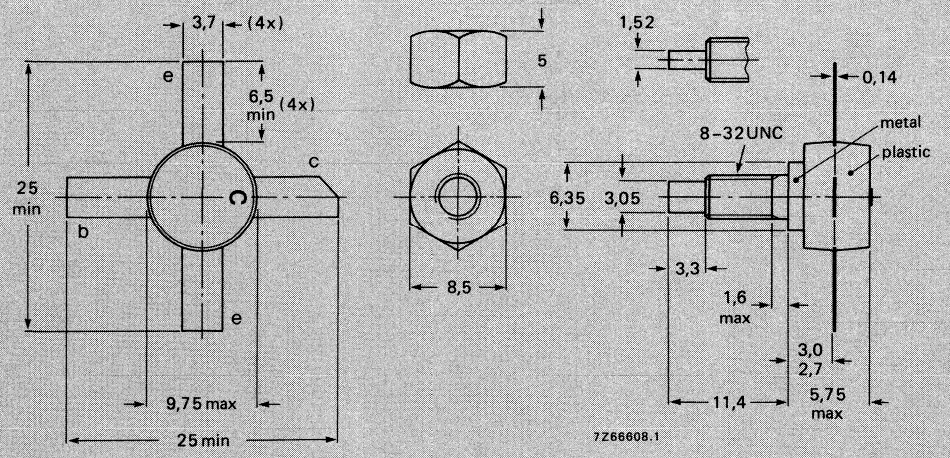
SOT48/1/3



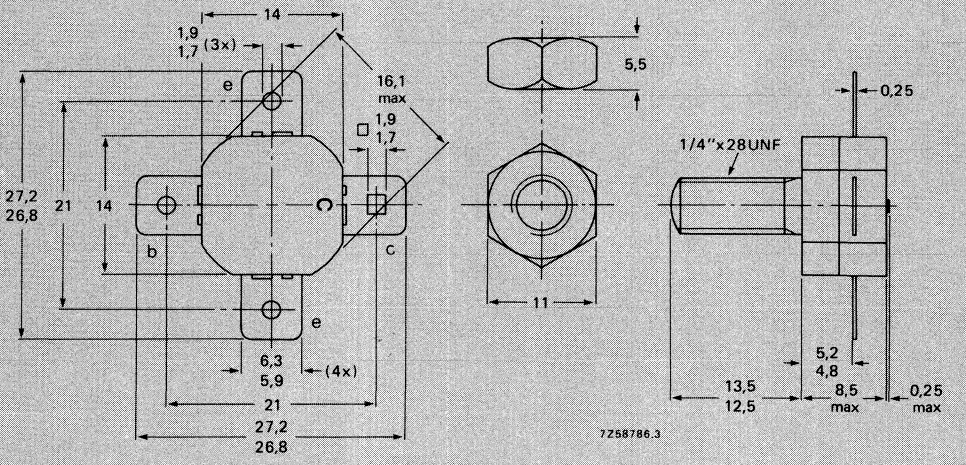
(dimensions in mm)

ENVELOPE SPECIFICATIONS *continued*

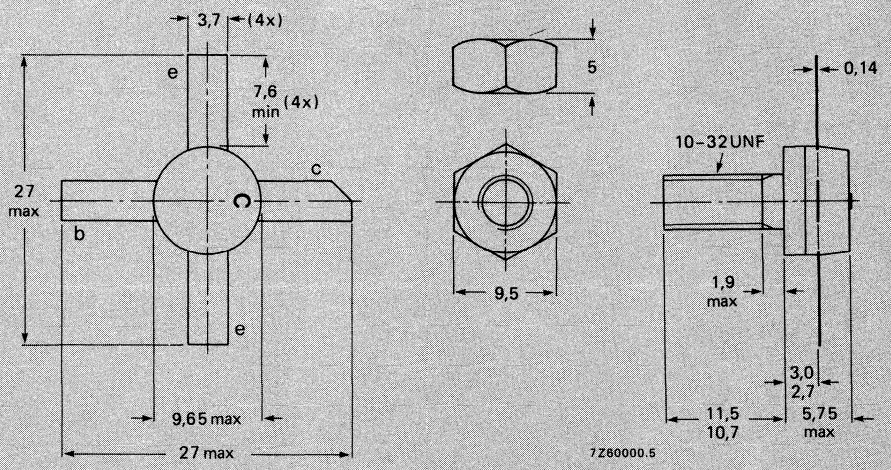
SOT48/2



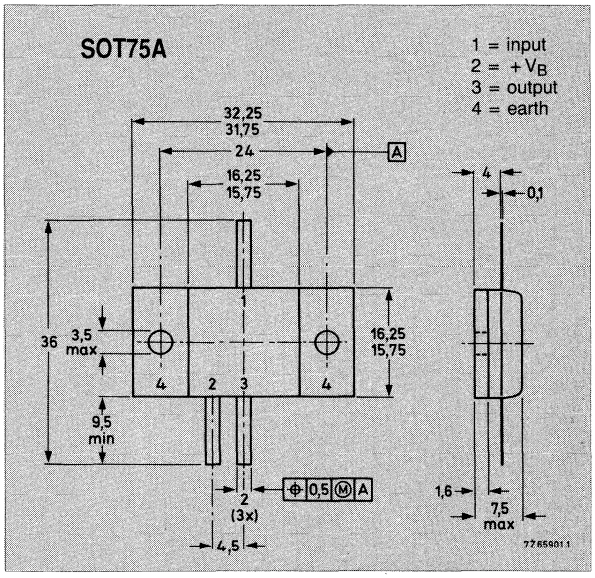
SOT55



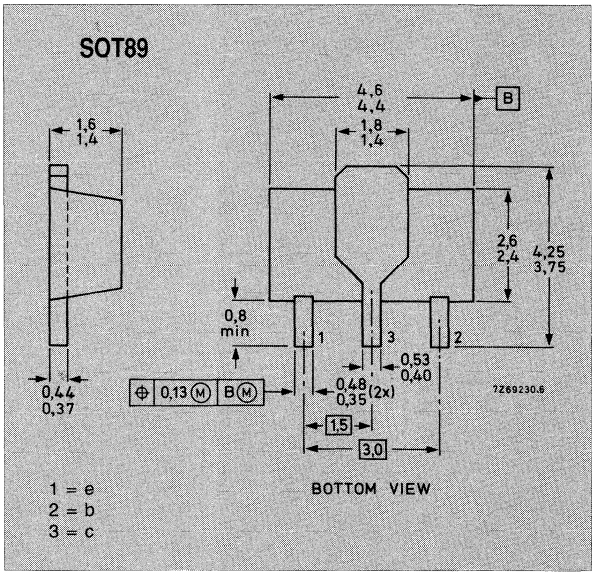
SOT56



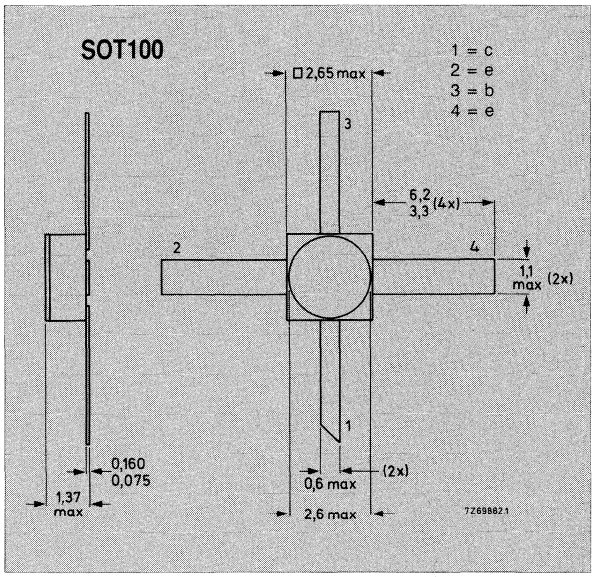
SOT75A



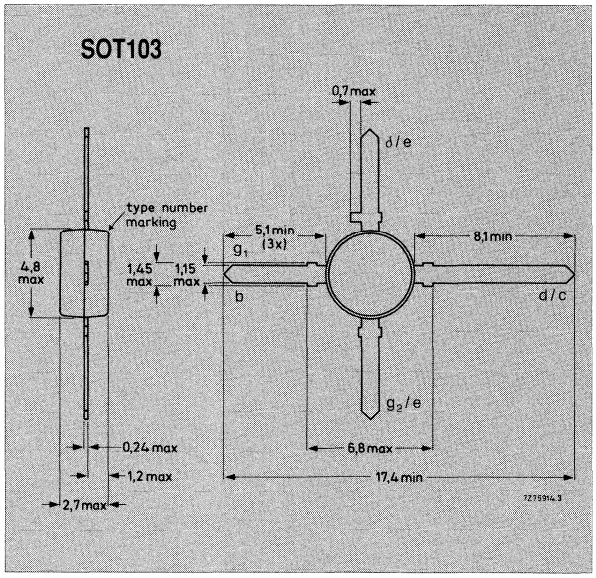
SOT89



SOT100



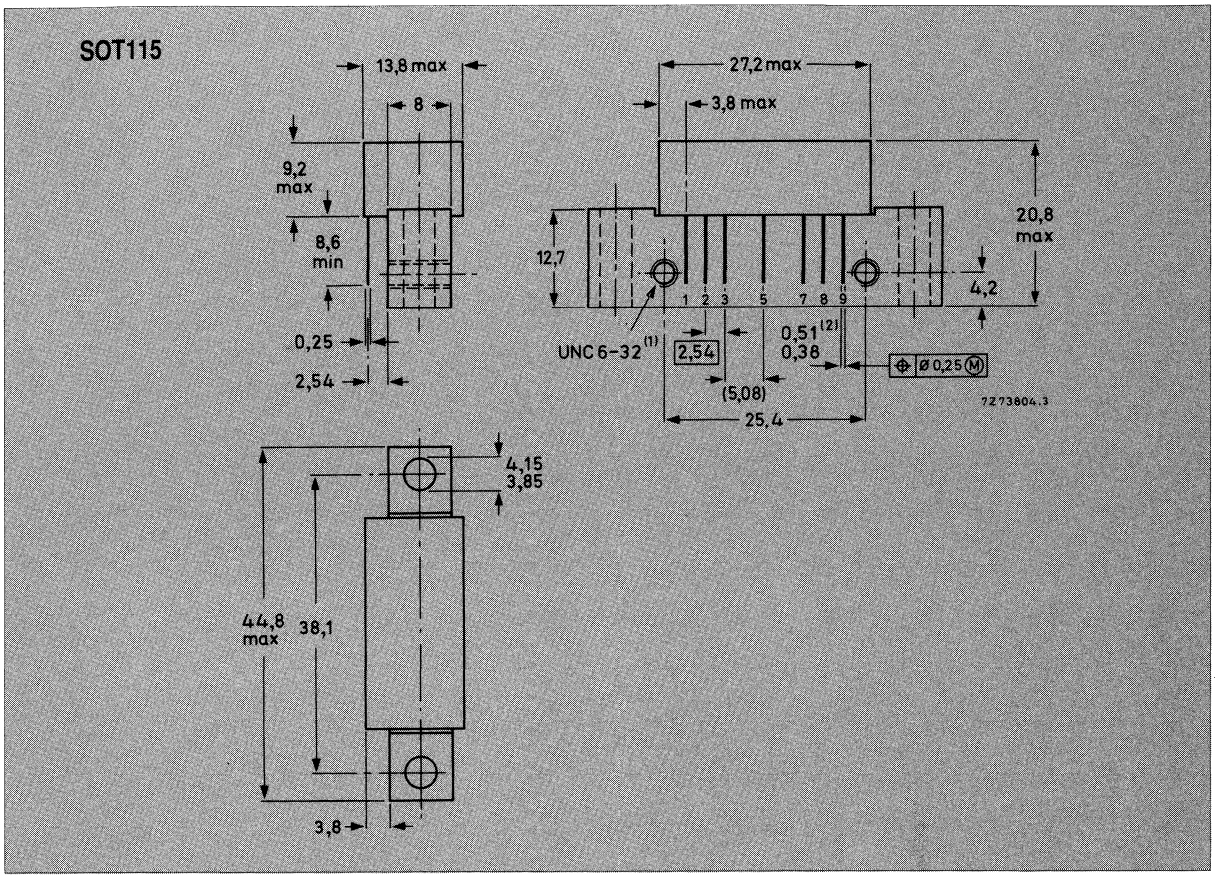
SOT103



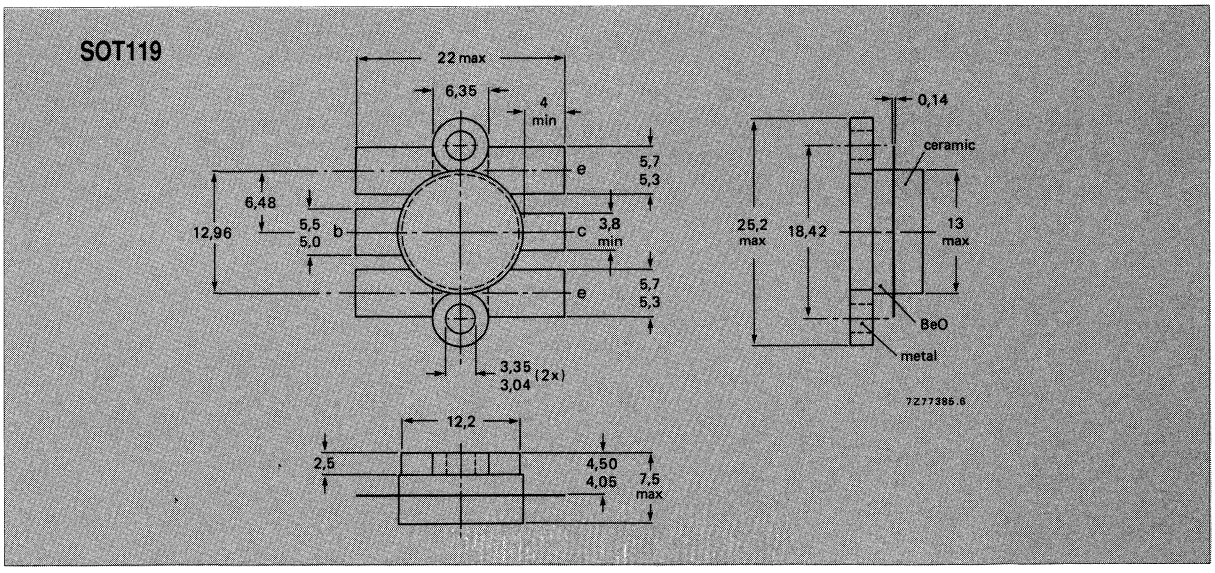
(dimensions in mm)

ENVELOPE SPECIFICATIONS *continued*

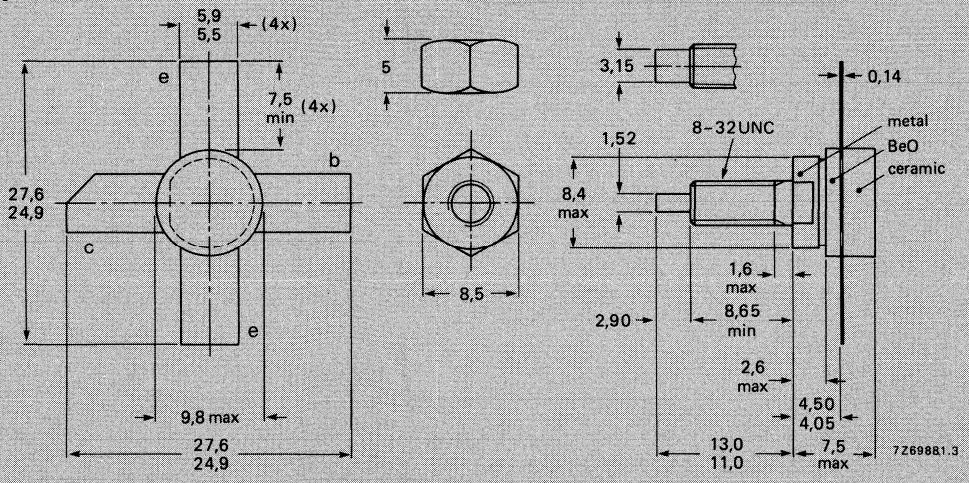
SOT115



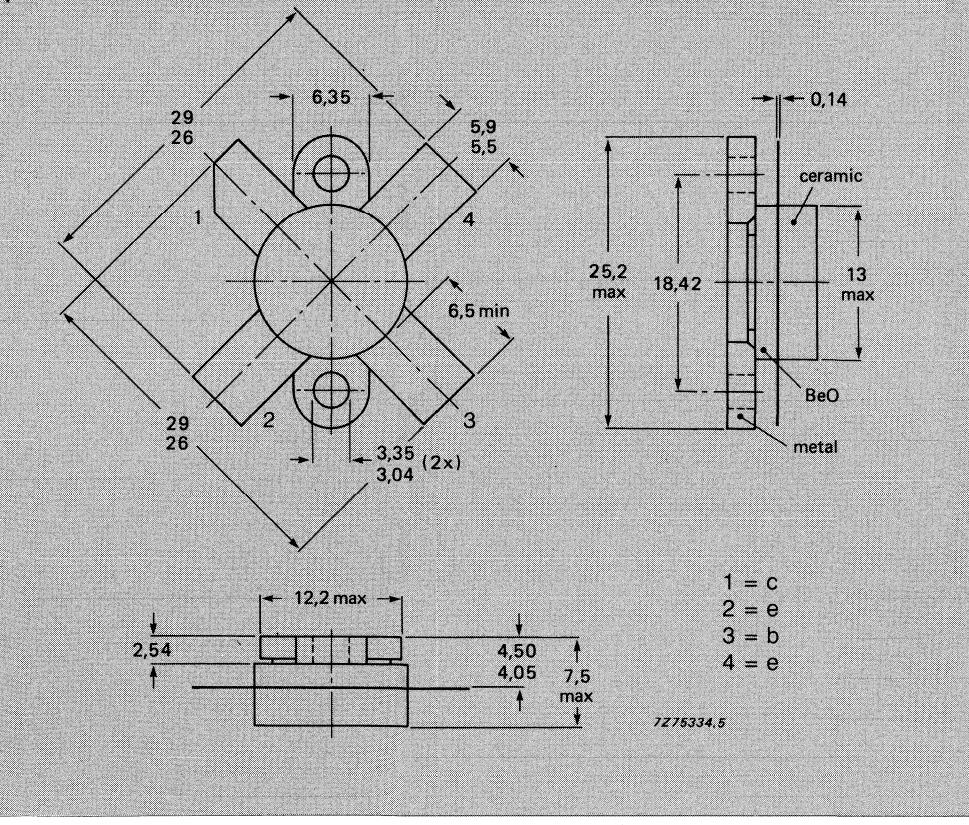
SOT119



SOT120



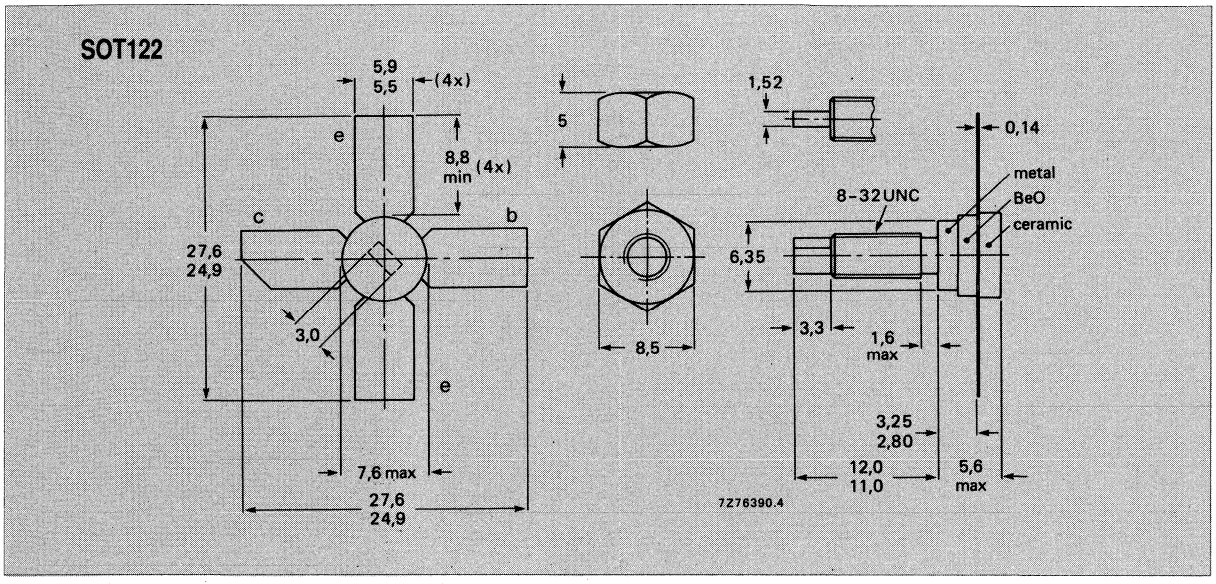
SOT121



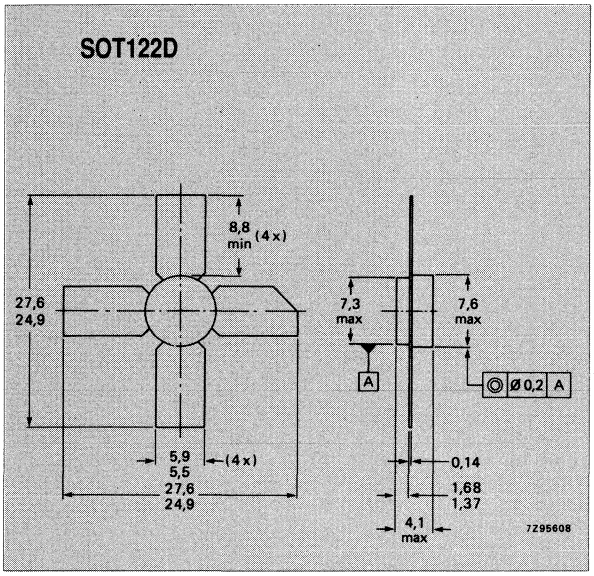
(dimensions in mm)

ENVELOPE SPECIFICATIONS *continued*

SOT122



SOT122D



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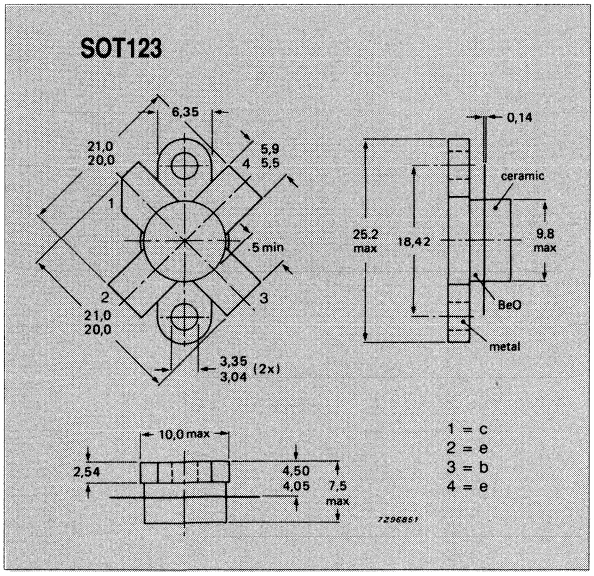
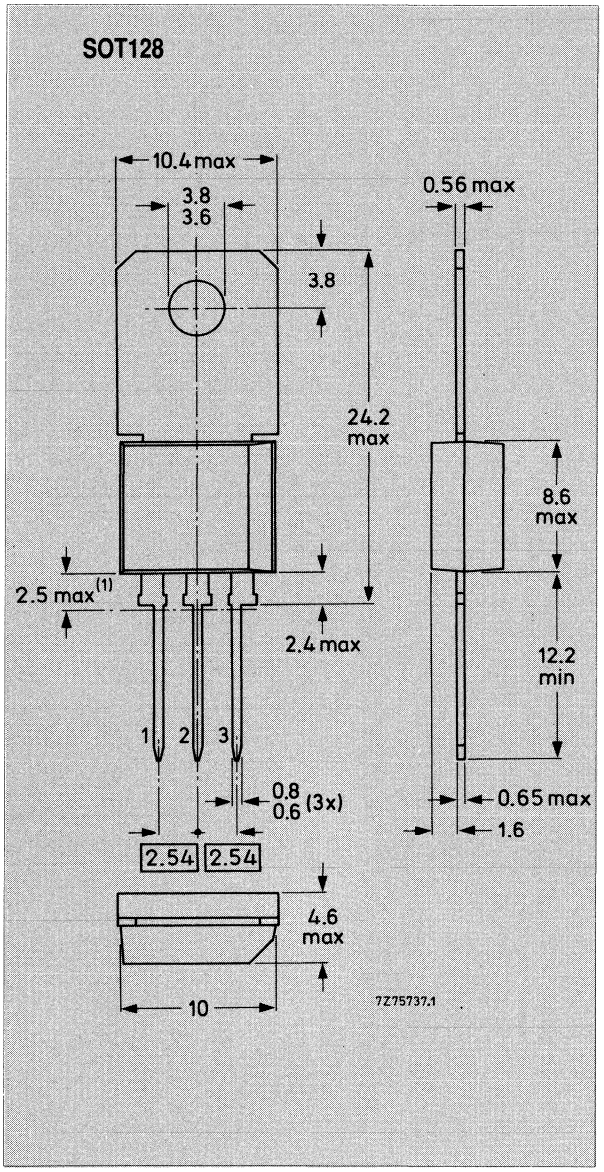
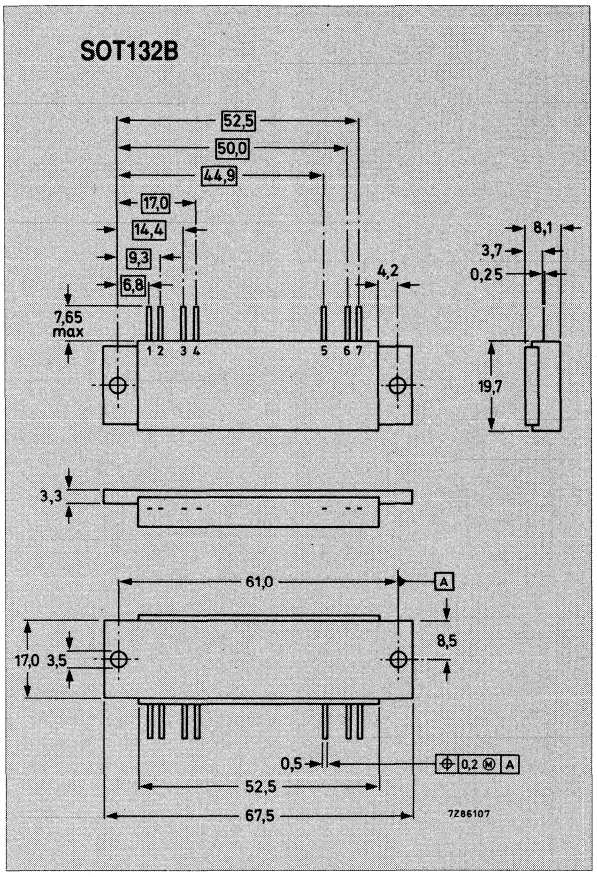


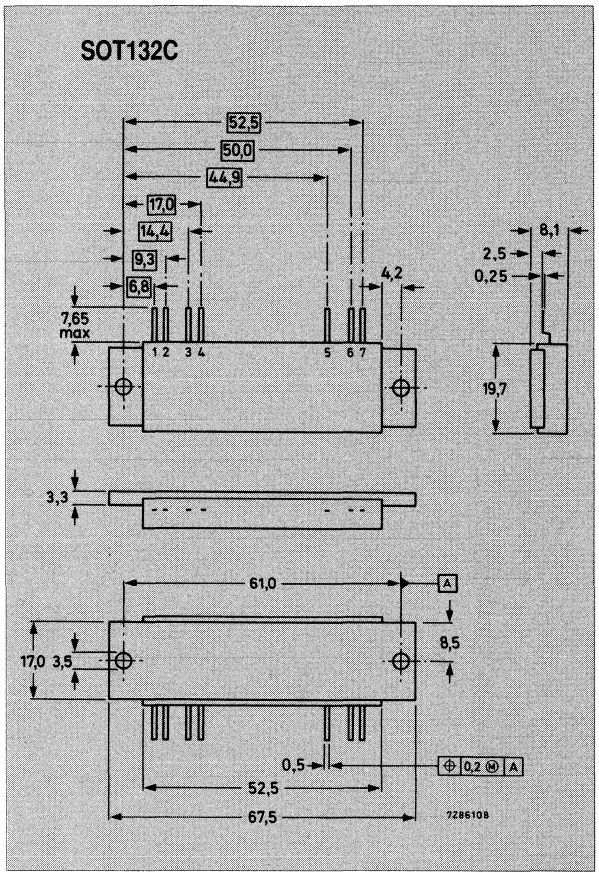
SOT128



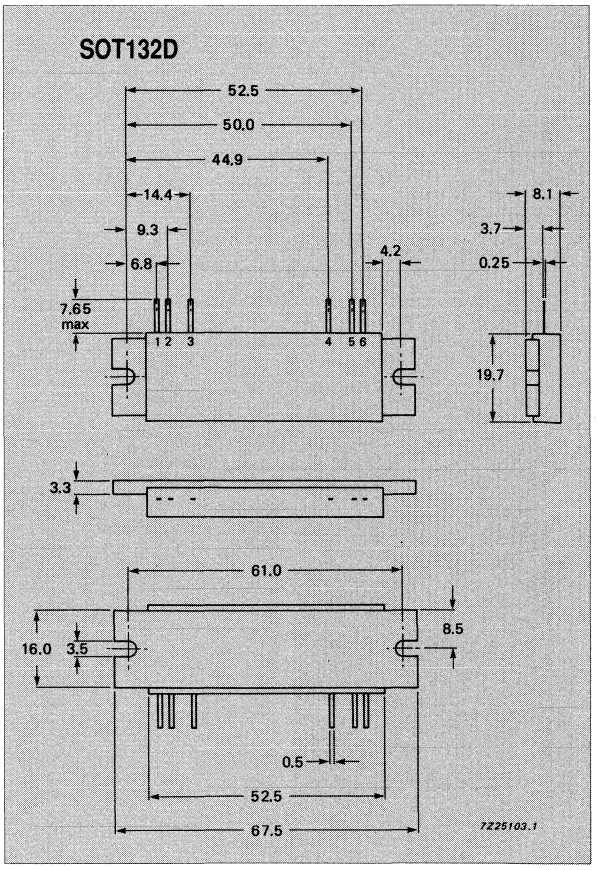
SOT132B



SOT132C



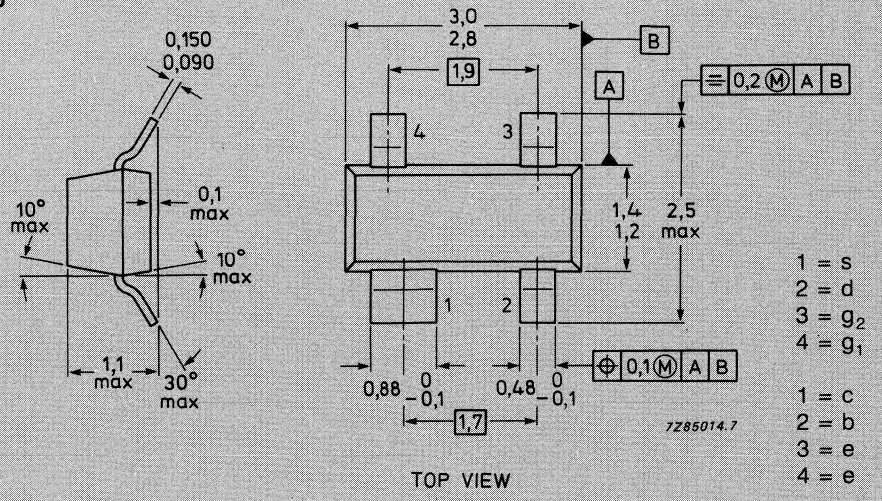
SOT132D



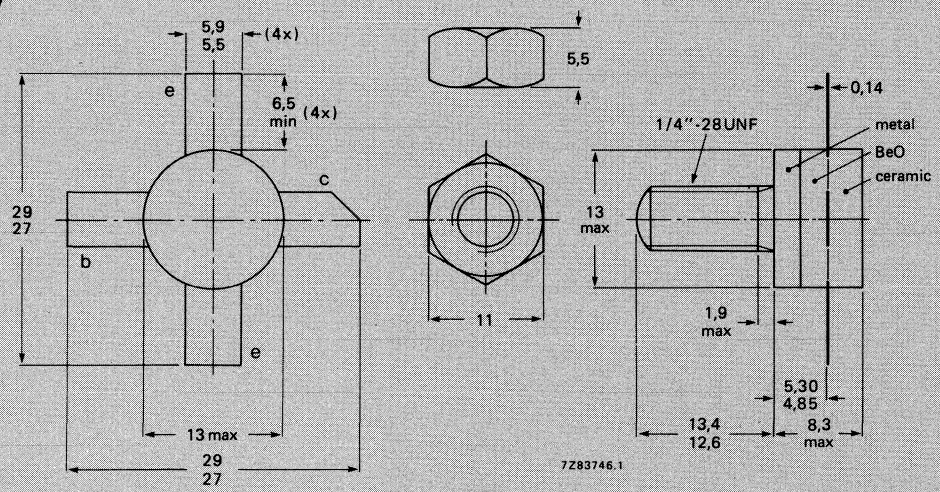
(dimensions in mm)

ENVELOPE SPECIFICATIONS *continued*

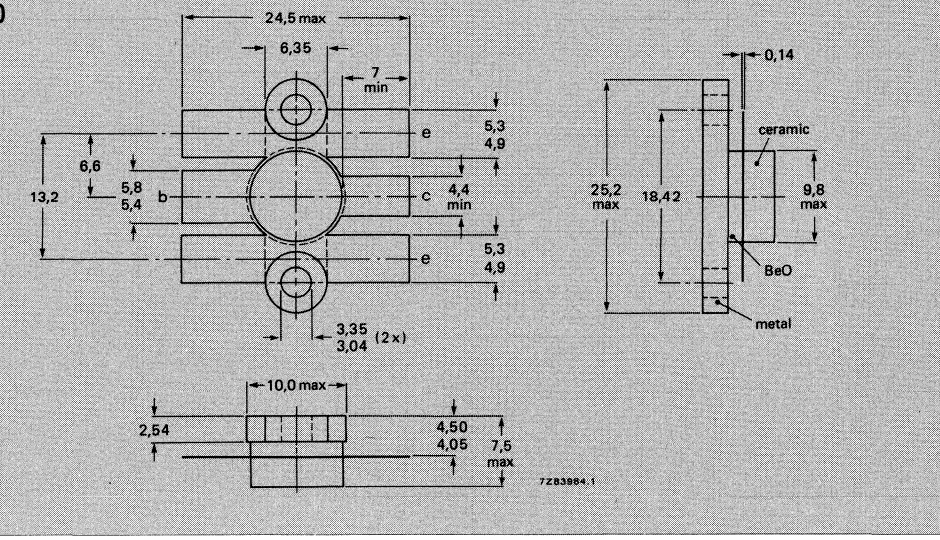
SOT143



SOT147

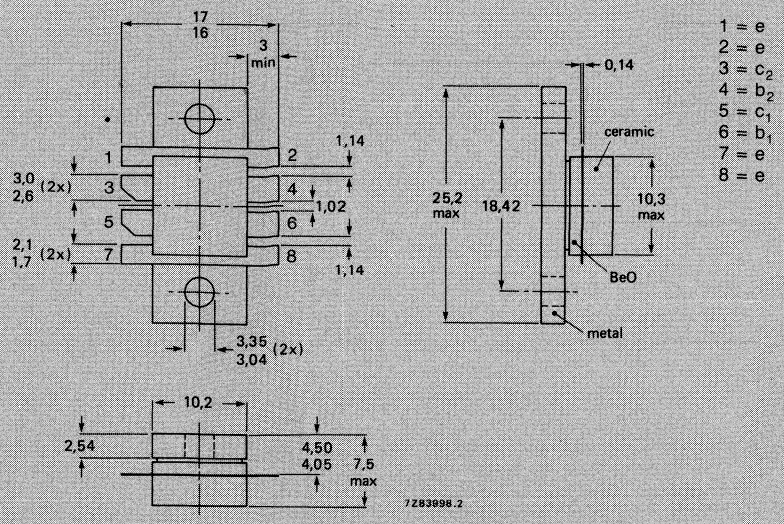


SOT160

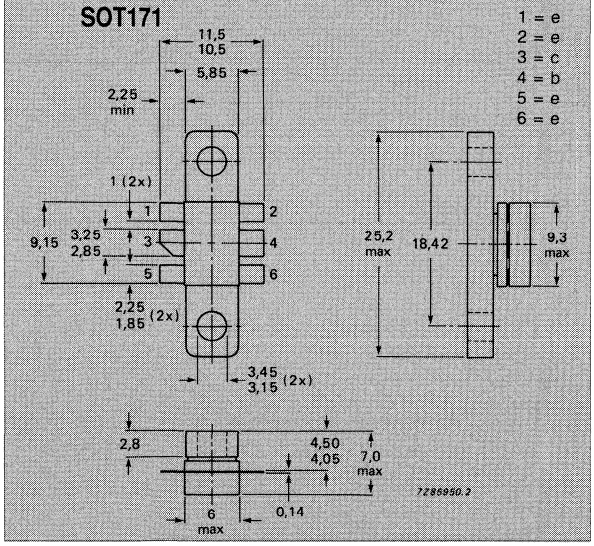


ENVELOPE SPECIFICATIONS *continued*

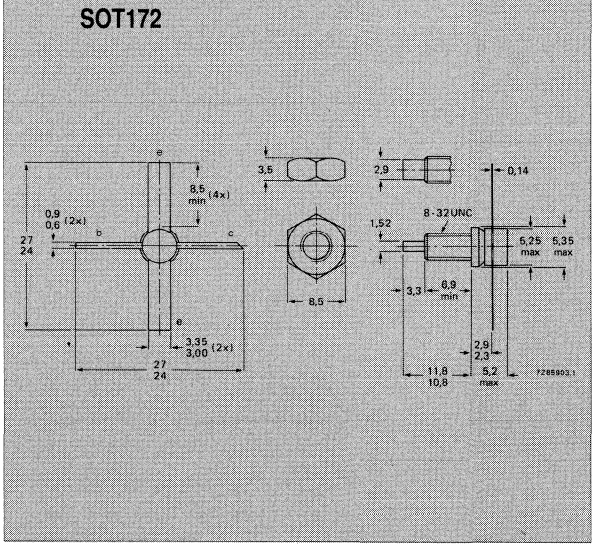
SOT161



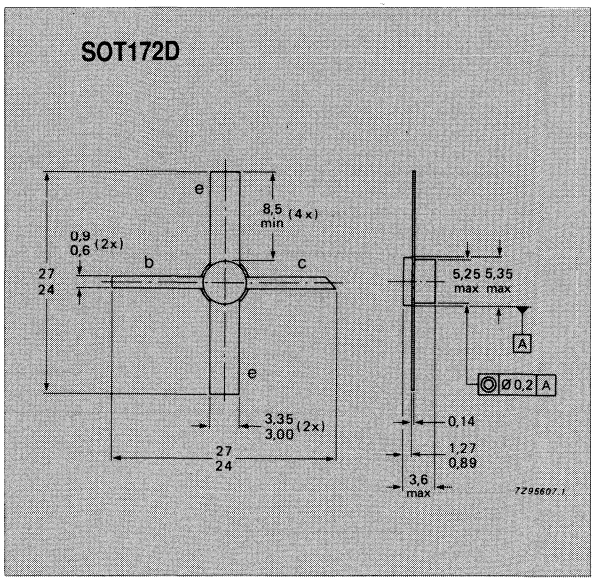
SOT171



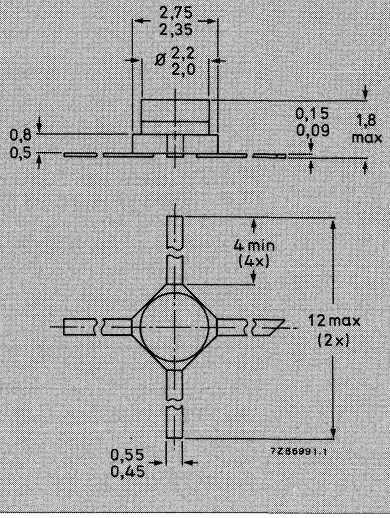
SOT172



SOT172D



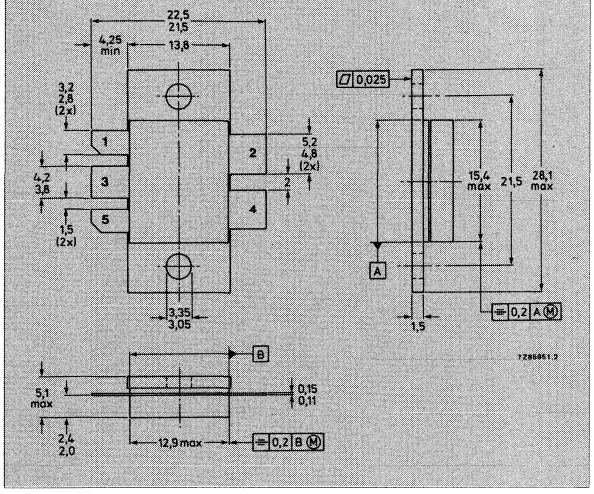
SOT173



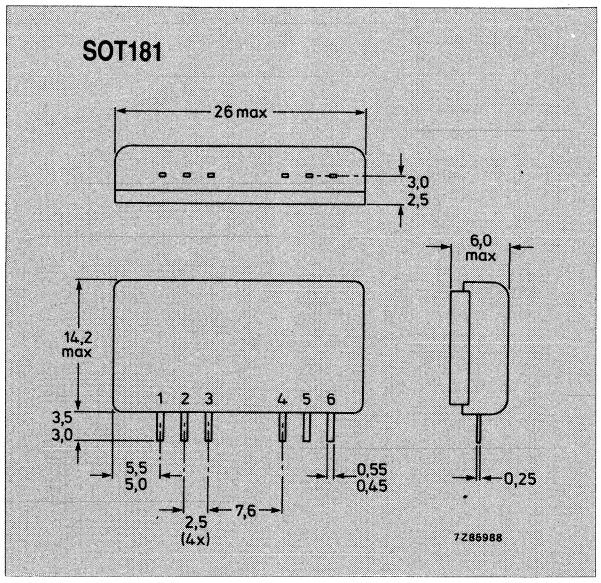
(dimensions in mm)

ENVELOPE SPECIFICATIONS *continued*

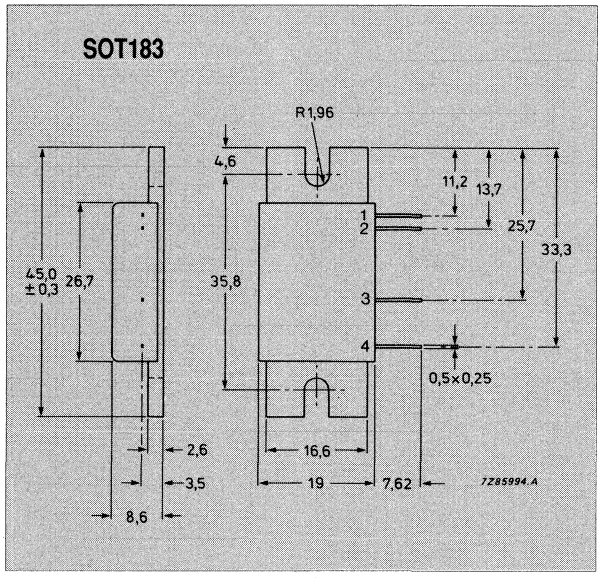
SOT179



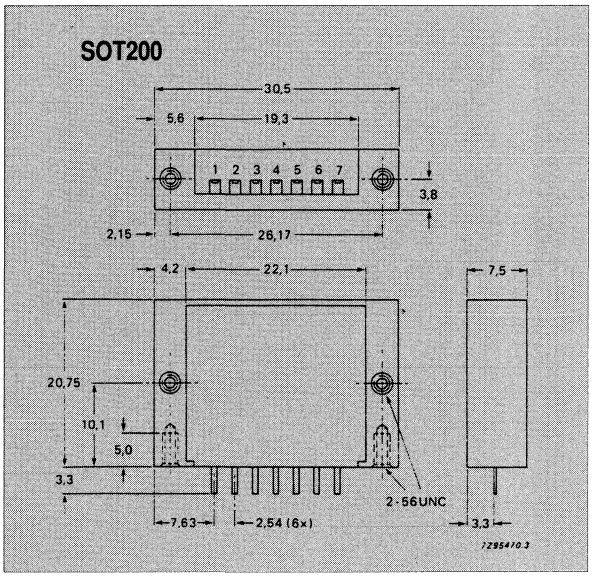
SOT181



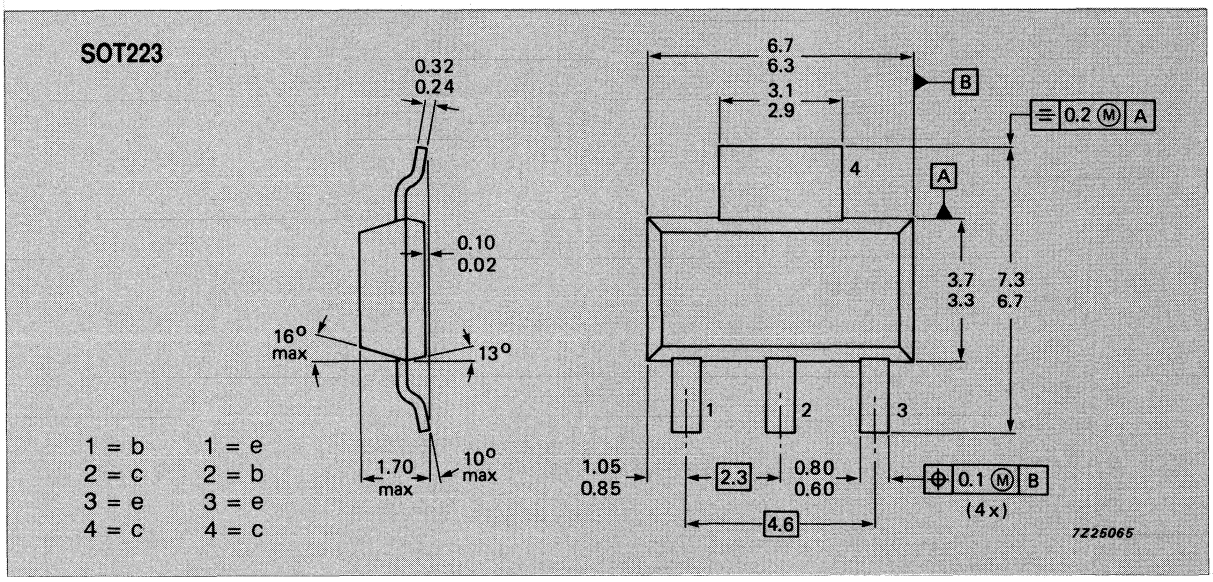
SOT183



SOT200

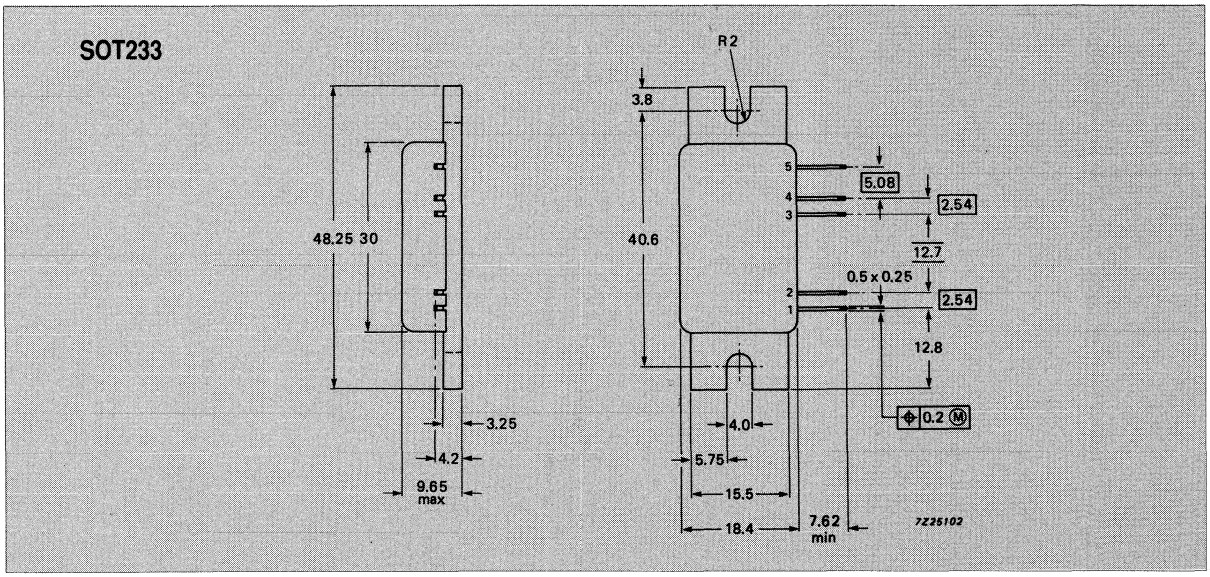


SOT223

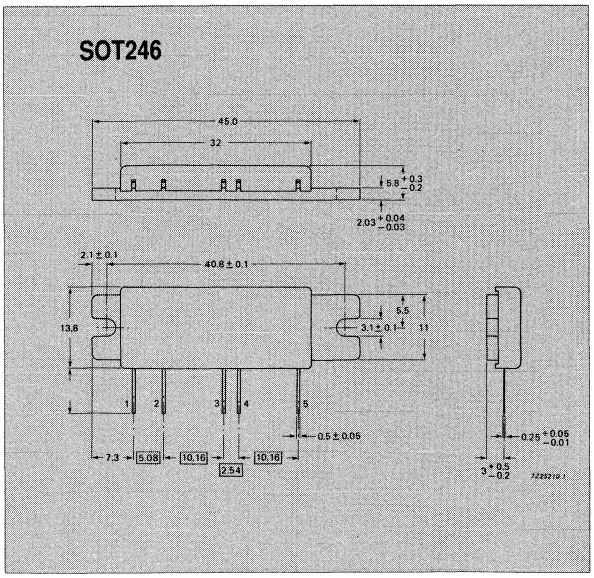


1 = b 1 = e
2 = c 2 = b
3 = e 3 = e
4 = c 4 = c

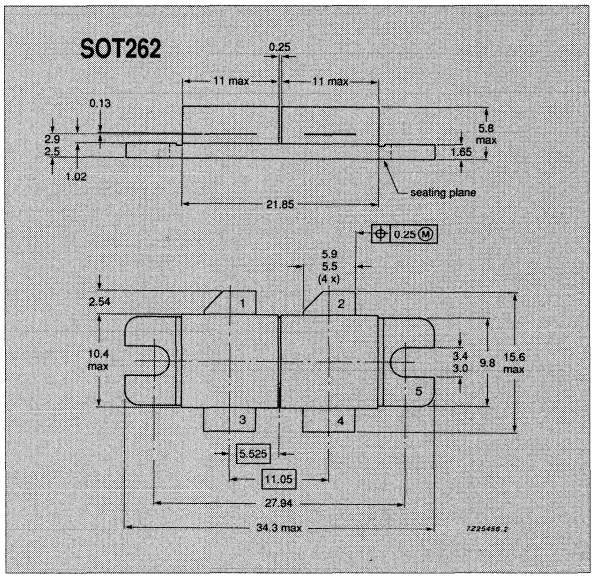
SOT233



SOT246

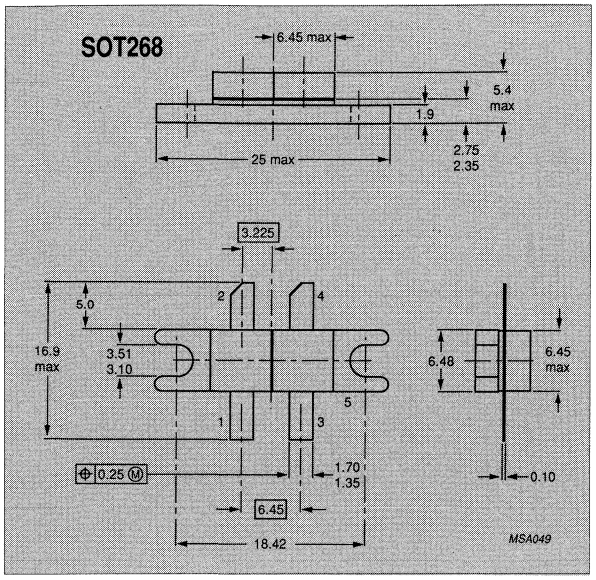


SOT262

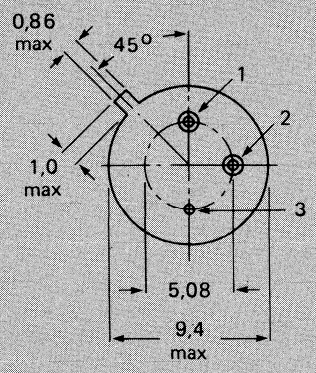


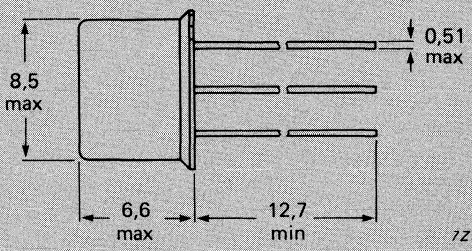
(dimensions in mm)

ENVELOPE SPECIFICATIONS *continued*



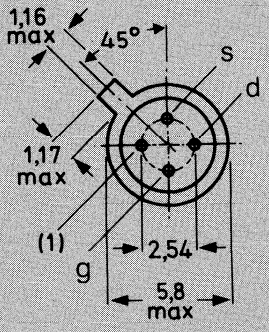
TO-39

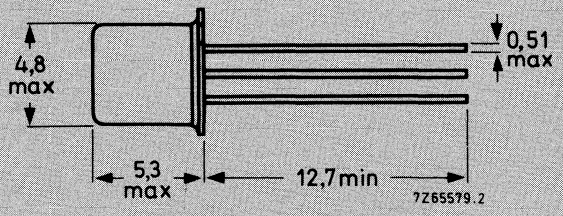




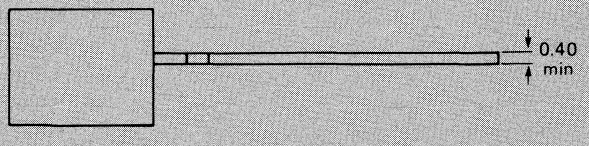
	1	2
TO-39/1	e	c
TO-39/3	c	e

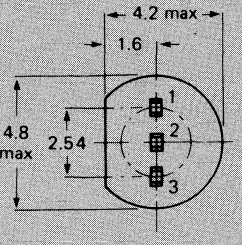
TO-72

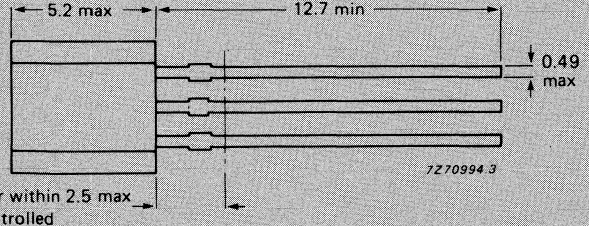




TO-92







1 = d	1 = e	1 = c	1 = A
2 = s	2 = b	2 = e	2 = K
3 = g	3 = c	3 = b	3 = A

(dimensions in mm)

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