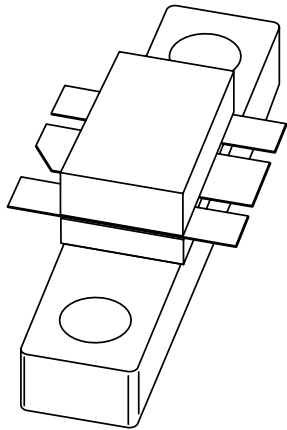


DATA SHEET



BLV920 UHF power transistor

Product specification
Supersedes data of 1995 Apr 10

1997 Nov 17

UHF power transistor

BLV920

FEATURES

- Internal input matching to achieve high power gain and easy design of wideband circuits
- Emitter ballasting resistors for an optimum temperature profile
- Gold metallization ensures excellent reliability.

APPLICATIONS

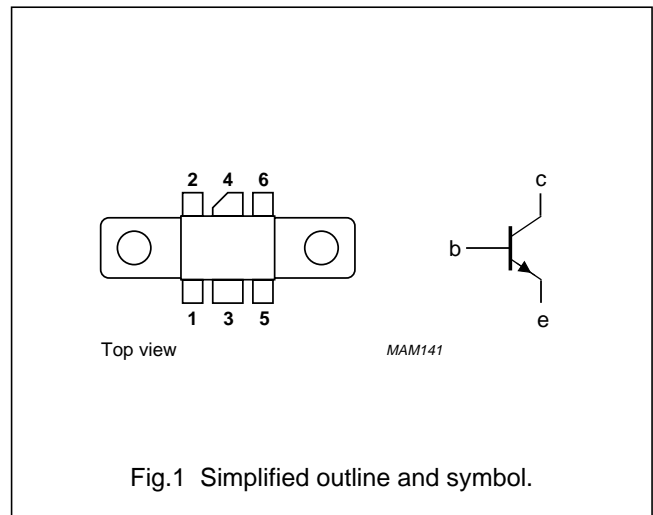
- Base station transmitters in the 820 to 960 MHz range.

PINNING - SOT171A

PIN	SYMBOL	DESCRIPTION
1	e	emitter
2	e	emitter
3	b	base
4	c	collector
5	e	emitter
6	e	emitter

DESCRIPTION

NPN silicon planar epitaxial transistor intended for common emitter class-AB operation. The transistor is encapsulated in a 6-lead SOT171A flange envelope with a ceramic cap. All leads are isolated from the flange.



QUICK REFERENCE DATA

RF performance at $T_h = 25\text{ }^\circ\text{C}$ in a common emitter test circuit.

MODE OF OPERATION	f (MHz)	V _{CE} (V)	P _L (W)	G _p (dB)	η_c (%)
CW, class-AB	960	26	20	≥ 10	≥ 55

WARNING

Product and environmental safety - toxic materials

This product contains beryllium oxide. The product is entirely safe provided that the BeO disc is not damaged. All persons who handle, use or dispose of this product should be aware of its nature and of the necessary safety precautions. After use, dispose of as chemical or special waste according to the regulations applying at the location of the user. It must never be thrown out with the general or domestic waste.

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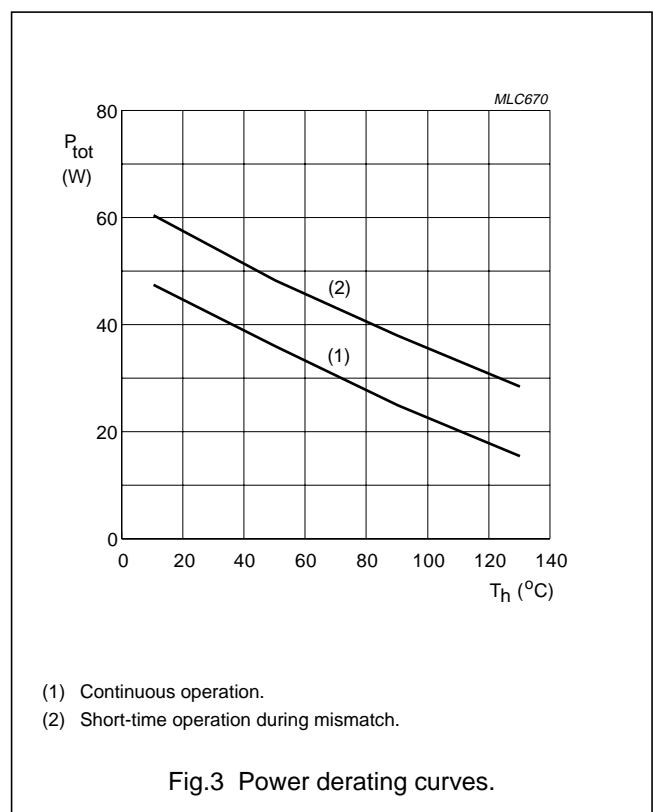
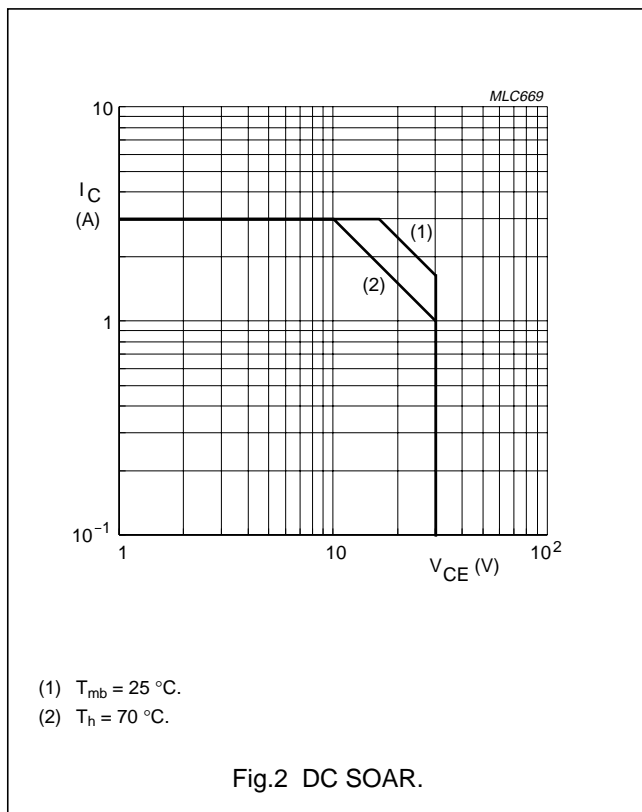
LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	70	V
V_{CEO}	collector-emitter voltage	open base	–	30	V
V_{EBO}	emitter-base voltage	open collector	–	3	V
I_C	collector current (DC)		–	3	A
$I_{C(AV)}$	average collector current		–	3	A
P_{tot}	total power dissipation	up to $T_{mb} = 25\text{ °C}$	–	50	W
T_{stg}	storage temperature		–65	+150	°C
T_j	operating junction temperature		–	200	°C

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-mb}$	thermal resistance from junction to mounting base	$P_{tot} = 49\text{ W}; T_{mb} = 25\text{ °C}$	3.5	K/W
$R_{th\ mb-h}$	thermal resistance from mounting base to heatsink		0.4	K/W



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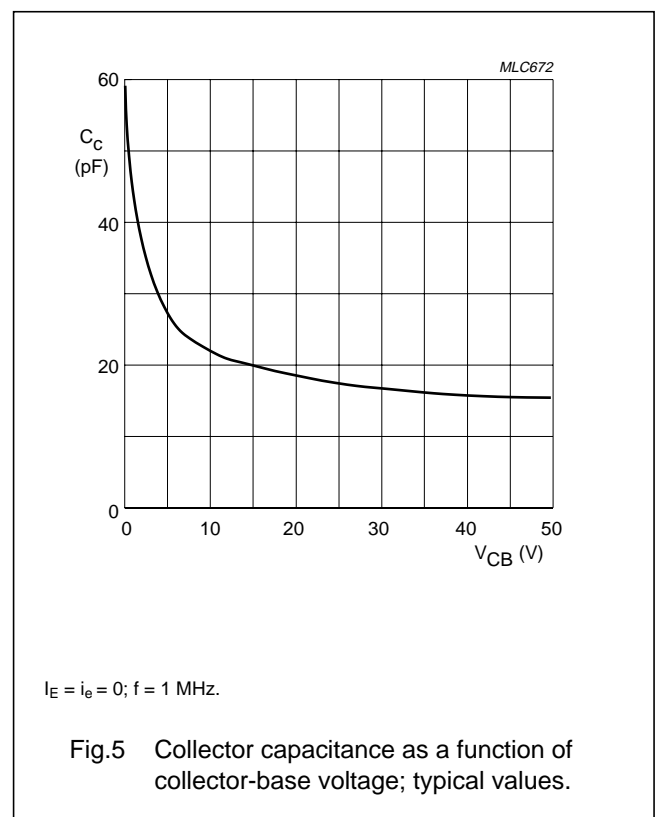
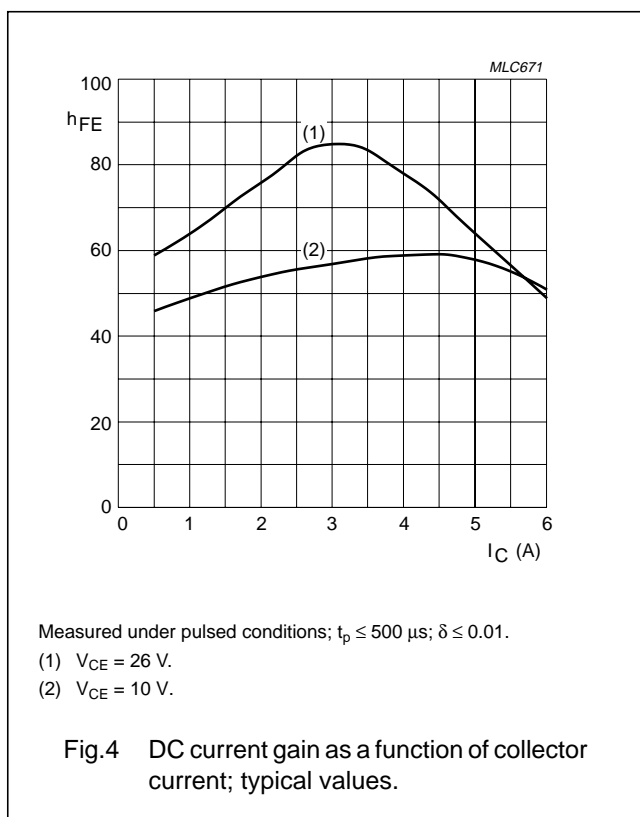
CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V _{(BR)CBO}	collector-base breakdown voltage	open emitter; I _C = 15 mA	70	–	–	V
V _{(BR)CEO}	collector-emitter breakdown voltage	open base; I _C = 30 mA	30	–	–	V
V _{(BR)EBO}	emitter-base breakdown voltage	open collector; I _E = 0.6 mA	3	–	–	V
I _{CES}	collector leakage current	V _{BE} = 0; V _{CE} = 28 V	–	–	1.5	mA
h _{FE}	DC current gain	V _{CE} = 10 V; I _C = 1 A; note 1	30	–	120	
C _c	collector capacitance	V _{CB} = 26 V; I _E = i _e = 0; f = 1 MHz	–	17	–	pF
C _{re}	feedback capacitance	V _{CE} = 26 V; I _C = 0; f = 1 MHz	–	11	–	pF

Note

1. Measured under pulsed conditions: t_p ≤ 500 μs; δ ≤ 0.01.



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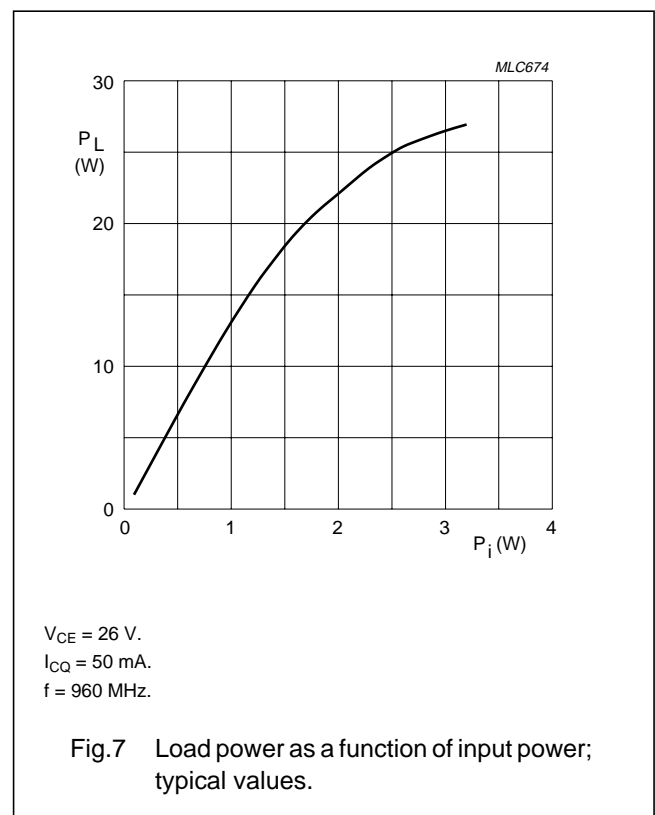
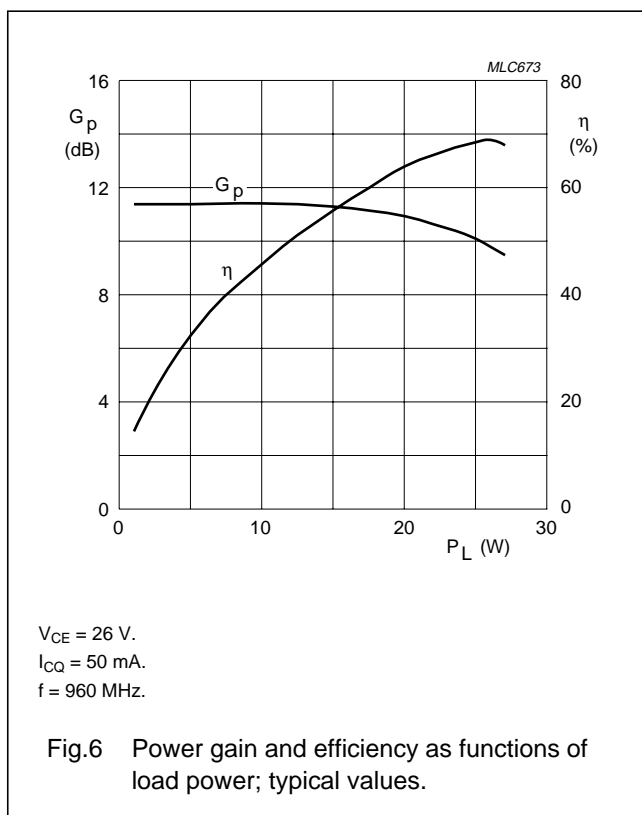
APPLICATION INFORMATION

RF performance at $T_h = 25\text{ }^\circ\text{C}$ in a common emitter, class-AB test circuit; $R_{th\ mb-h} = 0.4\text{ K/W}$.

MODE OF OPERATION	f (MHz)	V_{CE} (V)	I_{CQ} (mA)	P_L (W)	G_p (dB)	η_c (%)
CW, class-AB	960	26	50	20	≥ 10	≥ 55

Ruggedness in class-AB operation

The BLV920 is capable of withstanding a load mismatch corresponding to $VSWR = 20 : 1$ through all phases at rated output power, under the following conditions: $V_{CE} = 26\text{ V}$; $f = 960\text{ MHz}$; $I_{CQ} = 50\text{ mA}$; $T_h = 25\text{ }^\circ\text{C}$; $R_{th\ mb-h} = 0.4\text{ K/W}$.



UHF power transistor

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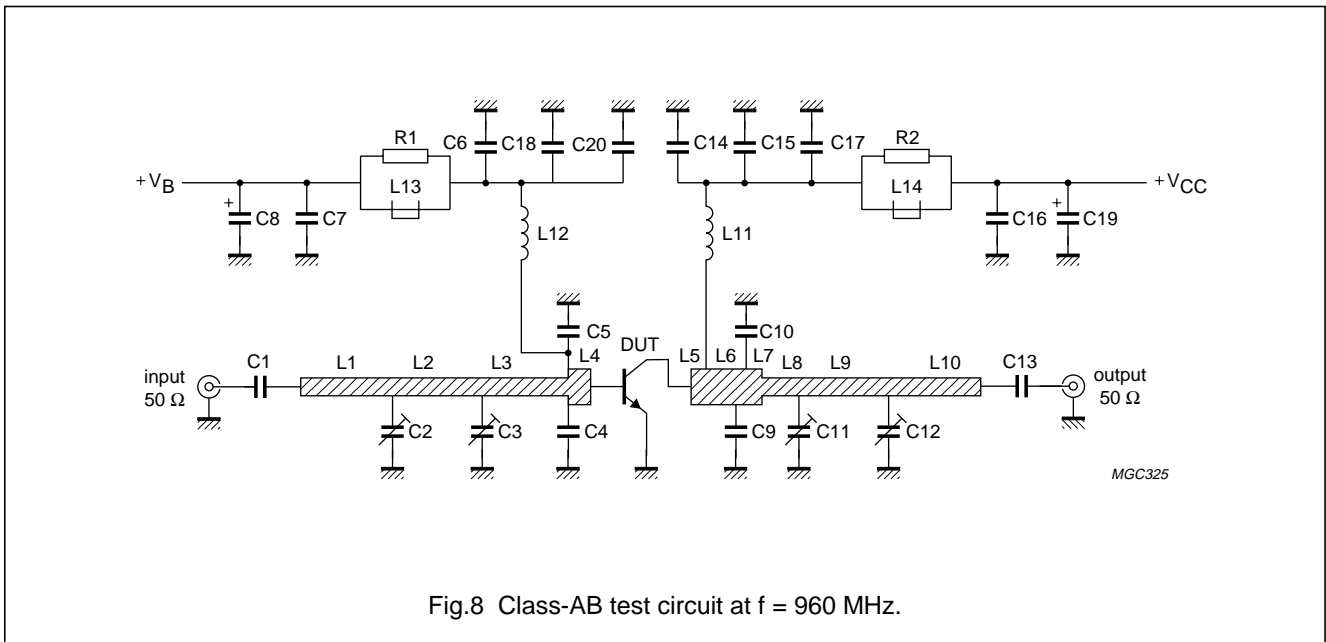


Fig.8 Class-AB test circuit at f = 960 MHz.

List of components (see Figs 8 and 9)

COMPONENT	DESCRIPTION	VALUE	DIMENSIONS	CATALOGUE No.
C1, C13	multilayer ceramic chip capacitor; note 1	43 pF		
C2, C3, C11, C12	film dielectric trimmer	1.4 pF to 5.5 pF		2222 809 09001
C4, C5	multilayer ceramic chip capacitor; note 2	10 pF		
C6, C17	multilayer ceramic chip capacitor; note 1	150 pF		
C7, C16	ceramic capacitor	22 nF		2222 640 08223
C8, C19	solid aluminium capacitor	10 μ F, 63 V		2222 030 38109
C14	multilayer ceramic chip capacitor; note 1	20 pF		
C9, C10	multilayer ceramic chip capacitor; note 2	11 pF		
C20	multilayer ceramic chip capacitor; note 1	1 nF		
C15, C18	multilayer ceramic chip capacitor; note 1	62 pF		
L1	stripline; note 3	50 Ω	length 16.8 mm width 2.4 mm	
L2	stripline; note 3	50 Ω	length 14.8 mm width 2.4 mm	
L3	stripline; note 3	50 Ω	length 13.7 mm width 2.4 mm	

UHF power transistor

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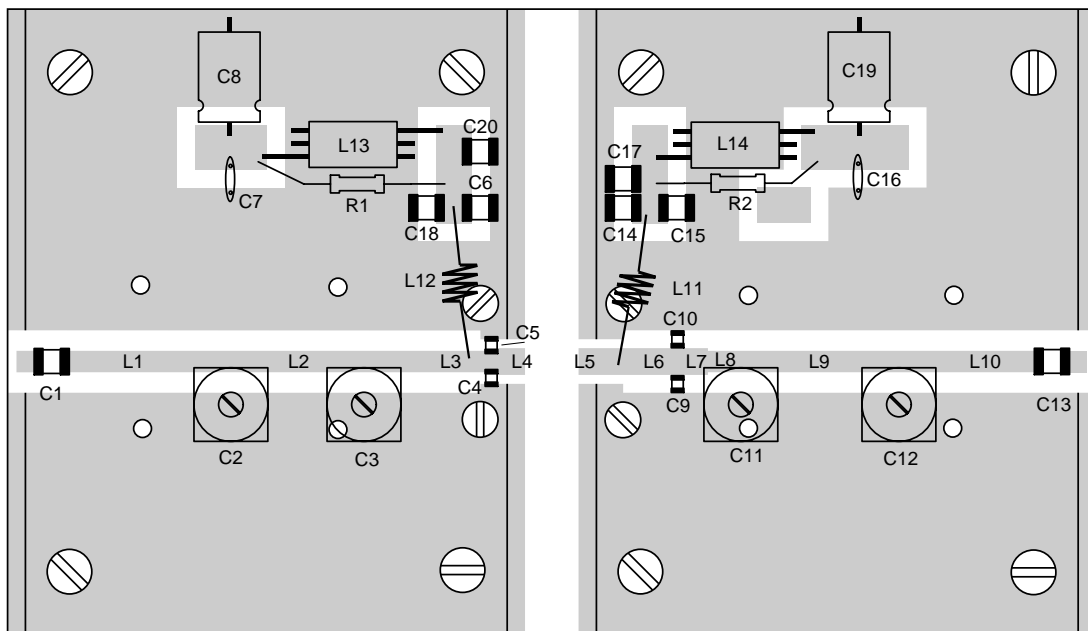
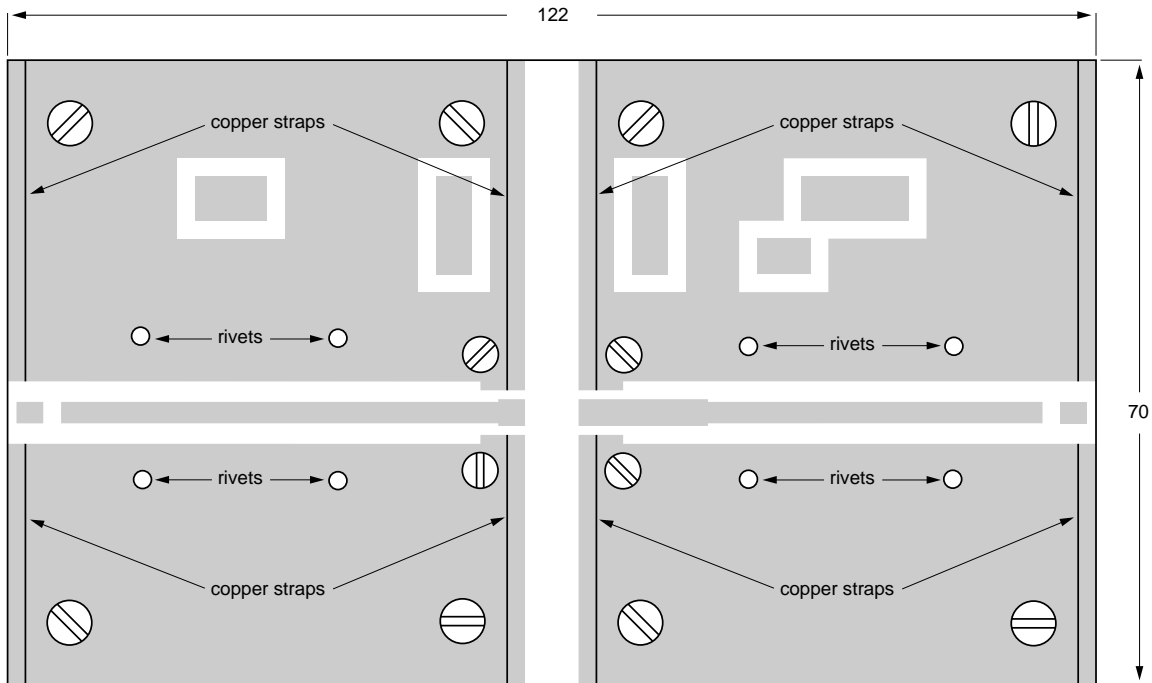
COMPONENT	DESCRIPTION	VALUE	DIMENSIONS	CATALOGUE No.
L4	stripline; note 3	43 Ω	length 3.5 mm width 3 mm	
L5	stripline; note 3	43 Ω	length 6.4 mm width 3 mm	
L6	stripline; note 3	43 Ω	length 5.8 mm width 3 mm	
L7	stripline; note 3	43 Ω	length 2.4 mm width 3 mm	
L8	stripline; note 3	50 Ω	length 3 mm width 2.4 mm	
L9	stripline; note 3	50 Ω	length 15.5 mm width 2.4 mm	
L10	stripline; note 3	50 Ω	length 20 mm width 2.4 mm	
L11	4 turns enamelled 0.8 mm copper wire	45 nH	int. diameter 4mm length 5 mm leads 2 \times 5 mm	
L12	3 turns enamelled 0.8 mm copper wire	30 nH	int. diameter 3mm length 5 mm leads 2 \times 5 mm	
L13, L14	grade 3B Ferroxcube wideband RF choke			4312 020 36642
R1, R2	metal film resistor	10 Ω , 0.4 W		2322 151 71009

Notes

1. American Technical Ceramics type 100B or capacitor of same quality.
2. American Technical Ceramics type 100A or capacitor of same quality.
3. The striplines are on double-clad PCB with PTFE fibre-glass dielectric ($\epsilon_r = 2.2$); thickness $\frac{1}{32}$ ".

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MGC326

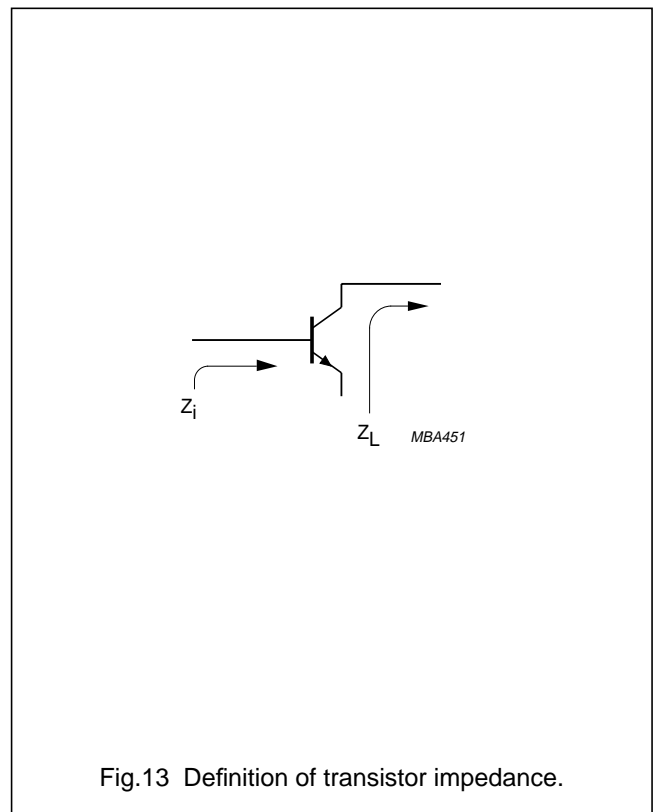
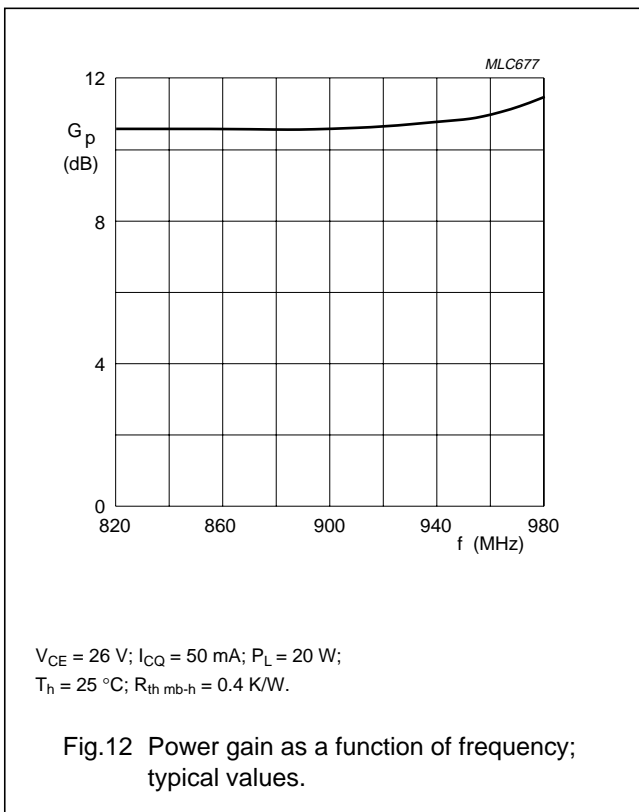
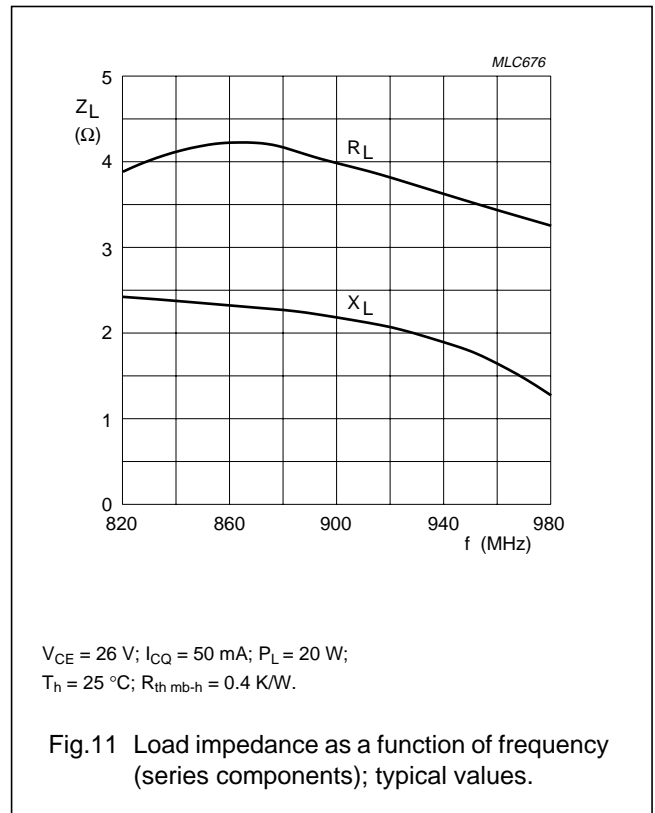
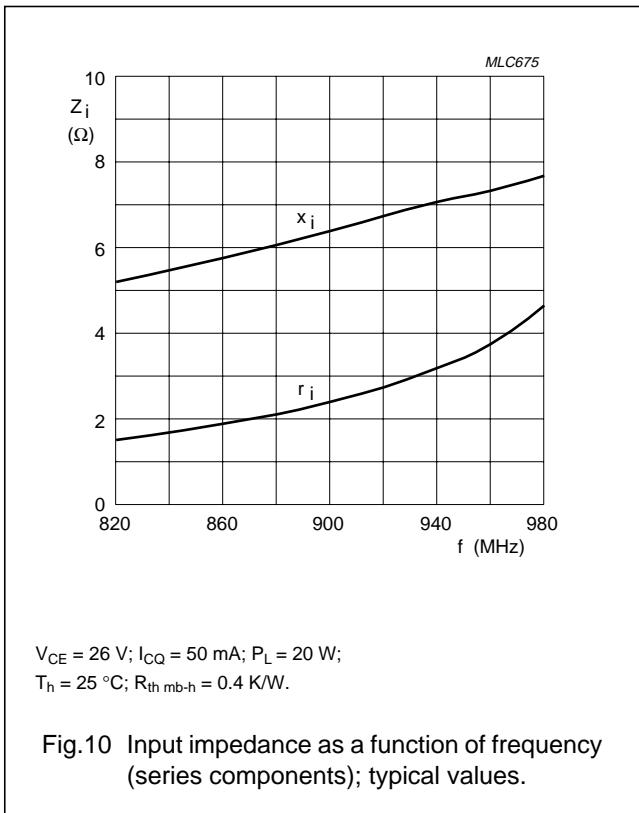
Dimensions in mm.

The components are located on one side of the PTFE fibre-glass board, the other side being fully metallized to serve as an earth. Earth connections are made by fixing screws, hollow rivets and copper straps around the board and under the emitters to provide a direct contact between the component side and the ground plane.

Fig.9 Component layout for 960 MHz class-AB test circuit.

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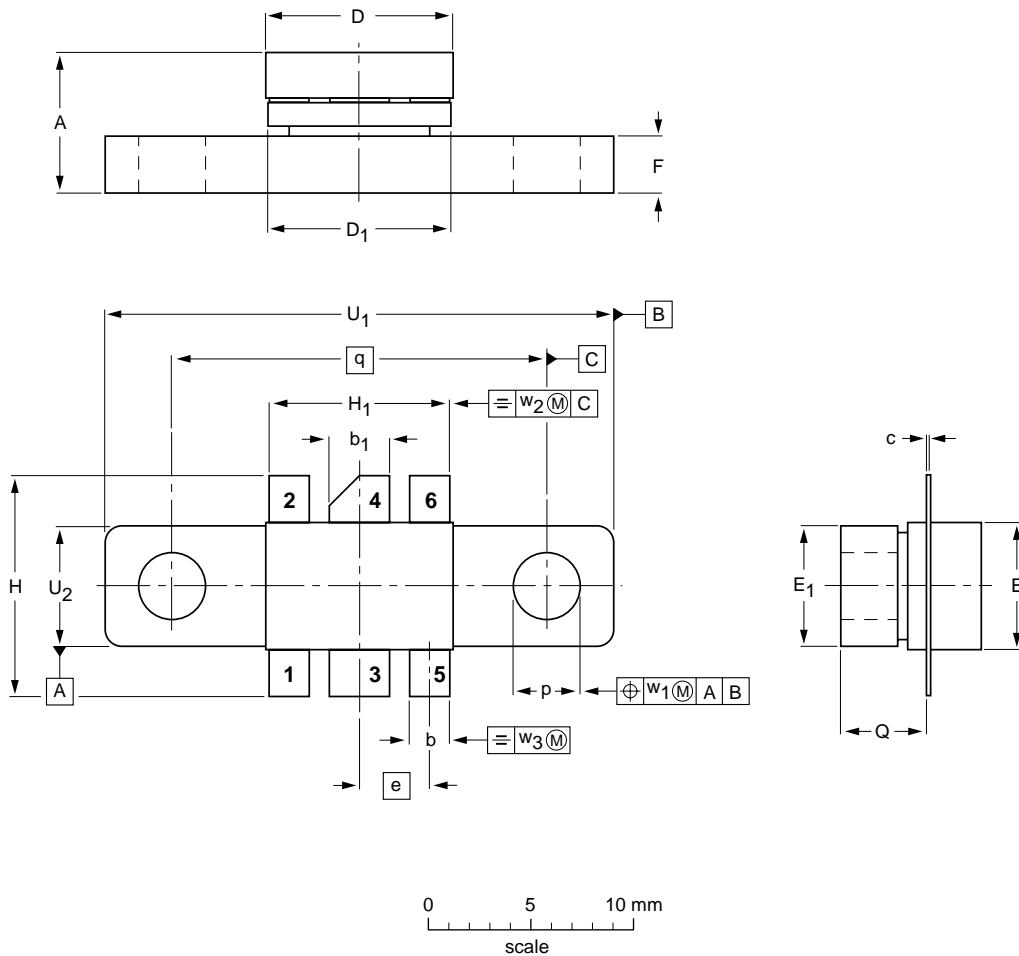
UHF power transistor

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PACKAGE OUTLINE

Flanged ceramic package; 2 mounting holes; 6 leads

SOT171A



DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A	b	b ₁	c	D	D ₁	E	E ₁	e	F	H	H ₁	p	Q	q	U ₁	U ₂	w ₁	w ₂	w ₃
mm	6.81 6.07	2.15 1.85	3.20 2.89	0.16 0.07	9.25 9.04	9.30 8.99	5.95 5.74	6.00 5.70	3.58	3.05 2.54	11.31 10.54	9.27 9.01	3.43 3.17	4.32 4.11	18.42	24.90 24.63	6.00 5.70	0.51	1.02	0.26
inches	0.268 0.239	0.085 0.073	0.126 0.114	0.006 0.003	0.364 0.356	0.366 0.354	0.234 0.226	0.236 0.224	0.140	0.120 0.100	0.445 0.415	0.365 0.355	0.135 0.125	0.170 0.162	0.725	0.980 0.970	0.236 0.224	0.02	0.04	0.01

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT171A						97-06-28

UHF power transistor

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DEFINITIONS

Data Sheet Status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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Australia: 34 Waterloo Road, NORTH RYDE, NSW 2113,
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Austria: Computerstr. 6, A-1101 WIEN, P.O. Box 213, Tel. +43 160 1010,
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Belarus: Hotel Minsk Business Center, Bld. 3, r. 1211, Volodarski Str. 6,
220050 MINSK, Tel. +375 172 200 733, Fax. +375 172 200 773

Belgium: see The Netherlands

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Bulgaria: Philips Bulgaria Ltd., Energoproject, 15th floor,
51 James Bourchier Blvd., 1407 SOFIA,
Tel. +359 2 689 211, Fax. +359 2 689 102

Canada: PHILIPS SEMICONDUCTORS/COMPONENTS,
Tel. +1 800 234 7381

China/Hong Kong: 501 Hong Kong Industrial Technology Centre,
72 Tat Chee Avenue, Kowloon Tong, HONG KONG,
Tel. +852 2319 7888, Fax. +852 2319 7700

Colombia: see South America

Czech Republic: see Austria

Denmark: Prags Boulevard 80, PB 1919, DK-2300 COPENHAGEN S,
Tel. +45 32 88 2636, Fax. +45 31 57 0044

Finland: Sinikalliontie 3, FIN-02630 ESPOO,
Tel. +358 9 615800, Fax. +358 9 61580920

France: 51 Rue Carnot, BP317, 92156 SURESNES Cedex,
Tel. +33 1 40 99 6161, Fax. +33 1 40 99 6427

Germany: Hammerbrookstraße 69, D-20097 HAMBURG,
Tel. +49 40 23 53 60, Fax. +49 40 23 536 300

Greece: No. 15, 25th March Street, GR 17778 TAVROS/ATHENS,
Tel. +30 1 4894 339/239, Fax. +30 1 4814 240

Hungary: see Austria

India: Philips INDIA Ltd, Band Box Building, 2nd floor,
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Tel. +91 22 493 8541, Fax. +91 22 493 0966

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Israel: RAPAC Electronics, 7 Kehilat Saloniki St, PO Box 18053,
TEL AVIV 61180, Tel. +972 3 645 0444, Fax. +972 3 649 1007

Italy: PHILIPS SEMICONDUCTORS, Piazza IV Novembre 3,
20124 MILANO, Tel. +39 2 6752 2531, Fax. +39 2 6752 2557

Japan: Philips Bldg 13-37, Kohnan 2-chome, Minato-ku, TOKYO 108,
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Korea: Philips House, 260-199 Itaewon-dong, Yongsan-ku, SEOUL,
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Malaysia: No. 76 Jalan Universiti, 46200 PETALING JAYA, SELANGOR,
Tel. +60 3 750 5214, Fax. +60 3 757 4880

Mexico: 5900 Gateway East, Suite 200, EL PASO, TEXAS 79905,
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Middle East: see Italy

Netherlands: Postbus 90050, 5600 PB EINDHOVEN, Bldg. VB,
Tel. +31 40 27 82785, Fax. +31 40 27 88399

New Zealand: 2 Wagener Place, C.P.O. Box 1041, AUCKLAND,
Tel. +64 9 849 4160, Fax. +64 9 849 7811

Norway: Box 1, Manglerud 0612, OSLO,
Tel. +47 22 74 8000, Fax. +47 22 74 8341

Philippines: Philips Semiconductors Philippines Inc.,
106 Valero St. Salcedo Village, P.O. Box 2108 MCC, MAKATI,
Metro MANILA, Tel. +63 2 816 6380, Fax. +63 2 817 3474

Poland: Ul. Lukiska 10, PL 04-123 WARSZAWA,
Tel. +48 22 612 2831, Fax. +48 22 612 2327

Portugal: see Spain

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Russia: Philips Russia, Ul. Usatcheva 35A, 119048 MOSCOW,
Tel. +7 095 755 6918, Fax. +7 095 755 6919

Singapore: Lorong 1, Toa Payoh, SINGAPORE 1231,
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South America: Al. Vicente Pinzon, 173, 6th floor,
04547-130 SÃO PAULO, SP, Brazil,
Tel. +55 11 821 2333, Fax. +55 11 821 2382

Spain: Balmes 22, 08007 BARCELONA,
Tel. +34 3 301 6312, Fax. +34 3 301 4107

Sweden: Kottbygatan 7, Akalla, S-16485 STOCKHOLM,
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Tel. +41 1 488 2686, Fax. +41 1 481 7730

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Turkey: Talatpasa Cad. No. 5, 80640 GÜLTEPE/ISTANBUL,
Tel. +90 212 279 2770, Fax. +90 212 282 6707

Ukraine: PHILIPS UKRAINE, 4 Patrice Lumumba str., Building B, Floor 7,
252042 KIEV, Tel. +380 44 264 2776, Fax. +380 44 268 0461

United Kingdom: Philips Semiconductors Ltd., 276 Bath Road, Hayes,
MIDDLESEX UB3 5BX, Tel. +44 181 730 5000, Fax. +44 181 754 8421

United States: 811 East Arques Avenue, SUNNYVALE, CA 94088-3409,
Tel. +1 800 234 7381

Uruguay: see South America

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