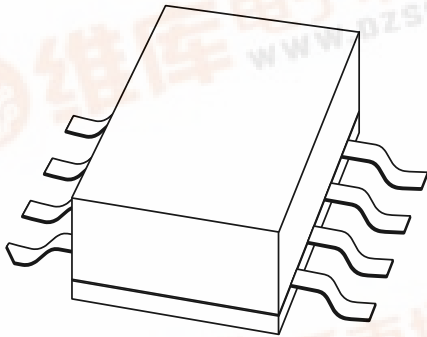


DISCRETE SEMICONDUCTORS

DATA SHEET



BLT52 UHF power transistor

Product specification
Supersedes data of 1997 Oct 15

1998 Jan 28

UHF power transistor

BLT52

FEATURES

- Emitter ballasting resistors for an optimum temperature profile
- Gold metallization ensures excellent reliability.

APPLICATIONS

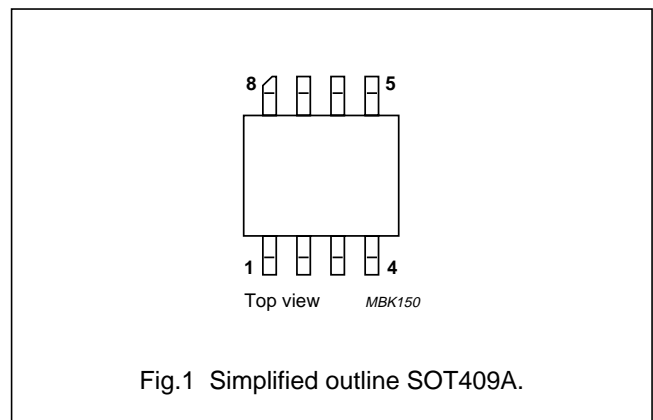
- Common emitter class-B operation in portable radio transmitters in the 470 MHz communication band.

DESCRIPTION

NPN silicon planar epitaxial power transistor encapsulated in a ceramic SOT409A SMD package.

PINNING

PIN	DESCRIPTION
1, 4, 5, 8	emitter
2, 3	base
6, 7	collector



QUICK REFERENCE DATA

RF performance at $T_{mb} \leq 60 \text{ }^\circ\text{C}$ in a common emitter test circuit.

MODE OF OPERATION	f (MHz)	V _{CE} (V)	P _L (W)	G _p (dB)	η_c (%)
CW, class-B	470	7.5	7	≥ 8 typ. 9.5	≥ 50 typ. 65
		6	3	≥ 8 typ. 9.5	≥ 50 typ. 55

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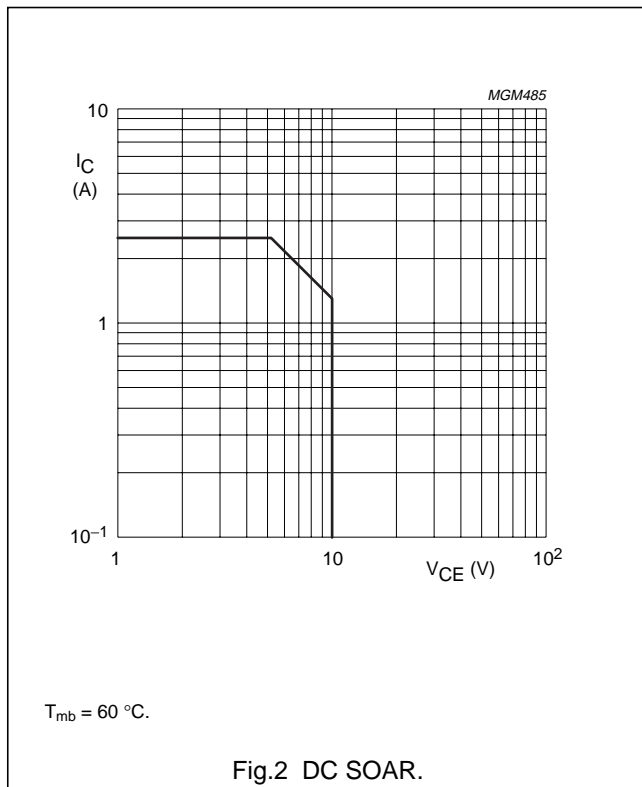
LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V _{CBO}	collector-base voltage	open emitter	–	20	V
V _{CEO}	collector-emitter voltage	open base	–	10	V
V _{EBO}	emitter-base voltage	open collector	–	3	V
I _C	collector current (DC)		–	2.5	A
P _{tot}	total power dissipation	T _{mb} ≤ 60 °C	–	13	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} = 13 W; T _{mb} ≤ 60 °C	8	K/W



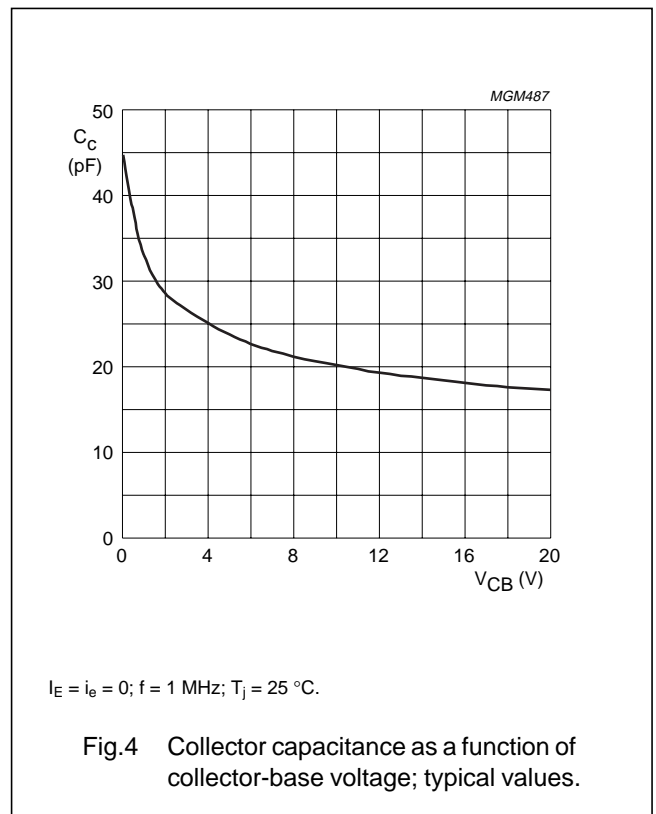
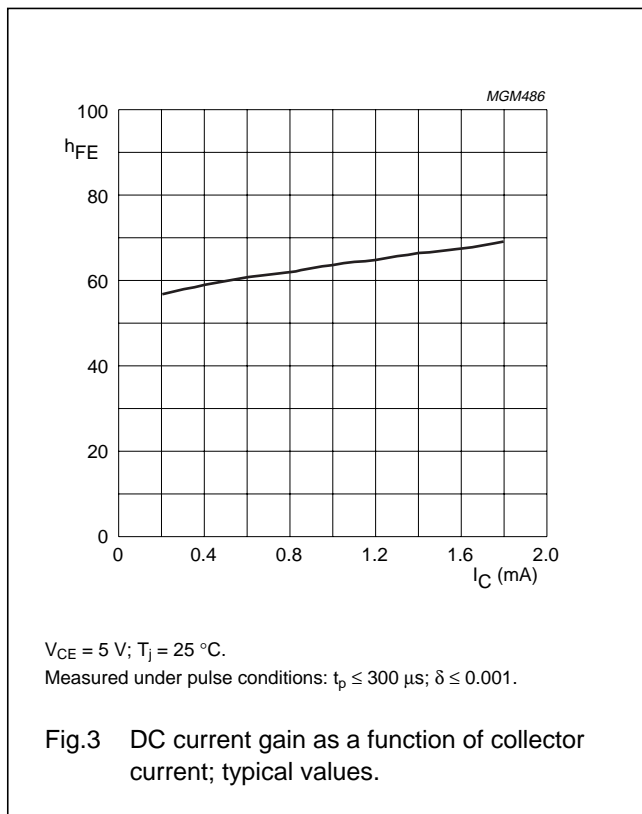
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CHARACTERISTICS

$T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	open emitter; $I_C = 20\text{ mA}$	20	–	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	open base; $I_C = 40\text{ mA}$	10	–	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; $I_E = 4\text{ mA}$	3	–	–	V
I_{CES}	collector leakage current	$V_{BE} = 0; V_{CE} = 7.5\text{ V}$	–	–	1	mA
h_{FE}	DC current gain	$I_C = 1.2\text{ A}; V_{CE} = 5\text{ V}$	25	–	–	
C_c	collector capacitance	$I_E = i_e = 0; V_{CB} = 7.5\text{ V}; f = 1\text{ MHz}$	–	24	–	pF
C_{re}	feedback capacitance	$I_C = 0; V_{CE} = 7.5\text{ V}; f = 1\text{ MHz}$	–	17	–	pF



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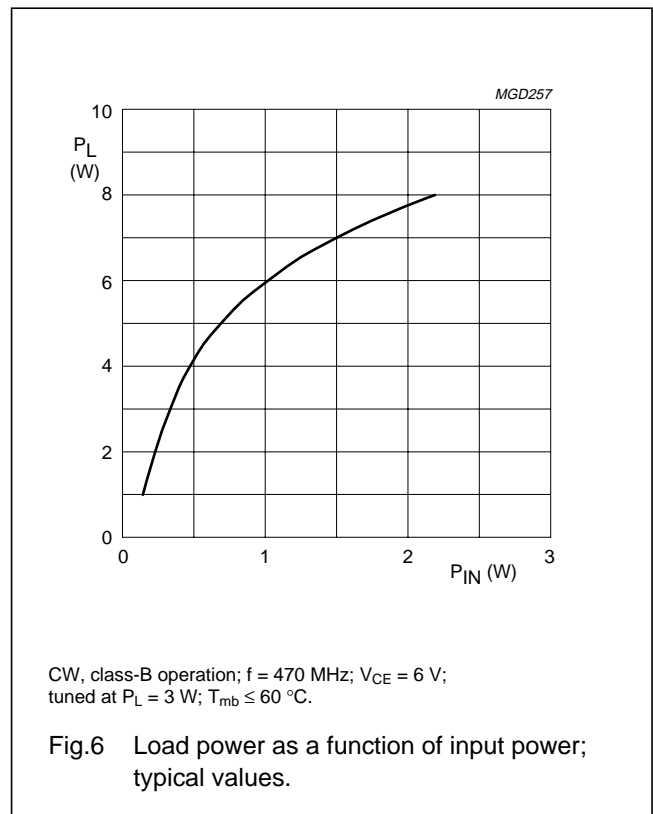
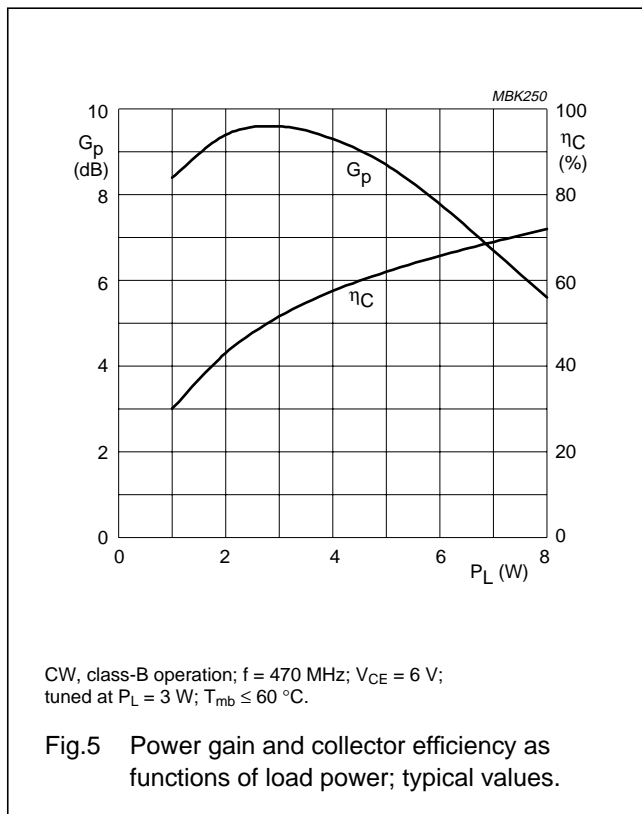
APPLICATION INFORMATION

RF performance at $T_{mb} \leq 60\text{ }^\circ\text{C}$ in a common emitter test circuit.

MODE OF OPERATION	f (MHz)	V _{CE} (V)	P _L (W)	G _p (dB)	η_c (%)
CW, class-B	470	7.5	7	≥ 8 typ. 9.5	≥ 50 typ. 65
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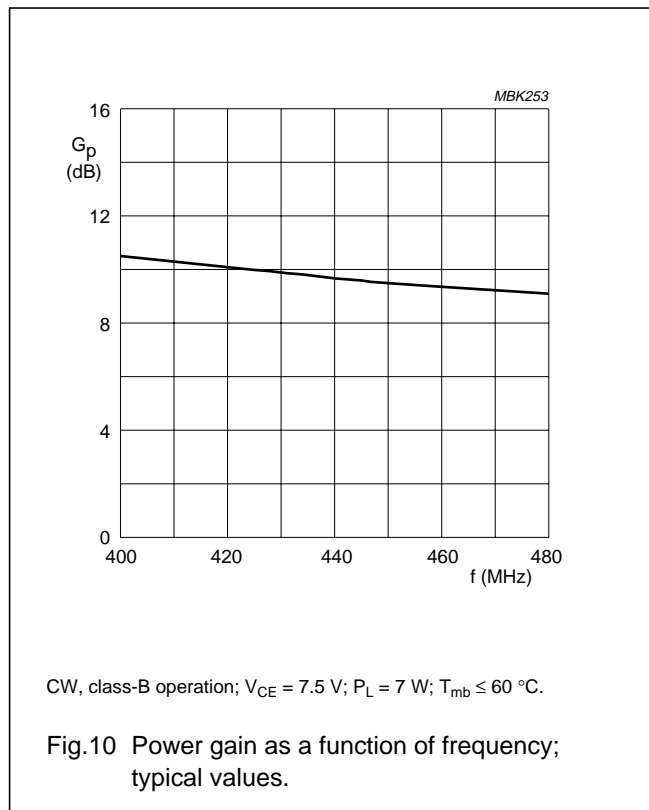
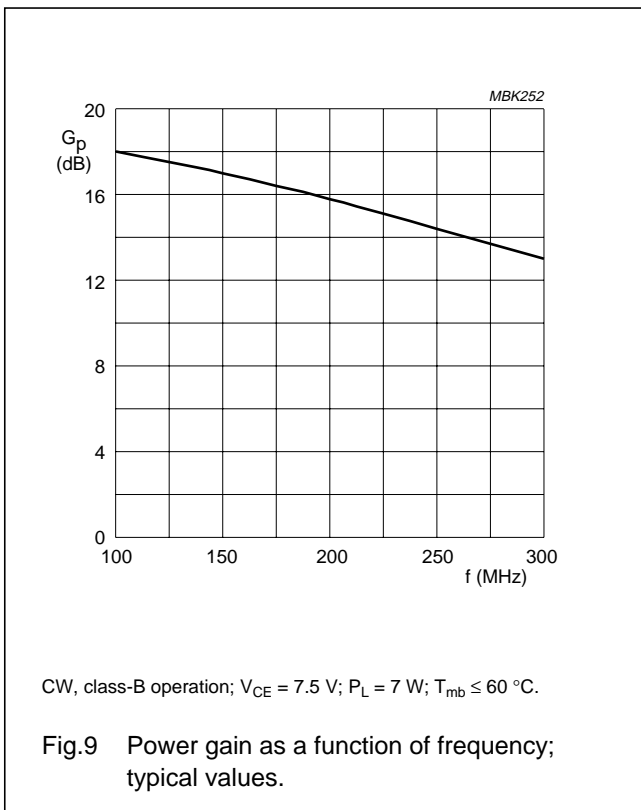
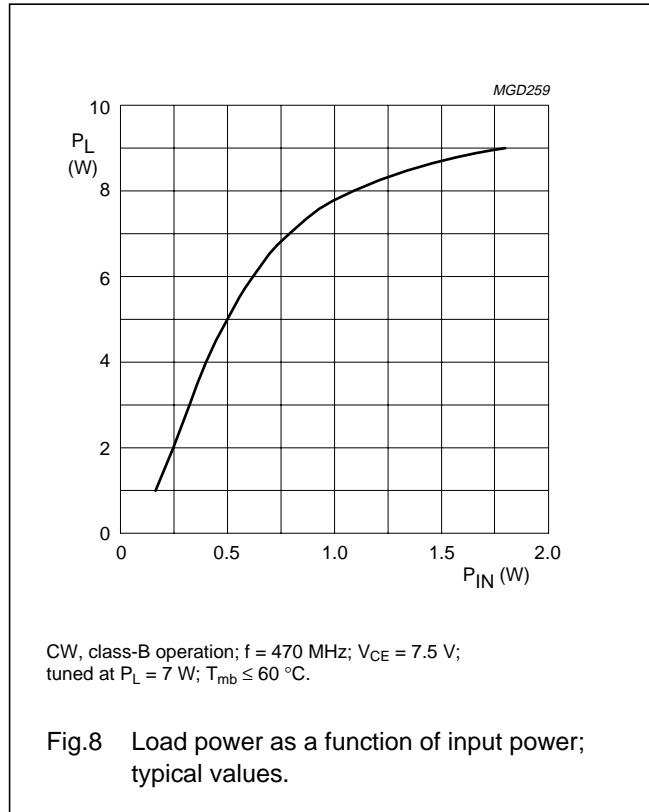
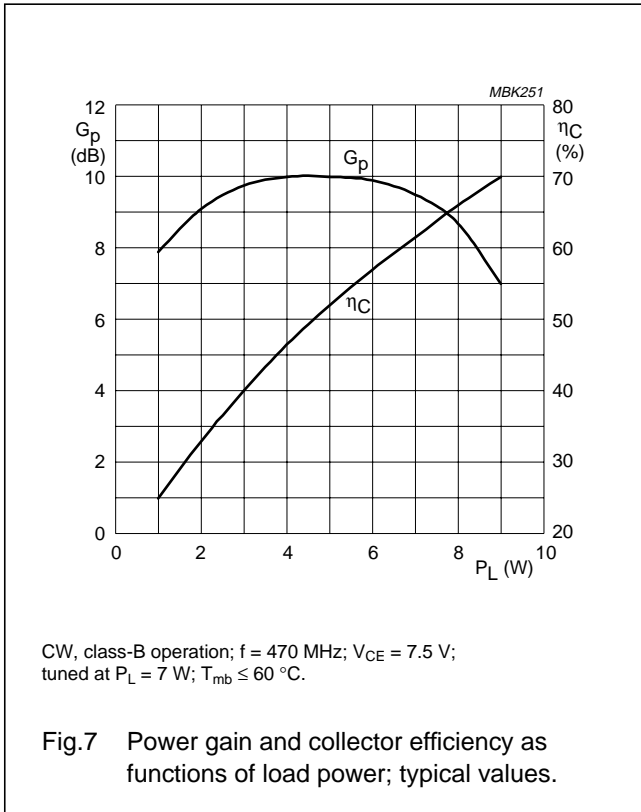
Ruggedness in class-B operation

The BLT52 is capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: CW, class-B operation; f = 470 MHz; V_{CE} = 9 V and P_L = 7 W; T_{mb} ≤ 60 °C.



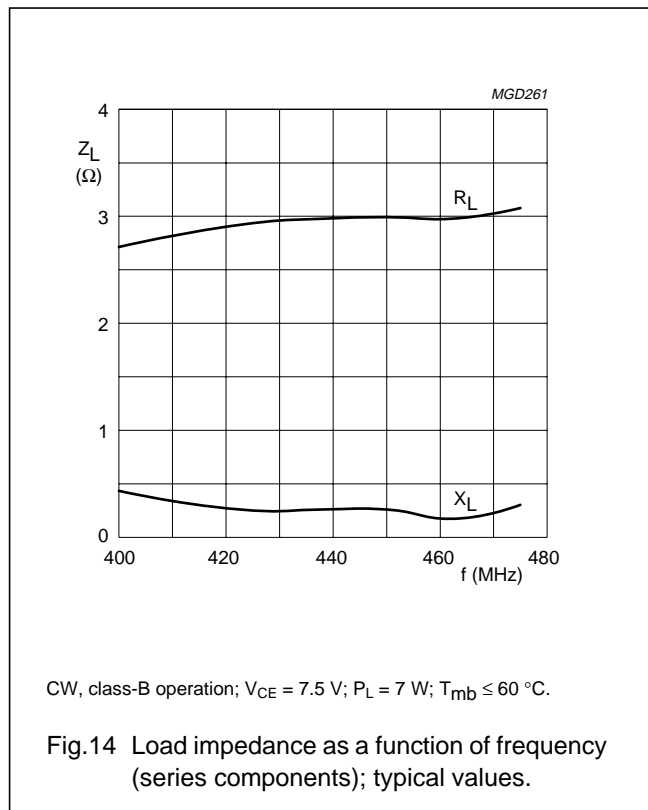
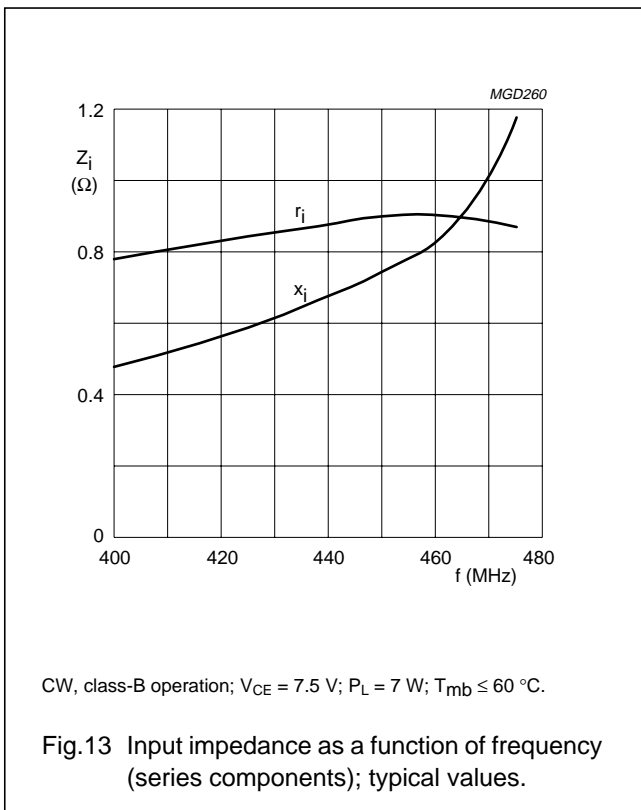
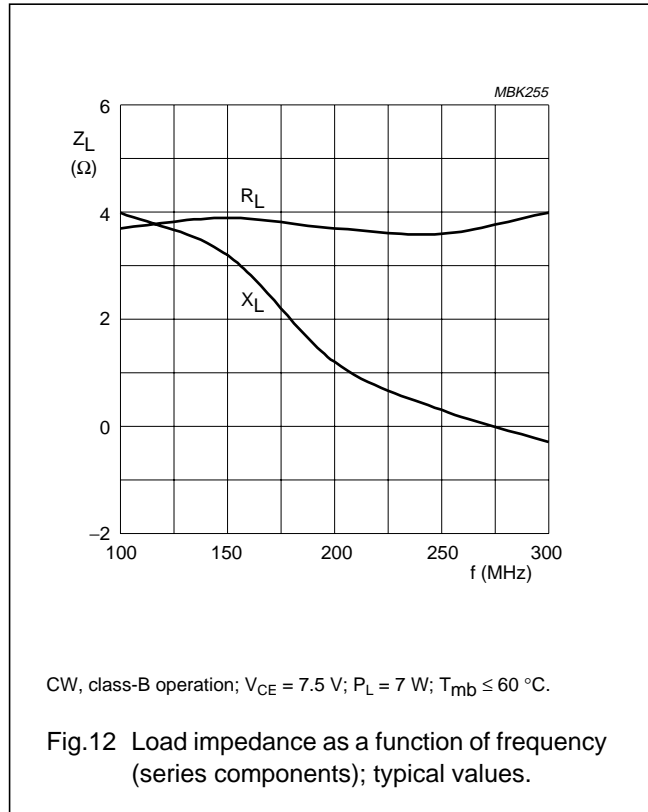
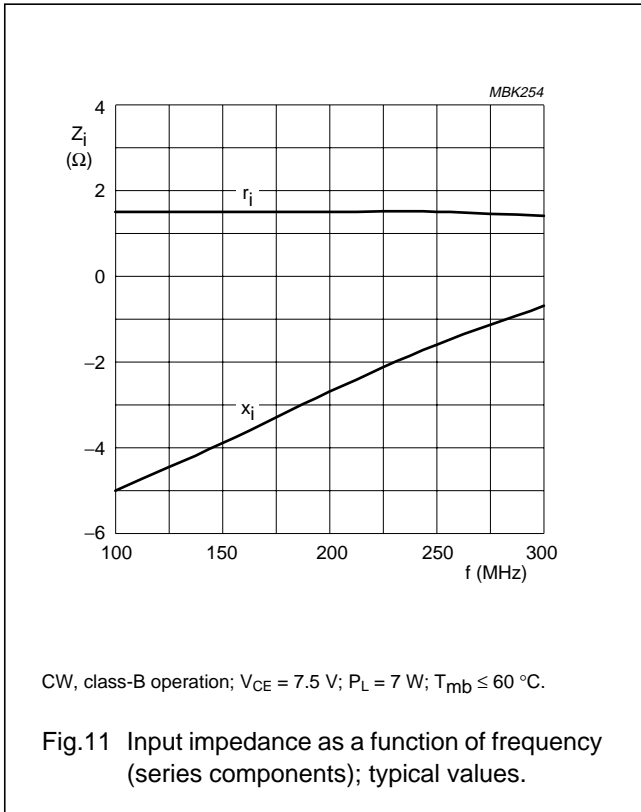
UHF power transistor

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UHF power transistor

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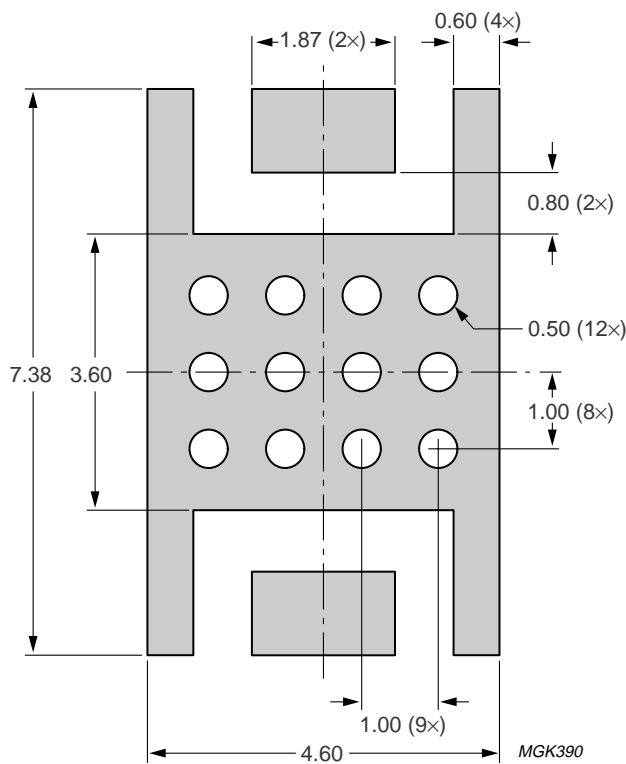
UHF power transistor

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MOUNTING RECOMMENDATIONS

Both the metallized groundplate and leads contribute to the heatflow. It is recommended that the transistor is mounted on a grounded metallized area of a maximum thickness of 0.8 mm on the printed-circuit board, equipped with at least 12 (0.5 mm diameter) through metallized holes filled with solder.

A thermal resistance $R_{th(mb-h)}$ of 5 K/W can be achieved if heatsink compound is applied when the transistor is mounted on the printed-circuit board.



Dimensions in mm.

Fig.15 Reflow soldering footprint for SOT409A.

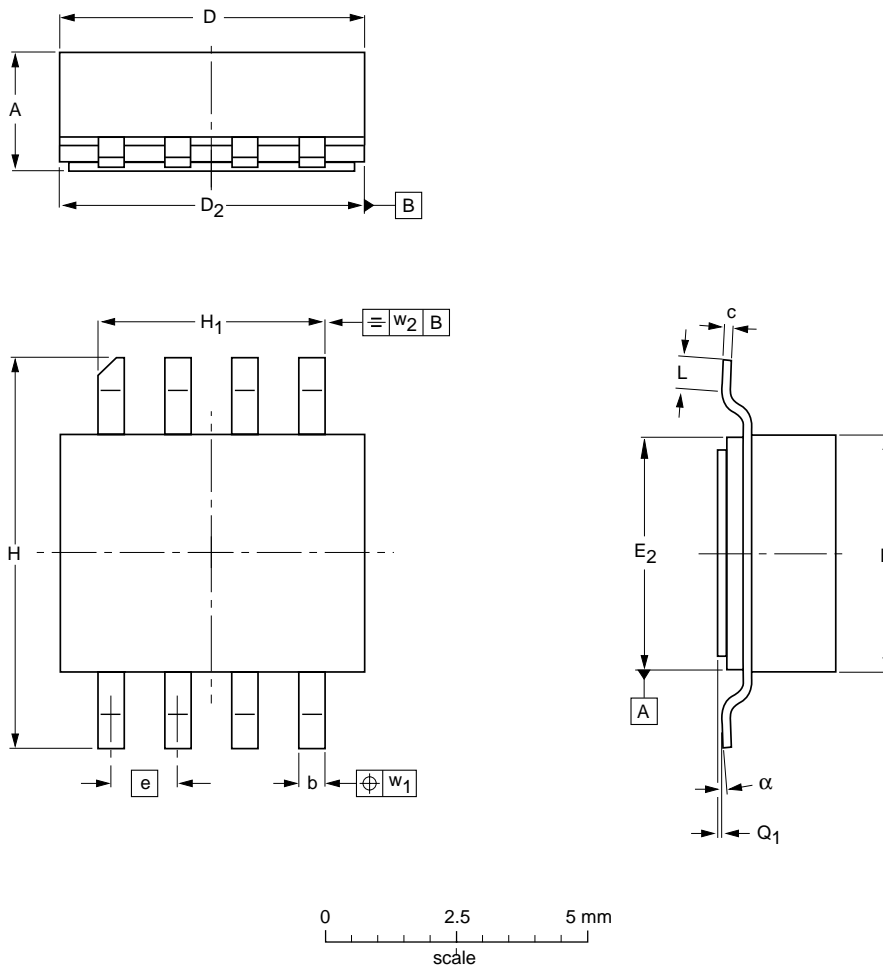
UHF power transistor

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PACKAGE OUTLINE

Ceramic surface mounted package; 8 leads

SOT409A



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

UNIT	A	b	c	D	D ₂	E	E ₂	e	H	H ₁	L	Q ₁	w ₁	w ₂	α
mm	2.36 2.06	0.58 0.43	0.23 0.18	5.94 5.03	5.16 5.00	4.93 4.01	4.14 3.99	1.27	7.47 7.26	4.39 4.24	1.02 0.51	0.10 0.00	0.25	0.25	7° 0°
inches	0.093 0.081	0.023 0.017	0.009 0.007	0.234 0.198	0.203 0.197	0.194 0.158	0.163 0.157	0.050	0.294 0.286	0.173 0.167	0.040 0.020	0.004 0.000	0.010	0.010	7° 0°

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT409A					97-06-28

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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.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

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