

DATA SHEET

PZB16035U

NPN microwave power transistor

Product specification
Supersedes data of June 1992
File under Discrete Semiconductors, SC15

1997 Feb 18

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FEATURES

- Interdigitated structure provides high emitter efficiency
- Diffused emitter ballasting resistors providing excellent current sharing and withstanding a high VSWR
- Gold metallization realizes very stable characteristics and excellent lifetime
- Multicell geometry gives good balance of dissipated power and low thermal resistance.
- Input matching cell improves input impedance and allows an easier design of wideband circuits.

APPLICATIONS

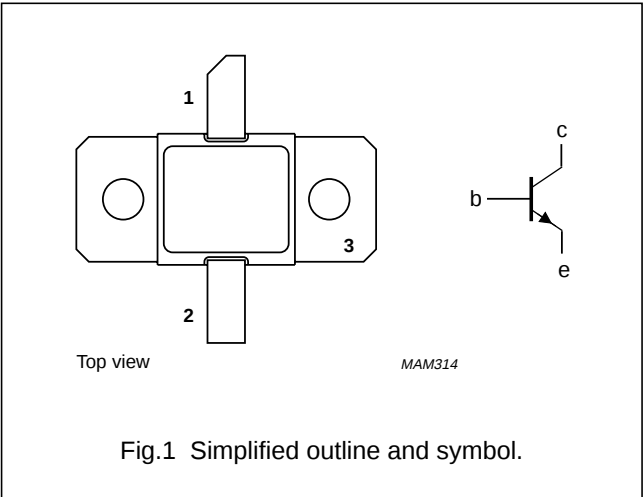
- Common base class-B power amplifiers under CW conditions in military and professional applications up to 1.6 GHz.

DESCRIPTION

NPN silicon planar epitaxial microwave power transistor in a SOT443A metal ceramic flange package with the base connected to the flange.

PINNING - SOT443A

PIN	DESCRIPTION
1	collector
2	emitter
3	base connected to flange



QUICK REFERENCE DATA

RF performance up to $T_{mb} = 25\text{ }^{\circ}\text{C}$ in a common base class-B selective amplifier.

MODE OF OPERATION	f (GHz)	V _{CC} (V)	P _L (W)	G _p (dB)	η _c (%)	Z _i ; Z _L (Ω)
Class-B (CW)	1.55	28	≥35	≥8	≥45	see Figs 5 and 6

WARNING
Product and environmental safety - toxic materials
This product contains beryllium oxide. The product is entirely safe provided that the BeO slab 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	–	40	V
V_{CEO}	collector-emitter voltage	open base	–	15	V
V_{CES}	collector-emitter voltage	$R_{BE} = 0 \Omega$	–	35	V
V_{EBO}	emitter-base voltage	open collector	–	3	V
I_C	collector current (DC)		–	4	A
P_{tot}	total power dissipation	$T_{mb} = 75^\circ\text{C}$	–	45	W
T_{stg}	storage temperature		–65	+200	$^\circ\text{C}$
T_j	operating junction temperature		–	200	$^\circ\text{C}$
T_{sld}	soldering temperature	Up to 0.2 mm from the flange; $t < 10 \text{ s}$	–	235	$^\circ\text{C}$

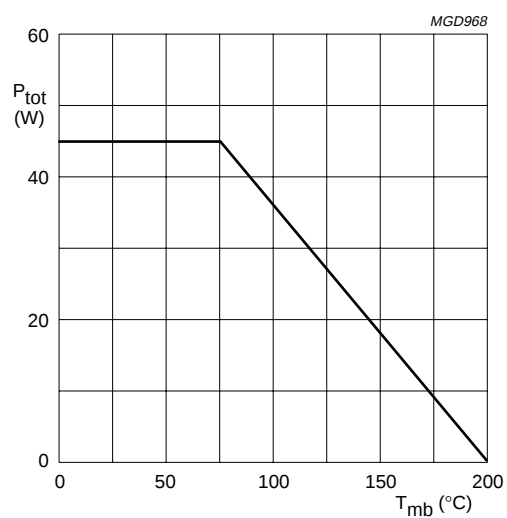


Fig.2 Power derating curve.

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
$R_{th\ j-mb}$	thermal resistance from junction to mounting-base	$T_j = 75\text{ }^{\circ}\text{C}$	2.2	K/W
$R_{th\ mb-h}$	thermal resistance from mounting-base to heatsink	$T_j = 75\text{ }^{\circ}\text{C}$; note 1	0.2	K/W

Note

1. See “Mounting recommendations in the General part of handbook SC15”.

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	$V_{CB} = 40\text{ V}; I_E = 0$	–	10	mA
		$V_{CB} = 30\text{ V}; I_E = 0$	–	5	mA
I_{CES}	collector cut-off current	$V_{CER} = 35\text{ V}; R_{BE} = 0$	–	50	mA
I_{EBO}	emitter cut-off current	$V_{EB} = 1.5\text{ V}; I_C = 0$	–	200	μA
C_{cb}	collector-base capacitance	$V_{CB} = 28\text{ V}; I_E = I_C = 0$	17	–	pF

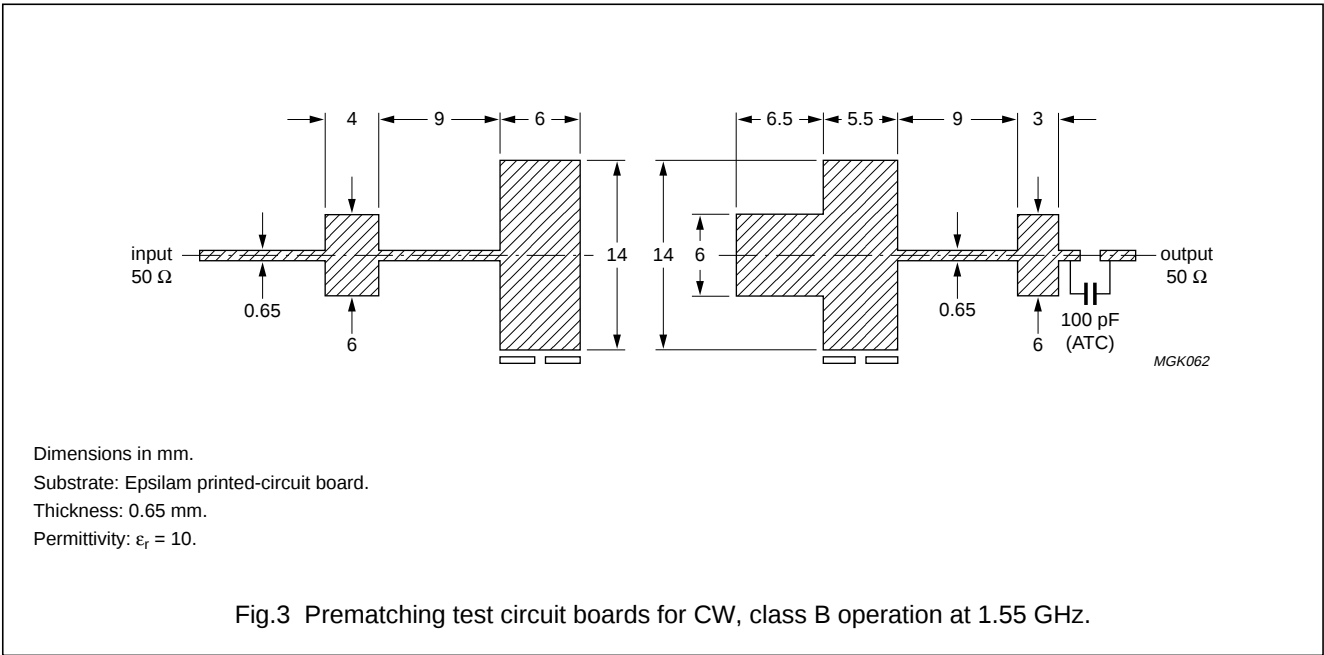
APPLICATION INFORMATION

Microwave performance up to $T_{mb} = 25\text{ }^{\circ}\text{C}$ in a common base class B selective amplifier; note 1.

MODE OF OPERATION	f (GHz)	V_{CC} (V)	P_L (W)	G_p (dB)	η_c (%)	$Z_i; Z_L$ (Ω)
Class B (CW)	1.55	28	>35; typ. 38	>8; typ. 9.8	>45; typ. 50	see Figs 5 and 6

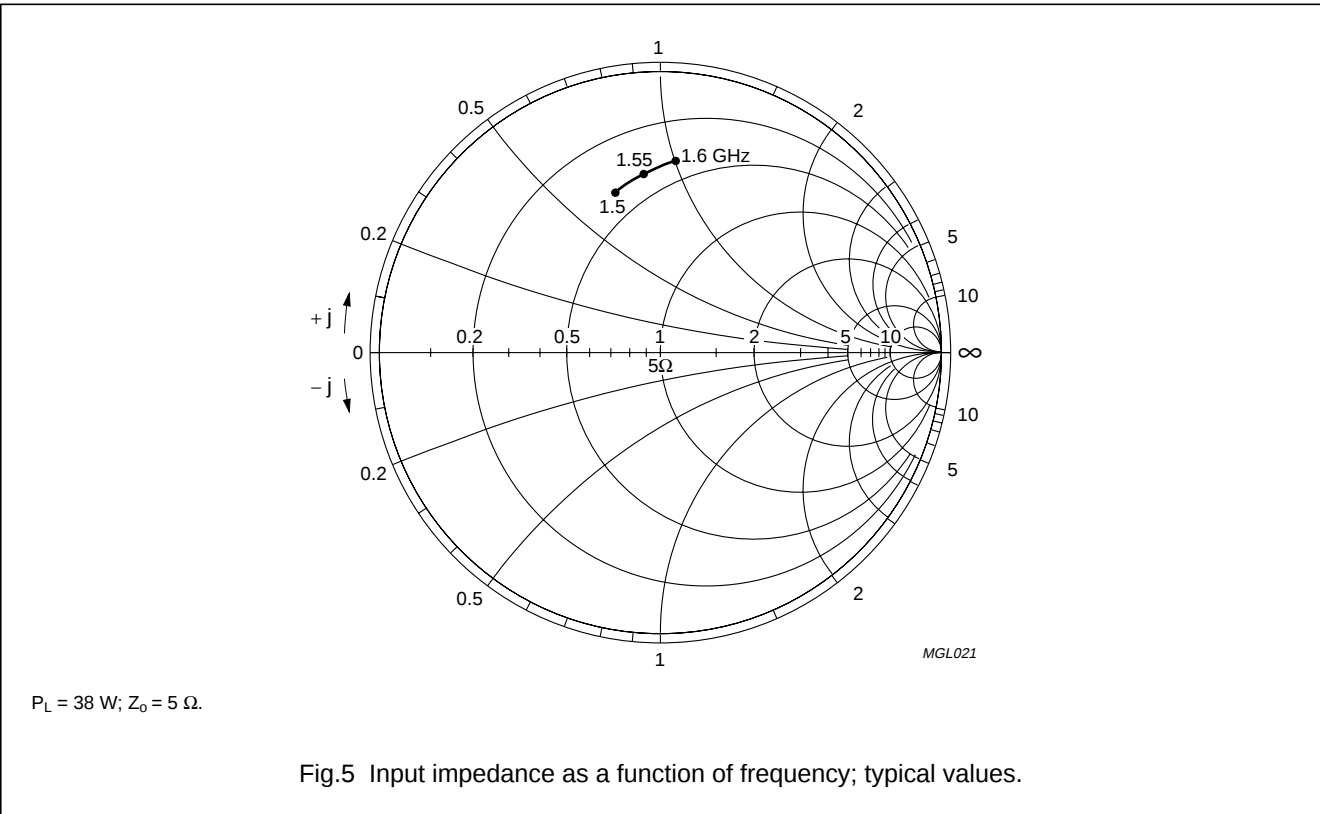
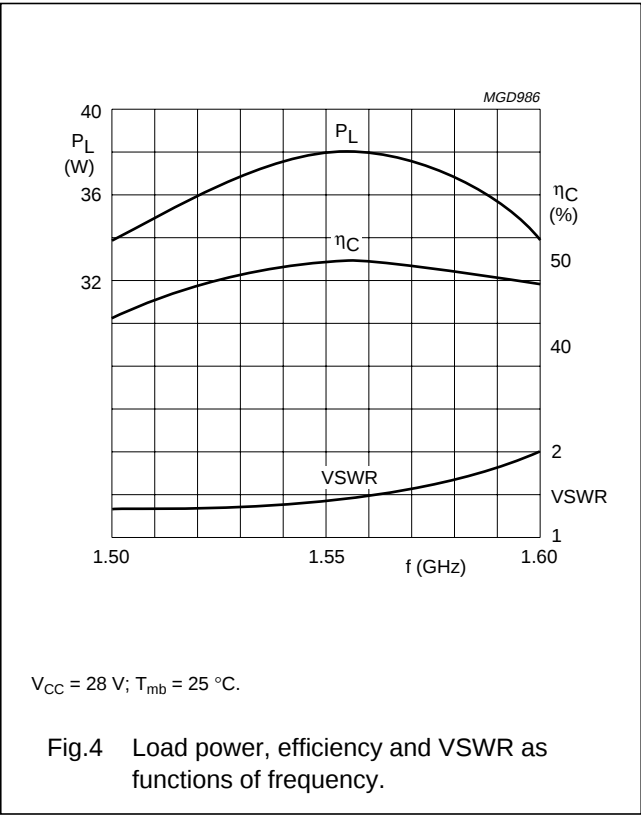
Note

1. Amplifier consists of pre-matching test-circuit with complementary input and output slug tuners.



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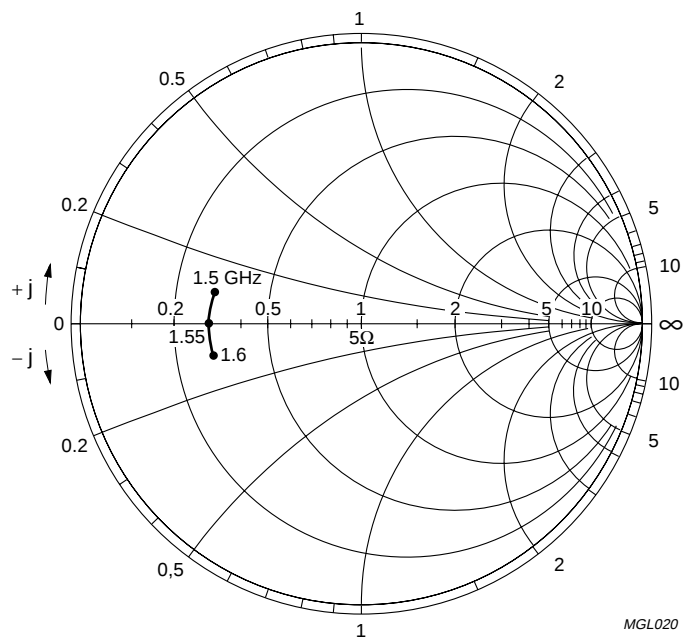
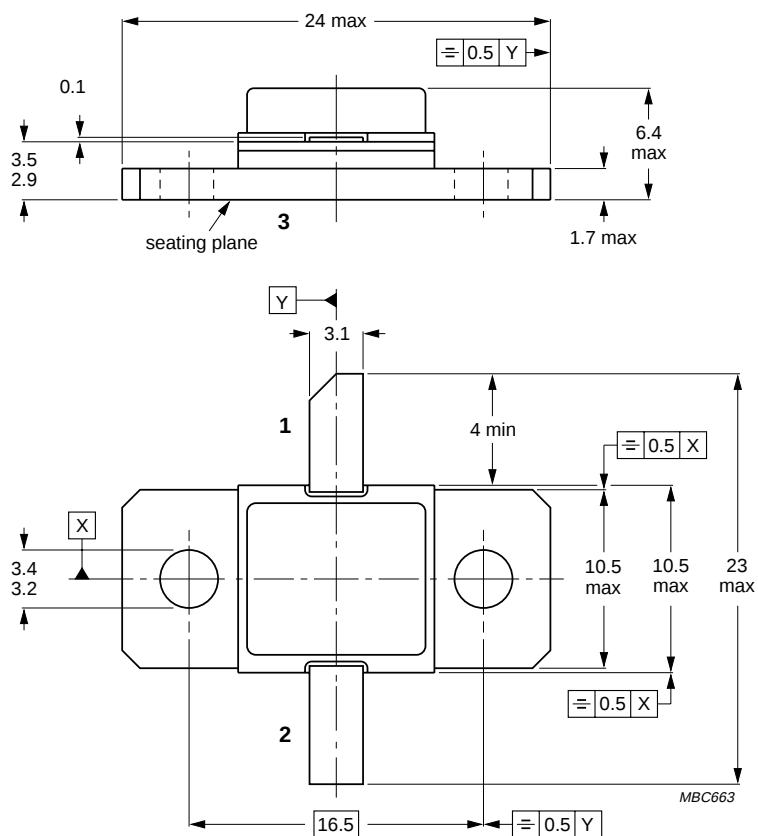
 $P_L = 38 \text{ W}; Z_0 = 5 \Omega.$

Fig.6 Optimum load impedance as a function of frequency; typical values.

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PACKAGE OUTLINE



Dimensions in mm.
 Torque on screw: Max. 0.5 Nm.
 Recommended screw: M3.

Fig.7 SOT443A.

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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

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NOTES

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