

# DATA SHEET

**LV2024E45R**

**NPN microwave power transistor**

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

1997 Feb 18

# NPN microwave power transistor

# LV2024E45R

### FEATURES

- Interdigitated structure provides high emitter efficiency
- Diffused emitter ballasting resistor provides 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
- Internal input and output prematching ensures good stability and allows an easier design of wideband circuits.

### APPLICATIONS

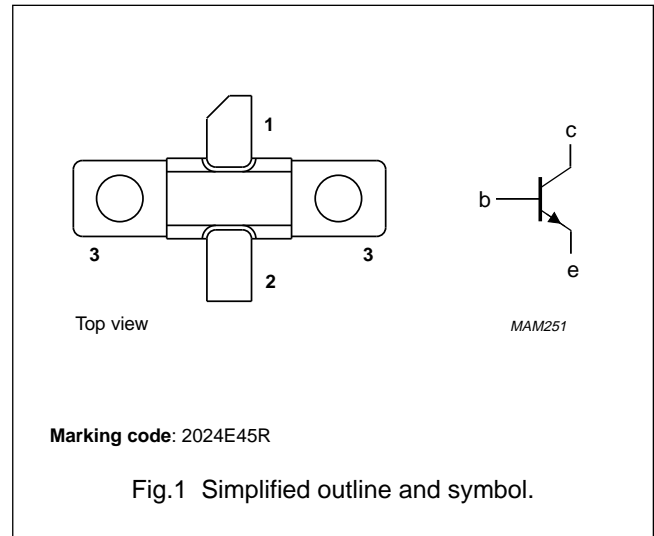
- Common emitter class-A amplifiers in CW conditions for military and professional applications in the 2 to 2.4 GHz band.

### DESCRIPTION

NPN silicon planar epitaxial microwave power transistor in a SOT445A metal ceramic flange package with the emitter connected to the flange.

### PINNING - SOT445A

PIN	DESCRIPTION
1	collector
2	base
3	emitter connected to flange



### QUICK REFERENCE DATA

Microwave performance up to  $T_{mb} = 25\text{ °C}$  in a common emitter class-A wideband amplifier.

MODE OF OPERATION	f (GHz)	$V_{CE}$ (V)	$I_C$ (A)	$P_{L1}$ (W)	$G_{po}$ (dB)	$Z_i; Z_L$ ( $\Omega$ )
Class-A (CW)	2 to 2.4	16	1.1	$\geq 4$	$\geq 6$	see Fig 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.

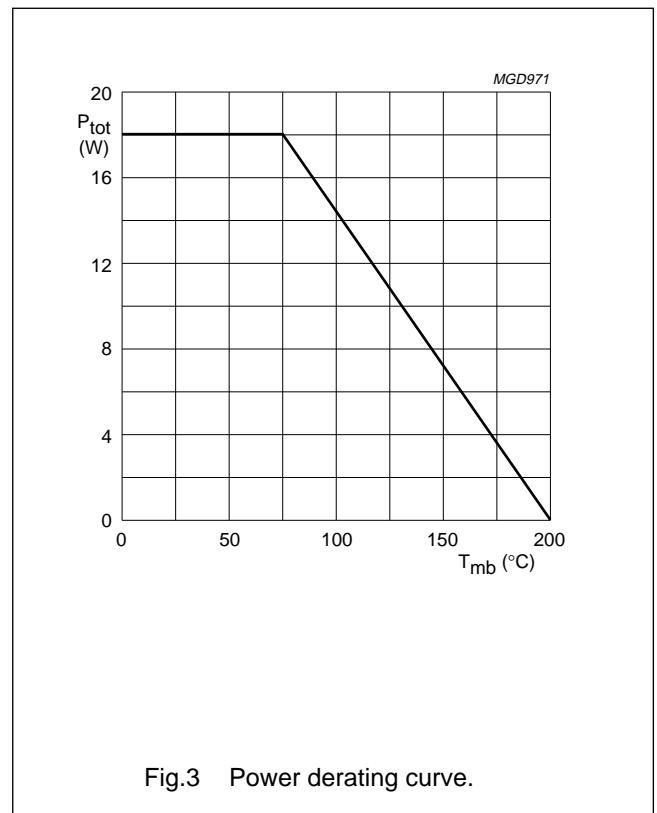
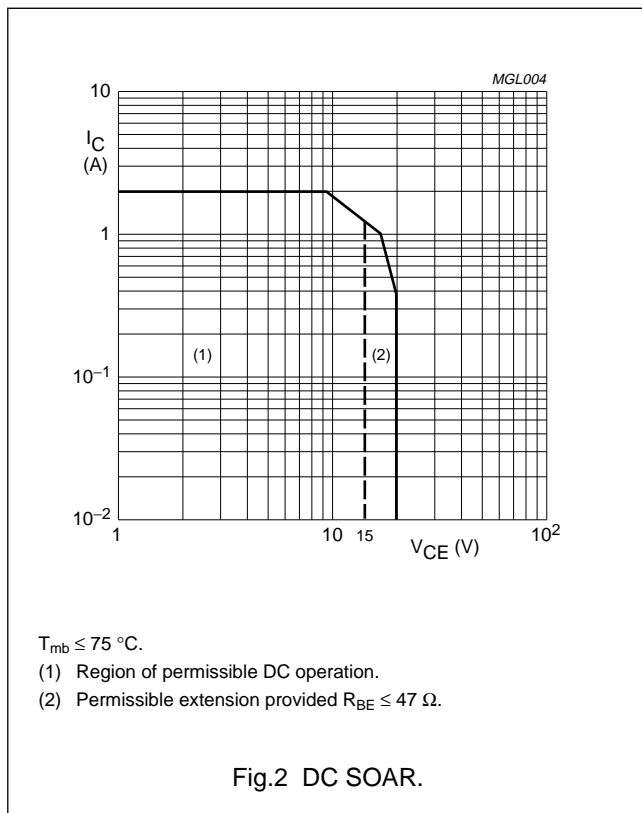
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**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter	–	40	V
V <sub>CER</sub>	collector-emitter voltage	R <sub>BE</sub> = 47 Ω	–	20	V
V <sub>CEO</sub>	collector-emitter voltage	open base	–	15	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	3	V
I <sub>C</sub>	collector current (DC)		–	2	A
P <sub>tot</sub>	total power dissipation	T <sub>mb</sub> ≤ 75 °C	–	18	W
T <sub>stg</sub>	storage temperature		–65	+200	°C
T <sub>j</sub>	operating junction temperature		–	200	°C
T <sub>slid</sub>	soldering temperature	at 0.1 mm from case; t ≤ 10 s	–	235	°C



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## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
$R_{th\ j-mb}$	thermal resistance from junction to mounting-base	$T_j = 75\text{ }^\circ\text{C}$	4	K/W
$R_{th\ mb-h}$	thermal resistance from mounting-base to heatsink	$T_j = 75\text{ }^\circ\text{C}$ ; note 1	0.7	K/W

### Note

- See "Mounting recommendations in the General part of handbook SC15".

## CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{CBO}$	collector cut-off current	$V_{CB} = 20\text{ V}; I_E = 0$	–	0.5	mA
		$V_{CB} = 40\text{ V}; I_E = 0$	–	2.5	mA
$I_{CER}$	collector cut-off current	$V_{CE} = 20\text{ V}; R_{BE} = 47\ \Omega$	–	25	mA
$I_{CEO}$	collector cut-off current	$V_{CE} = 15\text{ V}; I_B = 0$	–	2	mA
$I_{EBO}$	emitter cut-off current	$V_{EB} = 1.5\text{ V}; I_C = 0$	–	100	$\mu\text{A}$
$h_{FE}$	DC current gain	$V_{CE} = 3\text{ V}; I_C = 1\text{ A}$	15	100	

## APPLICATION INFORMATION

Microwave performance up to  $T_{mb} = 25\text{ }^\circ\text{C}$  in a common emitter class-A wideband amplifier.

MODE OF OPERATION	f (GHz)	$V_{CE}$ (V)	$I_C$ (A)	$P_{L1}$ (W)	$G_{po}$ (dB)	$Z_i; Z_L$ ( $\Omega$ )
Class-A (CW)	2 to 2.4	16	1.1	$\geq 4$ ; typ. 5	$\geq 6$ ; typ. 7	see Fig 6

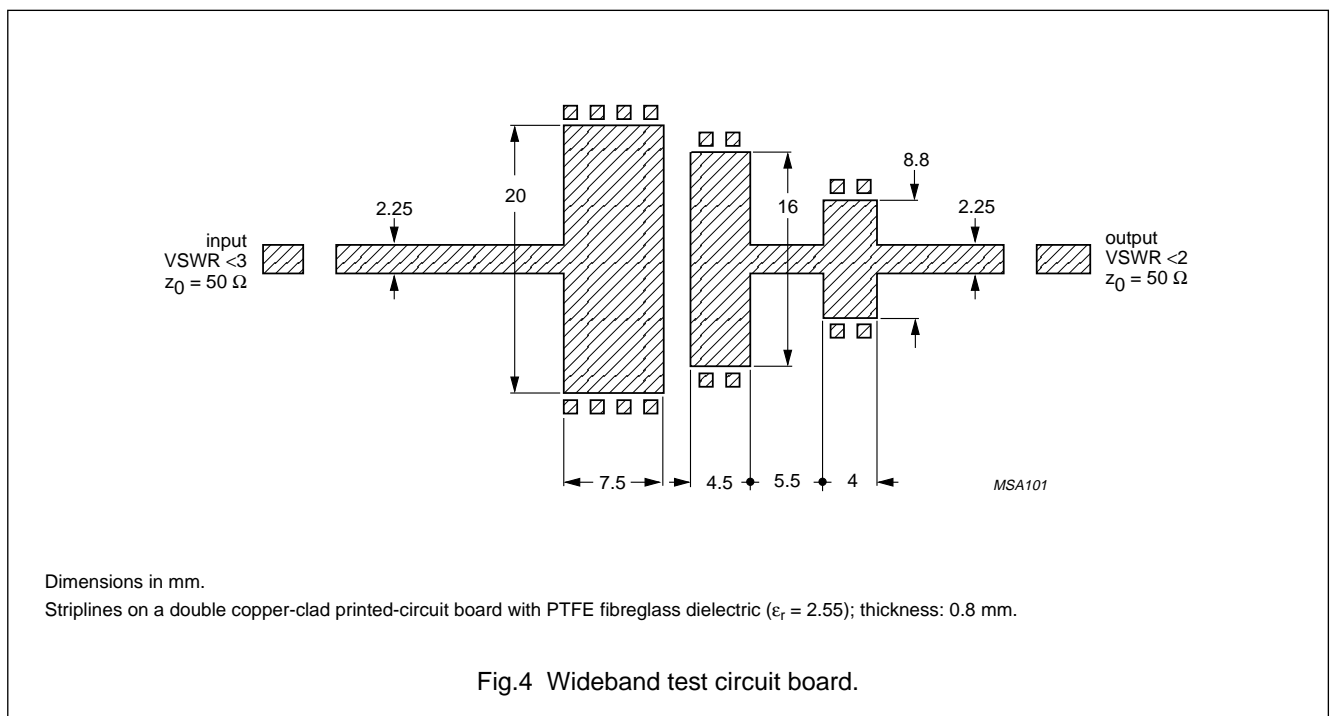
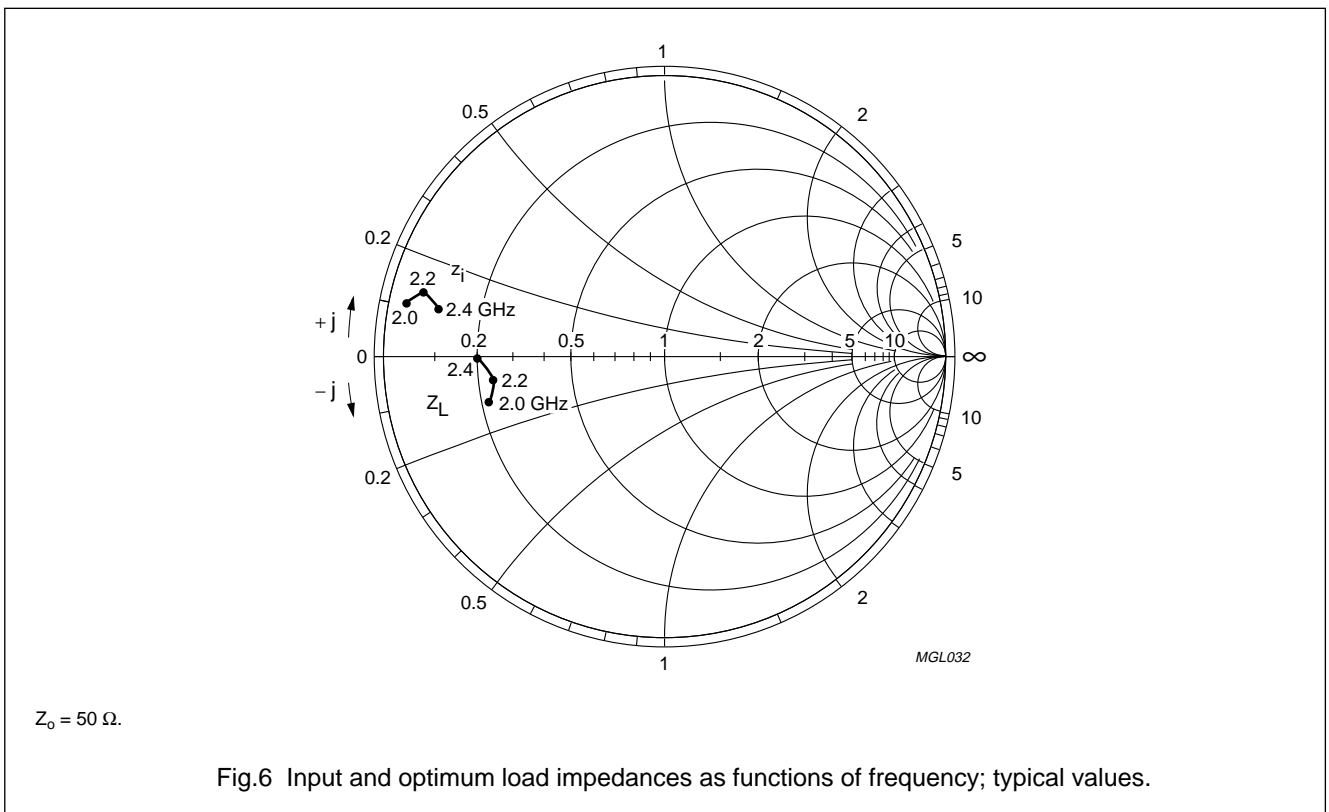
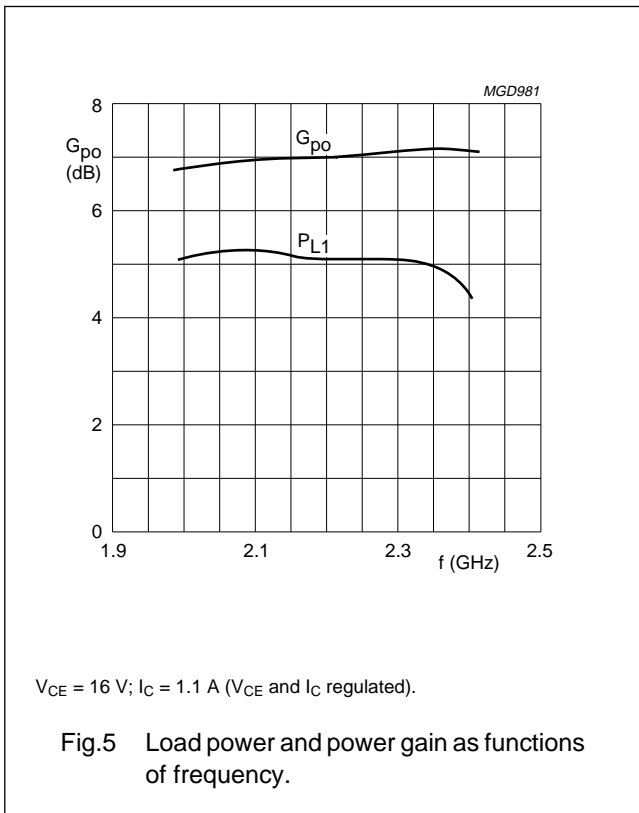


Fig.4 Wideband test circuit board.

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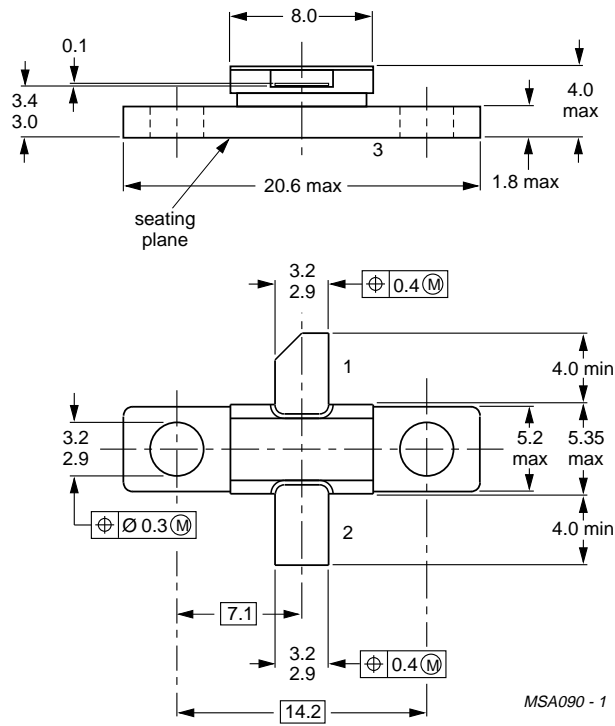
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PACKAGE OUTLINE



Dimensions in mm.  
 Torque on screw: Max. 0.4 Nm.  
 Recommended screw: M2.5 or cheesehead 4-40 UNC/2A.

Fig.7 SOT445A.

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**DEFINITIONS**

<b>Data Sheet Status</b>	
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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

**LIFE SUPPORT APPLICATIONS**

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