DATA SHEET

LVE21050R
NPN microwave power transistor

Product specification
Supersedes data of June 1992

1997 Feb 14

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NPN microwave power transistor LVE21050R

FEATURES

- Diffused emitter ballasting resistors provide excellent current sharing and withstanding a high VSWR
- Self-aligned process entirely ion implanted
- Gold metallization ensures an optimum temperature profile with excellent performance and reliability
- Input matching cell improves input impedance and allows an easier design of wideband circuits.

APPLICATIONS

- Common emitter class-A linear power amplifiers up to 4.2 GHz.

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

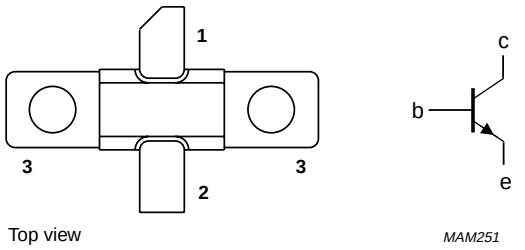


Fig.1 Simplified outline and symbol.

QUICK REFERENCE DATA

Microwave performance up to T_{mb} = 25 °C in a common emitter class-A circuit.

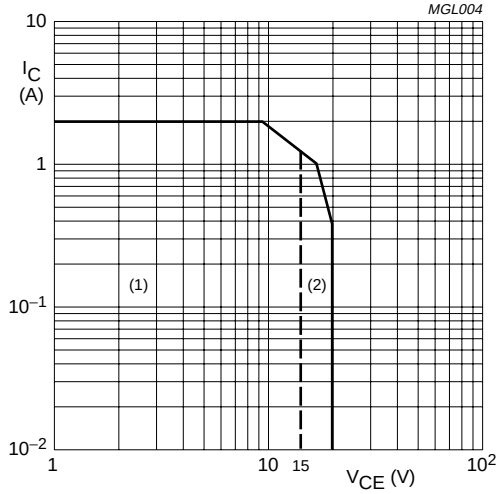
MODE OF OPERATION	f (GHz)	V_{CC} (V)	I_C (A)	P_{L1} (W)	G_{po} (dB)	Z_i; Z_L (Ω)
Class-A (CW)	2.1	16	1.1	typ. 5.5	typ. 8	see Fig 4

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.

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_{CER}	collector-emitter voltage	R_{BE} = 47 Ω	–	20	V
V_{CEO}	collector-emitter voltage	open base	–	16	V
V_{EBO}	emitter-base voltage	open collector	–	3	V
I_C	collector current (DC)		–	2	A
P_{tot}	total power dissipation	$T_{mb} \leq 75$ °C	–	18	W
T_{stg}	storage temperature		–65	+200	°C
T_j	operating junction temperature		–	200	°C
T_{sld}	soldering temperature	at 0.3 mm from case; t ≤ 10 s	–	235	°C



$T_{mb} \leq 75$ °C.

(1) Region of permissible DC operation.

(2) Permissible extension provided $R_{BE} \leq 47$ Ω.

Fig.2 DC SOAR.

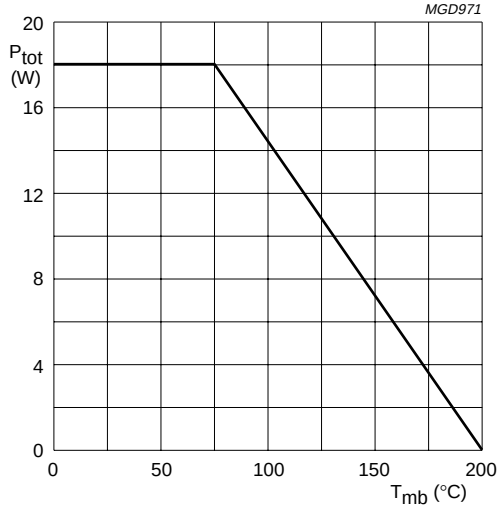


Fig.3 Power dissipation derating as a function of mounting base temperature.

THERMAL CHARACTERISTICS

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

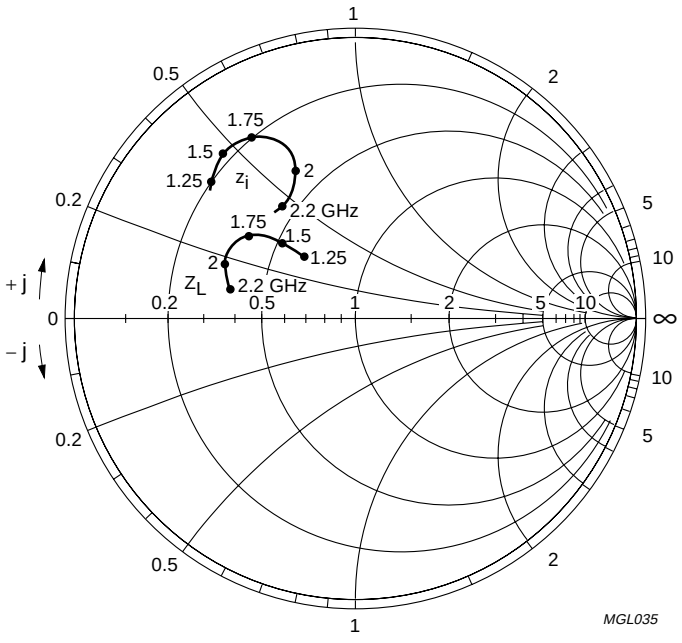
Note

1. See *"Mounting recommendations in the General part of handbook SC19a".*

CHARACTERISTICS

T_{mb} = 25 °C unless otherwise specified

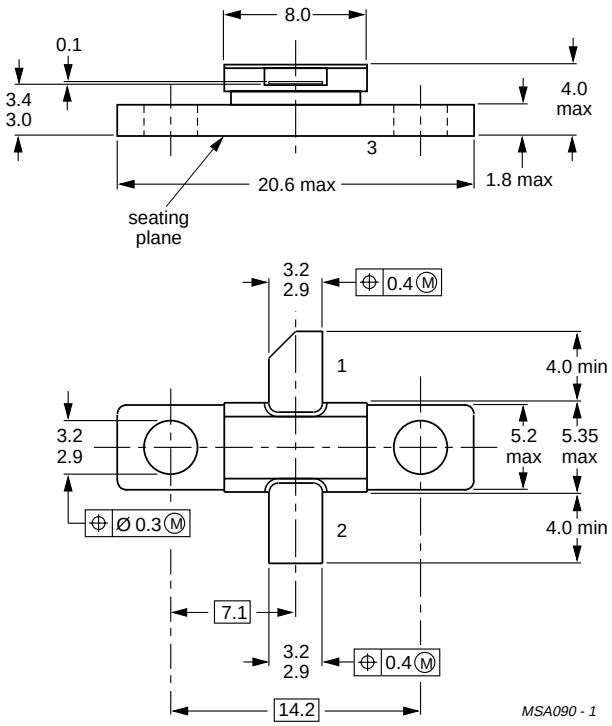
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	V_{CB} = 20 V; I_E = 0	–	–	0.5	mA
		V_{CB} = 40 V; I_E = 0	–	–	2.5	mA
I_{CER}	collector cut-off current	V_{CE} = 20 V; R_{BE} = 47 Ω	–	–	25	mA
I_{CEO}	collector cut-off current	V_{CE} = 15 V; I_B = 0	–	–	2	mA
I_{EBO}	emitter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



Z_o = 10 Ω.

Fig.4 Input and optimum load impedances as functions of frequency; typical values.

PACKAGE OUTLINE



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

Fig.5 SOT445A.

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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Printed in The Netherlands 127147/00/02/pp8 Date of release: 1997 Feb 14 Document order number: 9397 750 01714

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