

DATA SHEET

PTC4001T NPN microwave power transistor

Product specification
Supersedes data of November 1994
File under Discrete Semiconductors, SC15

1997 Feb 18

NPN microwave power transistor

PTC4001T

FEATURES

- Diffused emitter ballasting resistors providing excellent current sharing and withstanding a high VSWR
- Interdigitated structure provides high emitter efficiency
- Gold metallization realizes very good characteristics stability and excellent lifetime
- Multicell geometry gives good balance of dissipated power and low thermal resistance.

APPLICATIONS

Common collector oscillator circuits under CW conditions in military and professional applications up to 5 GHz.

DESCRIPTION

NPN silicon planar epitaxial microwave transistor in a SOT440A metal ceramic flange package with collector connected to flange.

QUICK REFERENCE DATA

Microwave performance up to $T_h = 25\text{ }^\circ\text{C}$ in an oscillator circuit up to 3 GHz.

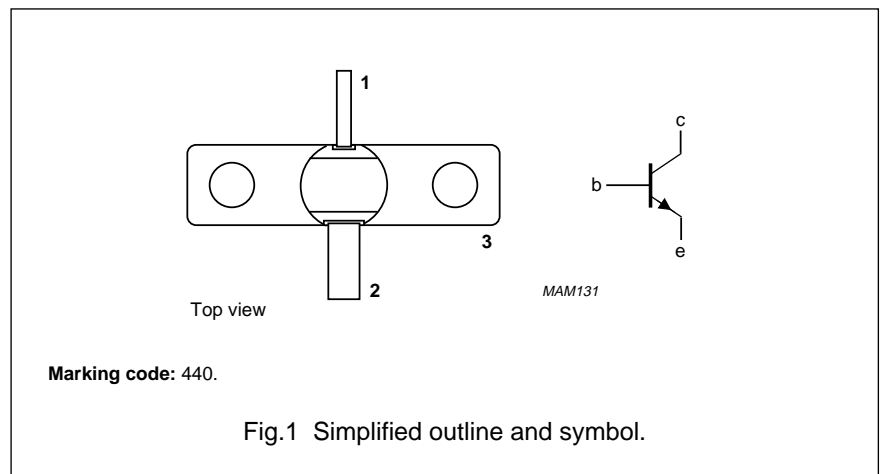
MODE OF OPERATION	f (GHz)	V _{CC} (V)	P _L (mW)	I _C (mA)
class A (CW)	2.88 to 3; note 1	20	≥550	200

Note

1. Oscillating frequency should stabilize in this range.

PINNING - SOT440A

PIN	DESCRIPTION
1	base
2	emitter
3	collector connected to flange



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LIMITING VALUES

In accordance with the Absolute Maximum 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	–	16	V
V_{CER}	collector-emitter voltage	$R_{BE} = 70 \Omega$	–	35	V
V_{EBO}	emitter-base voltage	open collector	–	3	V
I_C	average collector current		–	0.25	A
P_{tot}	total power dissipation	$T_{mb} = 75 \text{ }^\circ\text{C}$	–	4	W
T_{stg}	storage temperature		–65	+200	$^\circ\text{C}$
T_j	operating junction temperature		–	200	$^\circ\text{C}$
T_{sld}	soldering temperature	$t < 10 \text{ s}$; note 1	–	235	$^\circ\text{C}$

Note

- At 0.1 mm from case.

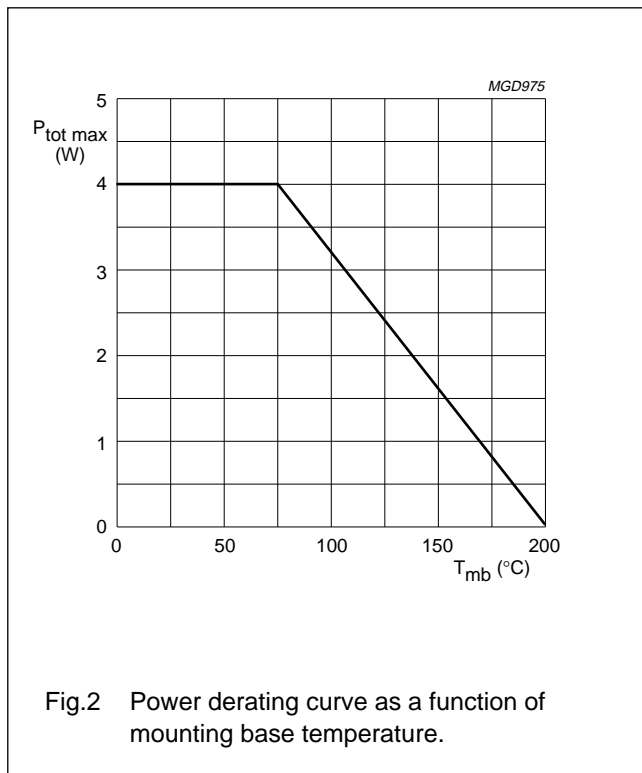
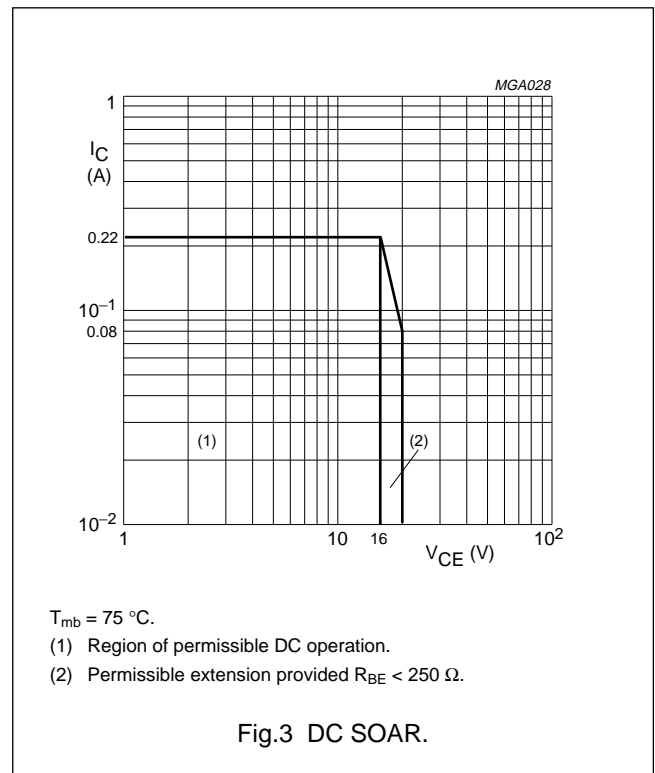


Fig.2 Power derating curve as a function of mounting base temperature.



$T_{mb} = 75 \text{ }^\circ\text{C}$.
 (1) Region of permissible DC operation.
 (2) Permissible extension provided $R_{BE} < 250 \Omega$.

Fig.3 DC SOAR.

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
$R_{th\ j-mb}$	thermal resistance from junction to mounting base	$T_j = 75\text{ °C}$	22	K/W

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	$V_{CB} = 24\text{ V}; I_E = 0$	–	100	μA
I_{EBO}	emitter cut-off current	$V_{EB} = 1.5\text{ V}; I_C = 0$	–	0.75	μA
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = 500\ \mu\text{A}; I_E = 0$	40	–	V
$V_{(BR)CER}$	collector-emitter breakdown voltage	$I_C = 2.5\text{ mA}; R_{BE} = 70\ \Omega$	35	–	V

APPLICATION INFORMATION

Microwave performance up to $T_n = 25\text{ °C}$ in a common collector test circuit and working in CW class A.

MODE OF OPERATION	f (GHz)	V_{CC} (V)	P_L (mW)	I_C (mA)
class A (CW)	2.88 to 3; note 1	20	550 to 750	200

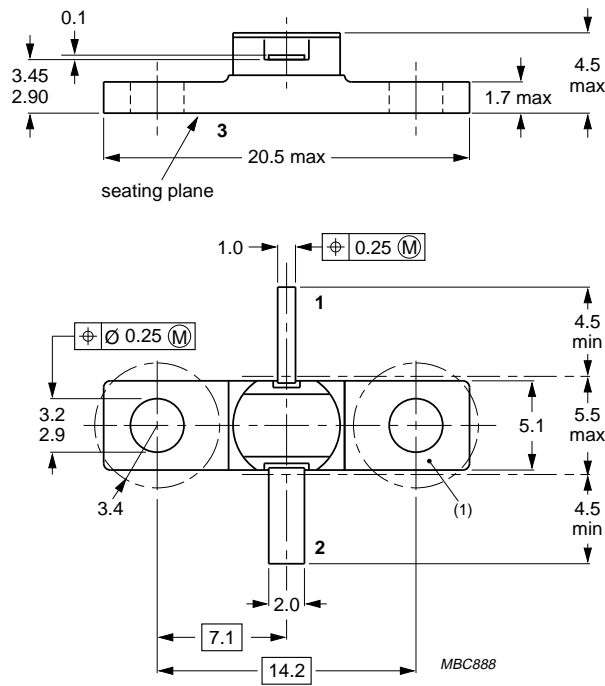
Note

- Oscillating frequency should stabilize in this frequency range.

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PACKAGE OUTLINE



Dimensions in mm.

Torque on nut: max. 0.4 Nm.

Recommended screw: M2.5.

(1) Flatness of this area ensures full thermal contact with bolt head.

Fig.4 SOT440A.

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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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