MICROWAVE POWER TRANSISTOR

NPN silicon power transistor for use in a common-base, class-C amplifier up to a frequency of 4.2 GHz in CW conditions in military and professional applications.

Features

- Interdigitated structure giving a high emitter efficiency
- Diffused emitter ballasting resistor providing excellent current sharing and withstanding a high VSWR
- Gold metallization realizing a very good stability of the characteristics and excellent life-time
- Multicell geometry giving good balance of dissipated power and low thermal resistance
- An input matching cell improving the input impedance and allowing an easier design of wideband circuits

The transistor is housed in a metal ceramic flange envelope (FO-41B).

QUICK REFERENCE DATA

Microwave performance up to T_{mb} = 25 °C in a common-base class-C selective amplifier

mode of operation	f GHz	V_{CC} V	P_L W	G_p dB	η_C %	z_i Ω	Z_L Ω
CW; class-C	4.2	24	⩾ 2.5	⩾ 5	⩾ 28	12 + j35	2.5 − j10

MECHANICAL DATA

Dimensions in mm

FO-41B (see Fig.1).

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.

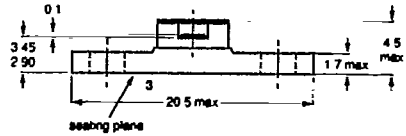
After use, dispose of as chemical or special waste according to the regulations applying at the location of the user. It must never be thrown out with general industrial or domestic waste.

MECHANICAL DATA

Dimensions in mm

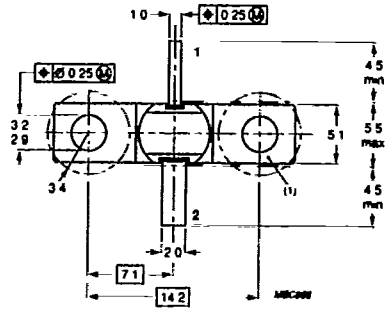
Fig.1 FO-41-B.

Base and metallic cap connected to flange



Pinning:

1 = collector
2 = emitter
3 = base



Torque on screw: max. 0.4 Nm

Recommended screw: M2.5 or 4-40 UNC/2A

Marking code: 4203X

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

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Collector-base voltage, open emitter	V_{CBO}	max.	40 V
Collector-emitter voltage			
open base	V_{CEO}	max.	15 V
$R_{BE} = 0$	V_{CES}	max.	40 V
Emitter-base voltage, open collector	V_{EBO}	max.	3.0 V
Collector current (DC)	I_C	max.	0.75 A
Total power dissipation	P_{tot}	max.	14.5 W
Storage temperature	T_{stg}		−65 to + 200 °C
Junction temperature	T_j	max.	200 °C
Soldering temperature			
at 0.1 mm from ceramic; $t_{sld} \leqslant 10$ s	T_{sld}	max.	235 °C

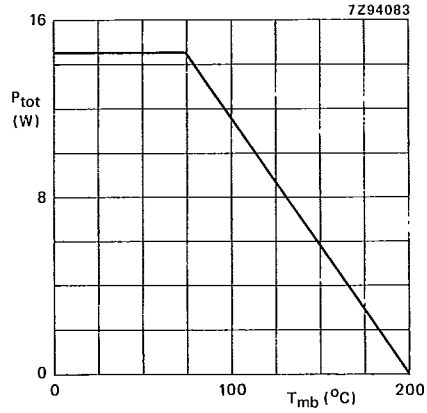


Fig.2 Power derating curve as a function of mounting base temperature.

THERMAL RESISTANCE (at $T_j = 75$ °C)

From junction to mounting base	$R_{th\ j\text{-}mb}$	max.	8.5 K/W
From mounting base to heatsink	$R_{th\ mb\text{-}h}$	max.	0.7 K/W

CHARACTERISTICS

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

Breakdown voltages			
$I_C = 3$ mA; $I_E = 0$	$V_{(BR)CBO}$	min.	40 V
$I_C = 10$ mA; $R_{BE} = 0$	$V_{(BR)CES}$	min.	40 V
Collector cut-off current			
$I_E = 0$; $V_{CB} = 24$ V	I_{CBO}	max.	30 μA
Emitter cut-off current			
$I_C = 0$; $V_{EB} = 1.5$ V	I_{EBO}	max.	0.6 μA
Collector-base capacitance			
$I_E = I_C = 0$; $V_{CB} = 24$ V	C_{cb}	typ.	3.8 pF

APPLICATION INFORMATION

Microwave performance up to T_{mb} = 25 °C in a common-base class C selective amplifier*

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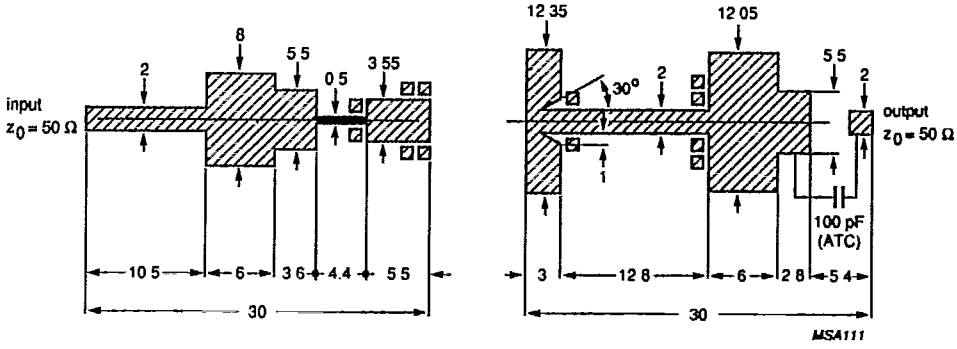

Fig.3 Prematching test circuit board for 4.2 GHz. (Dimensions in mm).

Striplines on a double Cu-clad printed circuit board with PTFE fibre-glass dielectric (ϵ_r = 2.54), thickness 0.8 mm.

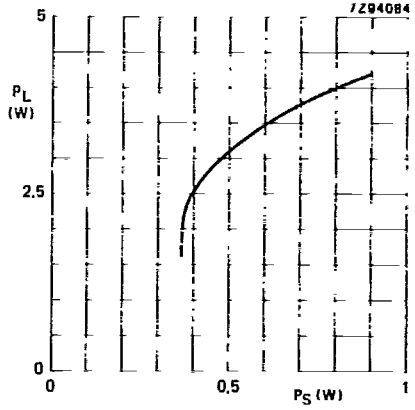

Fig.4 Load power as a function of source power.

* Circuit consists of prematching circuit board in combination with complementary input and output slug tuners.