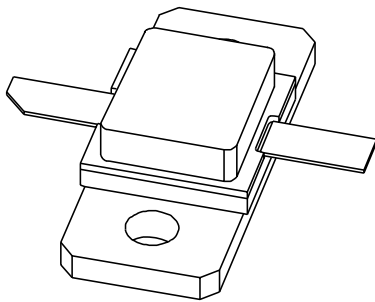


DATA SHEET



RZ1214B65Y NPN microwave power transistor

Product specification
Supersedes data of 1997 Feb 18

1999 Dec 24

NPN microwave power transistor

RZ1214B65Y

FEATURES

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

APPLICATIONS

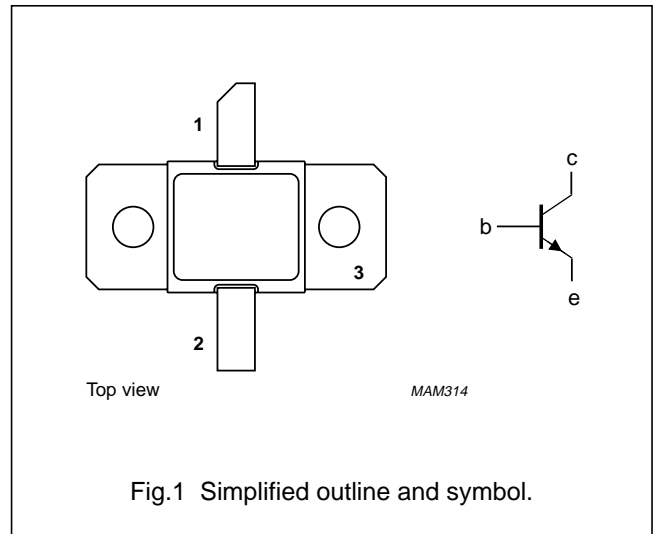
- Intended for use in common base class C wideband pulsed power amplifiers for L-band radar applications in the 1.2 to 1.4 GHz band.

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

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

MODE OF OPERATION	f (GHz)	V _{CC} (V)	P _L (W)	G _p (dB)	η_c (%)	Z _i ; Z _L (Ω)
Class-C; $t_p = 150\text{ }\mu\text{s}$; $\delta = 5\%$	1.2 to 1.4	50	≥ 70	≥ 7	≥ 35	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.

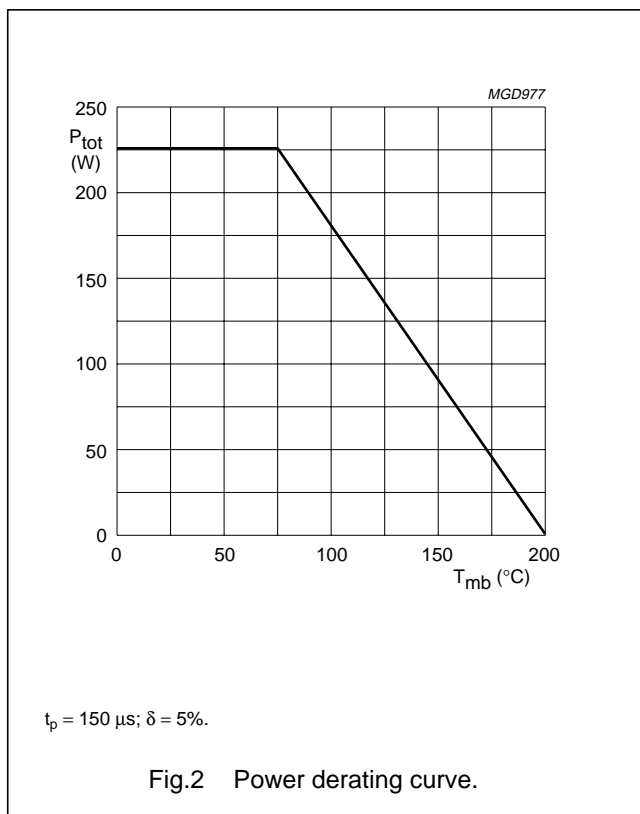
NPN microwave power transistor

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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	–	65	V
V_{CEO}	collector-emitter voltage	open base	–	15	V
V_{CES}	collector-emitter voltage	$R_{BE} = 0 \Omega$	–	60	V
V_{EBO}	emitter-base voltage	open collector	–	3	V
I_C	collector current (DC)	$t_p \leq 150 \mu\text{s}; \delta \leq 5\%$	–	6	A
P_{tot}	total power dissipation	$T_{mb} \leq 75 \text{ }^\circ\text{C};$ $t_p \leq 150 \mu\text{s}; \delta \leq 5\%$	–	225	W
T_{stg}	storage temperature		–65	+200	$^\circ\text{C}$
T_j	operating junction temperature		–	200	$^\circ\text{C}$
T_{sld}	soldering temperature	at 0.2 mm from the case; $t \leq 10 \text{ s}$	–	235	$^\circ\text{C}$



NPN microwave power transistor

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THERMAL CHARACTERISTICS $T_j = 75\text{ °C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
$R_{th\ j-mb}$	thermal resistance from junction to mounting-base		2.5	K/W
$R_{th\ mb-h}$	thermal resistance from mounting-base to heatsink	note 1	0.2	K/W
$Z_{th\ j-h}$	thermal resistance from junction to heatsink	$t_p = 100\ \mu\text{s}$; $\delta = 10\%$; notes 1 and 2	0.55	K/W

Notes

1. See "Mounting recommendations in the General part of associated Handbook".
2. Equivalent thermal impedance under pulsed microwave operating conditions.

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = 40\text{ mA}$; $I_E = 0$	65	–	V
$V_{(BR)CES}$	collector-emitter breakdown voltage	$I_C = 40\text{ mA}$; $R_{BE} = 0$	60	–	V
I_{CBO}	collector cut-off current	$V_{CB} = 50\text{ V}$; $I_E = 0$	–	4	mA
I_{EBO}	emitter cut-off current	$V_{EB} = 1.5\text{ V}$; $I_C = 0$	–	0.4	mA

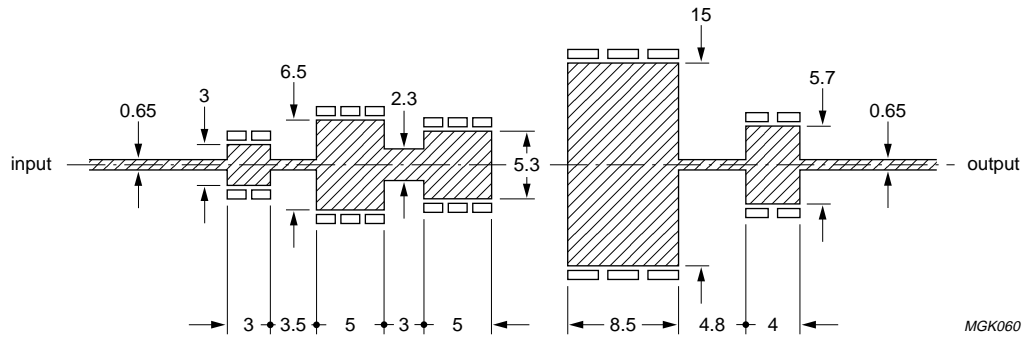
APPLICATION INFORMATION

The transistors are 100% tested under the following conditions.

MODE OF OPERATION	CONDITIONS	f (GHz)	V_{CC} (V)	P_L (W)	G_p (dB)	η_c (%)	Z_i ; Z_L (Ω)
Class-C	$t_p = 150\ \mu\text{s}$; $\delta = 5\%$	1.2 to 1,4	50	typ.80; >70	typ.7.8; >7	typ.40; >35	see Fig 4
	$t_p = 300\ \mu\text{s}$; $\delta = 10\%$	1.2 to 1,4	50	typ.80;	typ.7	typ.30	see Fig 4

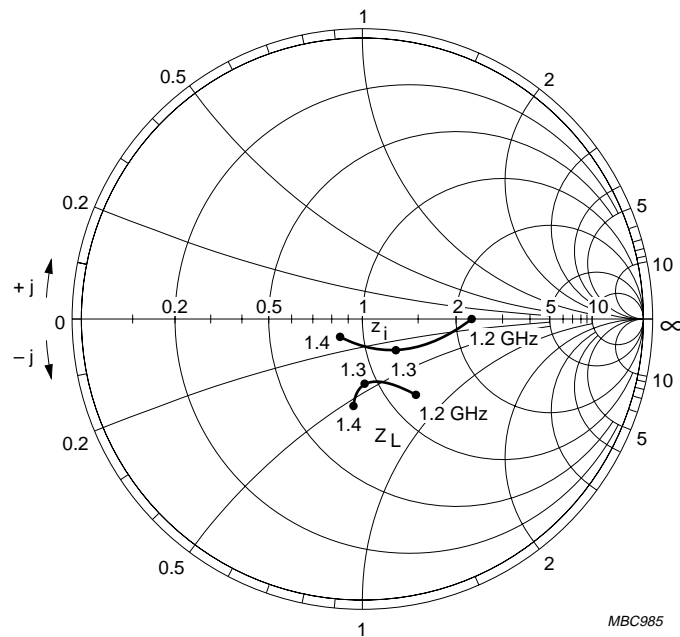
NPN microwave power transistor

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Dimensions in mm.
 Substrate: Epsilam.
 Thickness: 0.635 mm.
 Permittivity: $\epsilon_r = 10$.

Fig.3 Wideband test circuit for class-C operation at 1.2 to 1.4 GHz.



Class-C operation; $V_{CE} = 50$ V; $P_L = 65$ W; $Z_0 = 5 \Omega$; $t_p = 150 \mu s$; $\delta = 5\%$.

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

NPN microwave power transistor

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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

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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