

DATA SHEET

BFG11W/X NPN 2 GHz DECT power transistor

Preliminary specification
File under Discrete Semiconductors, SC14

1995 Sep 22

NPN 2 GHz DECT power transistor

BFG11W/X

FEATURES

- High power gain
- High efficiency
- Small size discrete power amplifier
- 1.9 GHz operating area
- Gold metallization ensures excellent reliability.

APPLICATIONS

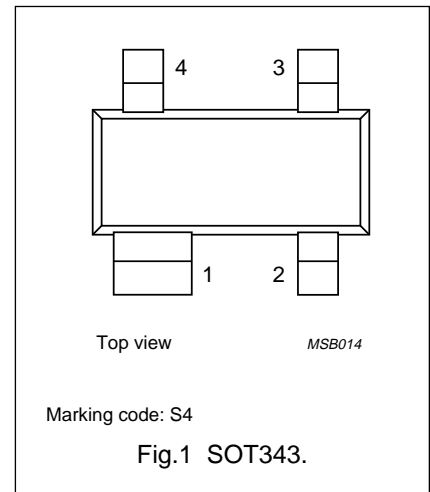
- Common emitter class-AB operation in handheld radio equipment at 1.9 GHz.

DESCRIPTION

NPN silicon planar epitaxial transistor encapsulated in a plastic SOT343 package.

PINNING

PIN	DESCRIPTION
BFG11/X (see Fig.1)	
1	collector
2	emitter
3	base
4	emitter



QUICK REFERENCE DATA

RF performance at $T_s \leq 60^\circ\text{C}$ in a common-emitter test circuit.

MODE OF OPERATION	f (GHz)	V_{CE} (V)	P_L (mW)	G_p (dB)	η_c (%)
Pulsed, class-AB, duty cycle: < 1 : 2; $t_p = 10$ ms	1.9	3.6	400	≥ 6	≥ 50

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	–	20	V
V_{CEO}	collector-emitter voltage	open base	–	8	V
V_{EBO}	emitter-base voltage	open collector	–	2.5	V
$I_{C(AV)}$	collector current (DC)		–	500	mA
P_{tot}	total power dissipation	up to $T_s = 60^\circ\text{C}$; note 1	–	630	mW
T_{stg}	storage temperature		–65	+150	$^\circ\text{C}$
T_j	junction temperature		–	175	$^\circ\text{C}$

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-s}$	thermal resistance from junction to soldering point	up to $T_s = 60\text{ °C}$; note 1; $P_{tot} = 630\text{ mW}$	180	K/W

Note to the Limiting values and Thermal characteristics

- T_s is the temperature at the soldering point of the collector pin.

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	open emitter; $I_C = 0.1\text{ mA}$	20	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	open base; $I_C = 10\text{ mA}$	8	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; $I_E = 0.1\text{ mA}$	2.5	–	V
I_{CES}	collector cut-off current	$V_{CE} = 8\text{ V}$; $V_{BE} = 0$	–	100	μA
h_{FE}	DC current gain	$I_C = 100\text{ mA}$; $V_{CE} = 5\text{ V}$	25	–	
C_c	collector capacitance	$I_E = I_e = 0$; $V_{CB} = 3.6\text{ V}$; $f = 1\text{ MHz}$	–	5	pF
C_{re}	feedback capacitance	$I_C = 0$; $V_{CE} = 3.6\text{ V}$; $f = 1\text{ MHz}$	–	4	pF

APPLICATION INFORMATION

RF performance at $T_s \leq 60\text{ °C}$ in a common-emitter test circuit.

MODE OF OPERATION	f (GHz)	V_{CE} (V)	I_{CQ} (mA)	P_L (mW)	G_p (dB)	η_c (%)
Pulsed, class-AB, duty cycle: < 1 : 2; $t_p = 10\text{ ms}$	1.9	3.6	1	400	>6	>50

Ruggedness in class-AB operation

The transistors are capable of withstanding a load mismatch corresponding to $V_{SWR} = 10 : 1$ through all phases, at rated output power under pulsed conditions up to a supply voltage of 5.5 V, $f = 1.9\text{ GHz}$ and a duty cycle of 1 : 2, $t_p = 10\text{ ms}$.

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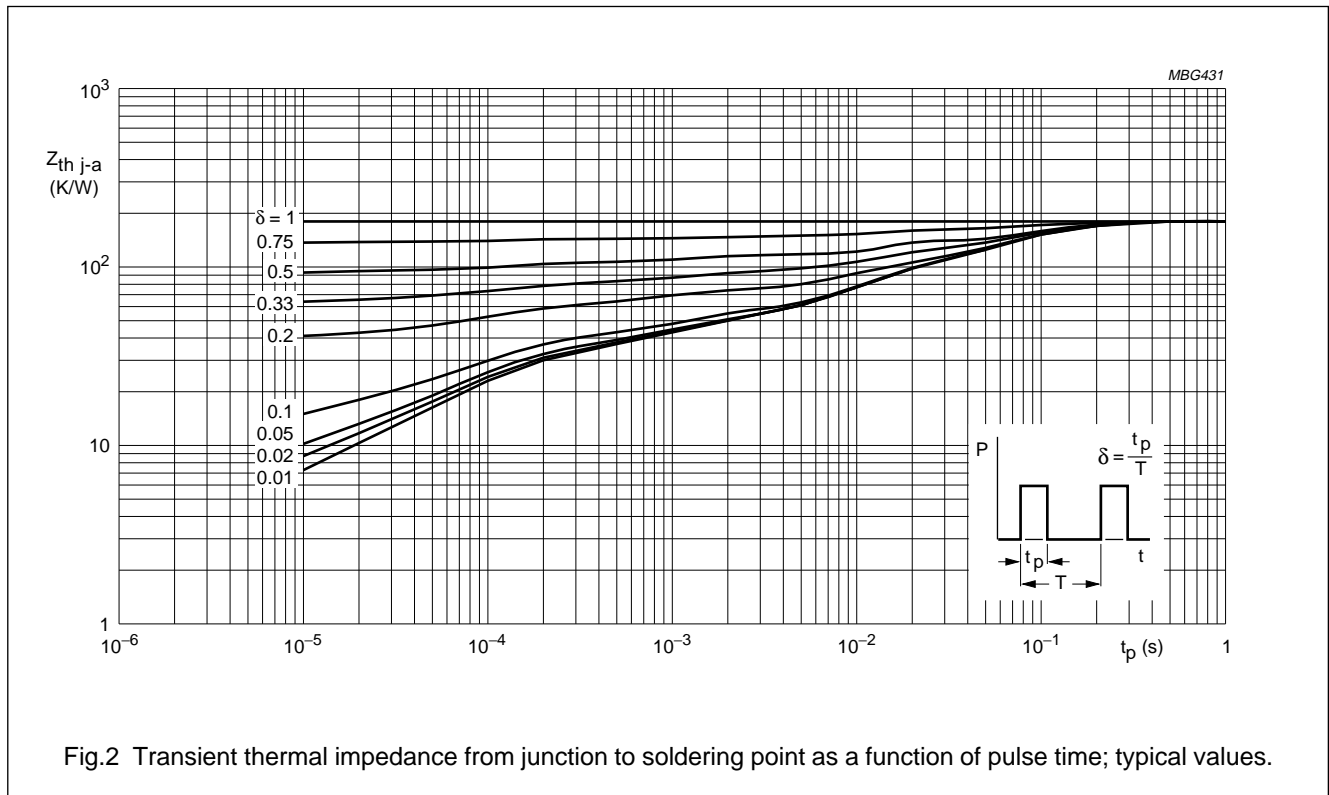


Fig.2 Transient thermal impedance from junction to soldering point as a function of pulse time; typical values.

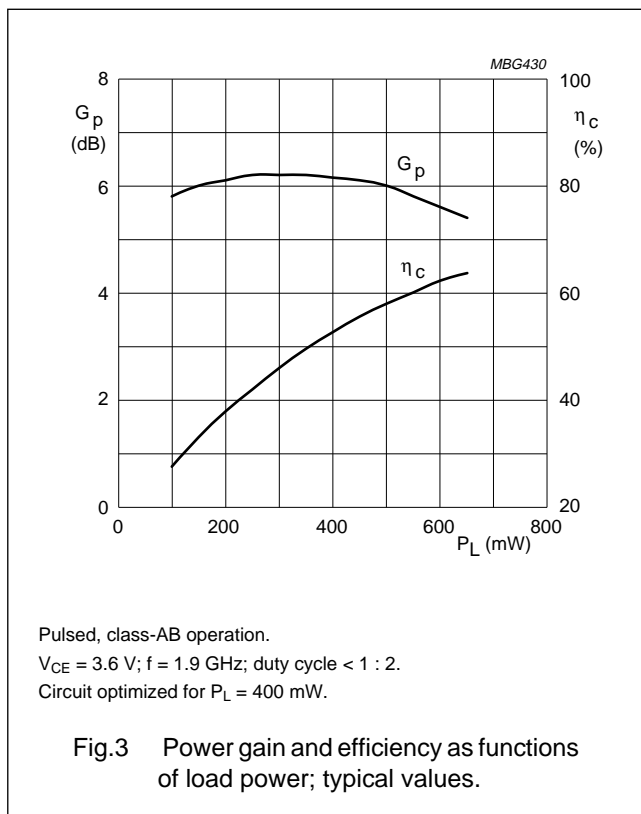
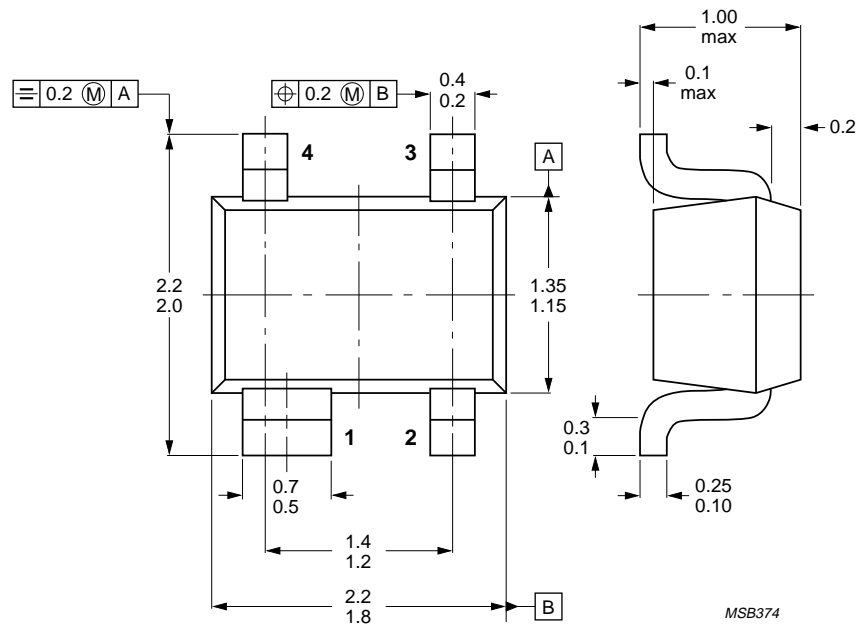


Fig.3 Power gain and efficiency as functions of load power; typical values.

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PACKAGE OUTLINE



Dimensions in mm.

Fig.4 SOT343.

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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

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