NPN 2 GHz wideband transistor — BFG16A

FEATURES

- High power gain
- Good thermal stability
- Gold metallization ensures excellent reliability.

DESCRIPTION

NPN transistor mounted in a plastic SOT223 envelope.

It is primarily intended for use in wideband amplifiers, aerial amplifiers and vertical amplifiers in high speed oscilloscopes.

PINNING

PIN	DESCRIPTION
1	emitter
2	base
3	emitter
4	collector

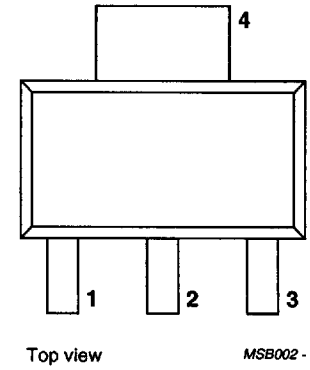

Fig.1 SOT223.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	–	40	V
V_{CEO}	collector-emitter voltage	open base	–	–	25	V
I_C	DC collector current		–	–	150	mA
P_{tot}	total power dissipation	up to T_s = 110 °C; note 1	–	–	1	W
h_{FE}	DC current gain	I_C = 150 mA; V_{CE} = 5 V; T_j = 25 °C	25	80	–	
f_T	transition frequency	I_C = 100 mA; V_{CE} = 10 V; f = 500 MHz; T_{amb} = 25 °C	–	1.5	–	GHz
G_{UM}	maximum unilateral power gain	I_C = 100 mA; V_{CE} = 10 V; f = 500 MHz; T_{amb} = 25 °C	–	10	–	dB

Note

1. T_s is the temperature at the soldering point of the collector tab.

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	–	25	V
V_{EBO}	emitter-base voltage	open collector	–	2	V
I_C	DC collector current		–	150	mA
P_{tot}	total power dissipation	up to T_s = 110 °C; note 1	–	1	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. T_s is the temperature at the soldering point of the collector tab.

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point	up to T_s = 110 °C; note 1	40	K/W

Note

1. T_s is the temperature at the soldering point of the collector tab.

CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	open emitter; I_C = 0.1 mA	25	–	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	open base; I_C = 10 mA	18	–	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; I_E = 0.1 mA	3	–	–	V
I_{CBO}	collector cut-off current	I_E = 0; V_{CB} = 28 V	–	–	20	μA
h_{FE}	DC current gain	I_C = 150 mA; V_{CE} = 5 V	25	80	–	
C_c	collector capacitance	$I_E = i_e$ = 0; V_{CB} = 10 V; f = 1 MHz	–	2.5	–	pF
C_e	emitter capacitance	$I_C = i_c$ = 0; V_{EB} = 0.5 V; f = 1 MHz	–	10.0	–	pF
C_{re}	feedback capacitance	I_C = 0; V_{CB} = 10 V; f = 1 MHz	–	1.5	–	pF
f_T	transition frequency	I_C = 100 mA; V_{CE} = 10 V; f = 500 MHz; T_{amb} = 25 °C	–	1.5	–	GHz
G_{UM}	maximum unilateral power gain note 1	I_C = 100 mA; V_{CE} = 10 V; f = 500 MHz; T_{amb} = 25 °C	–	10	–	dB

Note

1. G_{UM} is the maximum unilateral power gain, assuming s_{12} is zero. $G_{UM} = 10 \log \frac{|s_{21}|^2}{(1-|s_{11}|^2)(1-|s_{22}|^2)}$ dB.

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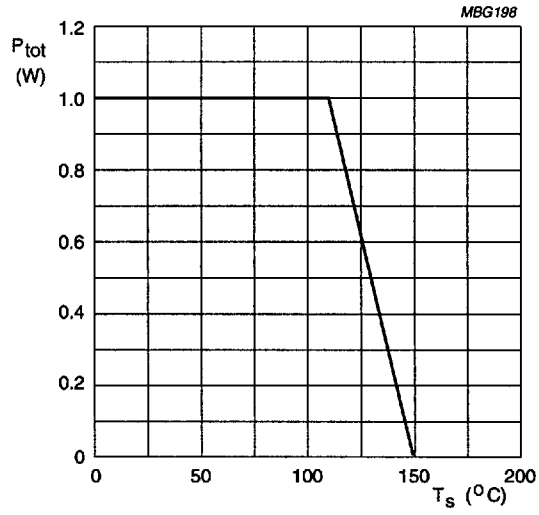
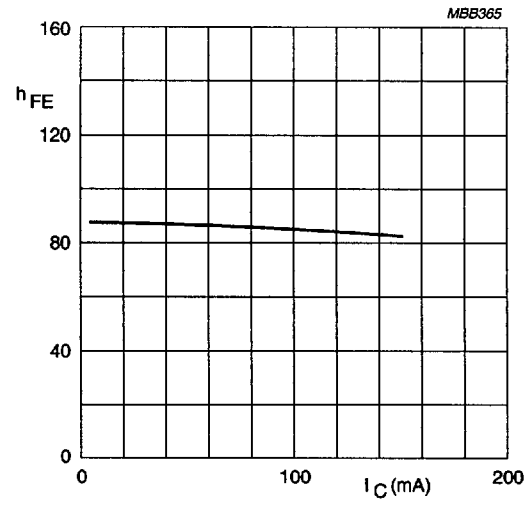
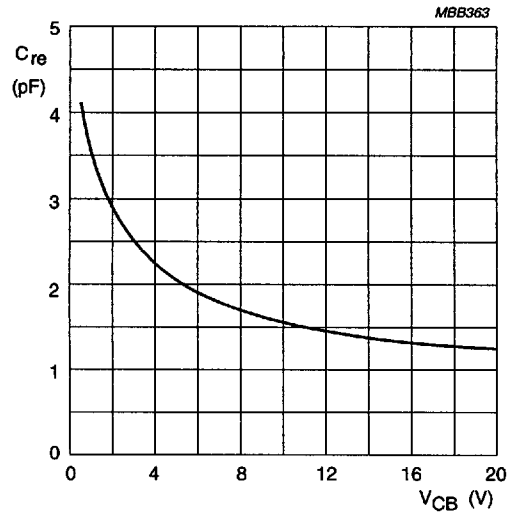


Fig.2 Power derating curve.



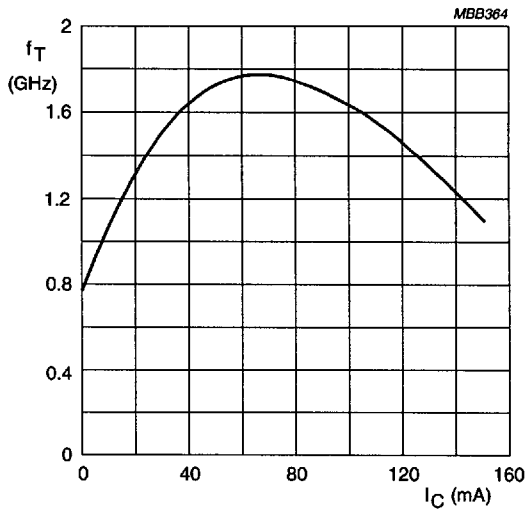
V_{CE} = 10 V; T_j = 25 °C.

Fig.3 DC current gain as function of collector current.



$I_C = i_c = 0$; f = 1 MHz.

Fig.4 Feedback capacitance as function of collector-base voltage.



V_{CE} = 10 V; f = 500 MHz; T_{amb} = 25 °C.

Fig.5 Transition frequency as a function of collector current.

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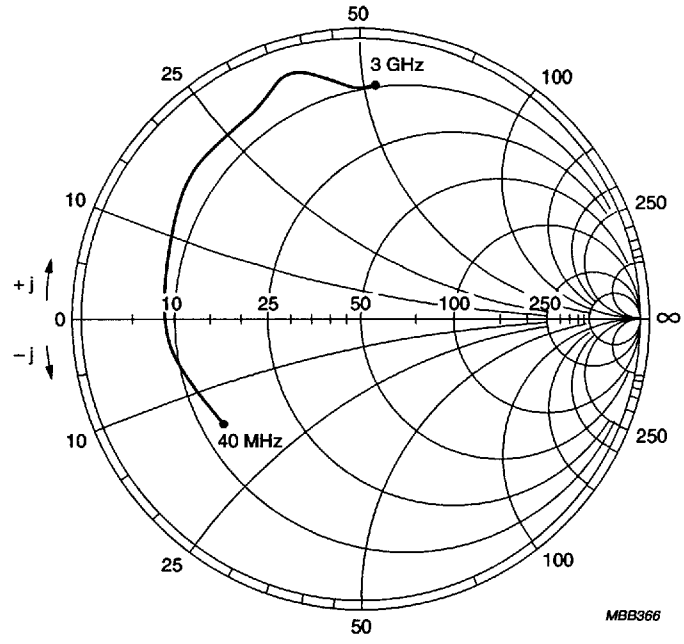
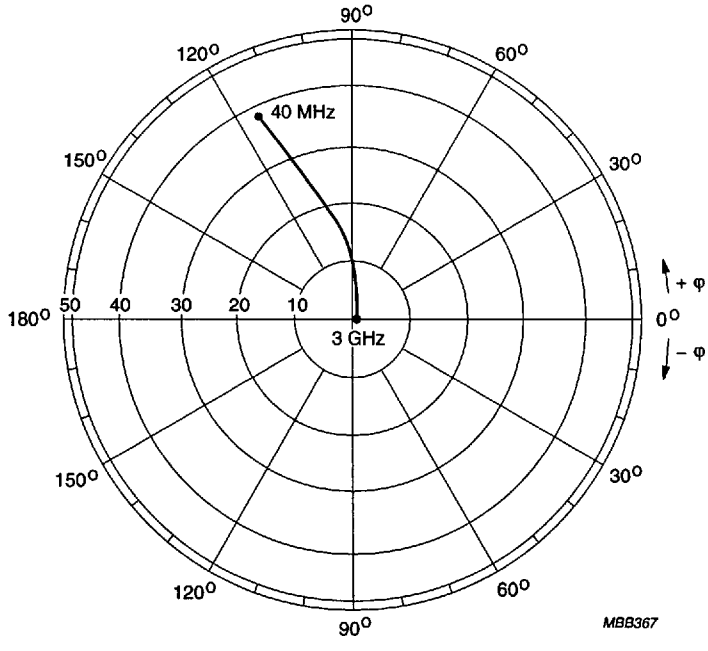


I_C = 70 mA; V_{CE} = 15 V; Z_o = 50 Ω.

Fig.6 Common emitter input reflection coefficient (S_{11}).



I_C = 70 mA; V_{CE} = 15 V.

Fig.7 Common emitter forward transmission coefficient (S_{21}).

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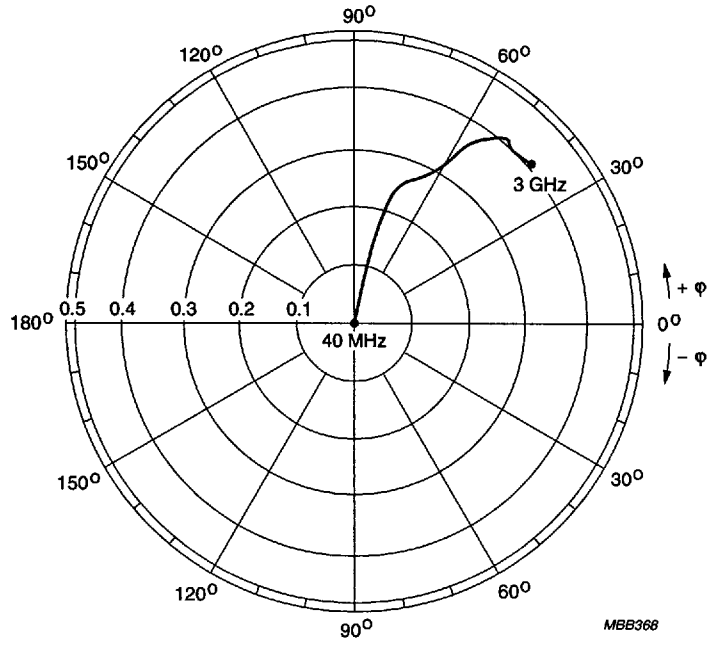
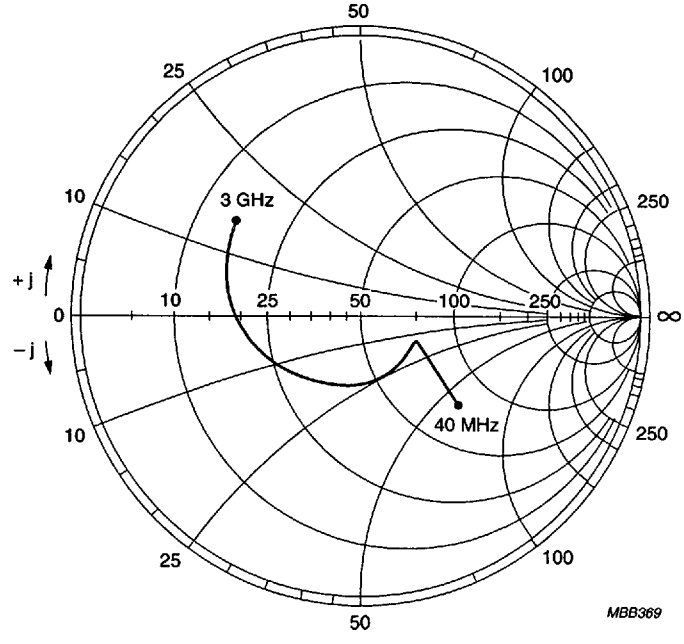


I_C = 70 mA; V_{CE} = 15 V.

Fig.8 Common emitter reverse transmission coefficient (S_{12}).



I_C = 70 mA; V_{CE} = 15 V; Z_o = 50 Ω.

Fig.9 Common emitter output transmission coefficient (S_{22}).

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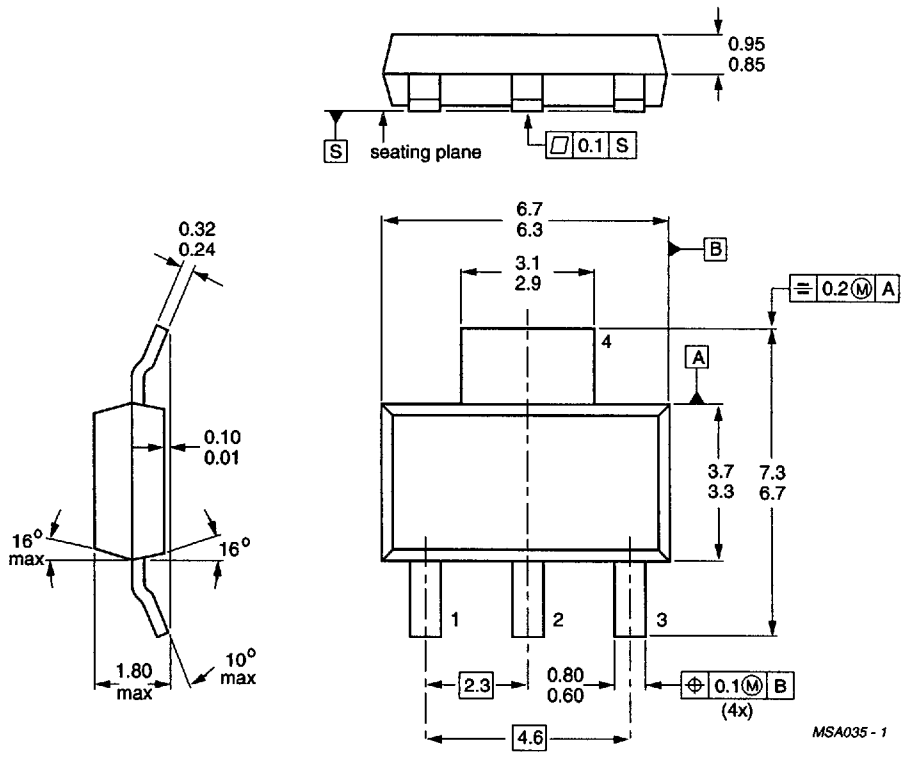
PACKAGE OUTLINE



Dimensions in mm.

Fig.10 SOT223.

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