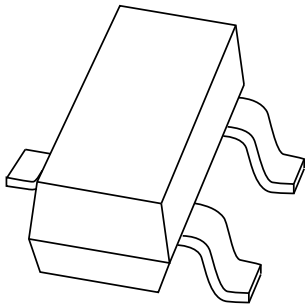


DATA SHEET



BFQ67

NPN 8 GHz wideband transistor

Product specification
Supersedes data of September 1995

1998 Aug 27



NPN 8 GHz wideband transistor

BFQ67

FEATURES

- High power gain
- Low noise figure
- High transition frequency
- Gold metallization ensures excellent reliability.

APPLICATIONS

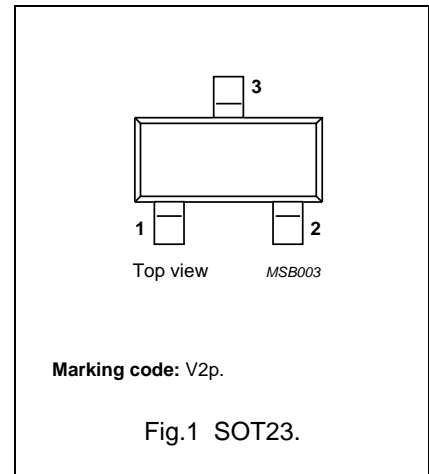
Satellite TV tuners and RF portable communications equipment up to 2 GHz.

DESCRIPTION

Silicon NPN wideband transistor in a plastic SOT23 package.

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{CB0}	collector-base voltage	open emitter	–	–	20	V
V_{CEO}	collector-emitter voltage	open base	–	–	10	V
I_C	collector current (DC)		–	–	50	mA
P_{tot}	total power dissipation	$T_s \leq 97\text{ }^\circ\text{C}$; note 1	–	–	300	mW
h_{FE}	DC current gain	$I_C = 15\text{ mA}$; $V_{CE} = 5\text{ V}$	60	100	–	
f_T	transition frequency	$I_C = 15\text{ mA}$; $V_{CE} = 8\text{ V}$	–	8	–	GHz
G_{UM}	maximum unilateral power gain	$I_C = 15\text{ mA}$; $V_{CE} = 8\text{ V}$; $f = 1\text{ GHz}$	–	14	–	dB
F	noise figure	$I_C = 5\text{ mA}$; $V_{CE} = 8\text{ V}$; $f = 1\text{ GHz}$	–	1.3	–	dB

Note

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

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CB0}	collector-base voltage	open emitter	–	20	V
V_{CEO}	collector-emitter voltage	open base	–	10	V
V_{EBO}	emitter-base voltage	open collector	–	2.5	V
I_C	collector current (DC)		–	50	mA
P_{tot}	total power dissipation	$T_s \leq 97\text{ }^\circ\text{C}$; note 1	–	300	mW
T_{stg}	storage temperature range		–65	+150	$^\circ\text{C}$
T_j	junction temperature		–	175	$^\circ\text{C}$

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
$R_{th\ j-s}$	thermal resistance from junction to soldering point	note 1	260	K/W

Note

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

CHARACTERISTICS

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

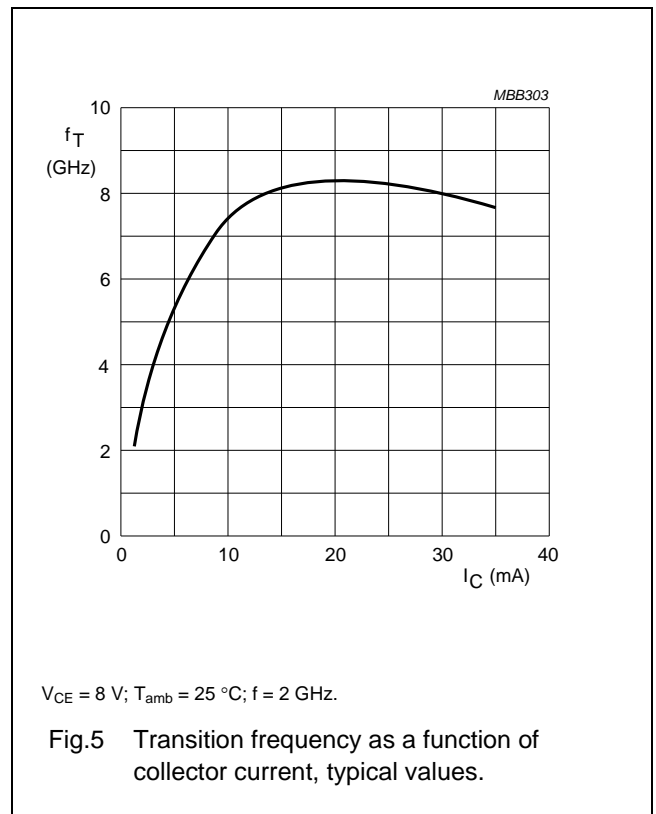
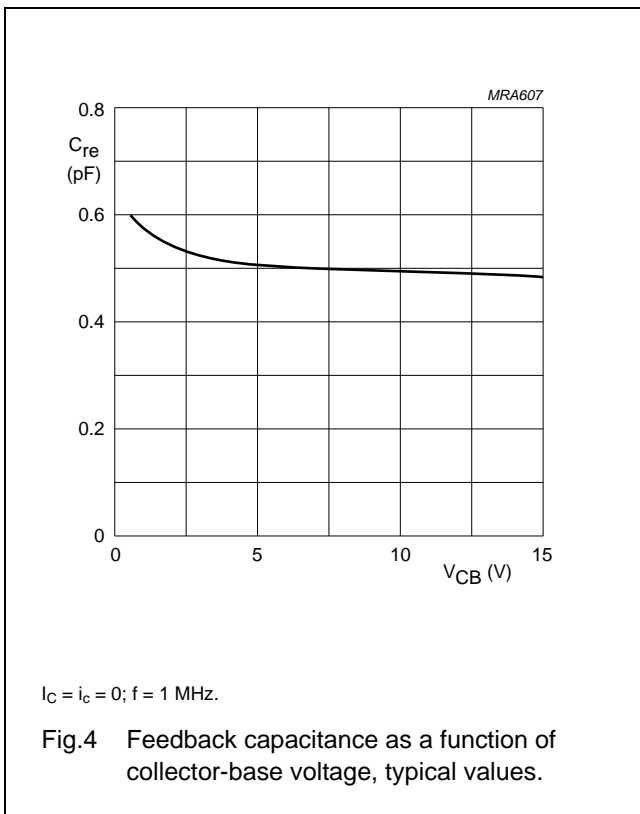
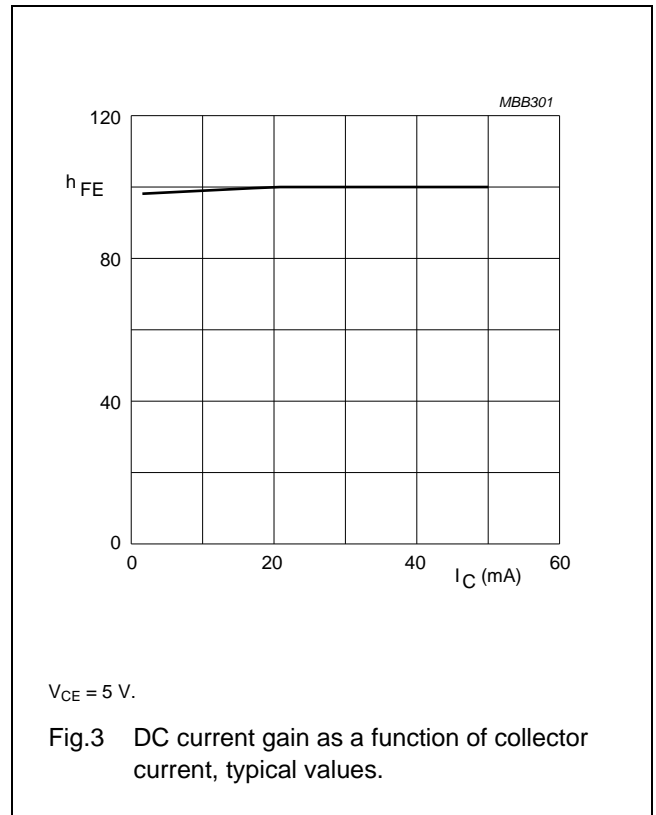
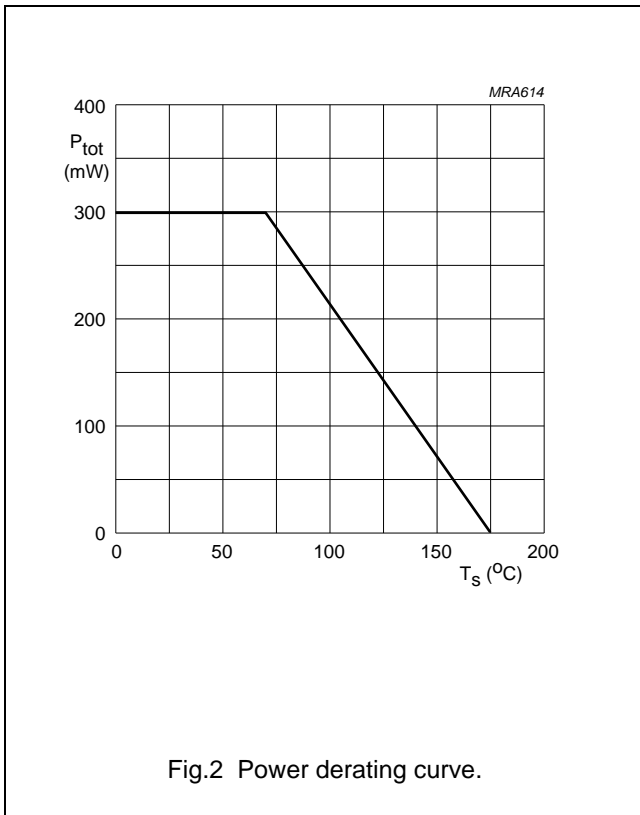
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0; V_{CB} = 5\text{ V}$	–	–	50	nA
h_{FE}	DC current gain	$I_C = 15\text{ mA}; V_{CE} = 5\text{ V}$	60	100	–	
C_c	collector capacitance	$I_E = i_e = 0; V_{CB} = 8\text{ V}; f = 1\text{ MHz}$	–	0.7	–	pF
C_e	emitter capacitance	$I_C = i_c = 0; V_{EB} = 0.5\text{ V}; f = 1\text{ MHz}$	–	1.3	–	pF
C_{re}	feedback capacitance	$I_C = 0; V_{CB} = 8\text{ V}; f = 1\text{ MHz}$	–	0.5	–	pF
f_T	transition frequency	$I_C = 15\text{ mA}; V_{CE} = 8\text{ V}$	–	8	–	GHz
G_{UM}	maximum unilateral power gain (note 1)	$I_C = 15\text{ mA}; V_{CE} = 8\text{ V}; T_{amb} = 25\text{ °C}; f = 1\text{ GHz}$	–	14	–	dB
		$I_C = 15\text{ mA}; V_{CE} = 8\text{ V}; f = 2\text{ GHz}$	–	8	–	dB
F	noise figure	$\Gamma_s = \Gamma_{opt}; I_C = 5\text{ mA}; V_{CE} = 8\text{ V}; T_{amb} = 25\text{ °C}; f = 1\text{ GHz}$	–	1.3	–	dB
		$\Gamma_s = \Gamma_{opt}; I_C = 15\text{ mA}; V_{CE} = 8\text{ V}; T_{amb} = 25\text{ °C}; f = 1\text{ GHz}$	–	1.7	–	dB
		$\Gamma_s = \Gamma_{opt}; I_C = 5\text{ mA}; V_{CE} = 8\text{ V}; T_{amb} = 25\text{ °C}; f = 2\text{ GHz}$	–	2.2	–	dB
		$I_C = 5\text{ mA}; V_{CE} = 8\text{ V}; T_{amb} = 25\text{ °C}; f = 2\text{ GHz}; Z_s = 60\ \Omega$	–	2.5	–	dB
		$\Gamma_s = \Gamma_{opt}; I_C = 15\text{ mA}; V_{CE} = 8\text{ V}; T_{amb} = 25\text{ °C}; f = 2\text{ GHz}$	–	2.7	–	dB
		$I_C = 15\text{ mA}; V_{CE} = 8\text{ V}; T_{amb} = 25\text{ °C}; f = 2\text{ GHz}; Z_s = 60\ \Omega$	–	3	–	dB

Note

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

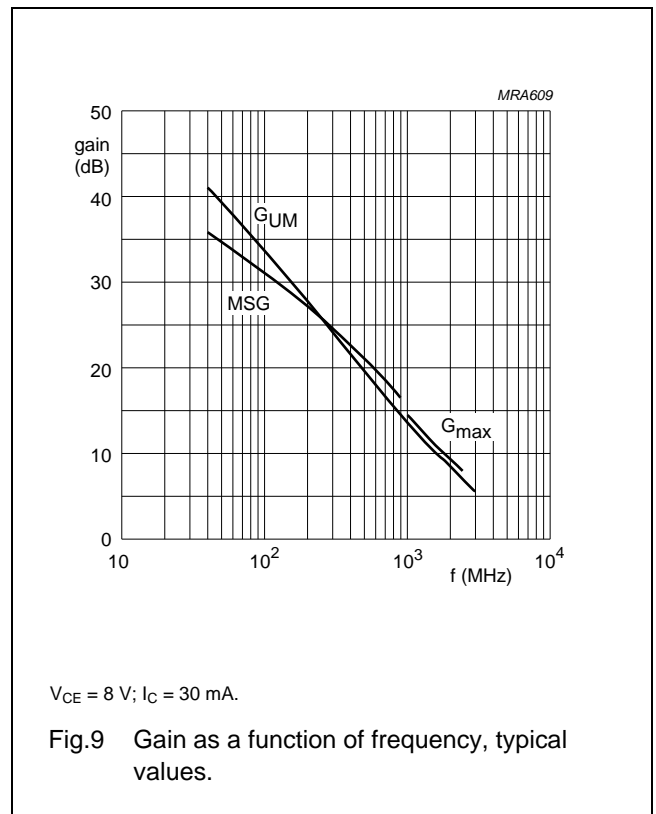
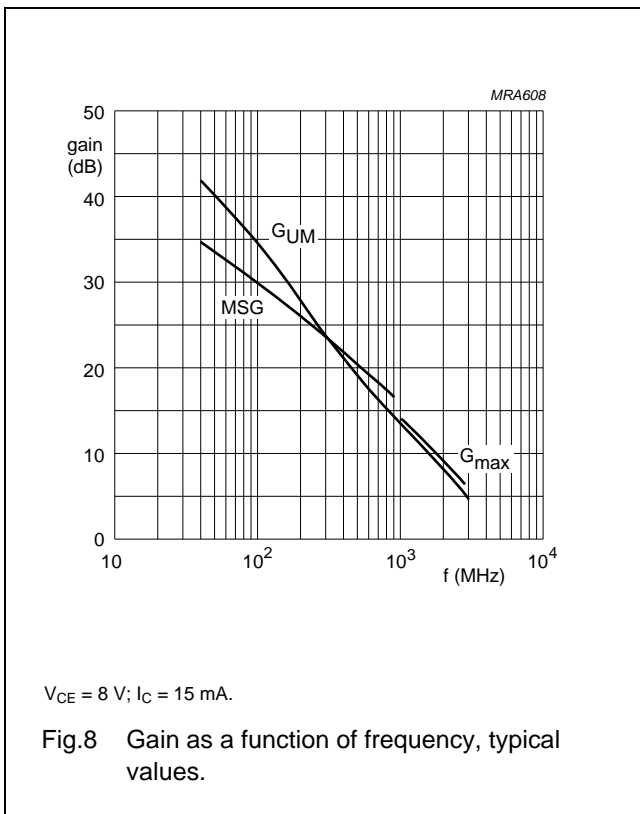
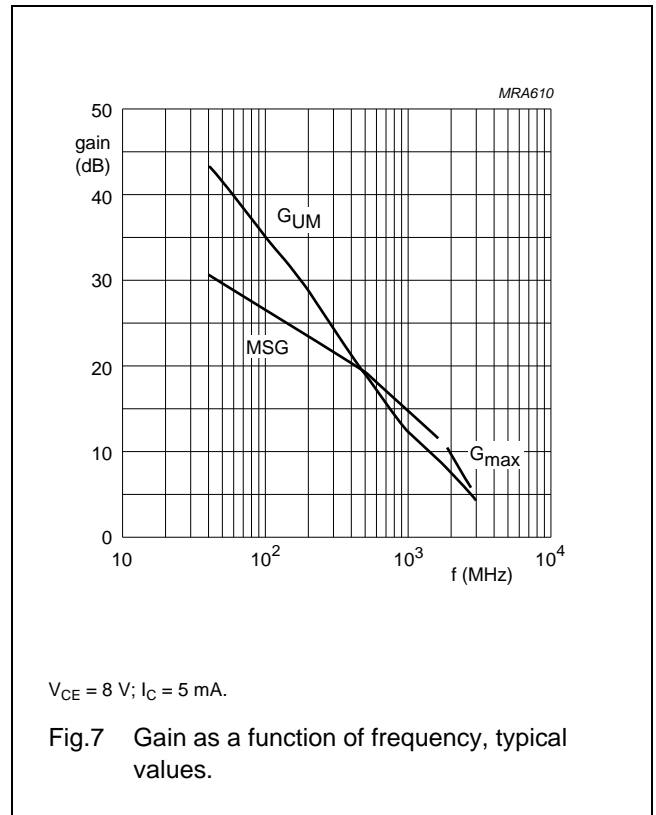
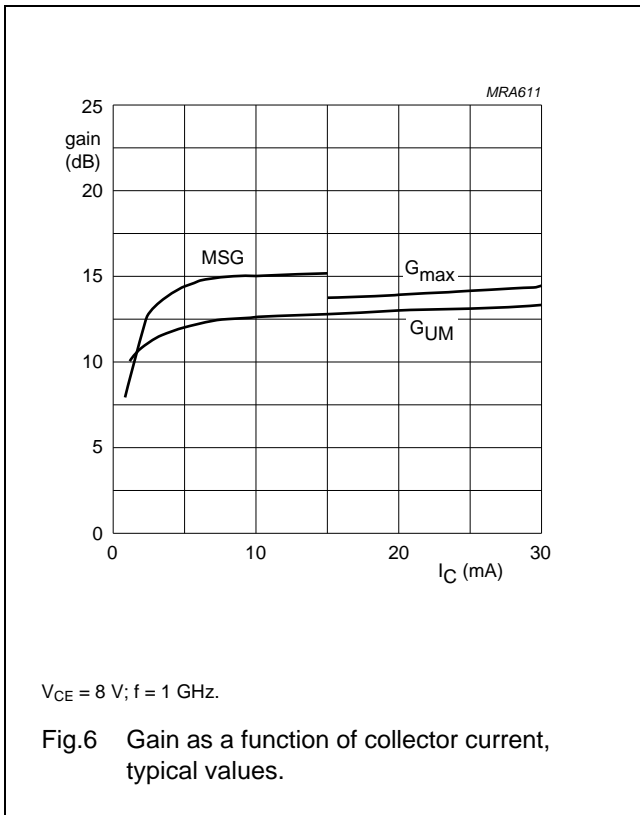
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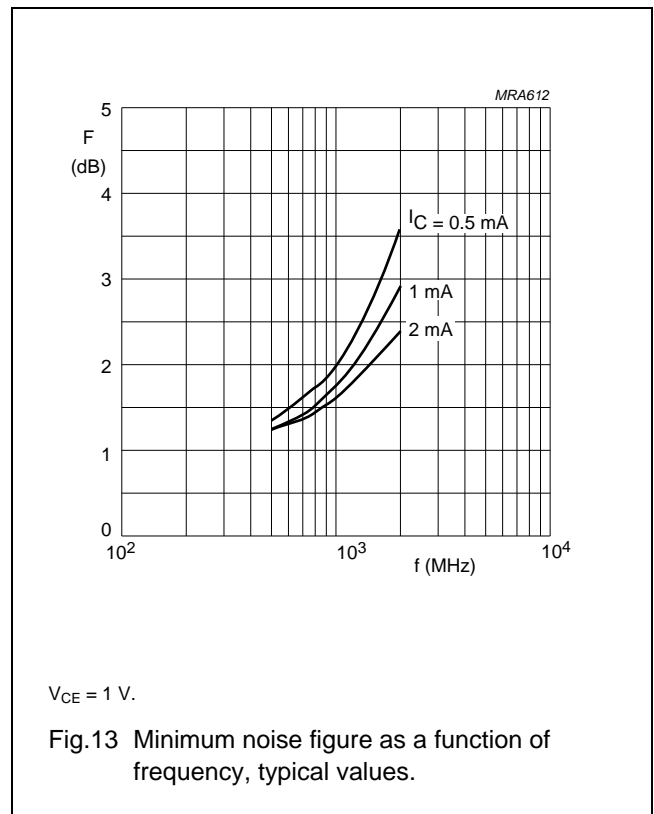
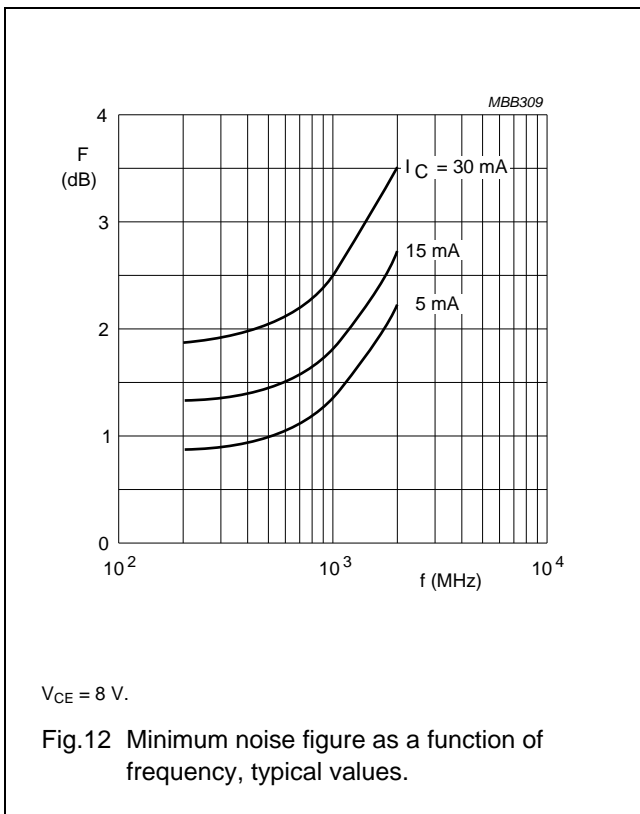
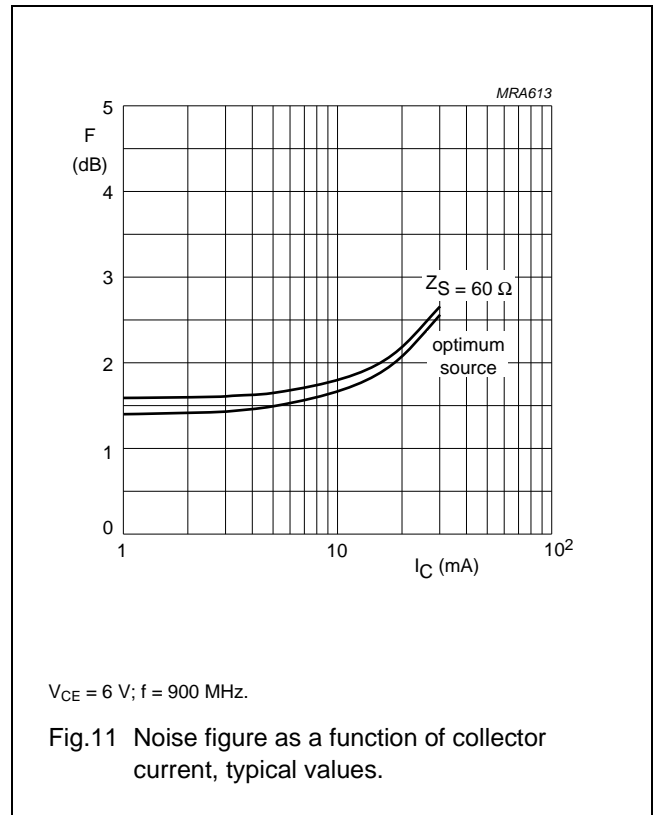
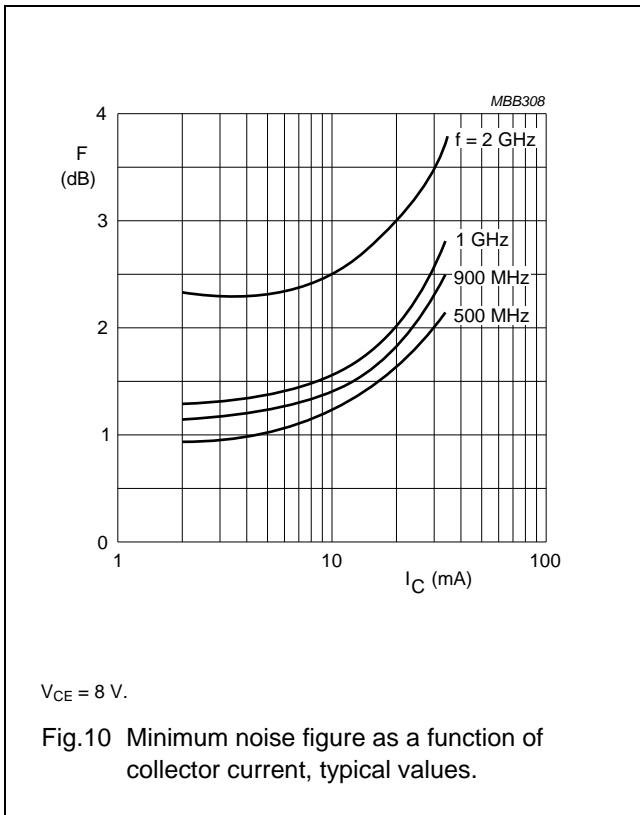
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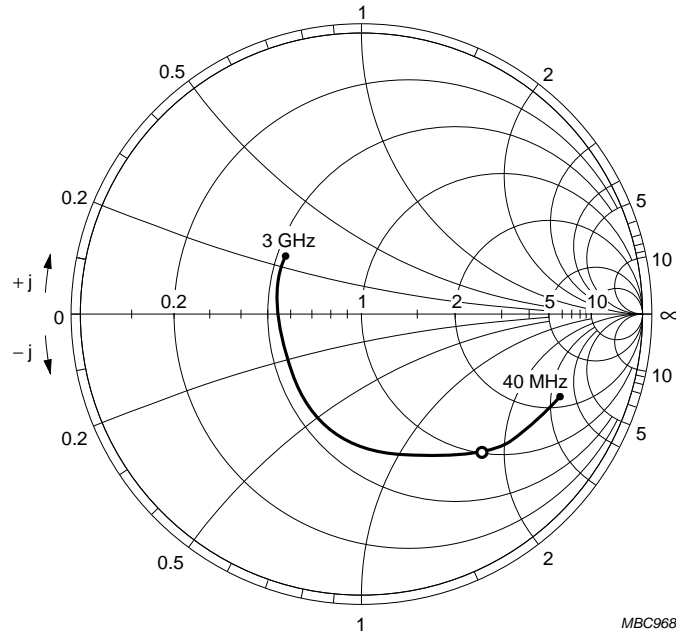
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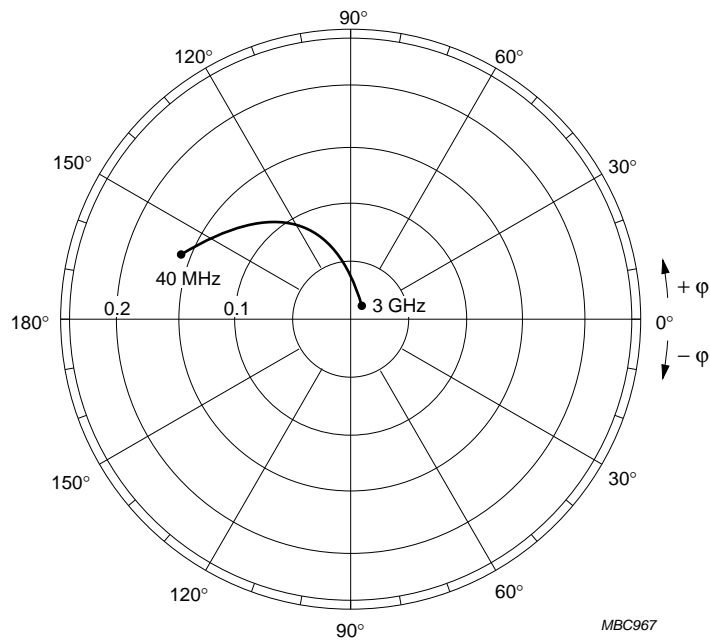
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$V_{CE} = 8\text{ V}; I_C = 15\text{ mA}; Z_o = 50\ \Omega.$

MBC968

Fig.14 Common emitter input reflection coefficient (S_{11}), typical values.



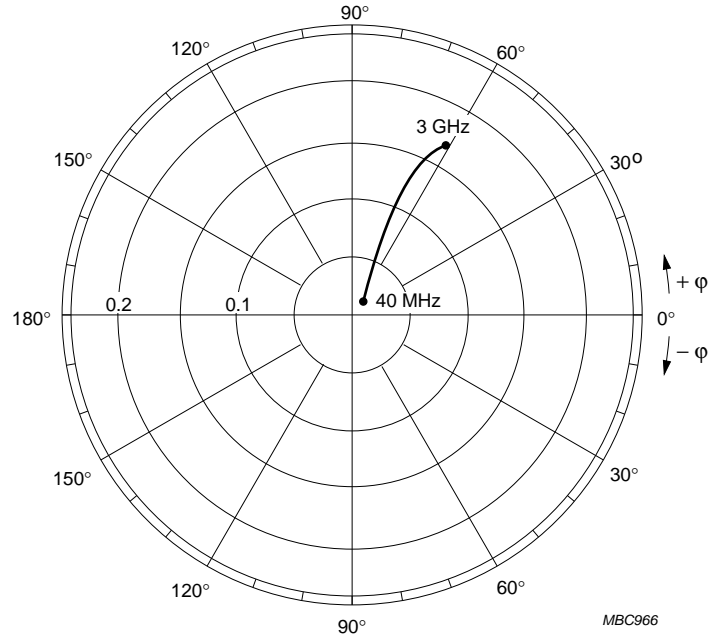
$V_{CE} = 8\text{ V}; I_C = 15\text{ mA}.$

MBC967

Fig.15 Common emitter forward transmission coefficient (S_{21}), typical values.

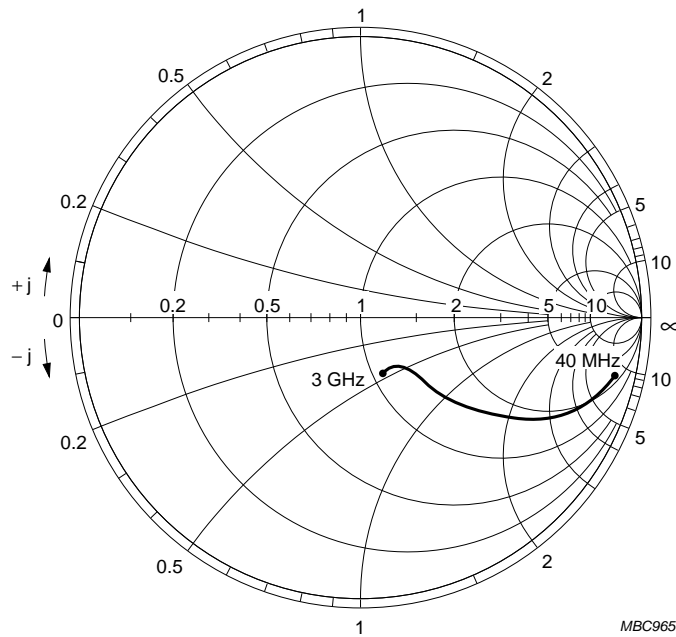
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$V_{CE} = 8\text{ V}; I_C = 15\text{ mA}$.

Fig.16 Common emitter reverse transmission coefficient (S_{12}), typical values.



$V_{CE} = 8\text{ V}; I_C = 15\text{ mA}; Z_0 = 50\ \Omega$.

Fig.17 Common emitter output reflection coefficient (S_{22}), typical values.

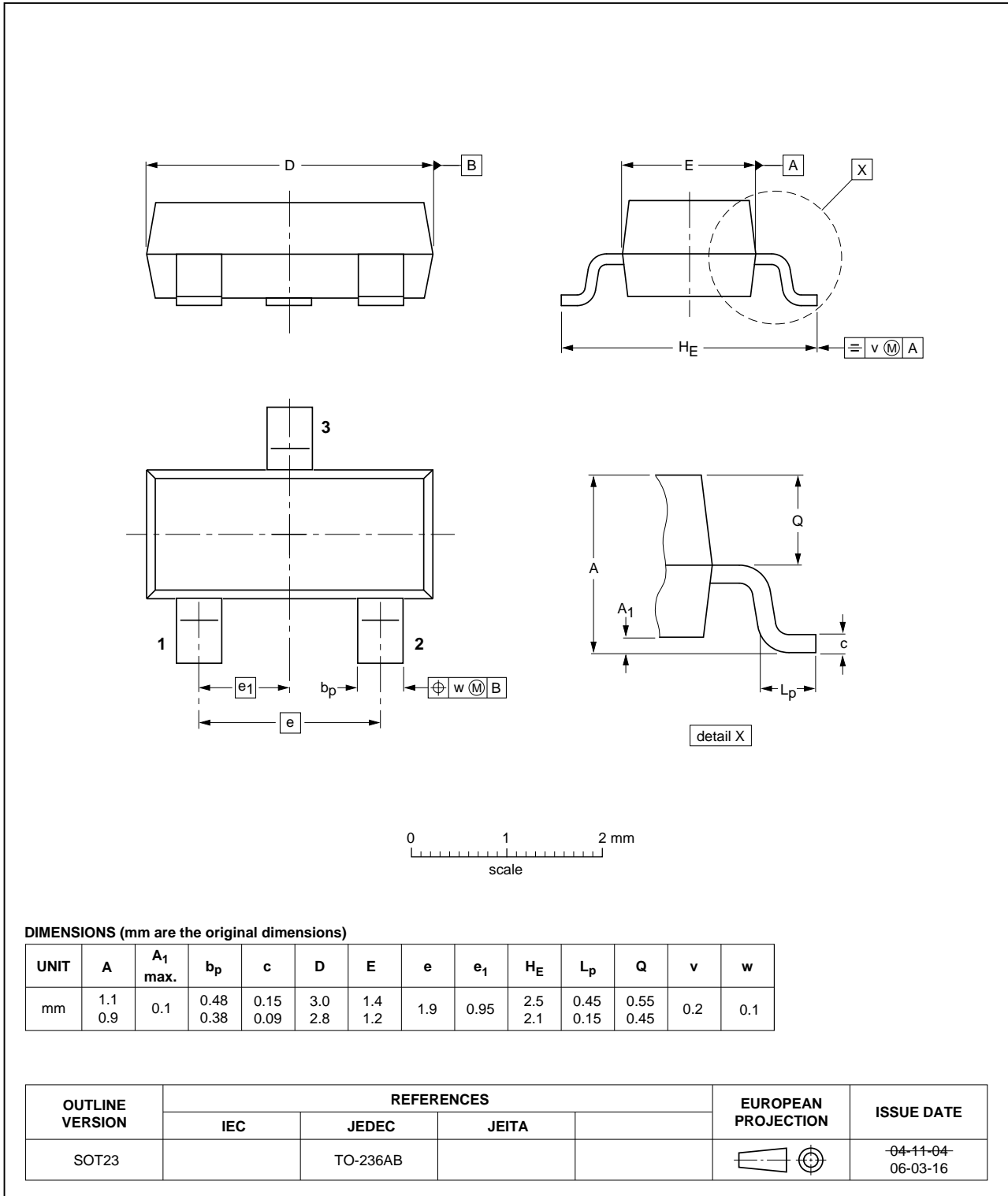
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PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



NPN 8 GHz wideband transistor

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DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITION
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Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
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Contact information

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