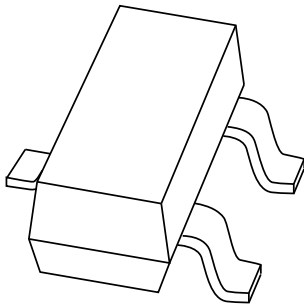


DATA SHEET



BFG67

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

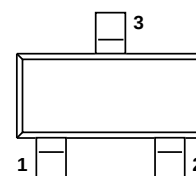
Satellite TV tuners and RF portable communications equipment up to 2 GHz.

DESCRIPTION

Silicon NPN wideband transistor in a plastic SOT23 package.

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector



Top view MSB003

Marking code: V2p.

Fig.1 SOT23.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{CBO}	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	$T_s \leq 97^\circ\text{C}$; 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_{CBO}	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	$T_s \leq 97^\circ\text{C}$; 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.

NPN 8 GHz wideband transistor

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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.

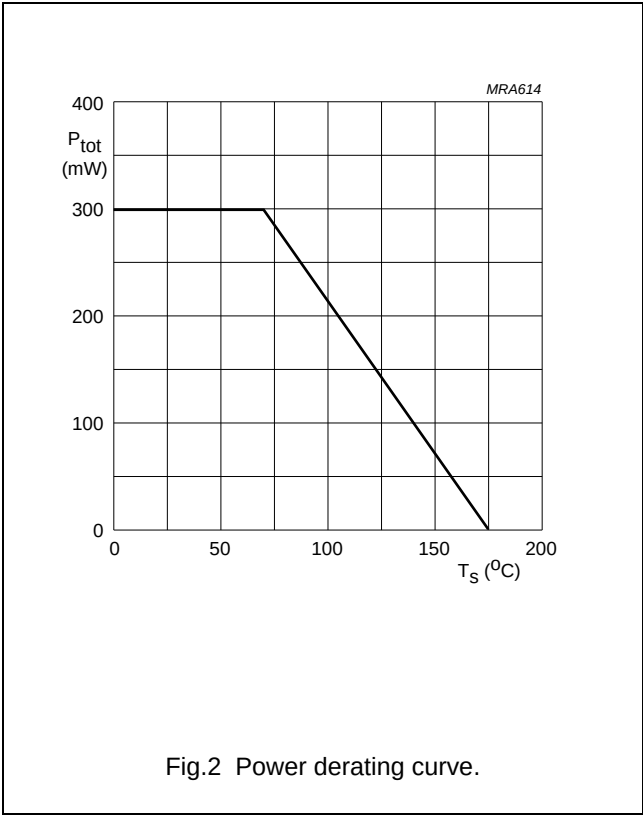
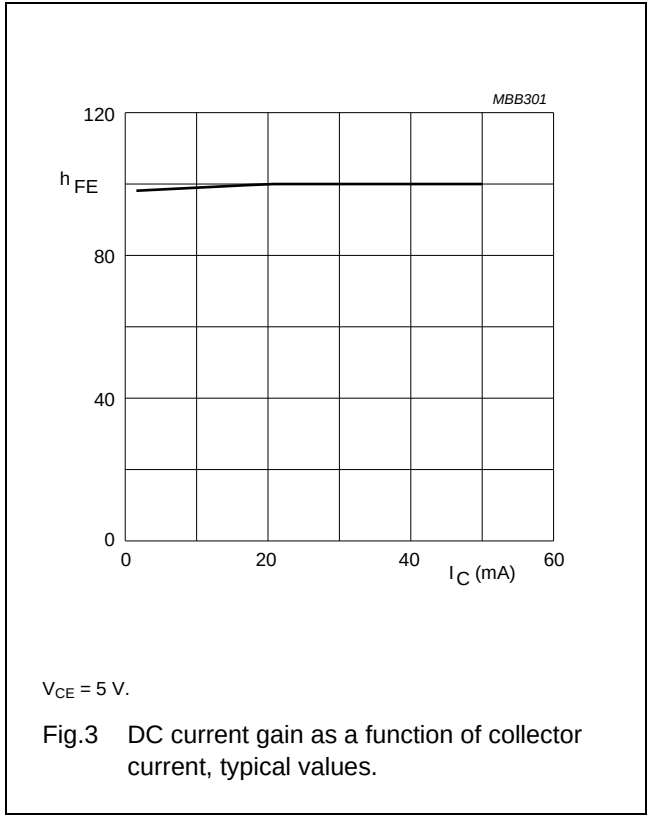
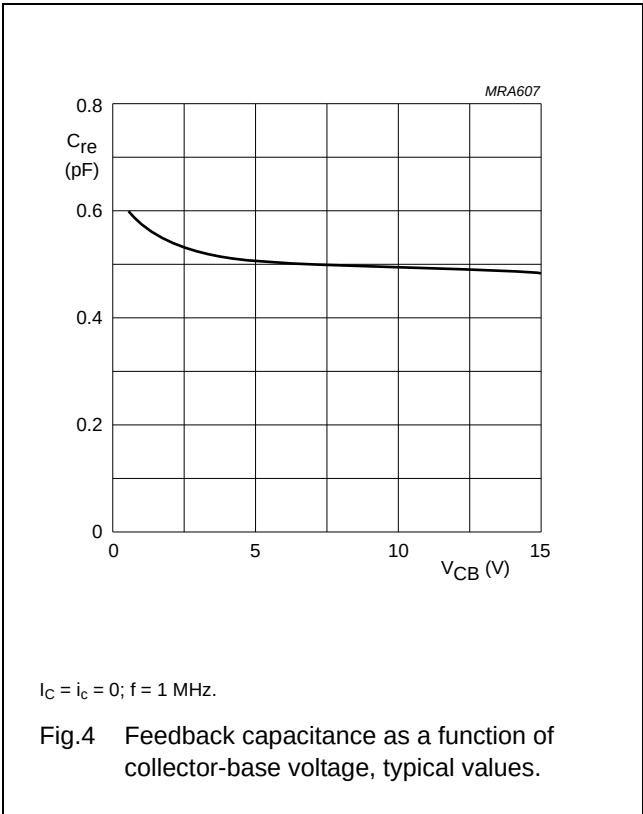
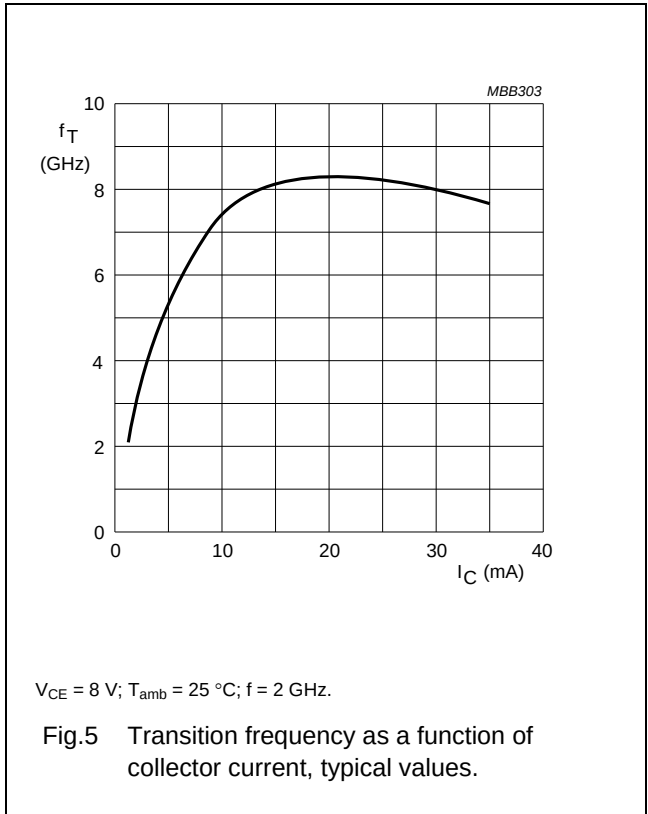
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0$; $V_{CB} = 5\text{ V}$	—	—	50	nA
h_{FE}	DC current gain	$I_C = 15\text{ mA}$; $V_{CE} = 5\text{ V}$	60	100	—	
C_c	collector capacitance	$I_E = i_e = 0$; $V_{CB} = 8\text{ V}$; $f = 1\text{ MHz}$	—	0.7	—	pF
C_e	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
		$I_C = 5\text{ mA}$; $V_{CE} = 8\text{ V}$; $T_{amb} = 25\text{ °C}$; $f = 2\text{ GHz}$; $Z_S = 60\text{ }\Omega$	—	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
		$I_C = 15\text{ mA}$; $V_{CE} = 8\text{ V}$; $T_{amb} = 25\text{ °C}$; $f = 2\text{ GHz}$; $Z_S = 60\text{ }\Omega$	—	3	—	dB

Note

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

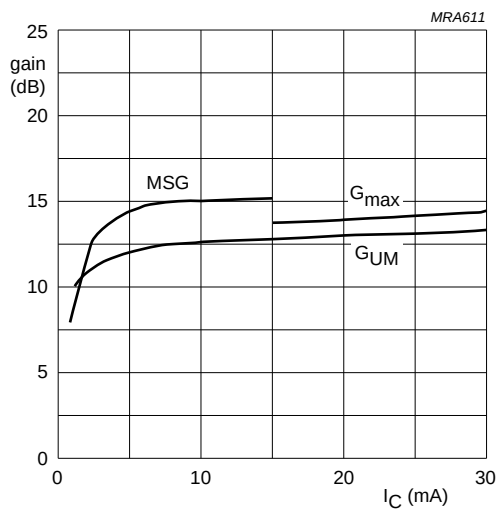
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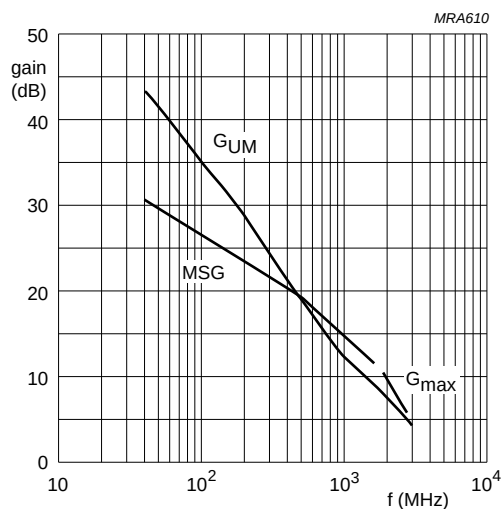
NPN 8 GHz wideband transistor

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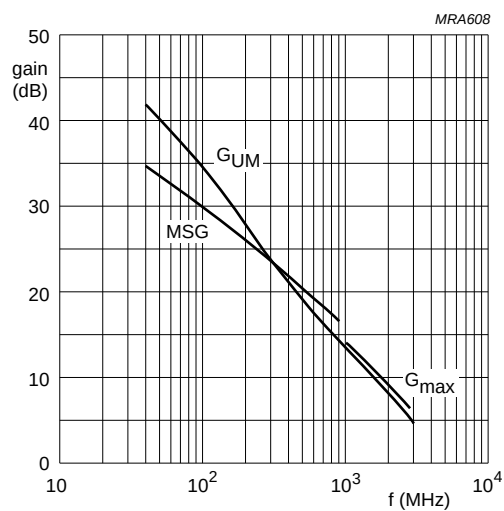
$V_{CE} = 8\text{ V}$; $f = 1\text{ GHz}$.

Fig.6 Gain as a function of collector current, typical values.



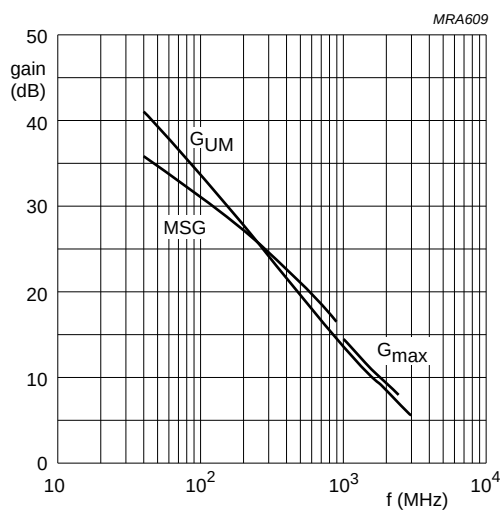
$V_{CE} = 8\text{ V}$; $I_C = 5\text{ mA}$.

Fig.7 Gain as a function of frequency, typical values.



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

Fig.8 Gain as a function of frequency, typical values.

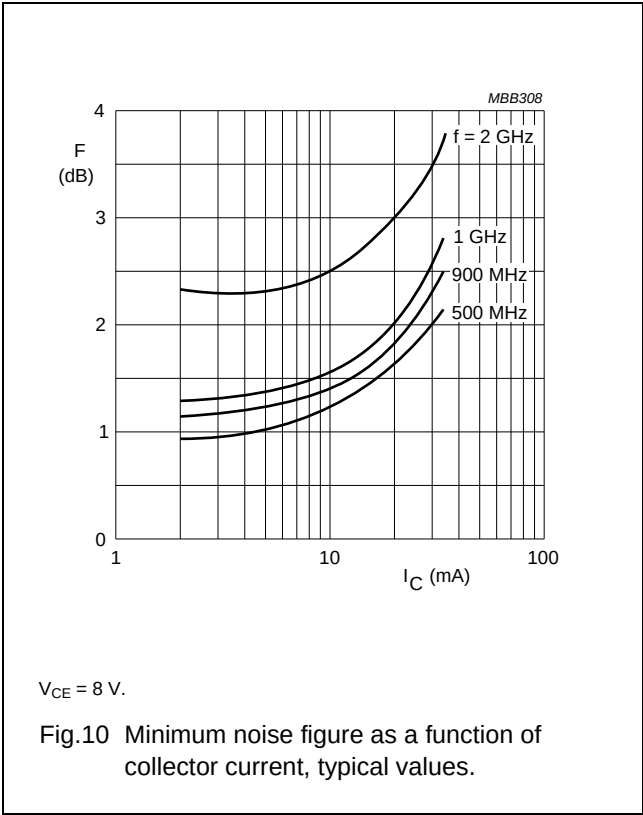
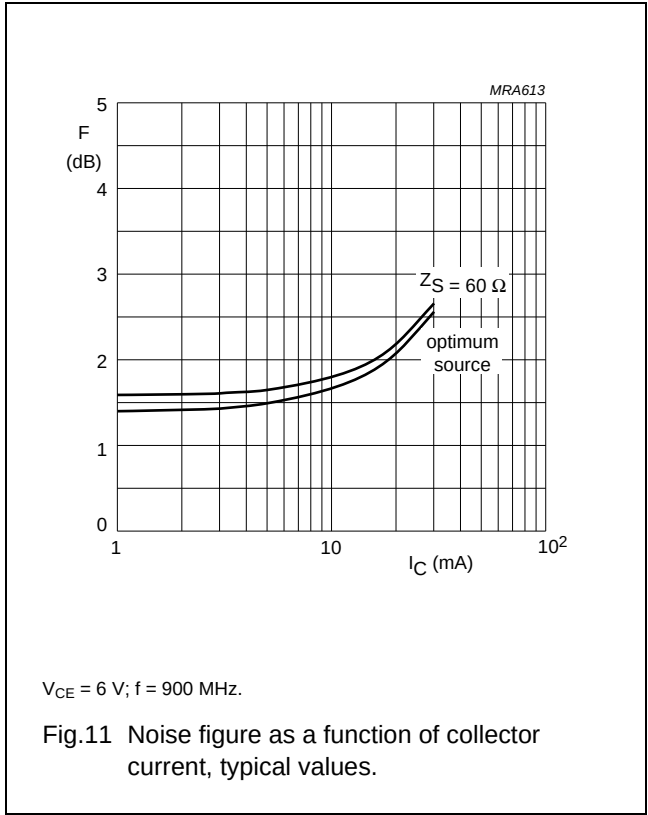
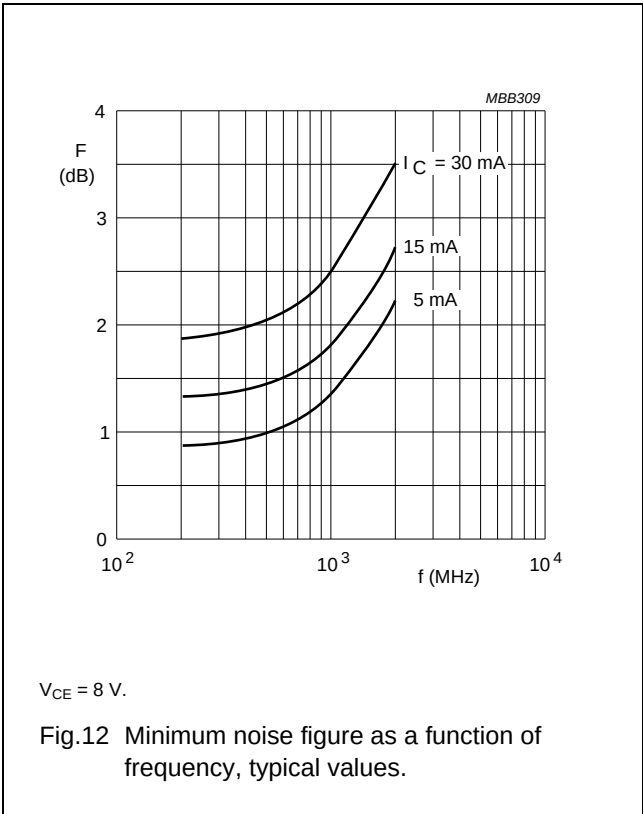
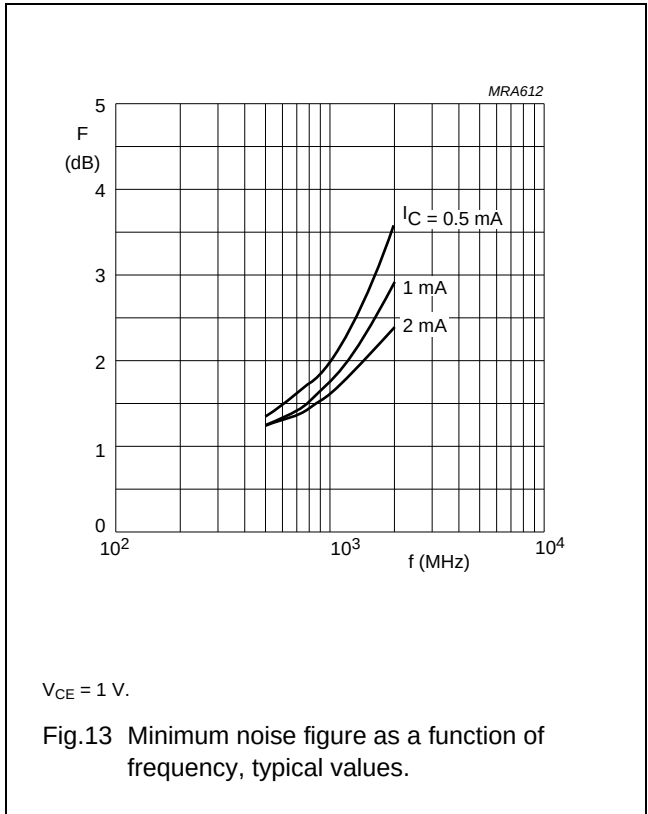


$V_{CE} = 8\text{ V}$; $I_C = 30\text{ mA}$.

Fig.9 Gain as a function of frequency, typical values.

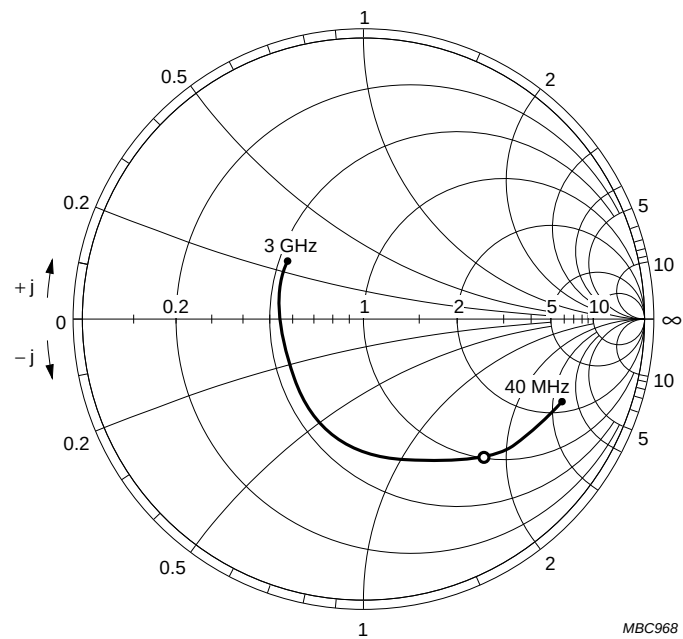
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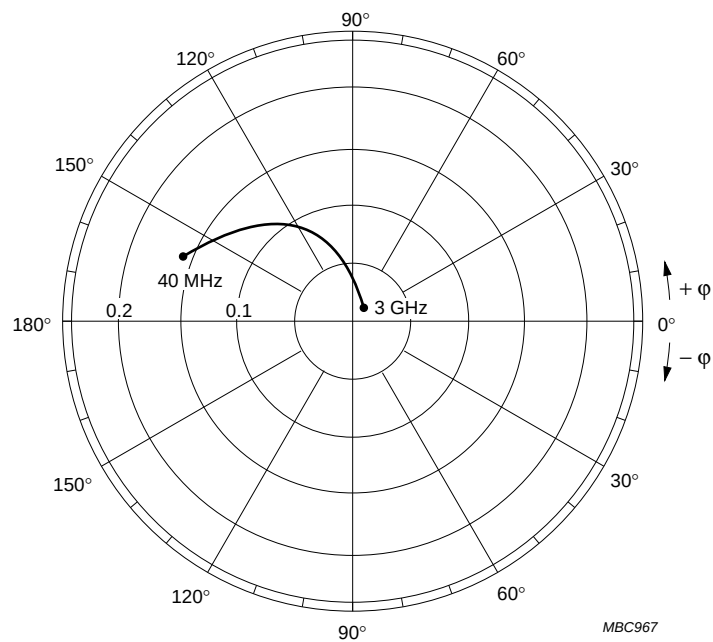
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$V_{CE} = 8\text{ V}$; $I_C = 15\text{ mA}$; $Z_0 = 50\ \Omega$.

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

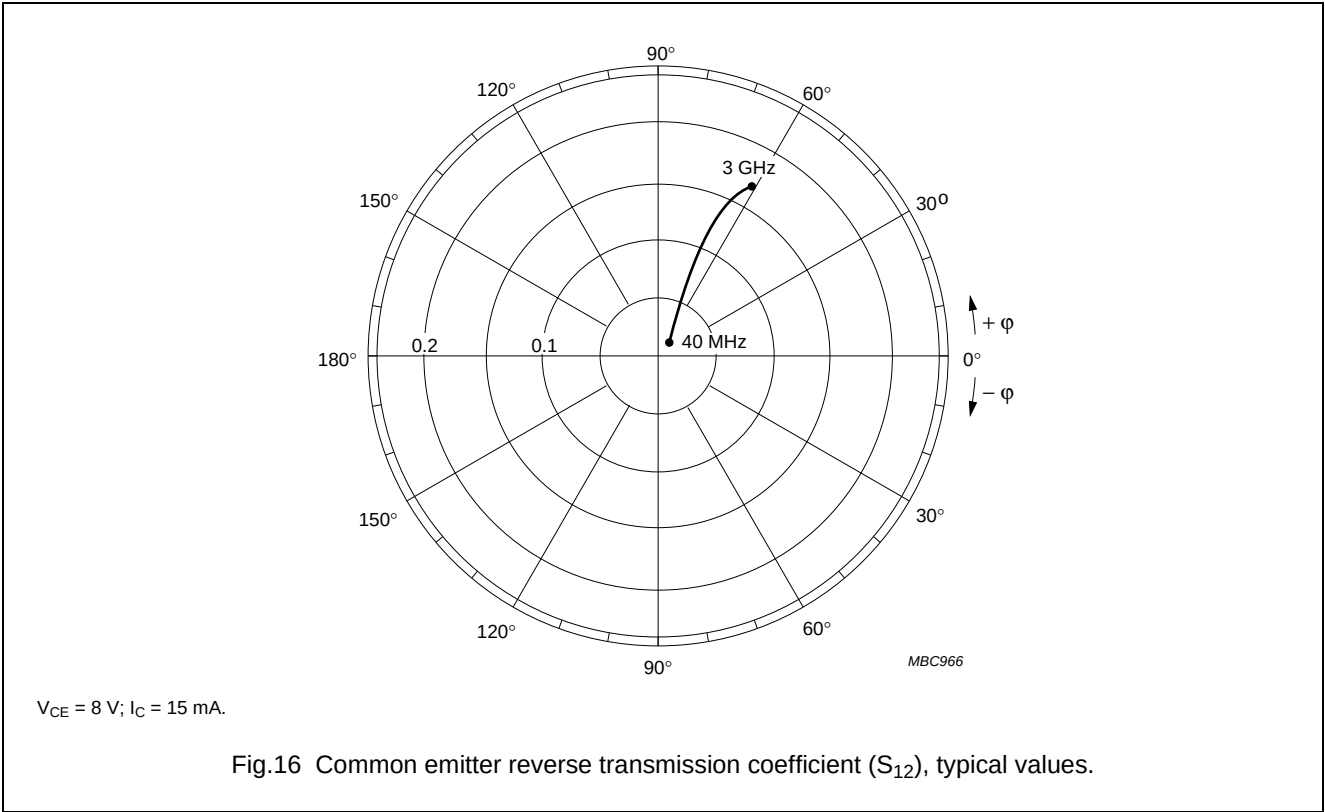
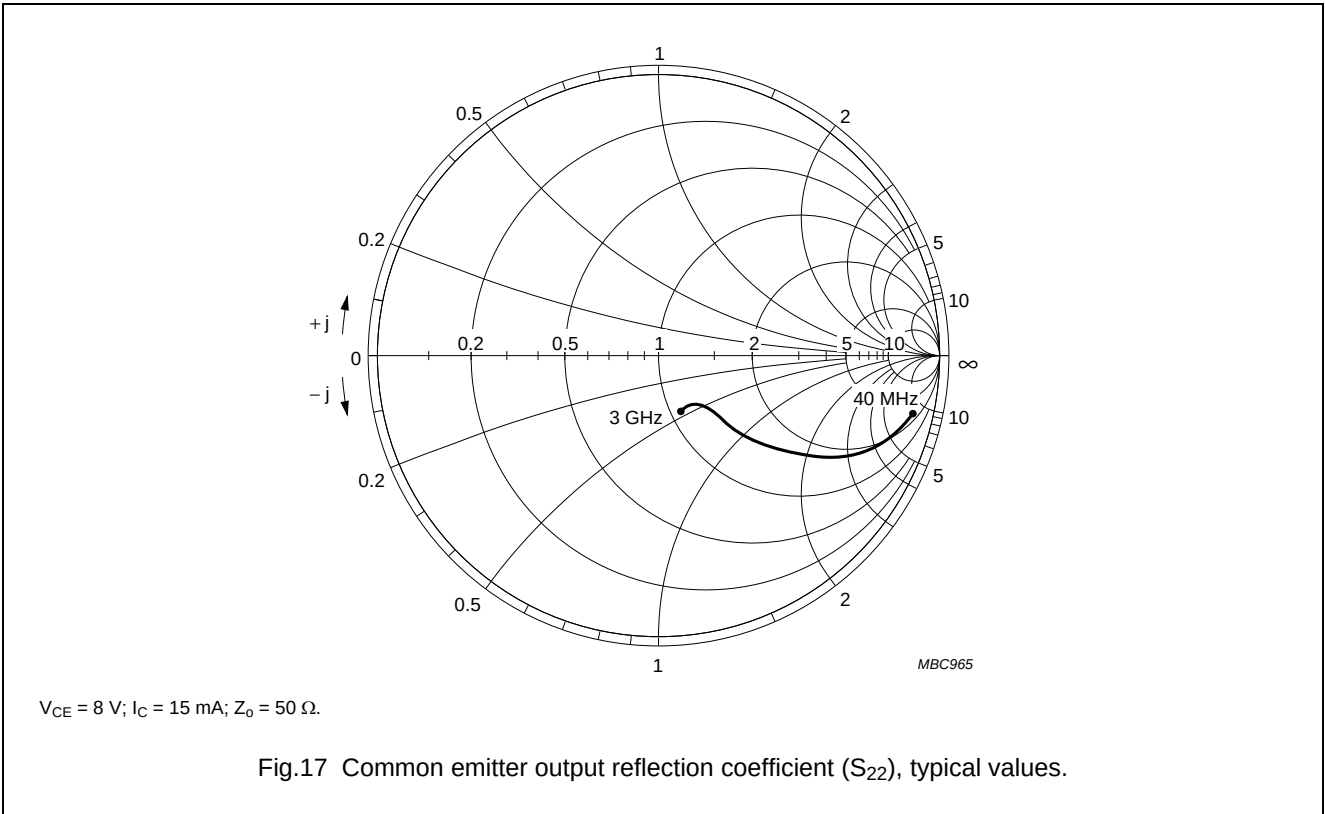


$V_{CE} = 8\text{ V}$; $I_C = 15\text{ mA}$.

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

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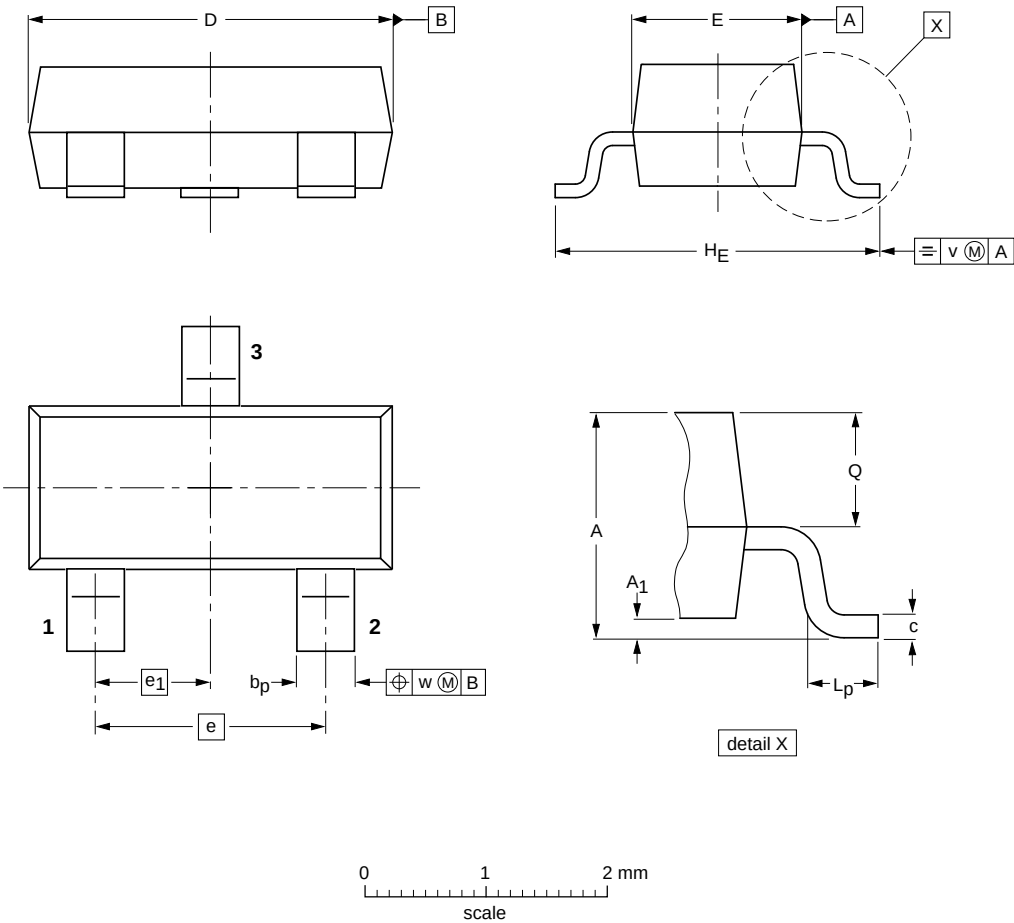
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PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max.	b _p	c	D	E	e	e ₁	H _E	L _p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT23		TO-236AB				04-11-04 06-03-16

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

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Contact information

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