

isc Silicon NPN RF Transistor

BFR540

DESCRIPTION

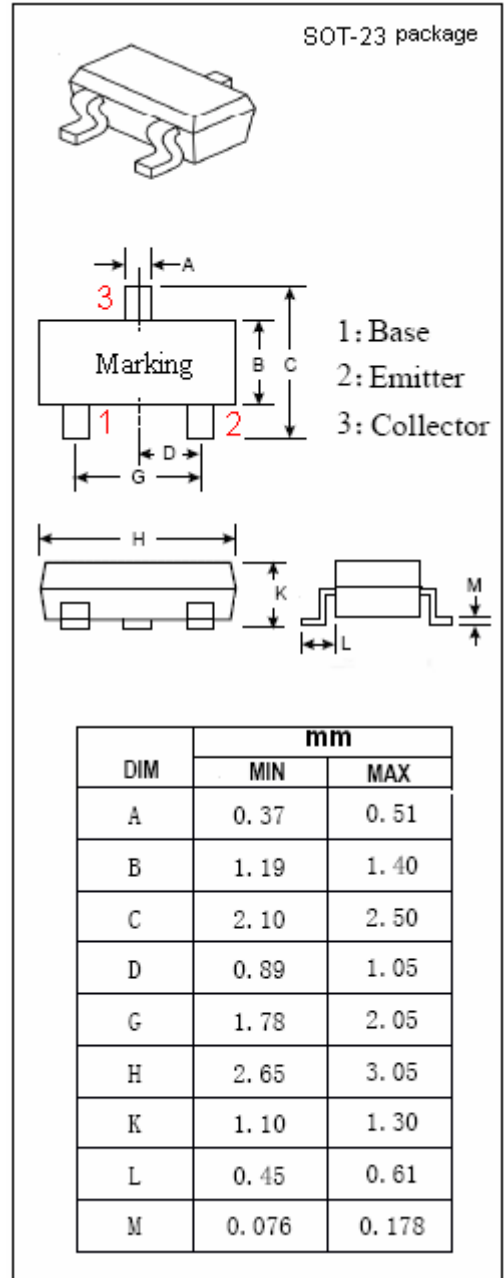
- High Power Gain
- High Current Gain Bandwidth Product
- Low Noise Figure

APPLICATIONS

- Designed for RF frontend in wideband applications in the GHz range, such as analog and digital cellular telephones, cordless telephones(CT1, CT2, DEC, etc.).

ABSOLUTE MAXIMUM RATINGS(T_a=25°C)

SYMBOL	PARAMETER	VALUE	UNIT
V _{CBO}	Collector-Base Voltage	20	V
V _{CES}	Collector-Emitter Voltage	15	V
V _{EBO}	Emitter-Base Voltage	2.5	V
I _C	Collector Current-Continuous	120	mA
P _C	Collector Power Dissipation @T _C =25°C	0.5	W
T _J	Junction Temperature	175	°C
T _{stg}	Storage Temperature Range	-65~150	°C



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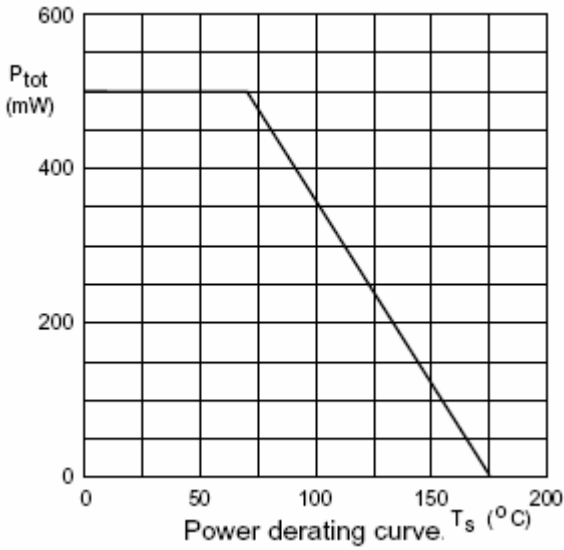
ELECTRICAL CHARACTERISTICS

T_C=25°C unless otherwise specified

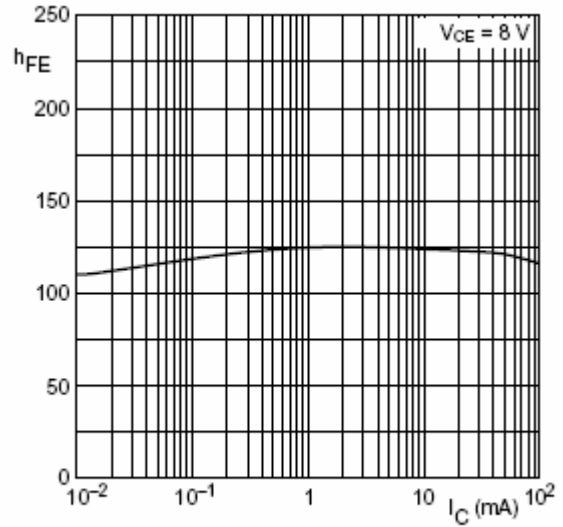
SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
I _{CBO}	Collector Cutoff Current	V _{CB} = 8V; I _E = 0			0.05	μ A
h _{FE}	DC Current Gain	I _C = 40mA ; V _{CE} = 8V	60		250	
f _T	Current-Gain—Bandwidth Product	I _C = 40mA ; V _{CE} = 8V; f= 1GHz		9		GHz
C _{OB}	Output Capacitance	I _E = 0 ; V _{CB} = 8V; f= 1MHz		0.9		pF
C _{re}	Feedback Frequency	I _E = 0 ; V _{CB} = 8V; f= 1MHz		0.6		pF
PG	Power Gain	I _C = 40mA ; V _{CE} = 8V; f= 900MHz		14		dB
PG	Power Gain	I _C = 40mA ; V _{CE} = 8V; f= 2GHz		7		dB
S _{21e} ²	Insertion Power Gain	I _C = 40mA ; V _{CE} = 8V; f= 900MHz	12	13		dB
NF	Noise Figure	I _C = 10mA ; V _{CE} = 8V; f= 900MHz		1.3	1.8	dB
NF	Noise Figure	I _C = 40mA ; V _{CE} = 8V; f= 900MHz		1.9	2.4	dB
NF	Noise Figure	I _C = 10mA ; V _{CE} = 8V; f= 2GHz		2.1		dB
V _o	Output Voltage	I _C = 40 mA; V _{CE} = 8 V; Z _L = Z _S = 75 Ω		550		mV

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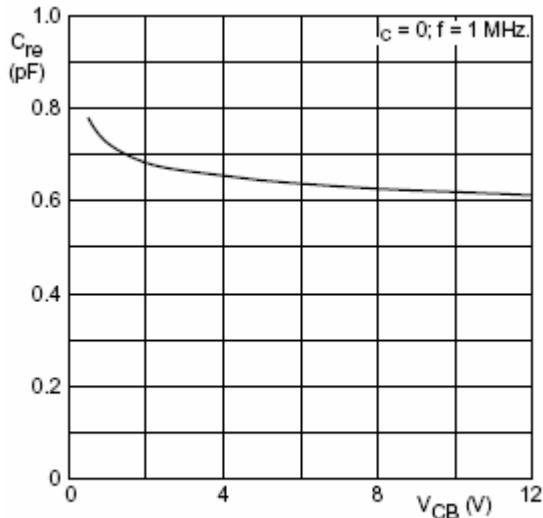
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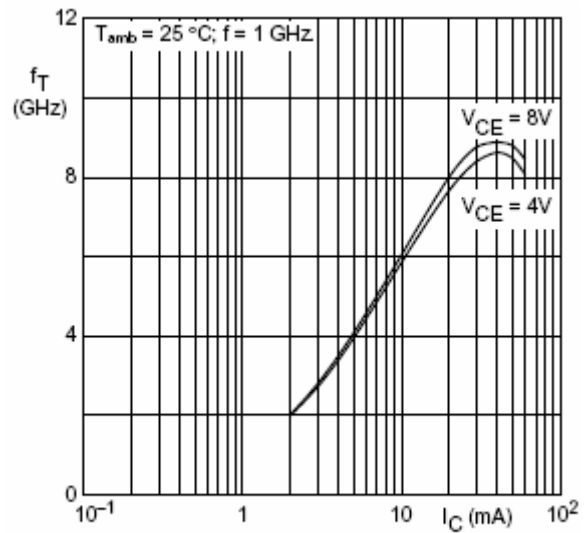
Power derating curve. T_s ($^{\circ}C$)



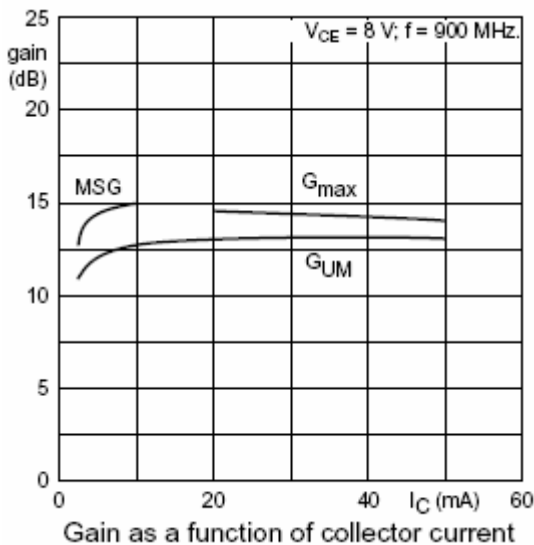
DC current gain as a function of collector current.



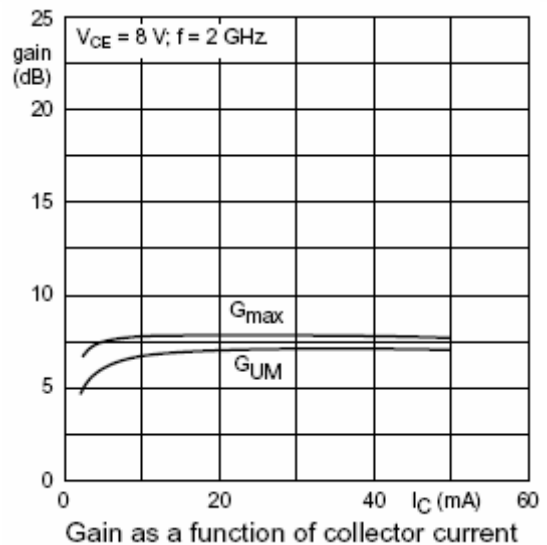
Feedback capacitance as a function of collector-base voltage.



Transition frequency as a function of collector current.



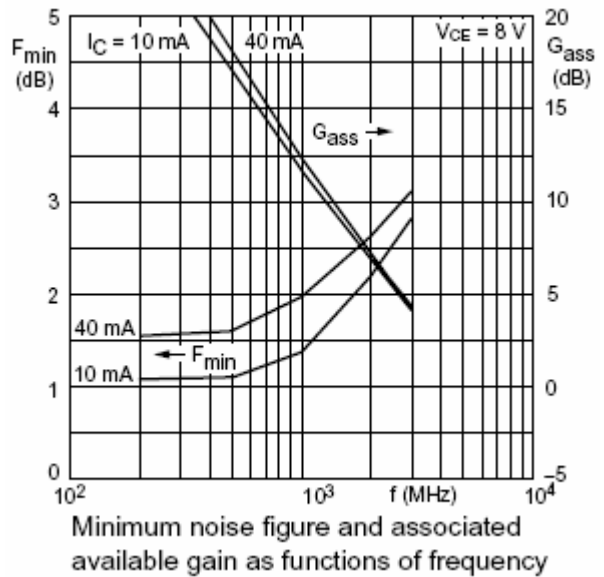
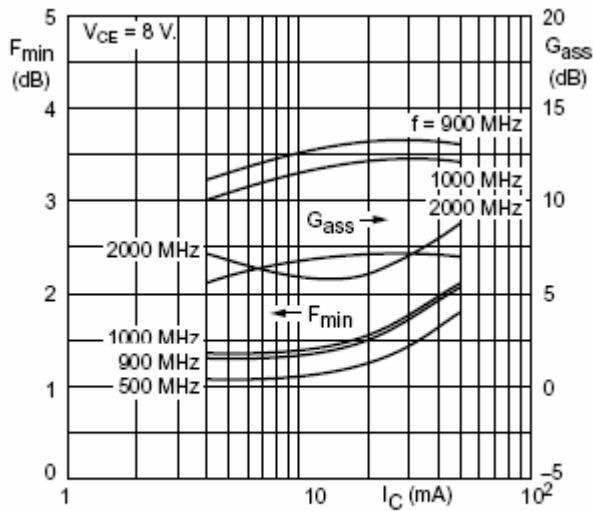
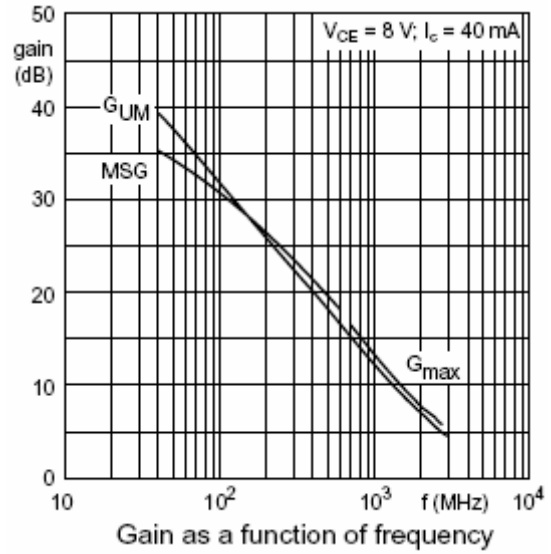
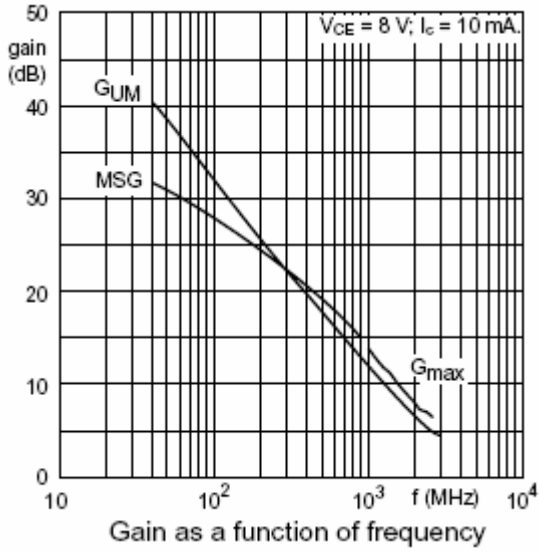
Gain as a function of collector current



Gain as a function of collector current

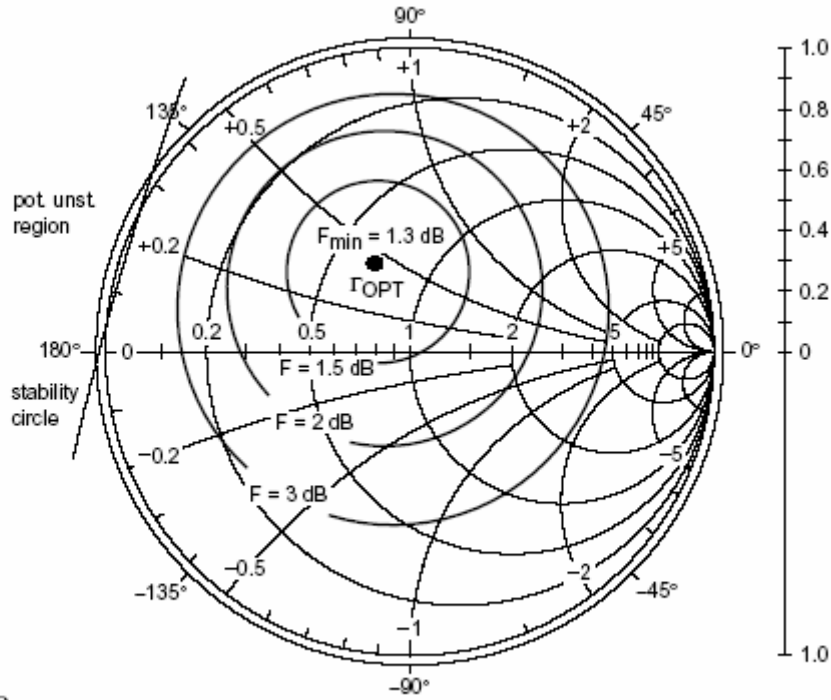
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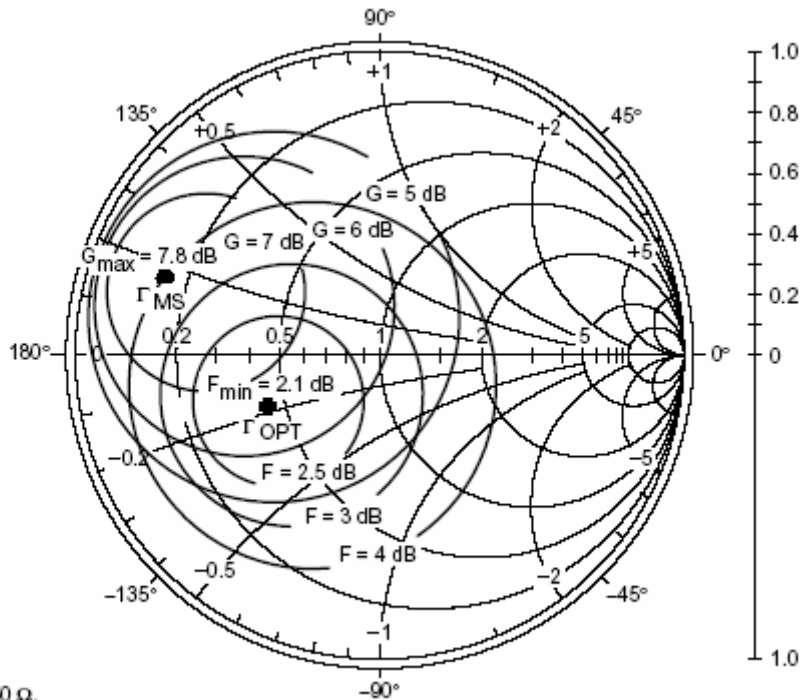


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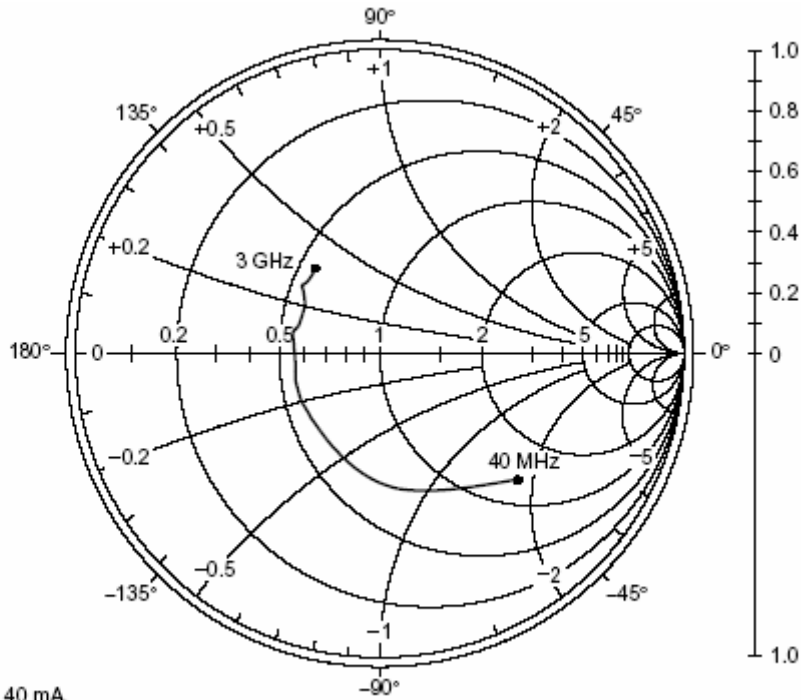
$Z_o = 50 \Omega$.
 $V_{CE} = 8 V$; $I_C = 10 mA$; $f = 900 MHz$. Noise circle figure.



$Z_o = 50 \Omega$.
 $V_{CE} = 8 V$; $I_C = 10 mA$; $f = 2000 MHz$ Noise circle figure

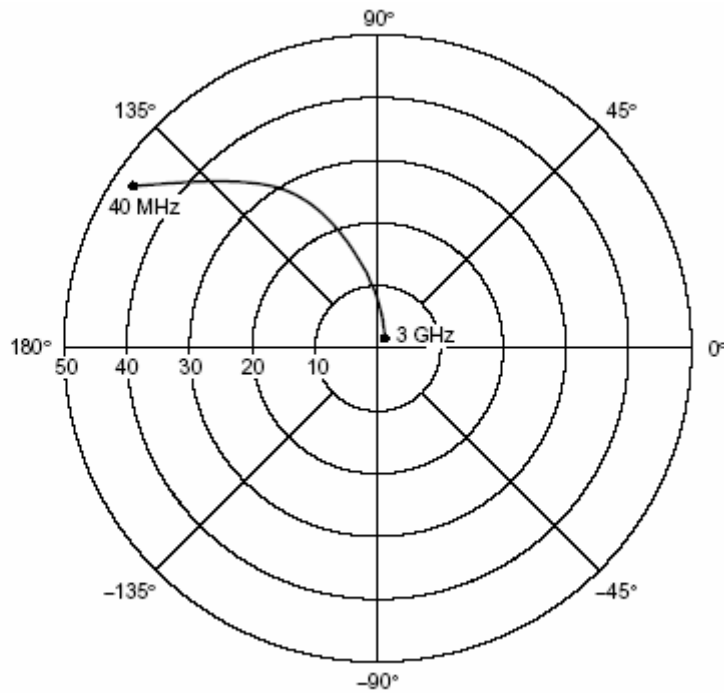
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$V_{CE} = 8\text{ V}; I_C = 40\text{ mA}$
 $Z_0 = 50\ \Omega$

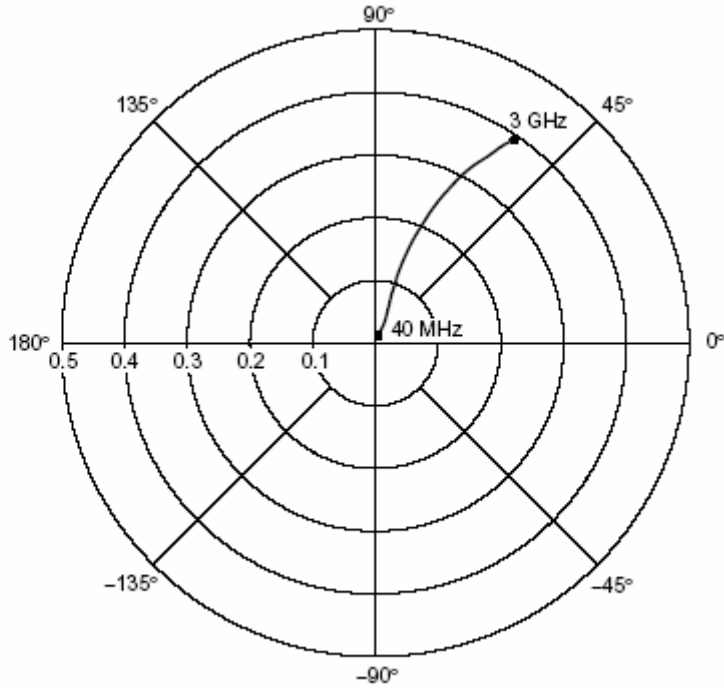
Common emitter input reflection coefficient (S_{11})



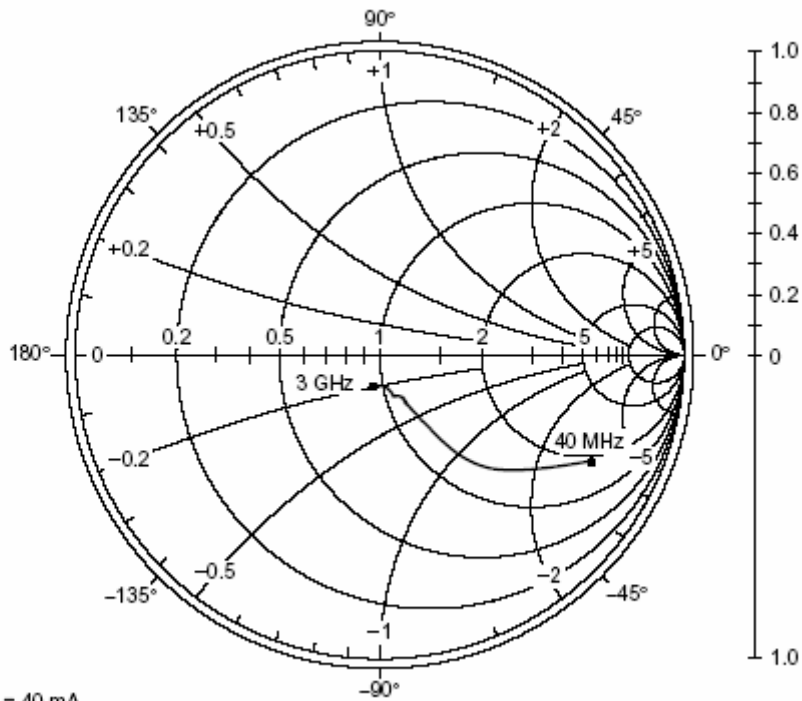
$V_{CE} = 8\text{ V}; I_C = 40\text{ mA}$ Common emitter forward transmission coefficient (S_{21})

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$V_{CE} = 8\text{ V}; I_C = 40\text{ mA}$. Common emitter reverse transmission coefficient (S_{12})



$V_{CE} = 8\text{ V}; I_C = 40\text{ mA}$.
 $Z_o = 50\ \Omega$. Common emitter output reflection coefficient (S_{22})