

isc Silicon NPN RF Transistor

2SC5090

DESCRIPTION

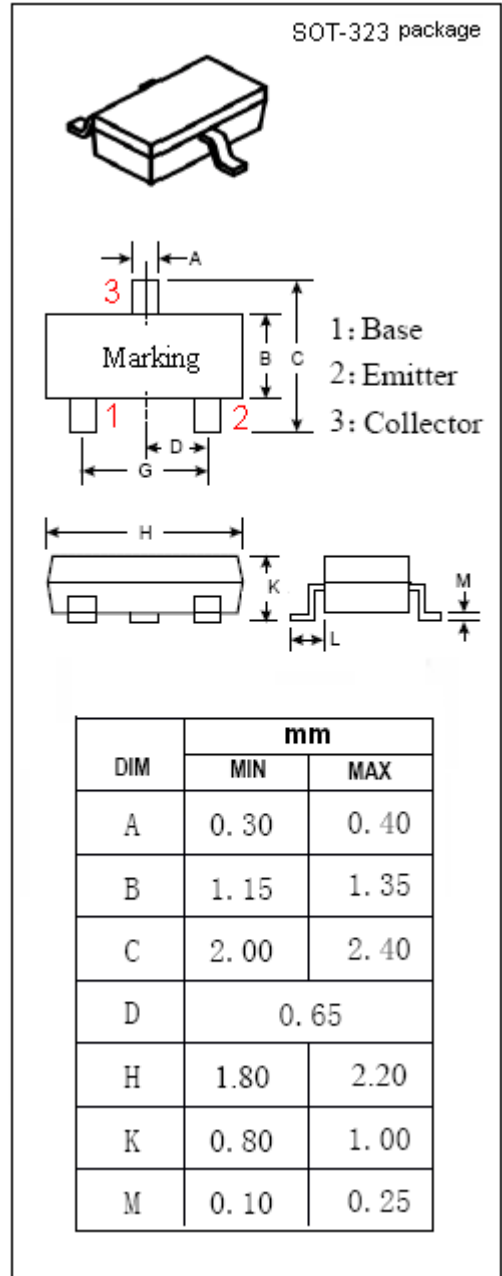
- High Gain Bandwidth Product
 $f_T = 10 \text{ GHz TYP.}$
- High Gain, Low Noise Figure
 $|S_{21e}|^2 = 13 \text{ dB TYP., NF} = 1.1 \text{ dB TYP @ } f = 1 \text{ GHz}$

APPLICATIONS

- Designed for VHF~UHF band low noise amplifier applications.

ABSOLUTE MAXIMUM RATINGS($T_a=25^\circ\text{C}$)

SYMBOL	PARAMETER	VALUE	UNIT
V_{CBO}	Collector-Base Voltage	20	V
V_{CEO}	Collector-Emitter Voltage	10	V
V_{EBO}	Emitter-Base Voltage	1.5	V
I_C	Collector Current-Continuous	40	mA
I_B	Base Current-Continuous	20	mA
P_C	Collector Power Dissipation @ $T_c=25^\circ\text{C}$	0.1	W
T_J	Junction Temperature	125	$^\circ\text{C}$
T_{stg}	Storage Temperature Range	-55~125	$^\circ\text{C}$



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ELECTRICAL CHARACTERISTICS

 $T_c=25^\circ\text{C}$ unless otherwise specified

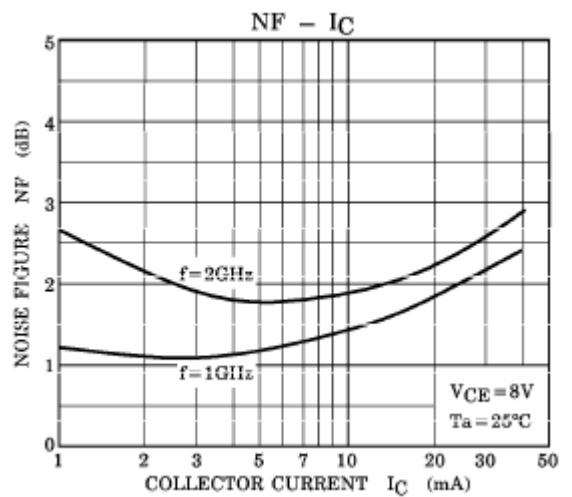
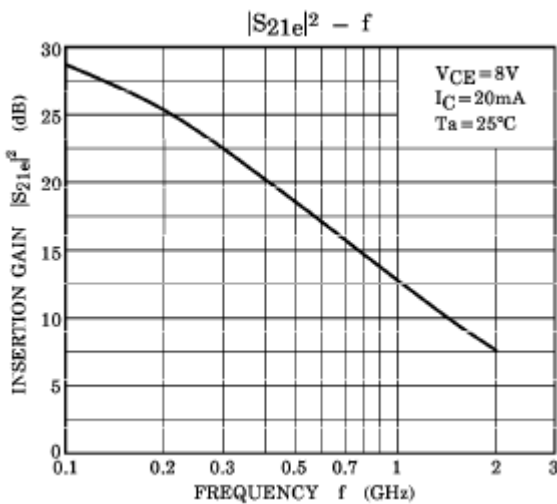
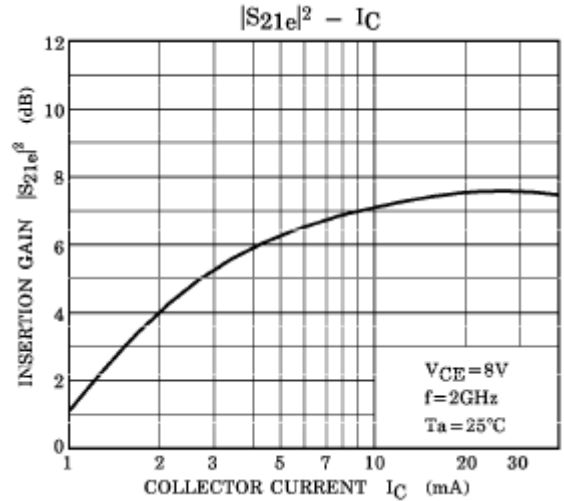
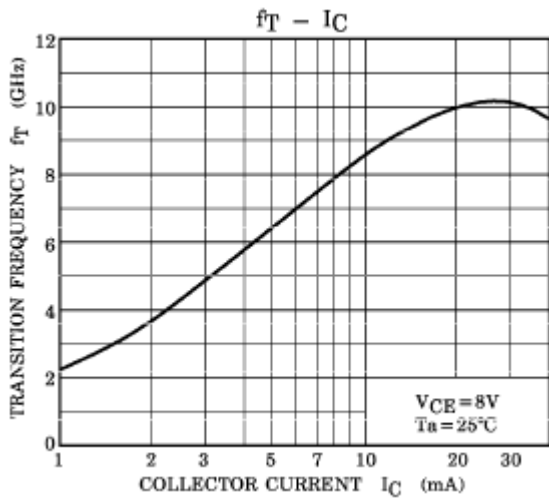
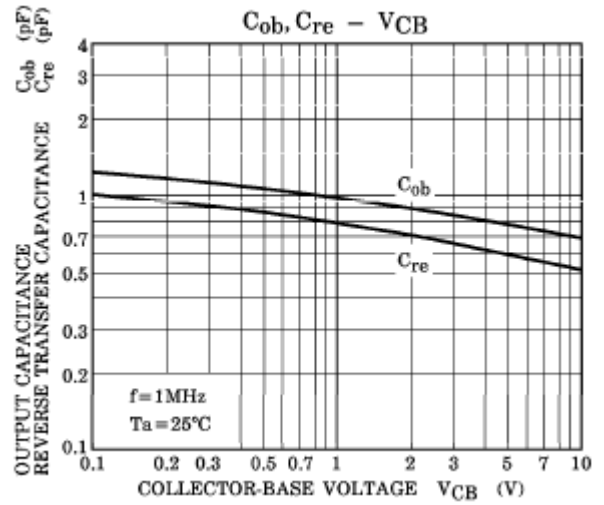
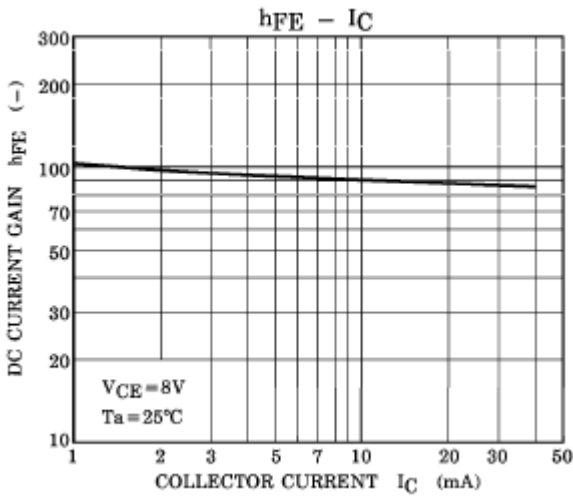
SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
I_{CBO}	Collector Cutoff Current	$V_{CB}=10\text{V}; I_E=0$			1	μA
I_{EBO}	Emitter Cutoff Current	$V_{EB}=1\text{V}; I_C=0$			1	μA
h_{FE}	DC Current Gain	$I_C=20\text{mA}; V_{CE}=8\text{V}$	50		160	
$ S_{21e} ^2$	Insertion Power Gain	$I_C=20\text{mA}; V_{CE}=8\text{V}; f=1\text{GHz}$	10	13		dB
$ S_{21e} ^2$	Insertion Power Gain	$I_C=20\text{mA}; V_{CE}=8\text{V}; f=2\text{GHz}$		7		dB
f_T	Current-Gain—Bandwidth Product	$I_C=20\text{mA}; V_{CE}=8\text{V}$	7	10		GHz
C_{OB}	Output Capacitance	$I_E=0; V_{CB}=10\text{V}; f=1.0\text{MHz}$		0.7		pF
C_{re}	Feedback Capacitance	$I_E=0; V_{CB}=10\text{V}; f=1.0\text{MHz}$		0.5	0.95	pF
NF	Noise Figure	$I_C=5\text{mA}; V_{CE}=8\text{V}; f=1\text{GHz}$		1.1	2.5	dB
NF	Noise Figure	$I_C=5\text{mA}; V_{CE}=8\text{V}; f=2\text{GHz}$		1.7		dB

◆ h_{FE} Classification

R	O
50-100	80-160

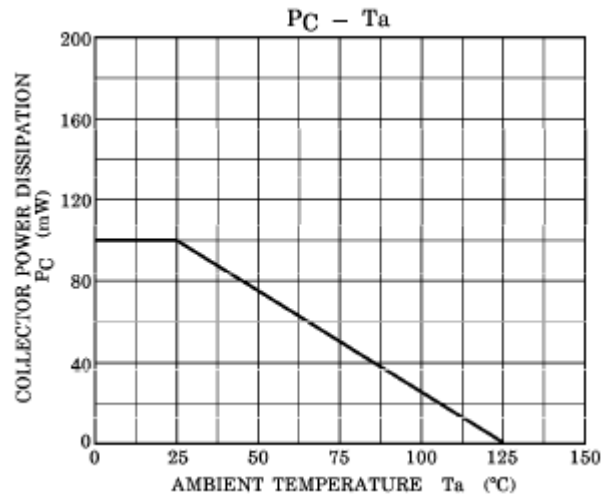
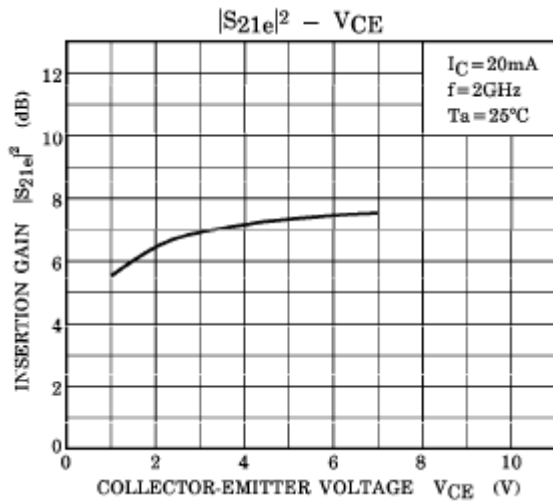
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S-PARAMETER

$V_{CE} = 8\text{ V}$, $I_C = 5\text{ mA}$, $Z_0 = 50\ \Omega$

Freque.	S_{11}		S_{21}		S_{12}		S_{22}	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.683	-50.1	10.186	138.3	0.049	62.0	0.773	-30.0
400	0.462	-86.9	7.472	114.6	0.071	54.3	0.556	-39.6
600	0.343	-113.1	5.618	100.9	0.086	53.8	0.448	-41.7
800	0.282	-133.6	4.407	91.7	0.101	55.3	0.392	-41.6
1000	0.249	-151.0	3.663	84.7	0,115	57.2	0.360	-41.7
1200	0.236	-166.6	3.128	78.7	0,131	58.9	0.339	-41.7
1400	0.233	179.7	2.759	73.1	0.150	60.1	0.330	-42.8
1600	0.234	168.3	2.457	68.2	0,168	60.0	0.319	-45.0
1800	0.238	158.6	2.224	63.4	0.185	60.0	0.311	-47.9
2000	0.251	149.6	2.038	59.4	0,203	60.4	0.302	-50.2

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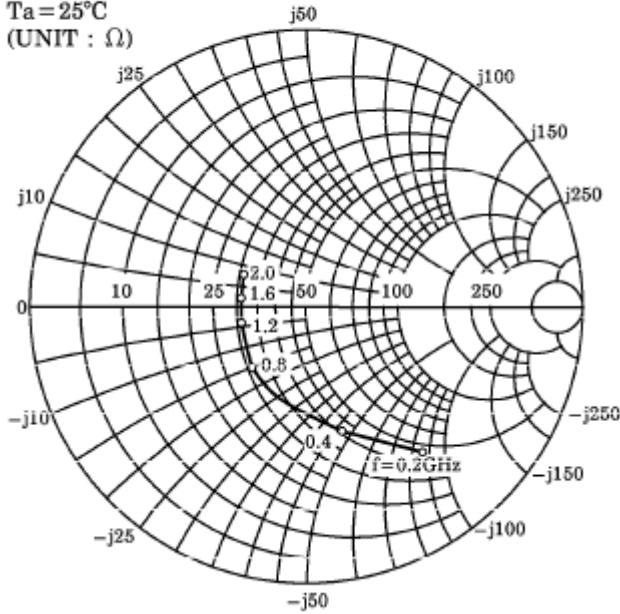
$V_{CE} = 8 \text{ V}$, $I_C = 20 \text{ mA}$, $Z_0 = 50 \Omega$

Freque.	S_{11}		S_{21}		S_{12}		S_{22}	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.319	-91.9	18.383	126.7	0.033	65.3	0.494	-43.5
400	0.213	-134.2	10.303	99.2	0.054	68.9	0.312	-42.4
600	0.185	-160.0	7.111	90.3	0.076	70.8	0.258	-37.6
800	0.176	-178.2	5.415	84.3	0.098	71.2	0.236	-34.3
1000	0.174	167.8	4.400	79.2	0,120	71.1	0.228	-32.0
1200	0.178	156.8	3.712	74.8	0,143	70.3	0.226	-31.5
1400	0.186	147.5	3.236	70.3	0.168	68.7	0.226	-32.8
1600	0.194	139.7	2.874	66.3	0,190	66.6	0.223	-35.9
1800	0.199	133.7	2.583	62.6	0.211	64.9	0.216	-39.0
2000	0.215	127.8	2.369	58.8	0,232	63.5	0.211	-41.9

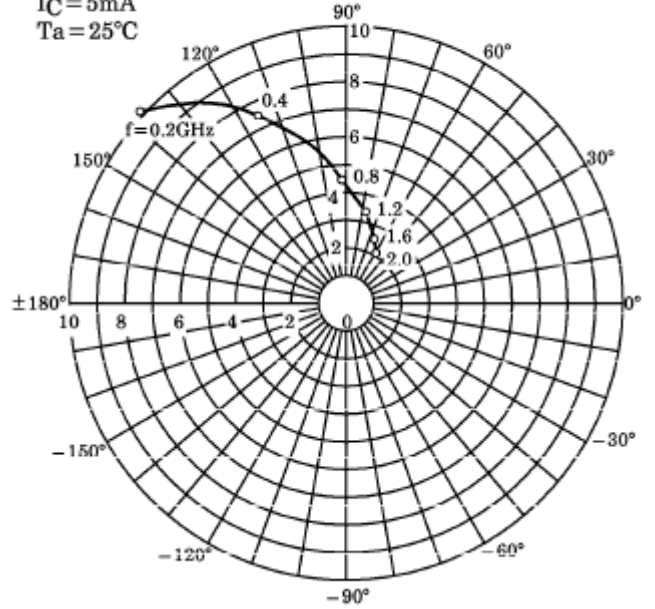
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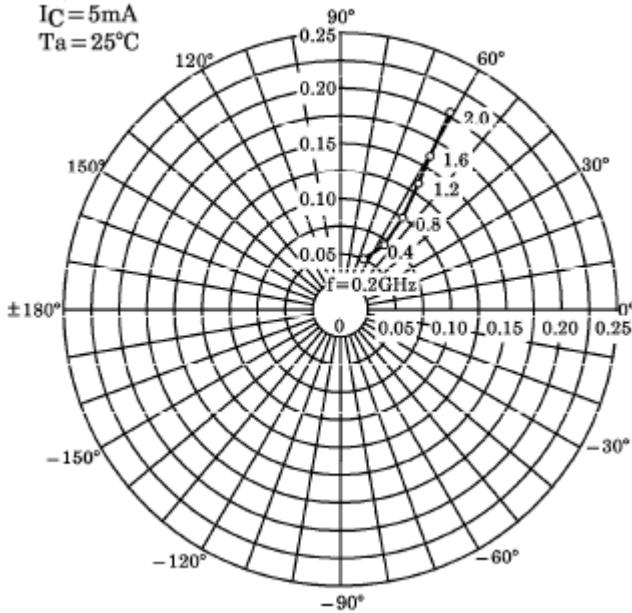
S_{11e}
 V_{CE} = 8V
 I_C = 5mA
 T_a = 25°C
 (UNIT : Ω)



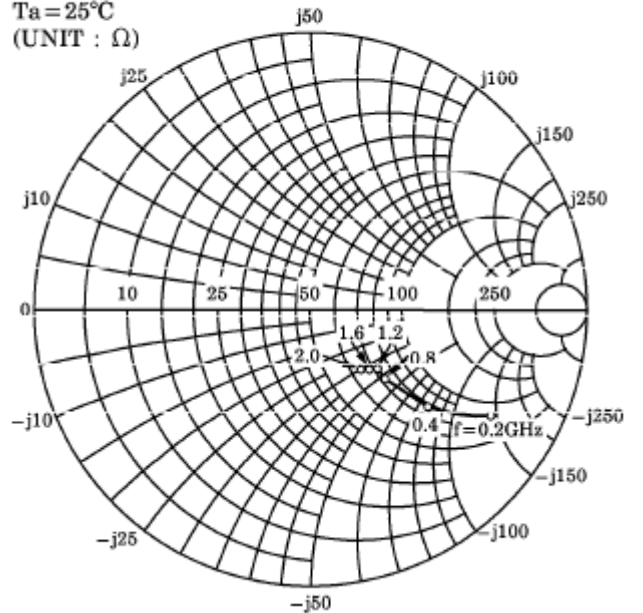
S_{21e}
 V_{CE} = 8V
 I_C = 5mA
 T_a = 25°C



S_{12e}
 V_{CE} = 8V
 I_C = 5mA
 T_a = 25°C



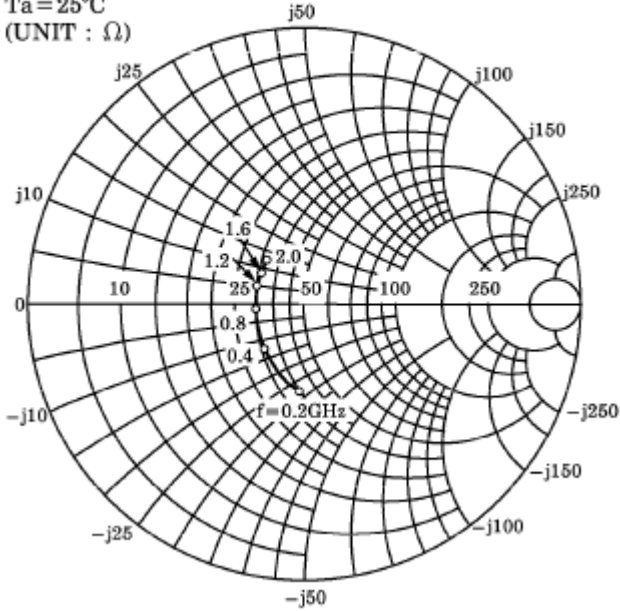
S_{22e}
 V_{CE} = 8V
 I_C = 5mA
 T_a = 25°C
 (UNIT : Ω)



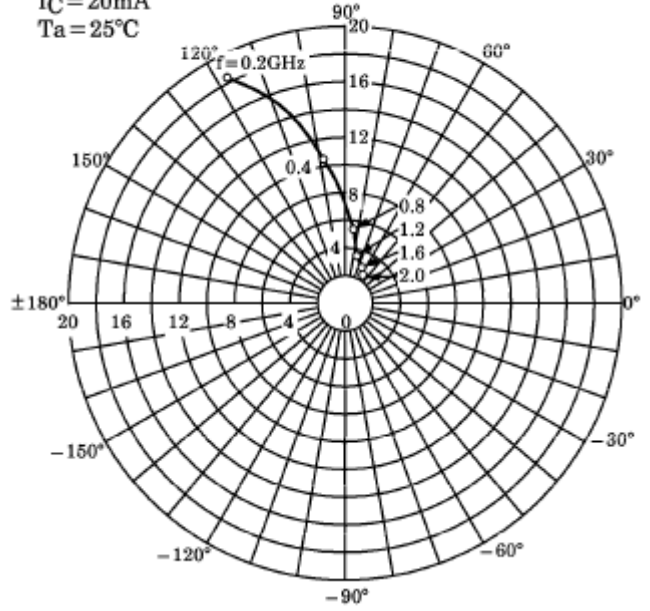
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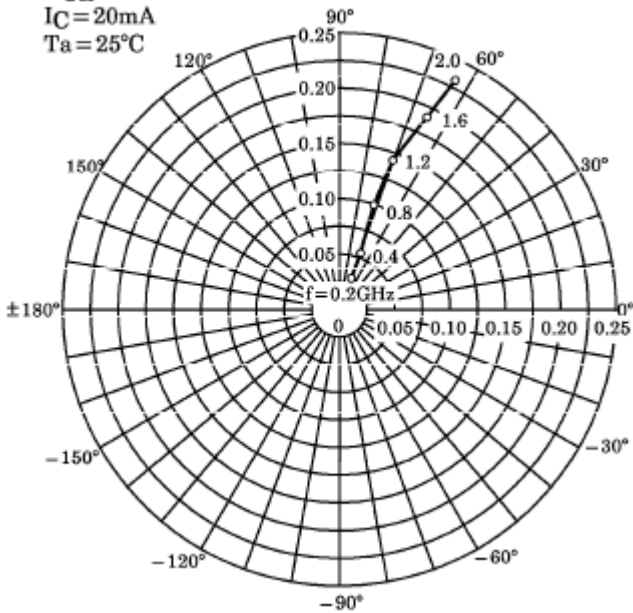
S11e
 VCE=8V
 IC=20mA
 Ta=25°C
 (UNIT : Ω)



S21e
 VCE=8V
 IC=20mA
 Ta=25°C



S12e
 VCE=8V
 IC=20mA
 Ta=25°C



S22e
 VCE=8V
 IC=20mA
 Ta=25°C
 (UNIT : Ω)

