

isc Silicon NPN RF Transistor

2SC3356

DESCRIPTION

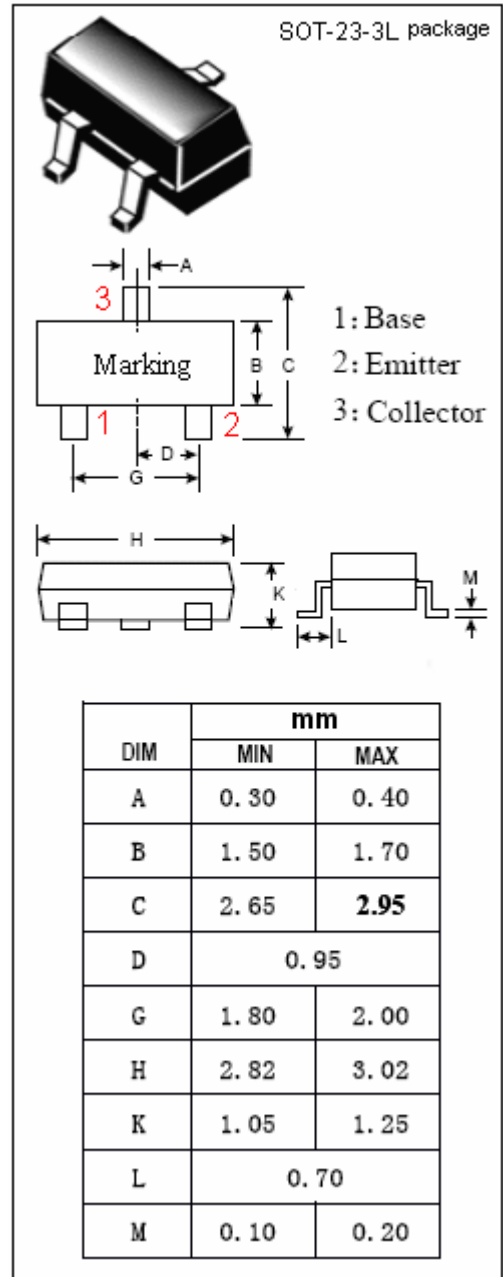
- Low Noise and High Gain  
 $NF = 1.1 \text{ dB TYP.}, G_a = 11 \text{ dB TYP.}$   
 $@V_{CE} = 10 \text{ V}, I_C = 7 \text{ mA}, f = 1.0 \text{ GHz}$
- High Power Gain  
 $MAG = 13 \text{ dB TYP.}$   
 $@V_{CE} = 10 \text{ V}, I_C = 20 \text{ mA}, f = 1.0 \text{ GHz}$

APPLICATIONS

- Designed for low noise amplifier at VHF, UHF and CATV band.

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	12	V
$V_{EBO}$	Emitter-Base Voltage	3.0	V
$I_C$	Collector Current-Continuous	0.1	A
$P_C$	Collector Power Dissipation @ $T_C=25^\circ\text{C}$	0.2	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature Range	-65~150	$^\circ\text{C}$



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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	$V_{CB}=10\text{V}; I_E=0$			1.0	$\mu\text{A}$
$I_{EBO}$	Emitter Cutoff Current	$V_{EB}=1\text{V}; I_C=0$			1.0	$\mu\text{A}$
$h_{FE}$	DC Current Gain	$I_C=20\text{mA}; V_{CE}=10\text{V}$	50		300	
$f_T$	Current-Gain—Bandwidth Product	$I_C=20\text{mA}; V_{CE}=10\text{V}$		7		GHz
$C_{re}$	Feed-Back Capacitance	$I_E=0; V_{CB}=10\text{V}; f=1.0\text{MHz}$		0.55	1.0	pF
$ S_{21e} ^2$	Insertion Power Gain	$I_C=20\text{mA}; V_{CE}=10\text{V}; f=1.0\text{GHz}$		11.5		dB
NF	Noise Figure	$I_C=7\text{mA}; V_{CE}=10\text{V}; f=1.0\text{GHz}$		1.1	2.0	dB

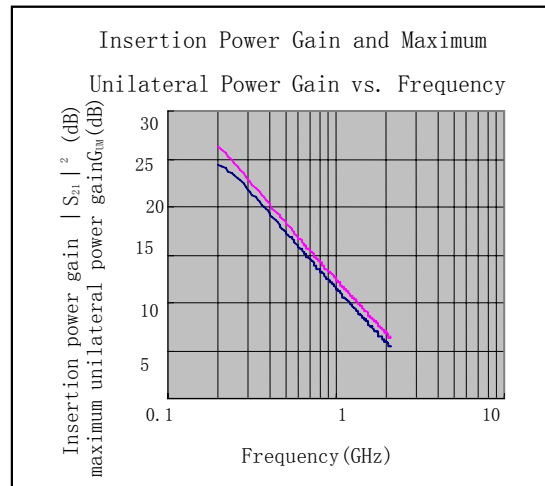
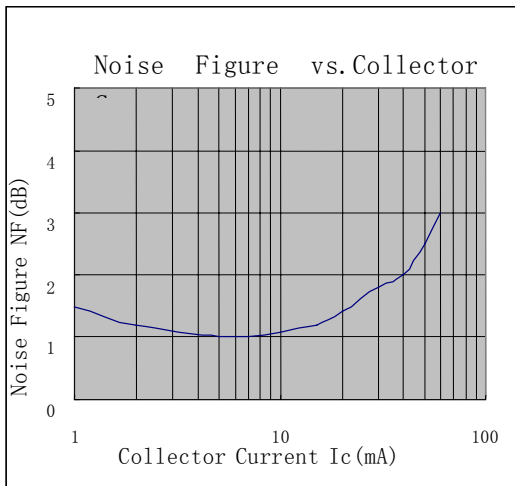
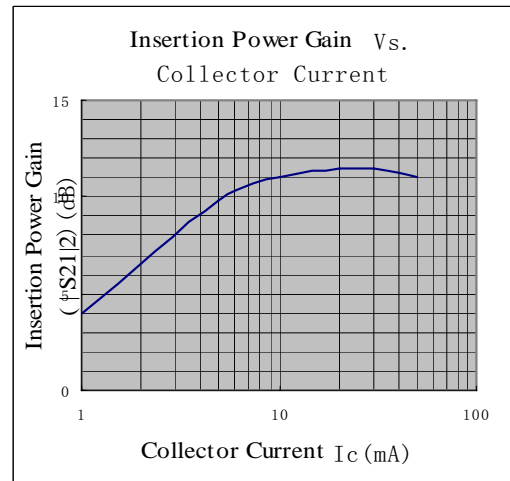
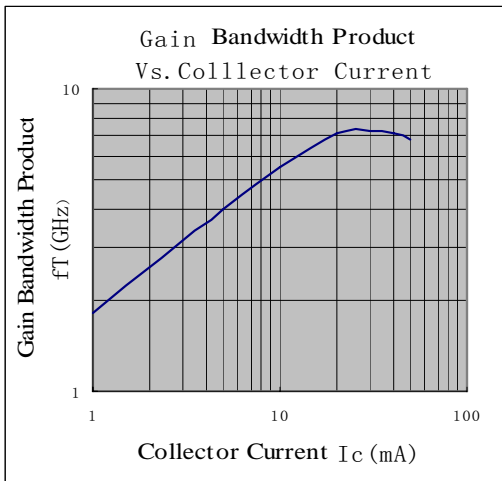
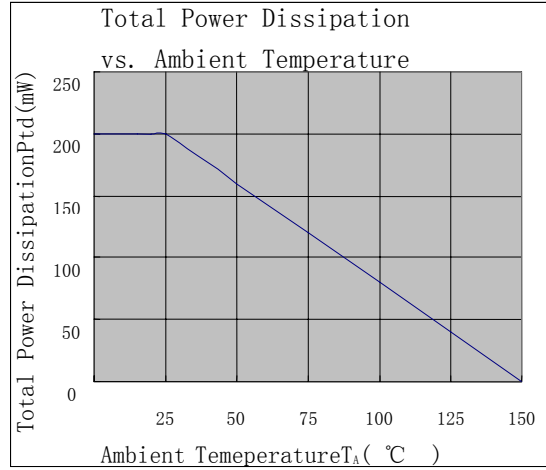
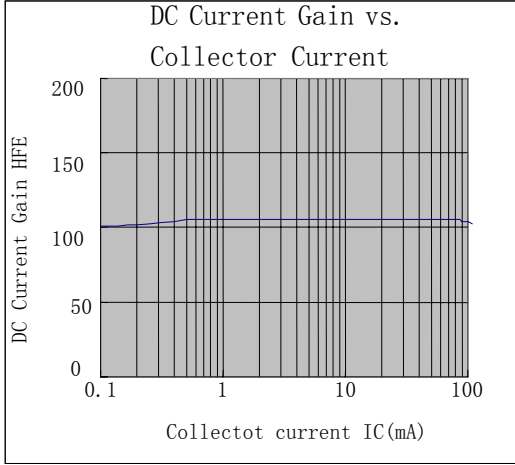
◆  $h_{FE}$  Classification

Class	Q	R	S
Marking	R23	R24	R25
$h_{FE}$	50-100	80-160	125-250

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TYPICAL CHARACTERISTICS (T<sub>a</sub>=25°C)



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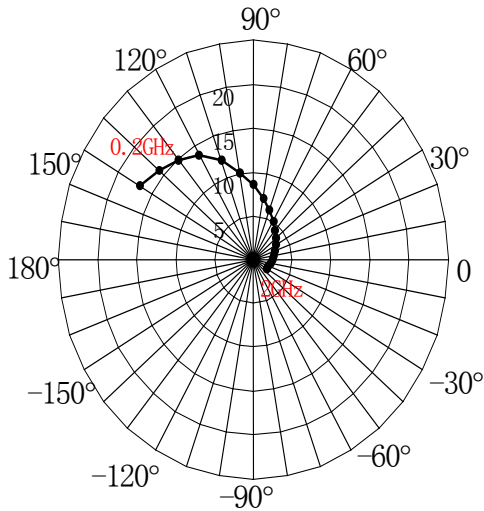
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SMITH CHART

(Test Condition:  $V_{CE}=10V$ ,  $I_C=20mA$ ,  $Z_0=50\Omega$ ,  $f=0.2GHz-2.0GHz$ )

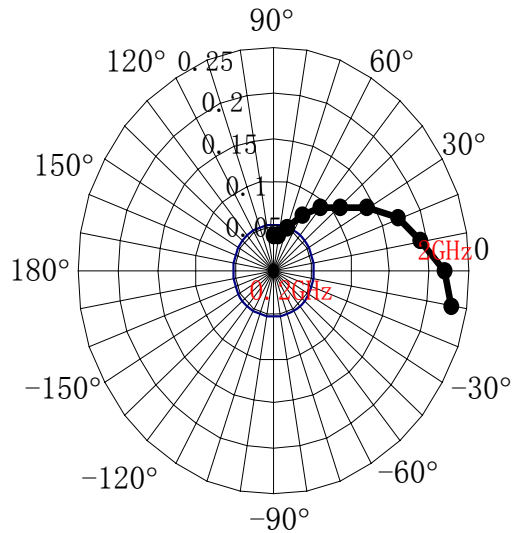
$S_{21}$ -FREQUENCY

Condition:  $V_{ce}=10V/I_c=20mA$

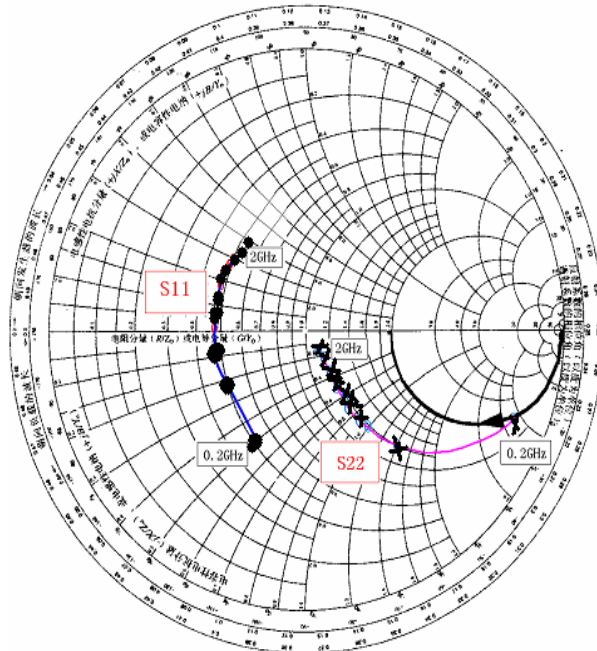


$S_{12}$ - FREQUENCY

Condition:  $V_{ce}=10V, I_c=20mA$



$S_{11}$ 、 $S_{22}$  -FREQUENCY



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**S-PARAMETER** $V_{CE} = 10\text{ V}$ ,  $I_C = 20\text{ mA}$ 

Freque.	$S_{11}$		$S_{21}$		$S_{12}$		$S_{22}$	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.2	0.45	-70.42	16.73	150.2	0.04	89.27	0.42	-12.05
0.4	0.4	-177.3	9.3	94.32	0.06	65.65	0.21	-53.52
0.6	0.41	150.4	6.2	72.41	0.07	55.63	0.17	-76.62
0.8	0.41	126.3	4.69	55.83	0.1	47.91	0.17	-97.1
1	0.42	104.6	3.75	40.65	0.12	38.96	0.17	-119
1.2	0.42	85.22	3.17	26.22	0.14	30.11	0.17	-138.9
1.4	0.42	65.91	2.74	13.54	0.17	21.39	0.18	-158.9
1.6	0.42	47.16	2.4	1.03	0.2	12.16	0.19	-177.5
1.8	0.41	27.84	2.13	-12.34	0.22	2.27	0.21	164.93
0.2	0.45	-70.42	16.73	150.2	0.04	89.27	0.42	-12.05

 $V_{CE} = 10\text{ V}$ ,  $I_C = 5\text{ mA}$ 

Freque.	$S_{11}$		$S_{21}$		$S_{12}$		$S_{22}$	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.2	0.77	-3.8	6.78	-177.5	0.06	99.12	0.8	6.86
0.4	0.62	-112.9	6.04	117.8	0.08	50.85	0.44	-48.92
0.6	0.52	-174.9	4.82	83	0.09	36.61	0.35	-73.18
0.8	0.49	150	3.81	61.86	0.1	30.36	0.32	-93.35
1	0.48	122.4	3.09	43.61	0.11	24.14	0.31	-113.7
1.2	0.48	99.54	2.64	27.16	0.12	18.43	0.31	-133.2
1.4	0.48	78.4	2.27	13.76	0.14	13.12	0.32	-153.3
1.6	0.48	58	1.97	0.66	0.17	6.97	0.32	-172.6
1.8	0.47	37.79	1.75	-13.71	0.18	0.2	0.34	168.78
0.2	0.46	17.69	1.66	-25.39	0.2	-9.01	0.36	150.36