

NPN High-frequency low-noise transistor.

Description

The 2SC3357 is an ultra-high-frequency low-noise power transistor, utilizing a planar NPN silicon epitaxial bipolar process. It offers high power gain, low noise figure, a wide dynamic range, and excellent current characteristics. Packaged in a SOT-89 surface-mount configuration, it is primarily used in VHF, UHF, and CATV applications for high-frequency broadband low-noise amplification.

Features

High gain: $ S_{21e} $ typically 10dB	@ $V_{CE}=10V$, $I_C=20mA$, $f=1GHz$
Low noise: NF typically 1.7dB	@ $V_{CE}=10V$, $I_C=7mA$, $f=1GHz$
Gain-bandwidth product: fT typically 6.5GHz.	@ $V_{CE}=10V$, $I_C=20mA$, $f=1GHz$

Limit parameters (TA=25°C)

Parameter	Symbol	Value	Unit
Collector-base breakdown voltage.	VCBO	20	V
Collector-emitter breakdown voltage.	VCEO	12	V
Emitter-base breakdown voltage.	VEBO	2.5	V
Collector current.	IC	100	mA
*Power dissipation.	PC	1200	mW
Junction temperature.	Tj	150	°C
Storage temperature.	Tstg	-65 ~ +150	°C

*Use of a heatsink.

HFE position

Binning	A	B	C	D
Label	RH	RF	RE	
HFE	60-100	90-140	120-180	170-250

Electrical Characteristic(TA=25°C)

Parameter	Symbol	Min	Typ	Max	Unit	Text Condition
Collector-base breakdown voltage.	VCBO	20			V	IC=1.0μA
Collector-emitter breakdown voltage.	VCEO	12			V	IC=100μA
Collector-base leakage current.	ICBO			0.1	μA	VCB=10V
Emitter-base leakage current.	IEBO			0.1	μA	VEB=1V
DC gain.	hFE	60	150	250		VCE=10V,IC=20mA
Gain-bandwidth product.	f _T		6.5		GHz	VCE=10V,IC=20mA
Output feedback capacitor.	Cre		0.65		pF	VCB=10V,IE=0mA,f=1MHz
power gain.	S _{21e} ²	9	10		dB	VCE=10V,IC=20mA,f=1GHz

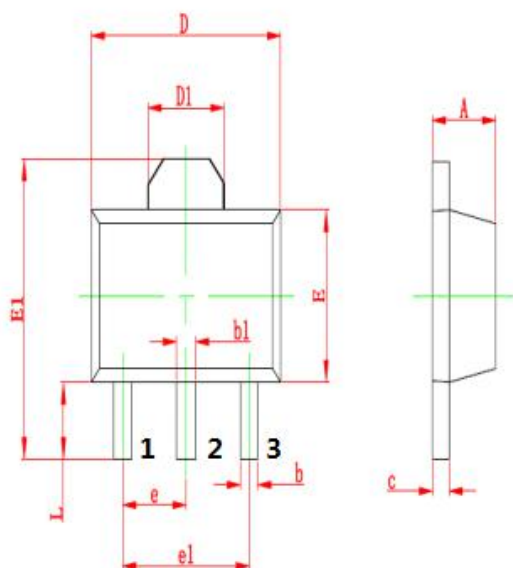
Package

SOT-89

Pin definition : 1: Base

2: Collector

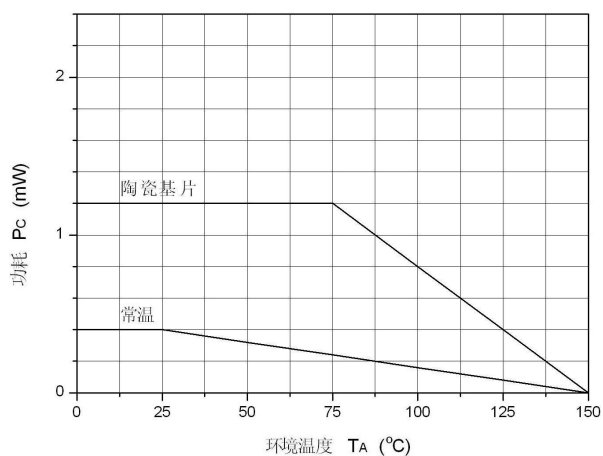
3: Emitter



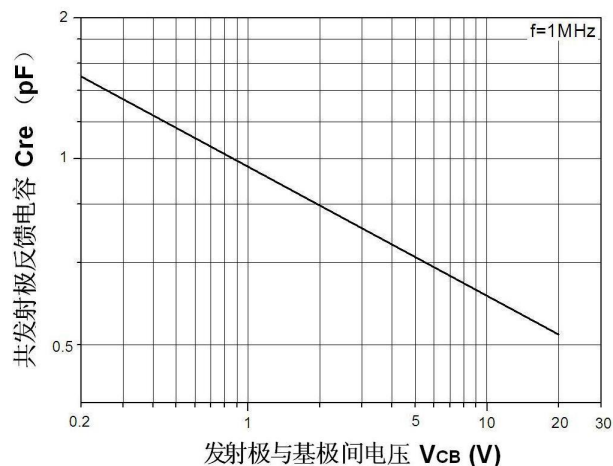
Symbol	Min (mm)	Max (mm)
A	1.4	1.6
b	0.32	0.52
b1	0.4	0.58
c	0.35	0.44
D	4.4	4.6
D1	1.55	
E	2.3	2.6
E1	3.94	4.25
e	1.5	
e1	3	
L	0.9	1.2

Typical characteristic curve (TA =25°C)

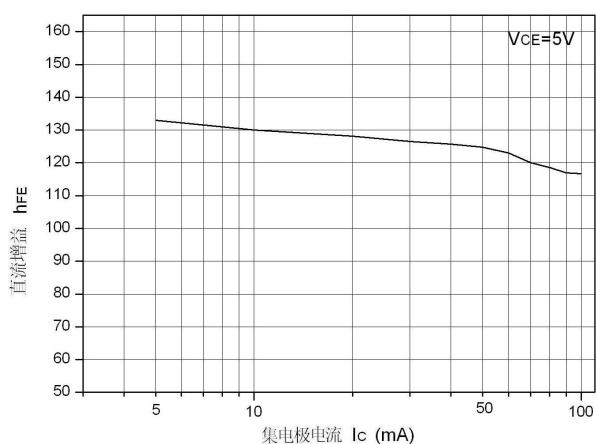
功耗 vs. 环境温度



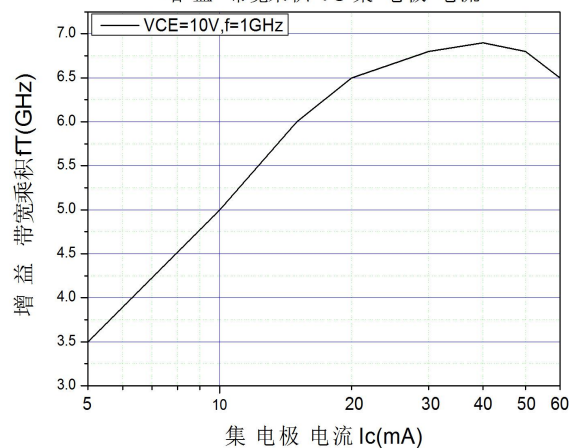
共发射极反馈电容 vs. 发射极与基极间电压



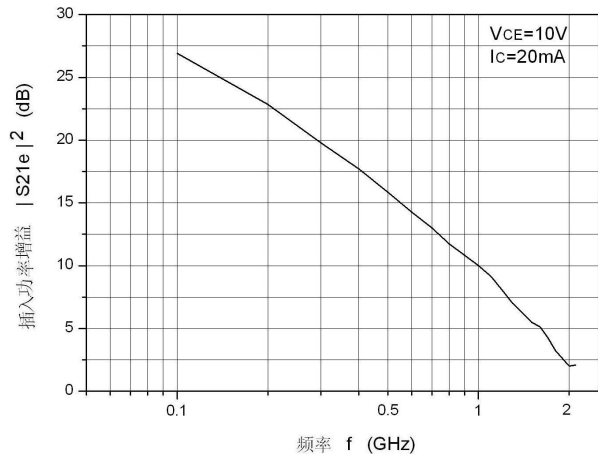
直流增益 vs. 集电极电流



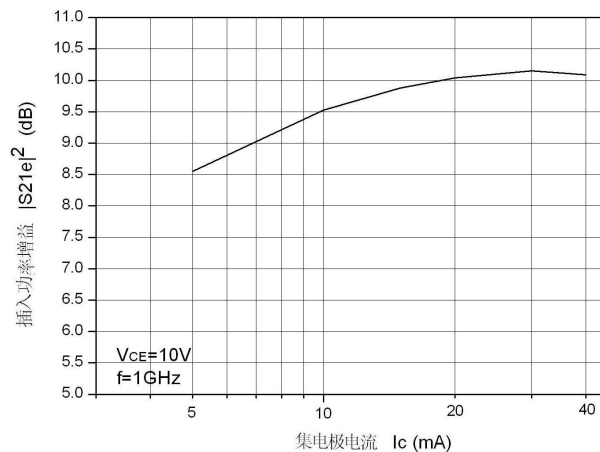
增益 带宽乘积 VS 集电极 电流



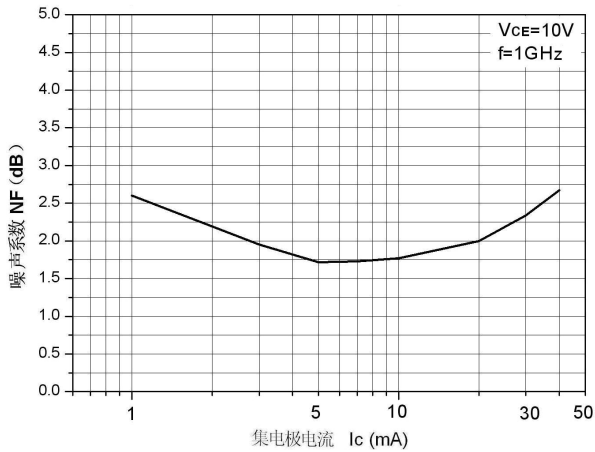
插入功率增益 vs. 频率



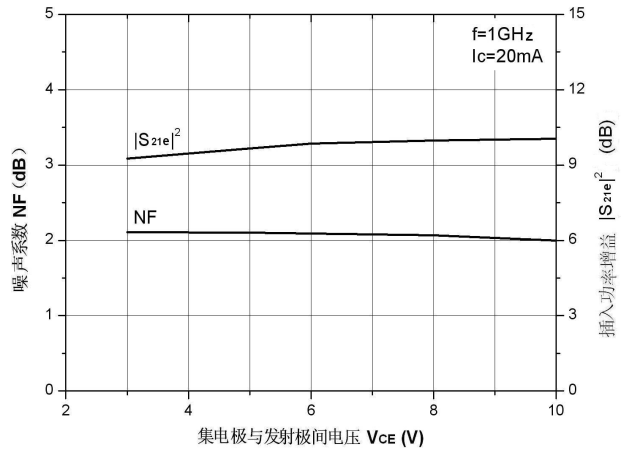
插入功率增益 vs. 集电极电流



噪声系数 vs. 集电极电流



噪声系数, 插入功率增益 vs. 集电极与发射极电压

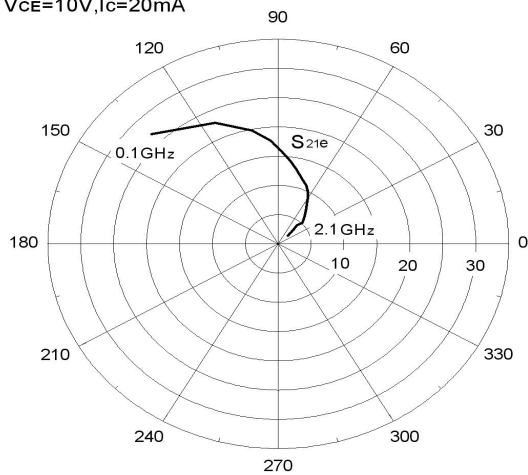


SMITH

Text condition: $V_{CE}=10V, I_c=20mA$

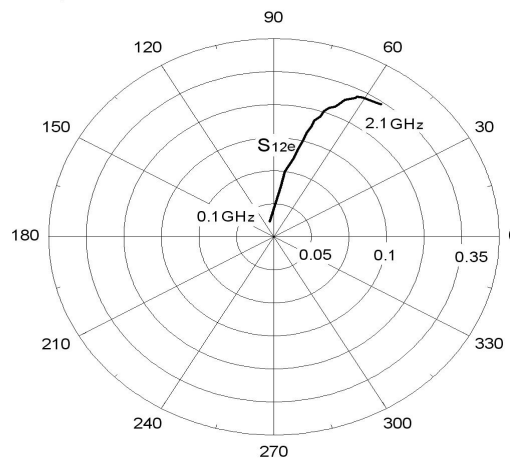
S_{21e} -FREQUENCY

条件 : $V_{CE}=10V, I_c=20mA$



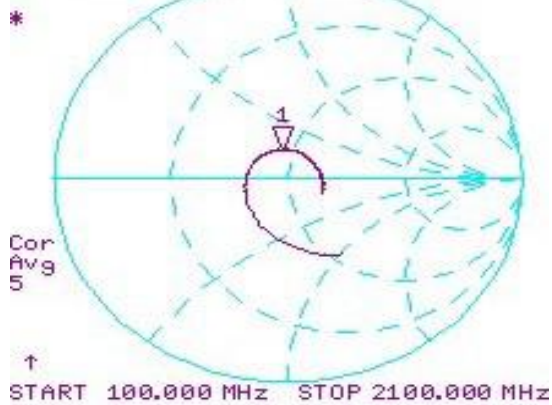
S_{12e} -FREQUENCY

条件 : $V_{CE}=10V, I_c=20mA$



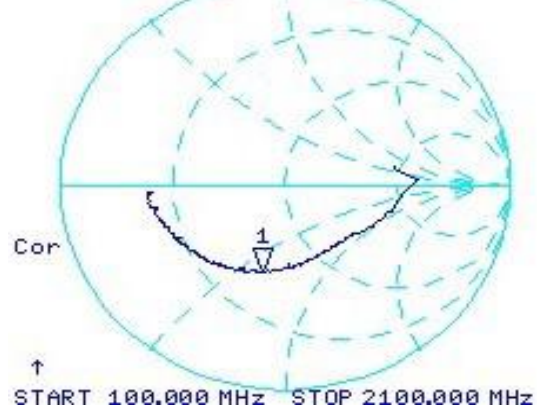
S_{11e} -FREQUENCY

1: 45.182 Ω 13.434 Ω 2.1380 nH
1 000.000 000 MHz



S_{22e} -FREQUENCY

1: 29.025 Ω -30.086 Ω 5.2900 pF
1 000.000 000 MHz



Scattering parameters (S-PARAMETER)

 Text condition: $V_{CE}=10V$, $I_c=20mA$, $Z_o=50\Omega$

Test frequency	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.1	0.428	-60.224	22.164	145.74	0.023	104.25	0.511	7.6753
0.2	0.253	-117.89	13.861	114.86	0.043	82.102	0.417	-27.876
0.3	0.212	-145.3	9.759	101.71	0.056	81.584	0.381	-42.616
0.4	0.189	-169.34	7.674	93.823	0.072	77.728	0.370	-50.74
0.5	0.174	172.38	6.214	88.463	0.086	74.095	0.372	-61.589
0.6	0.171	154.24	5.164	82.661	0.102	74.858	0.378	-70.929
0.7	0.163	141.51	4.465	77.532	0.118	74.821	0.391	-79.882
0.8	0.160	127.18	3.868	72.492	0.132	73.33	0.400	-87.409
0.9	0.151	115.31	3.473	66.78	0.148	73.294	0.423	-95.753
1	0.151	102.36	3.168	63.403	0.162	71.299	0.435	-104.1
1.1	0.142	88.639	2.868	60.58	0.180	70.737	0.450	-112.42
1.2	0.138	77.466	2.520	57.553	0.197	69.384	0.475	-120.11
1.3	0.137	64.644	2.237	53.468	0.205	67.626	0.479	-126.83
1.4	0.135	52.022	2.053	50.386	0.221	66.669	0.503	-133.31
1.5	0.131	39.53	1.879	46.524	0.245	65.426	0.519	-139.42
1.6	0.134	28.437	1.805	44.72	0.261	62.681	0.525	-147.55
1.7	0.140	15.808	1.632	48.301	0.279	62.412	0.546	-152.46
1.8	0.139	6.0136	1.453	46.876	0.294	60.664	0.569	-159.89
1.9	0.148	-8.0118	1.349	45.758	0.300	57.496	0.585	-165.38
2	0.152	-15.281	1.260	45.023	0.316	55.64	0.611	-171.46
2.1	0.163	-25.128	1.274	44.816	0.334	54.651	0.613	-177.8