

NPN High-Frequency Low-Noise Transistor

Description

The 2SC3356 is a UHF low-noise transistor that adopts a planar NPN silicon-epitaxial bipolar process. It features high-power gain, low noise figure, wide dynamic range and perfect current linearity. Being packaged with SOT-23, the transistor is mainly used in VHFUHF and CATV low-noise amplifiers with high-frequency broadband.

Key Features

High Gain: | S21e | 2 Type Value:12dB @ VCE=10V, IC=20mA, f=1GHz
 Low Noise Figure: NF Type Value:1.5dB @ VCE=10V, IC=7mA, f=1GHz
 Gain-Bandwidth Product f_T Type Value: 7GHz @ VCE=10V, IC=20mA, f=1GHz

Operating Limit Range (TA=25°C)

Parameters	Symbols	MAX/MIN	Unit
Collector-Base Breakdown Voltage	VCBO	20	V
Collector Emitter Breakdown Voltage	VCEO	12	V
Emitter base breakdown voltage	VEBO	3	V
Collector current	IC	100	mA
Power consumption	PC	200	mW
Junction Temperature	Tj	150	°C
Storage temperature	Tstg	-65 ~ +150	°C

HFE

Grading	B	C	D
Number	R25		
HFE	80-140	120-180	170-260

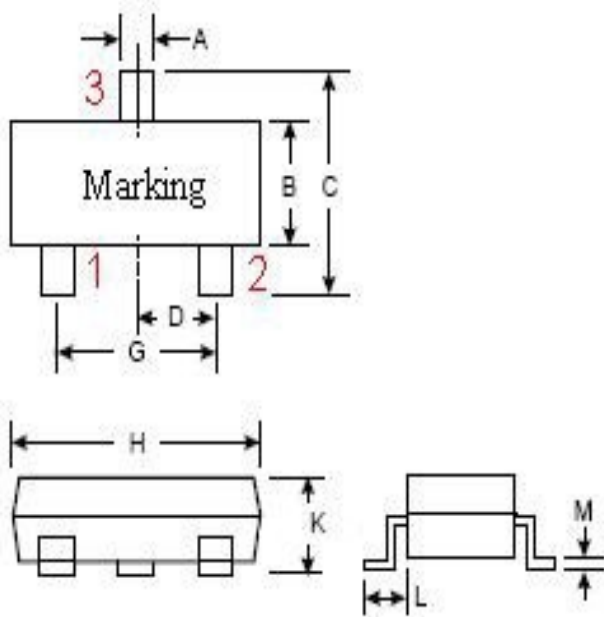
Electrical Property (TA=25°C)

Parameters	Symbols	MIN	Typical	MAX	Unit	Testing conditions
Collector-Base Breakdown Voltage	VCBO	20			V	IC=1.0μA
Collector-Base Leakage Current	ICBO			0.1	μA	VCB=10V
Emitter-Base Leakage Current	IEBO			0.1	μA	VEB=1V
Gain-Bandwidth Product	f _T	5.5	7		GHz	VCE=10V, IC=20mA
Output Feedback Capacitance	C _{re}		0.65		pF	VCB=10V, IE=0mA, f=1MHz
Power Gain	S _{21e}		12		dB	VCE=10V, IC=20mA, f=1GHz
Noise Factor	NF		1.5		dB	VCE=10V, IC=7mA, f=1GHz

Package mode

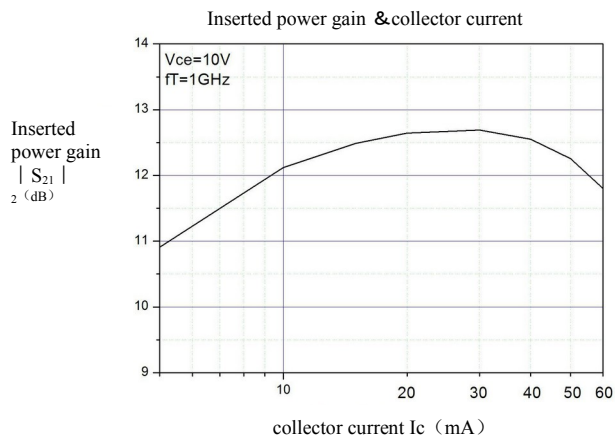
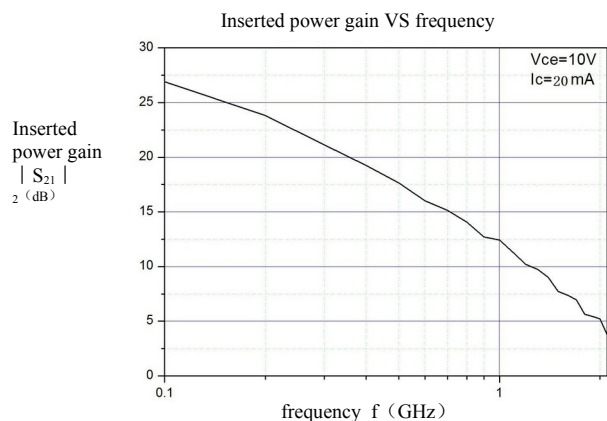
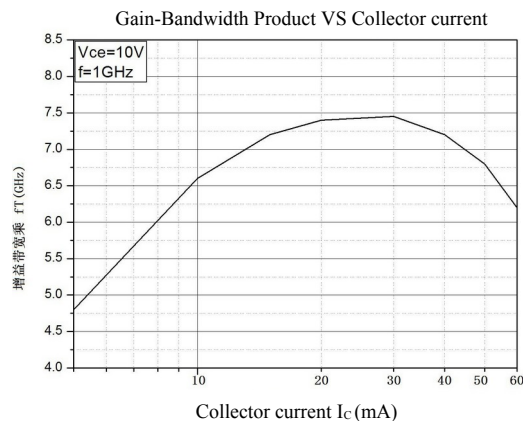
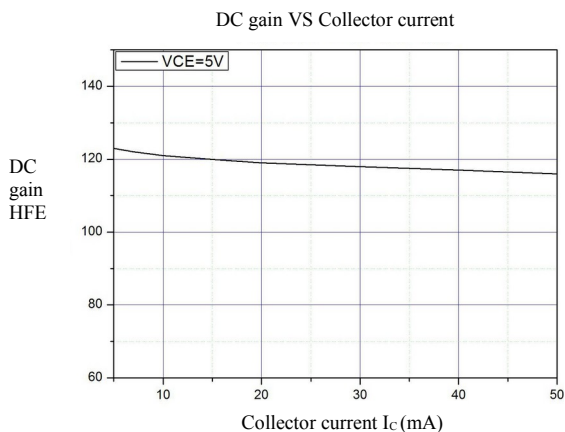
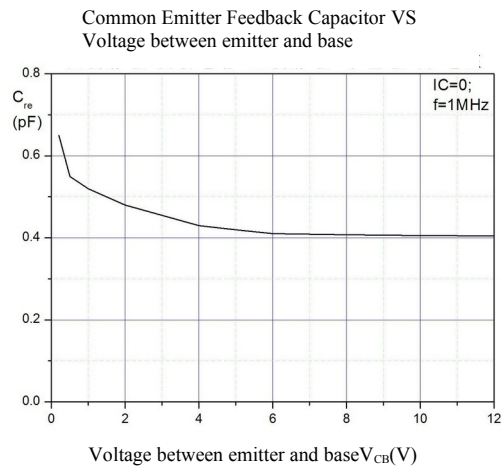
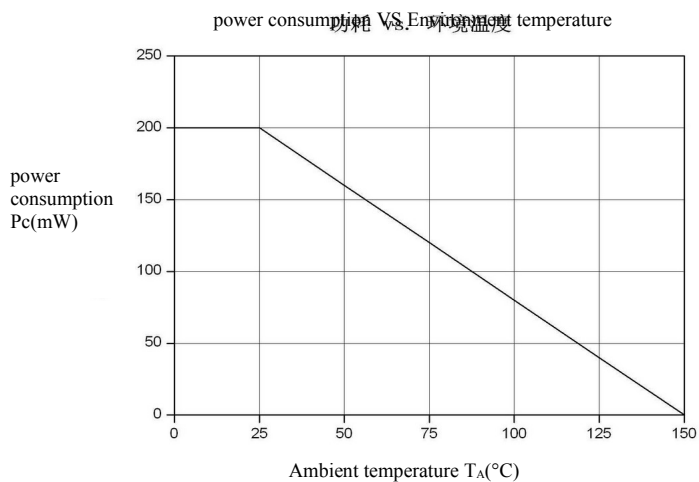
SOT-23

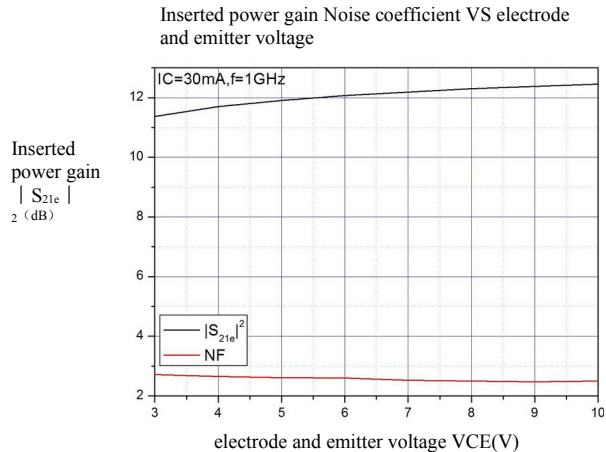
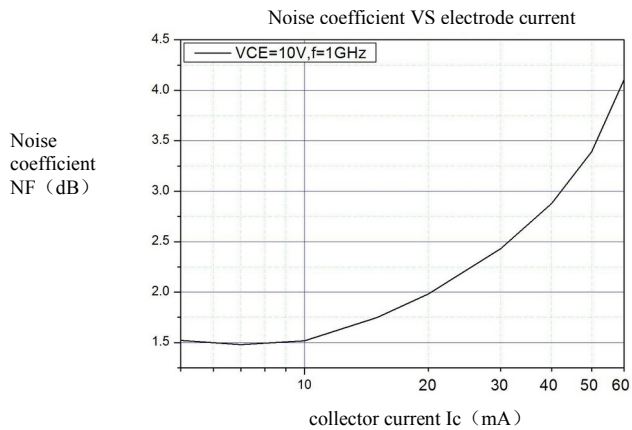
Pin Description: 1: Base 2: Emitter 3: Collector



SOT-23		
Symbol	Min. value (mm)	Max (mm)
A	0.3	0.5
B	1.2	1.4
C	2.25	2.55
D	0.95	
G	1.8	2
H	2.8	3
K	0.9	1.15
L	0.55	
M	0.08	0.15

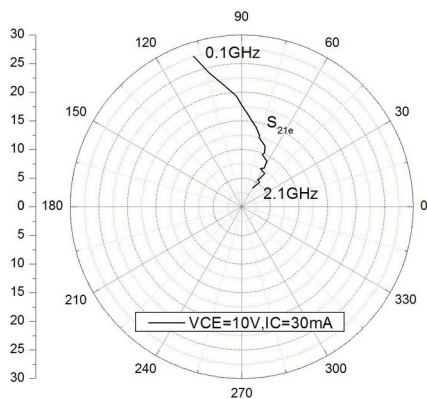
Typical Features (TA =25°C)



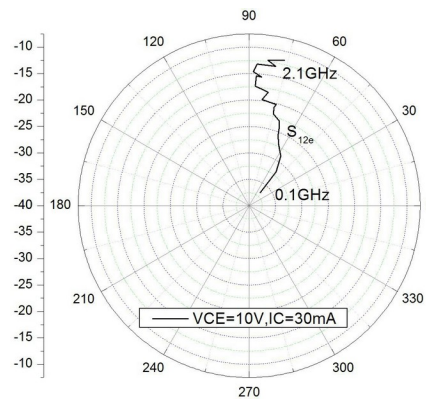


SMITH

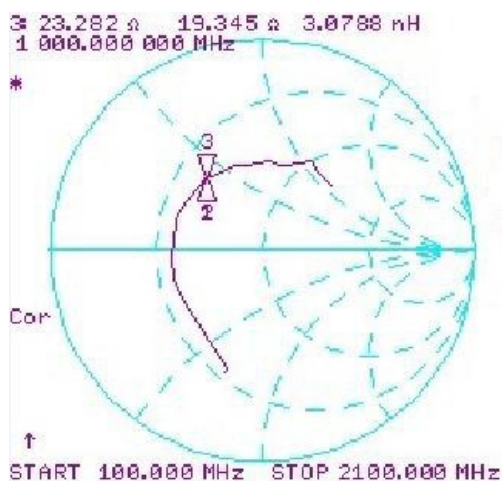
Test Condition: $V_{CE}=10V, I_C=20mA$
 S_{21e} -FREQUENCY



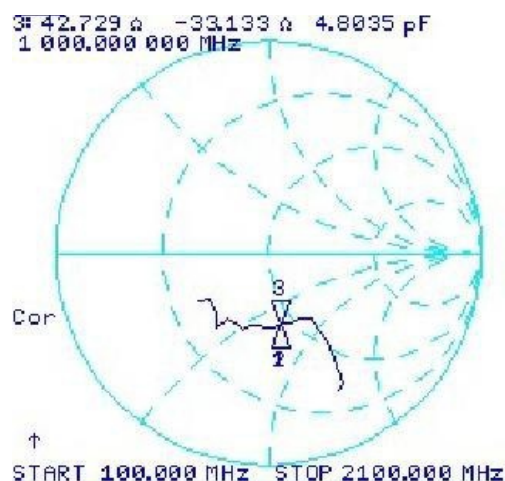
S_{12e} -FREQUENCY



S_{11e} -FREQUENCY



S_{22e} -FREQUENCY



Scattering Parameter (S-PARAMETER)

 Test 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	-4.4887	-107.42	27.586	107.71	-36.76	49.128	-2.9397	-62.468
0.2	-6.7891	-140.98	24.2	103.81	-31.8	51.684	-6.0189	-57.342
0.3	-7.2322	-163.11	21.338	98.039	-28.868	57.605	-7.9522	-56.709
0.4	-7.1858	-176.01	19.392	92.782	-26.985	64.917	-8.6659	-57.373
0.5	-7.4501	172.11	17.747	90.058	-25.557	67.75	-8.9477	-59.875
0.6	-7.3244	160.46	16.1	86.005	-24.173	68.77	-9.3303	-64.141
0.7	-7.2467	153.42	15.174	83.595	-22.96	70.383	-9.3035	-68.472
0.8	-7.5163	144.71	14.099	79.671	-22.02	75.134	-9.169	-72.808
0.9	-7.3334	135.33	12.767	75.789	-20.838	75.774	-9.3152	-77.445
1	-7.2486	129.3	12.445	75.699	-20.221	75.086	-9.2763	-82.417
1.1	-7.6324	120.87	11.337	68.982	-19.773	83.079	-9.0412	-89.48
1.2	-7.5426	112.22	10.248	67.1	-18.25	80.563	-9.0646	-93.193
1.3	-7.4681	106.23	9.8065	68.457	-17.795	83.598	-9.1476	-98.654
1.4	-7.7615	99.036	9.069	60.986	-17.352	87.012	-9.0139	-105.22
1.5	-7.7131	93.069	7.8139	59.825	-15.394	86.83	-8.4818	-107.7
1.6	-7.418	84.714	7.4217	64.124	-15.545	84.385	-8.6765	-112.92
1.7	-7.7491	79.21	7.0271	55.497	-14.625	88.168	-8.7946	-120.51
1.8	-7.5523	73.983	5.7067	57.787	-13.122	86.822	-7.5139	-125.48
1.9	-6.427	62.268	5.4719	59.598	-13.185	79.194	-8.4837	-131.5
2	-6.8626	54.527	5.2739	53.898	-12.216	82.641	-9.2253	-140.88
2.1	-7.0205	44.405	3.8021	59.296	-11.669	76.371	-7.9545	-145.67