

**HIGH FREQUENCY LOW NOISE AMPLIFIER  
NPN SILICON EPITAXIAL TRANSISTOR**

**DESCRIPTION**

The 2SC3355 is an NPN silicon epitaxial transistor designed for low noise amplifier at VHF, UHF and CATV band.

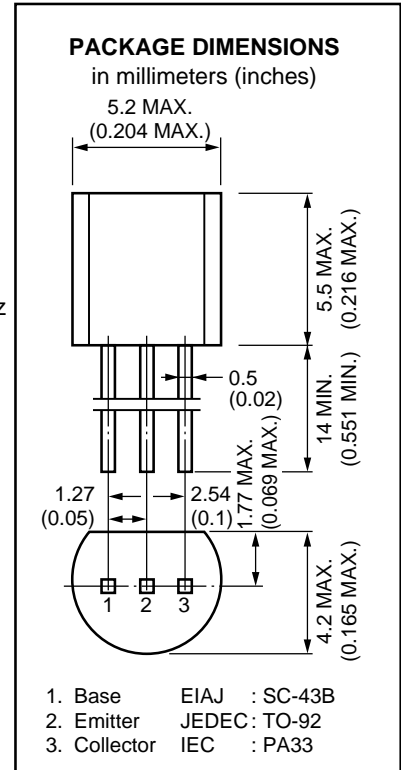
It has large dynamic range and good current characteristic.

**FEATURES**

- Low Noise and High Gain  
 NF = 1.1 dB TYP.,  $G_a = 8.0$  dB TYP. @  $V_{CE} = 10$  V,  $I_c = 7$  mA,  $f = 1.0$  GHz  
 NF = 1.1 dB TYP.,  $G_a = 9.0$  dB TYP. @  $V_{CE} = 10$  V,  $I_c = 40$  mA,  $f = 1.0$  GHz
- High Power Gain  
 MAG = 11 dB TYP. @  $V_{CE} = 10$  V,  $I_c = 20$  mA,  $f = 1.0$  GHz

**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25 °C)**

Collector to Base Voltage	V <sub>CB0</sub>	20	V
Collector to Emitter Voltage	V <sub>CEO</sub>	12	V
Emitter to Base Voltage	V <sub>EBO</sub>	3.0	V
Collector Current	I <sub>c</sub>	100	mA
Total Power Dissipation	P <sub>T</sub>	600	mW
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-65 to +150	°C



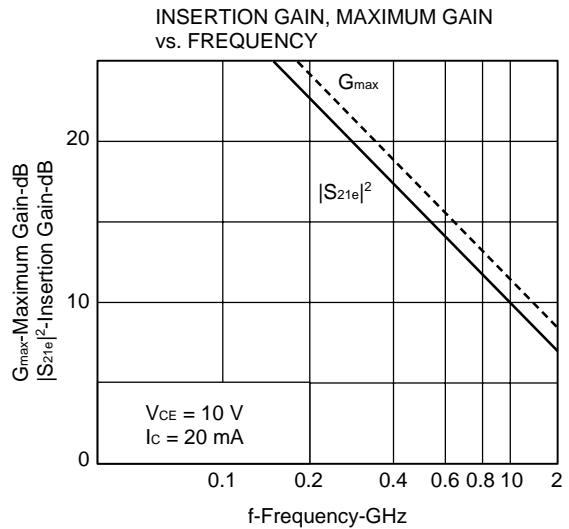
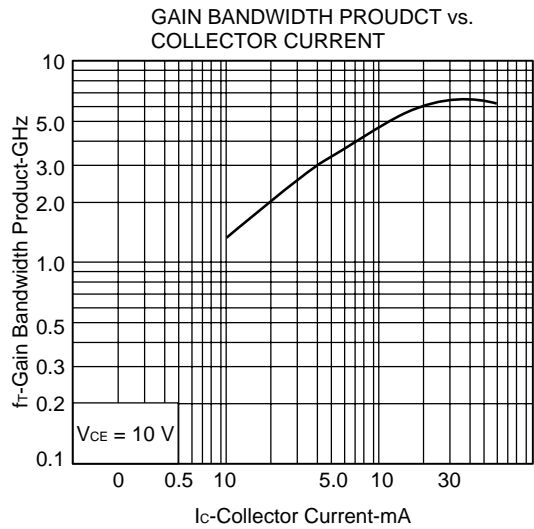
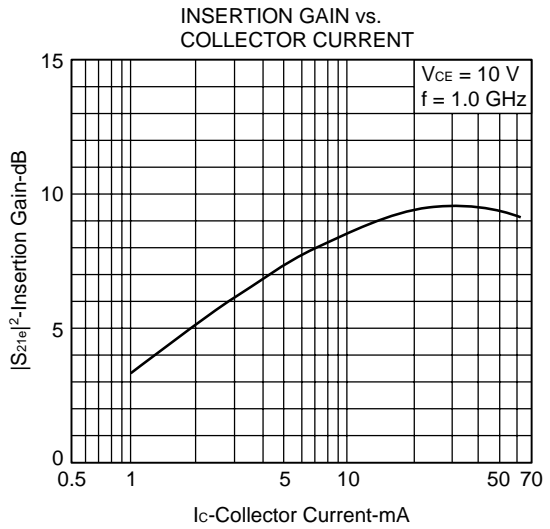
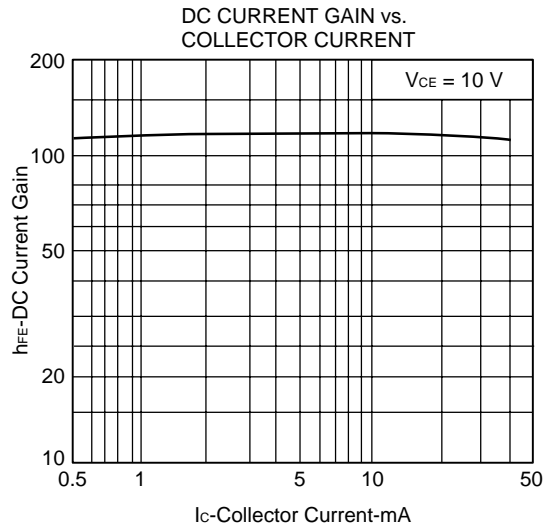
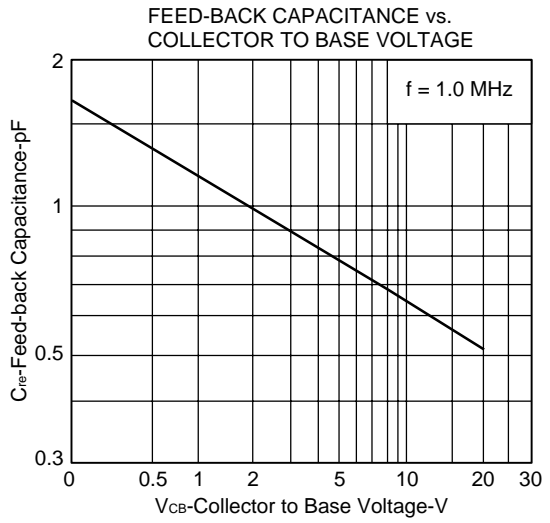
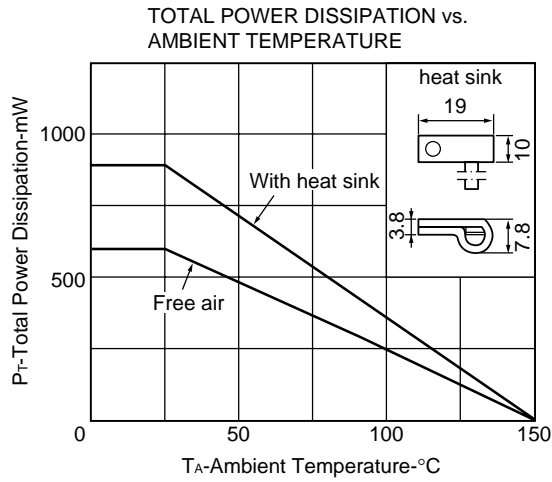
**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

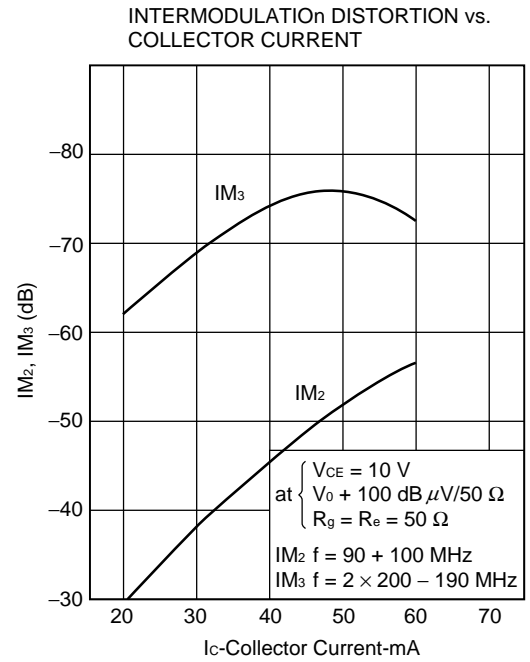
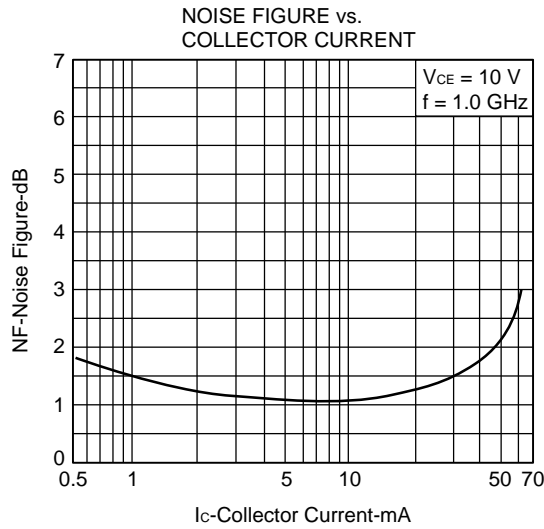
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I <sub>cBO</sub>			1.0	μA	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0
Emitter Cutoff Current	I <sub>EBO</sub>			1.0	μA	V <sub>EB</sub> = 1.0 V, I <sub>C</sub> = 0
DC Current Gain	h <sub>FE</sub>	50	120	300		V <sub>CE</sub> = 10 V, I <sub>C</sub> = 20 mA
Gain Bandwidth Product	f <sub>T</sub>		6.5		GHz	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 20 mA
Output Capacitance	C <sub>ob</sub>		0.65	1.0	pF	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1.0 MHz
Insertion Power Gain	S <sub>21e</sub>   <sup>2</sup>		9.5		dB	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 20 mA, f = 1.0 GHz
Noise Figure	NF		1.1		dB	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 7 mA, f = 1.0 GHz
Noise Figure	NF		1.8	3.0	dB	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 40 mA, f = 1.0 GHz

**h<sub>FE</sub> Classification**

Class	K
Marking	K
h <sub>FE</sub>	50 to 300

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





**S-PARAMETER**

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

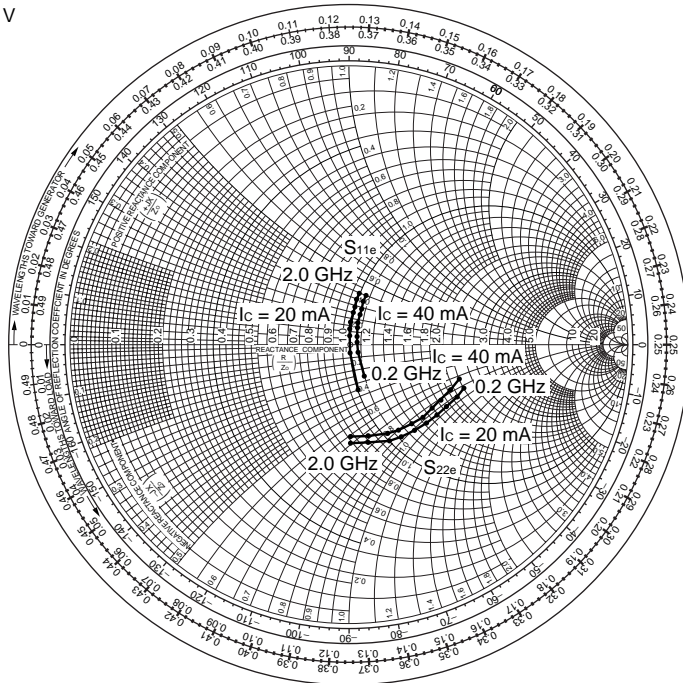
f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.173	-80.3	13.652	103.4	0.041	73.8	0.453	-21.8
400	0.054	-77.0	7.217	85.1	0.066	71.2	0.427	-26.0
600	0.013	-57.9	4.936	74.0	0.113	69.3	0.428	-30.8
800	0.028	81.8	3.761	62.3	0.144	67.0	0.414	-37.2
1000	0.062	82.2	3.094	58.3	0.183	64.7	0.392	-43.2
1200	0.091	80.7	2.728	52.9	0.215	61.7	0.377	-51.4
1400	0.121	80.2	2.321	44.9	0.240	58.7	0.359	-58.3
1600	0.148	80.1	2.183	36.4	0.288	50.7	0.354	-67.2
1800	0.171	80.0	1.892	30.2	0.305	46.8	0.345	-80.0
2000	0.207	79.9	1.814	21.4	0.344	39.1	0.344	-90.4

$V_{CE} = 10\text{ V}, I_c = 40\text{ mA}, Z_o = 50\ \Omega$

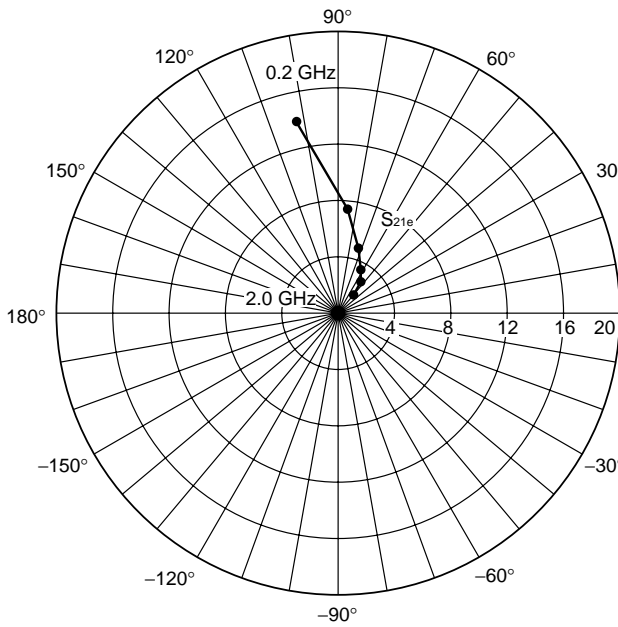
f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.011	-60.1	13.76	105.4	0.040	-73.3	0.421	-17.5
400	0.028	-42.9	7.338	82.9	0.069	66.7	0.416	-22.8
600	0.027	25.1	4.996	72.7	0.114	69.4	0.414	-28.7
800	0.043	65.7	3.801	61.9	0.144	67.8	0.406	-35.7
1000	0.074	75.1	3.134	57.6	0.183	63.4	0.386	-41.8
1200	0.098	75.6	2.759	52.4	0.221	62.1	0.373	-49.8
1400	0.120	74.1	2.351	44.4	0.247	55.7	0.356	-56.3
1600	0.146	75.8	2.203	36.0	0.291	49.6	0.347	-66.6
1800	0.171	77.2	1.910	29.9	0.299	46.0	0.342	-78.8
2000	0.205	78.0	1.825	21.3	0.344	39.4	0.335	-89.6

S-PARAMETER

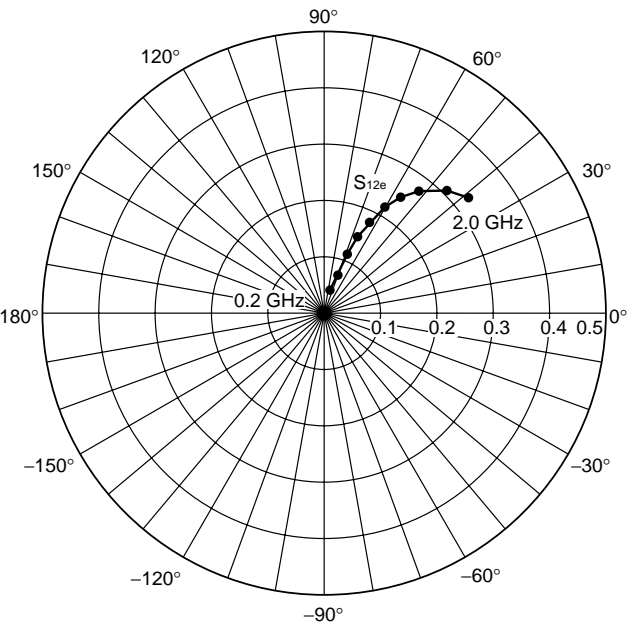
S<sub>11e</sub>, S<sub>22e</sub>-FREQUENCY    CONDITION    V<sub>CE</sub> = 10 V



S<sub>21e</sub>-FREQUENCY    CONDITION    V<sub>CE</sub> = 10 V  
I<sub>c</sub> = 40 mA



S<sub>12e</sub>-FREQUENCY    CONDITION    V<sub>CE</sub> = 10 V  
I<sub>c</sub> = 40 mA



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