

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.

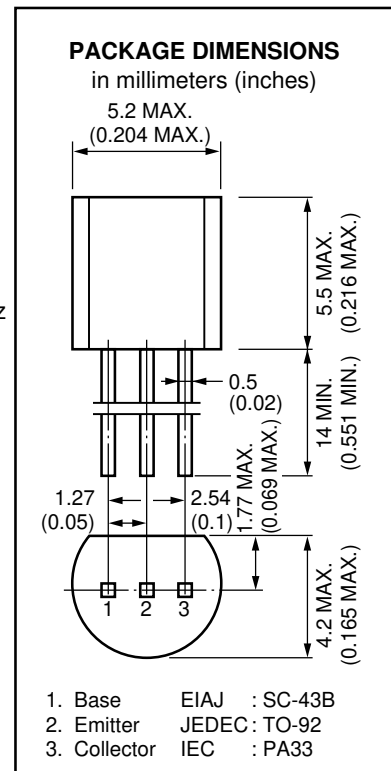
It has large dynamic range and good current characteristic.

FEATURES

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

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

Collector to Base Voltage	V_{CBO}	20	V
Collector to Emitter Voltage	V_{CEO}	12	V
Emitter to Base Voltage	V_{EBO}	3.0	V
Collector Current	I_c	100	mA
Total Power Dissipation	P_T	600	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65 to +150	$^\circ\text{C}$

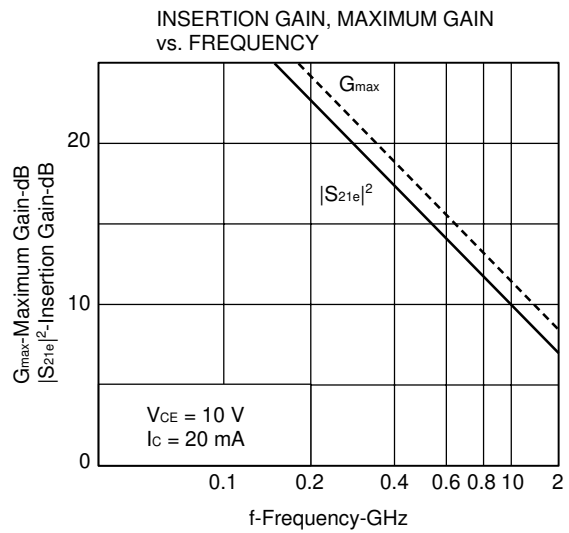
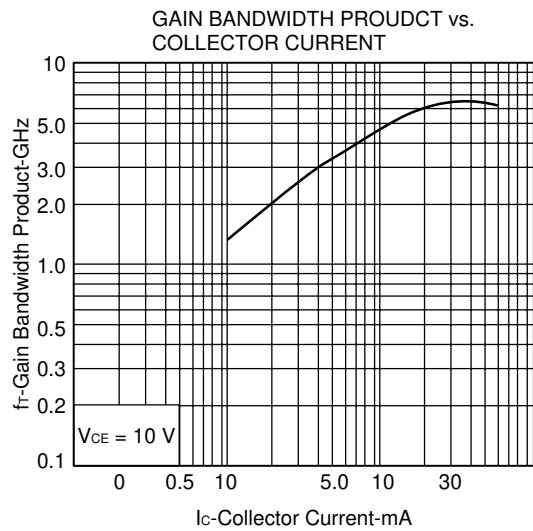
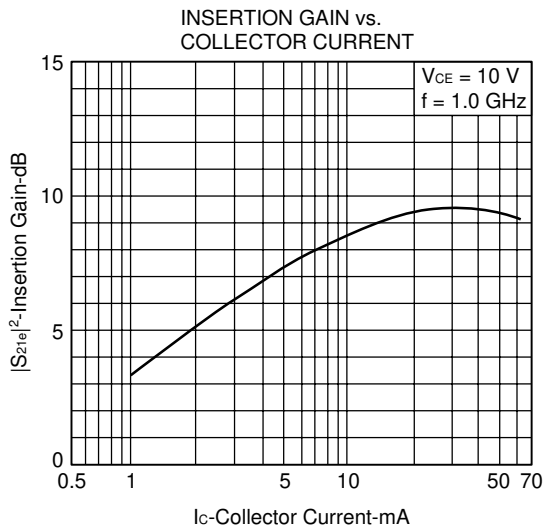
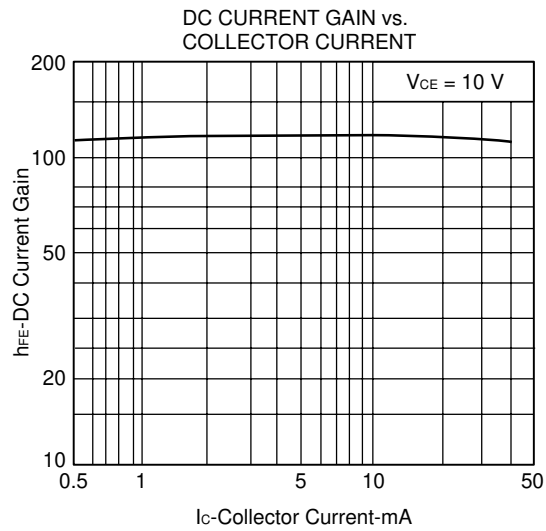
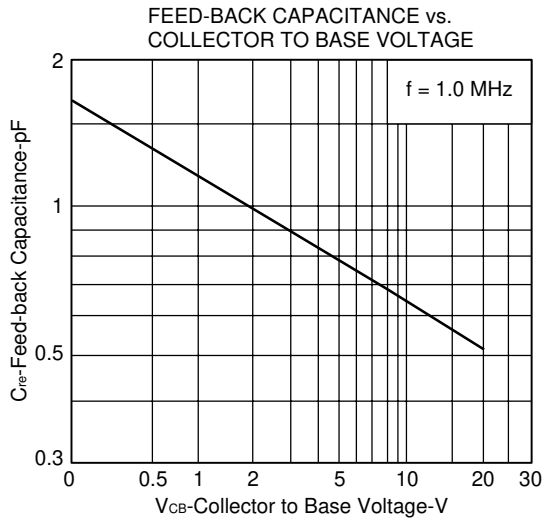
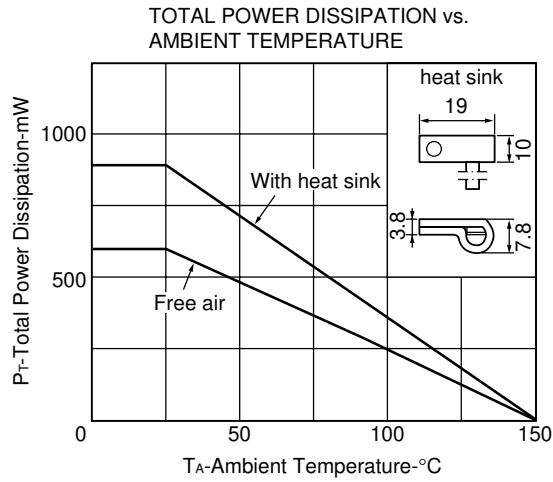
**ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)**

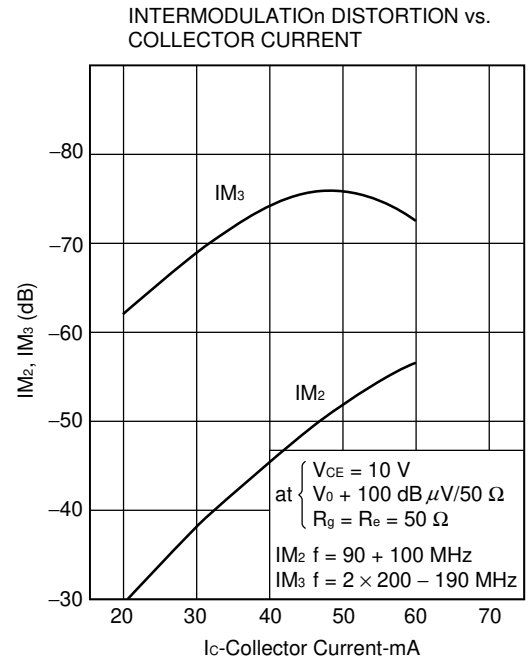
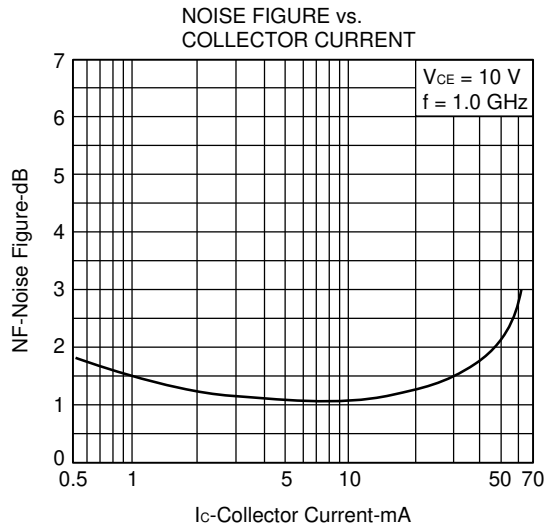
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			1.0	μA	$V_{CB} = 10 \text{ V}, I_E = 0$
Emitter Cutoff Current	I_{EBO}			1.0	μA	$V_{EB} = 1.0 \text{ V}, I_C = 0$
DC Current Gain	h_{FE}	50	120	300		$V_{CE} = 10 \text{ V}, I_c = 20 \text{ mA}$
Gain Bandwidth Product	f_T		6.5		GHz	$V_{CE} = 10 \text{ V}, I_c = 20 \text{ mA}$
Output Capacitance	C_{ob}		0.65	1.0	pF	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1.0 \text{ MHz}$
Insertion Power Gain	$ S_{21e} ^2$		9.5		dB	$V_{CE} = 10 \text{ V}, I_c = 20 \text{ mA}, f = 1.0 \text{ GHz}$
Noise Figure	NF		1.1		dB	$V_{CE} = 10 \text{ V}, I_c = 7 \text{ mA}, f = 1.0 \text{ GHz}$
Noise Figure	NF		1.8	3.0	dB	$V_{CE} = 10 \text{ V}, I_c = 40 \text{ mA}, f = 1.0 \text{ GHz}$

 h_{FE} Classification

Class	K
Marking	K
h_{FE}	50 to 300

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)





S-PARAMETER

$V_{CE} = 10\text{ V}$, $I_c = 20\text{ mA}$, $Z_0 = 50\text{ } \Omega$

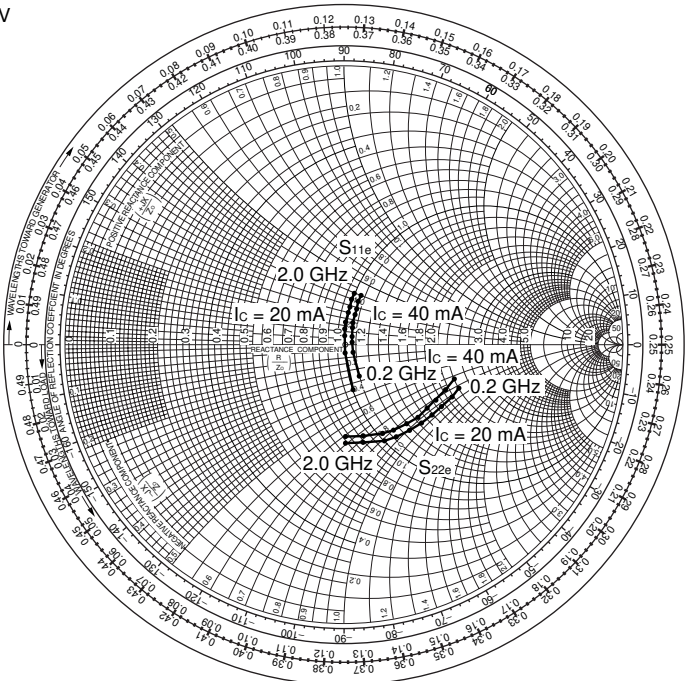
f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.173	-80.3	13.652	103.4	0.041	73.8	0.453	-21.8
400	0.054	-77.0	7.217	85.1	0.066	71.2	0.427	-26.0
600	0.013	-57.9	4.936	74.0	0.113	69.3	0.428	-30.8
800	0.028	81.8	3.761	62.3	0.144	67.0	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

$V_{CE} = 10\text{ V}$, $I_c = 40\text{ mA}$, $Z_0 = 50\text{ } \Omega$

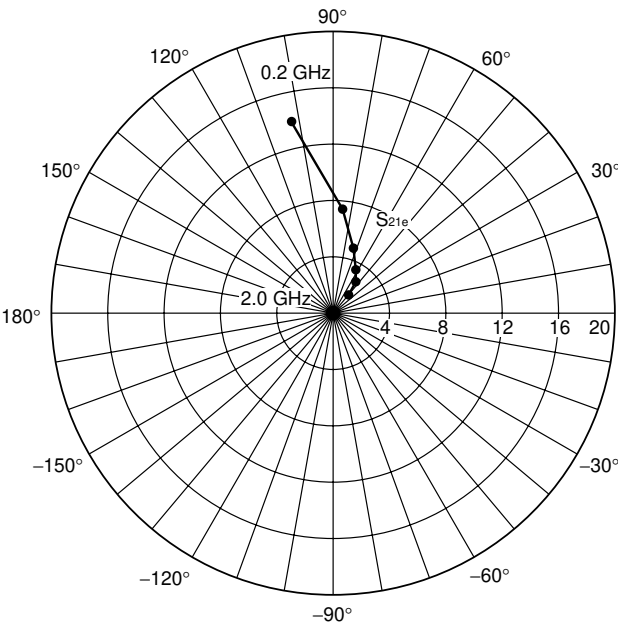
f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.011	-60.1	13.76	105.4	0.040	-73.3	0.421	-17.5
400	0.028	-42.9	7.338	82.9	0.069	66.7	0.416	-22.8
600	0.027	25.1	4.996	72.7	0.114	69.4	0.414	-28.7
800	0.043	65.7	3.801	61.9	0.144	67.8	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

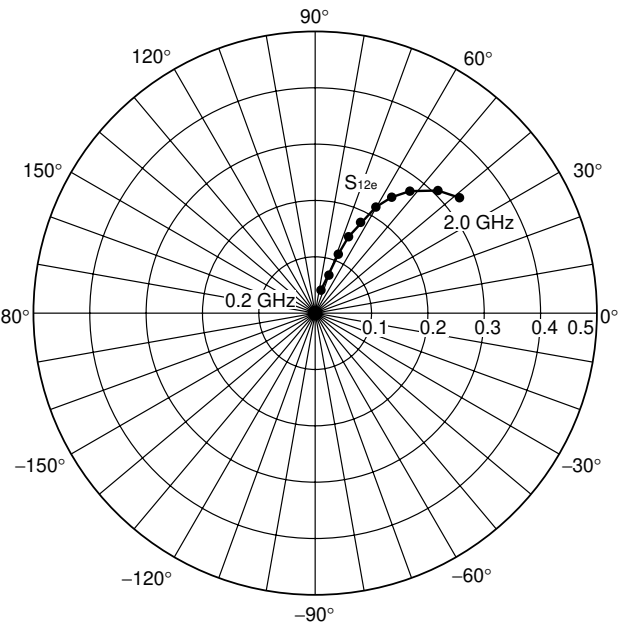
S_{11e} , S_{22e} -FREQUENCY CONDITION $V_{CE} = 10\text{ V}$



S_{21e} -FREQUENCY CONDITION $V_{CE} = 10\text{ V}$
 $I_c = 40\text{ mA}$



S_{12e} -FREQUENCY CONDITION $V_{CE} = 10\text{ V}$
 $I_c = 40\text{ mA}$



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Anti-radioactive design is not implemented in this product.