

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.

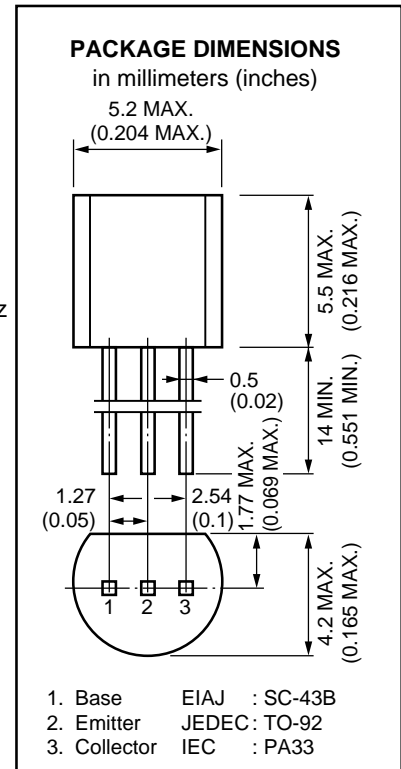
It has large dynamic range and good current characteristic.

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

Collector to Base Voltage	V_{CB0}	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	$^\circ\text{C}$



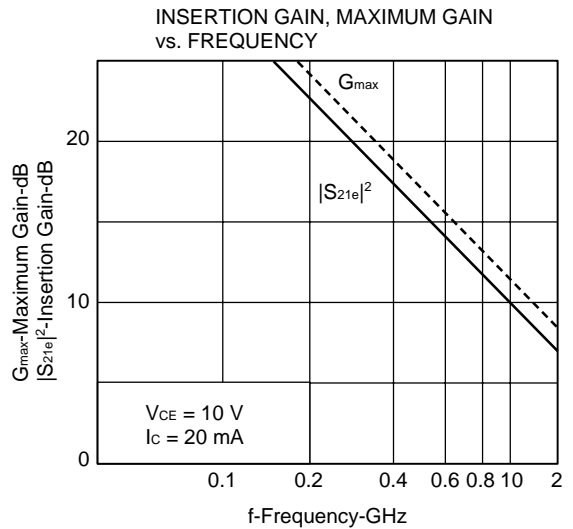
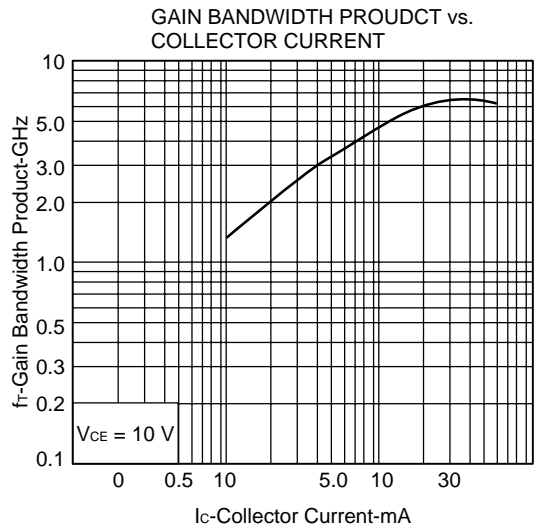
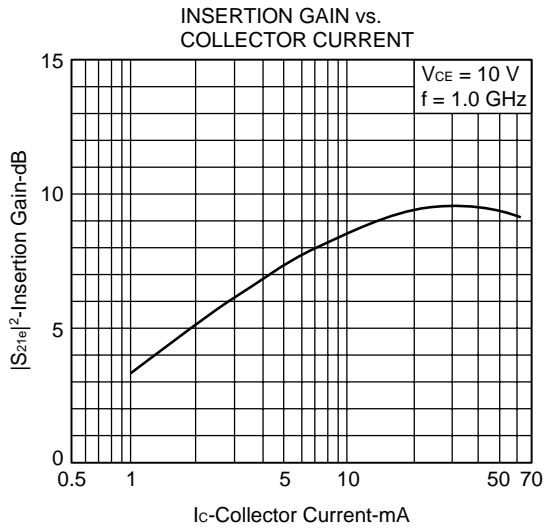
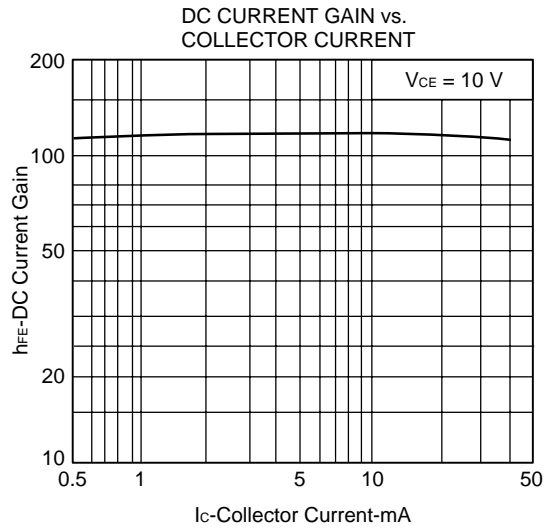
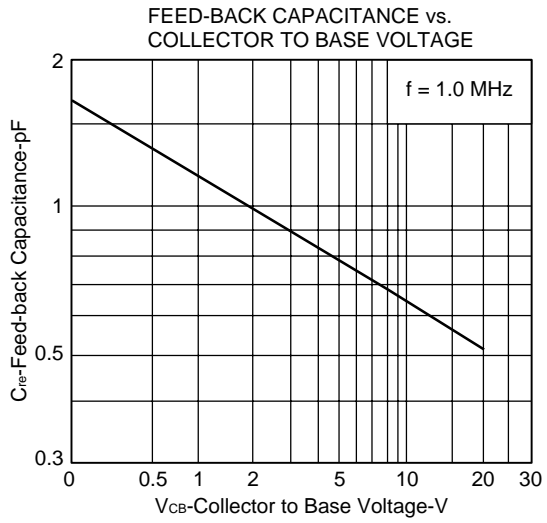
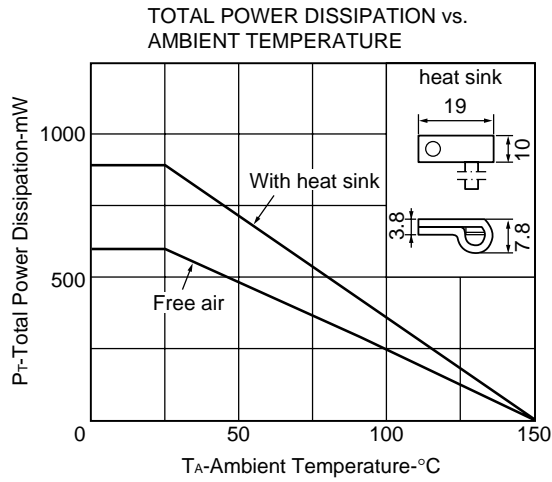
ELECTRICAL CHARACTERISTICS ($T_A = 25 \text{ }^\circ\text{C}$)

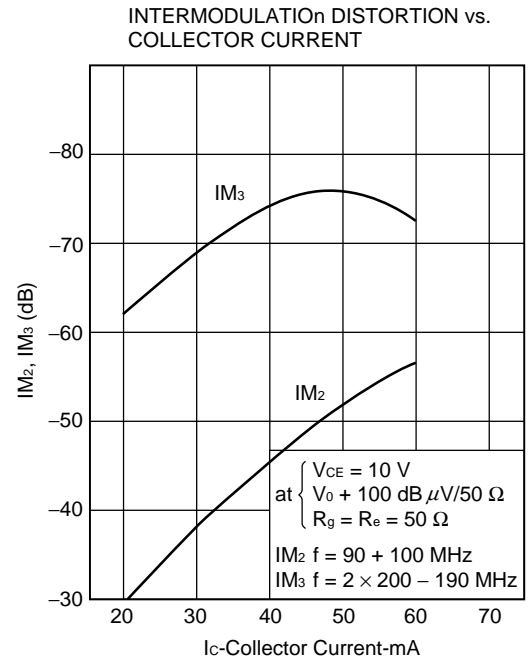
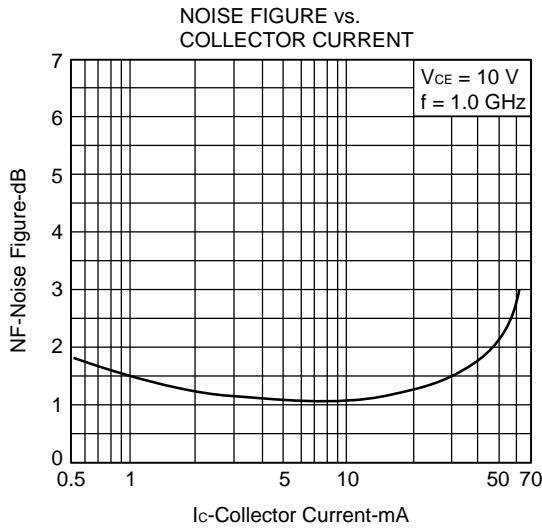
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CB0}			1.0	μA	$V_{CB} = 10 \text{ V}, I_E = 0$
Emitter Cutoff Current	I_{EBO}			1.0	μA	$V_{EB} = 1.0 \text{ V}, I_c = 0$
DC Current Gain	h_{FE}	50	120	300		$V_{CE} = 10 \text{ V}, I_c = 20 \text{ mA}$
Gain Bandwidth 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 °C)





S-PARAMETER

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

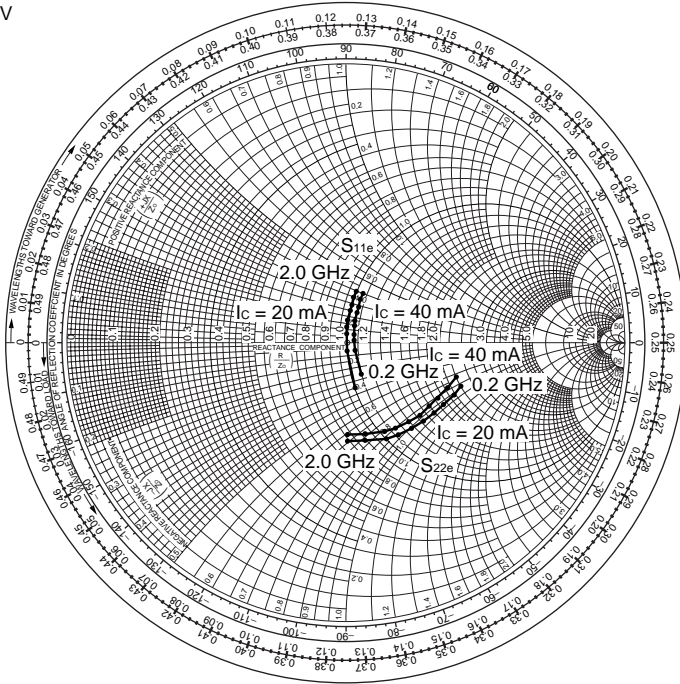
f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.173	-80.3	13.652	103.4	0.041	73.8	0.453	-21.8
400	0.054	-77.0	7.217	85.1	0.066	71.2	0.427	-26.0
600	0.013	-57.9	4.936	74.0	0.113	69.3	0.428	-30.8
800	0.028	81.8	3.761	62.3	0.144	67.0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

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

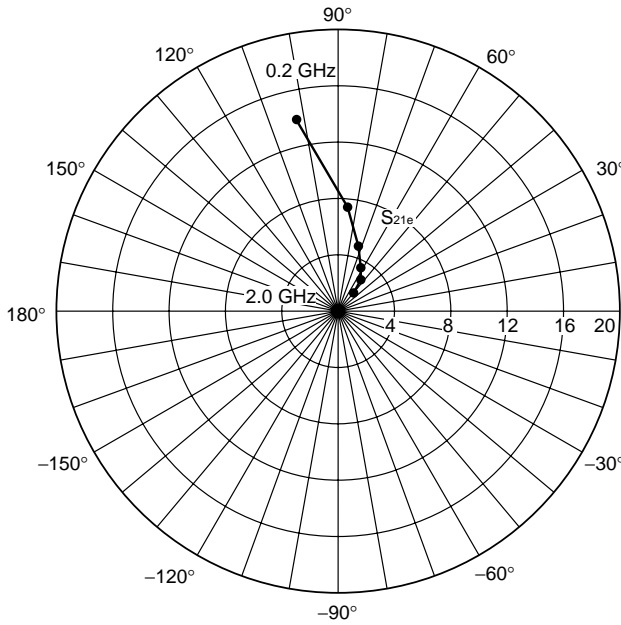
f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.011	-60.1	13.76	105.4	0.040	-73.3	0.421	-17.5
400	0.028	-42.9	7.338	82.9	0.069	66.7	0.416	-22.8
600	0.027	25.1	4.996	72.7	0.114	69.4	0.414	-28.7
800	0.043	65.7	3.801	61.9	0.144	67.8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

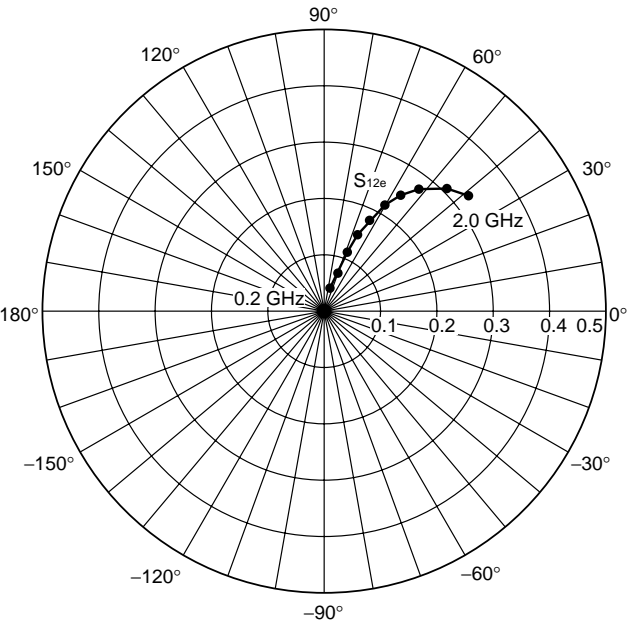
S_{11e} , S_{22e} -FREQUENCY CONDITION $V_{CE} = 10\text{ V}$



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.