DATA SHEET

NEC

NPN SILICON RF TRANSISTOR
2SC3355

NPN EPITAXIAL SILICON RF TRANSISTOR FOR HIGH-FREQUENCY LOW-NOISE AMPLIFICATION

DESCRIPTION

The 2SC3355 is an NPN silicon epitaxial transistor designed for low noise amplifier at VHF, UHF and CATV band. It has lange 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 GHz
  NF = 1.8 dB TYP., G_a = 9.0 dB TYP. @ V_{CE} = 10 V, I_C = 40 mA, f = 1 GHz
- High power gain : MAG = 11 dB TYP. @ V_{CE} = 10 V, I_C = 20 mA, f = 1 GHz

★ ORDERING INFORMATION

Part Number	Quantity	Supplying Form
2SC3355	500 pcs (Non reel)	• 18 mm wide radial taping
2SC3355-T	2.5 kpcs/box (Box type)	• Supplying paper tape with in a box

Remark To order evaluation samples, contact your nearby sales office.
The unit sample quantity is 500 pcs.

ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)

Parameter	Symbol	Ratings	Unit
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_{tot}	600	mW
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	−65 to +150	°C

Caution Observe precautions when handling because these devices are sensitive to electrostatic discharge.

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Printed in Japan

The mark ★ shows major revised points.

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Collector Cut-off Current	I_{CBO}	V_{CB} = 10 V, I_E = 0 mA	–	–	1.0	μA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 1.0 V, I_C = 0 mA	–	–	1.0	μA
DC Current Gain	h_{FE} Note 1	V_{CE} = 10 V, I_C = 20 mA	50	120	300	–
RF Characteristics						
Gain Bandwidth Product	f_T	V_{CE} = 10 V, I_C = 20 mA	–	6.5	–	GHz
Insertion Power Gain	$\|S_{21e}\|^2$	V_{CE} = 10 V, I_C = 20 mA, f = 1 GHz	–	9.5	–	dB
Noise Figure (1)	NF	V_{CE} = 10 V, I_C = 7 mA, f = 1 GHz	–	1.1	–	dB
Noise Figure (2)	NF	V_{CE} = 10 V, I_C = 40 mA, f = 1 GHz	–	1.8	3.0	dB
Output Capacitance	C_{ob} Note 2	V_{CB} = 10 V, I_E = 0 mA, f = 1 MHz	–	0.65	1.0	pF

★ **Notes 1.** Pulse measurement: PW ≤ 350 μs, Duty Cycle ≤ 2%

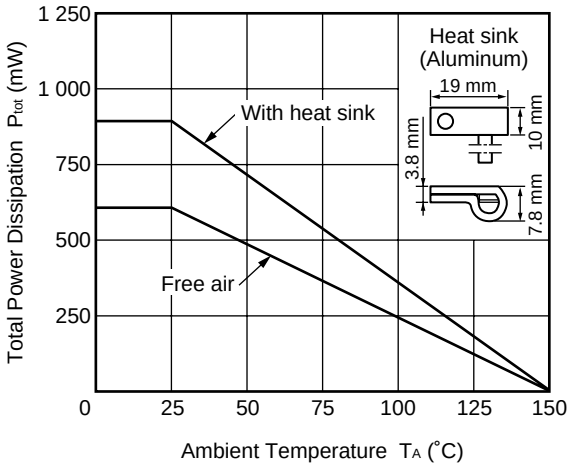
★ **2.** Collector to base capacitance when the emitter grounded

h_{FE} CLASSIFICATION

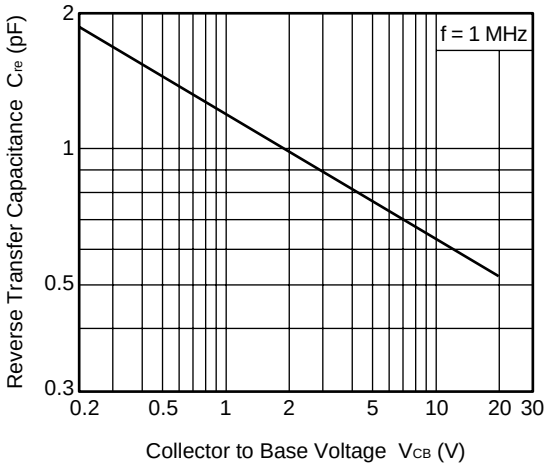
Rank	K
Marking	K
h_{FE} Value	50 to 300

TYPICAL CHARACTERISTICS (T_A = +25°C, unless otherwise specified)

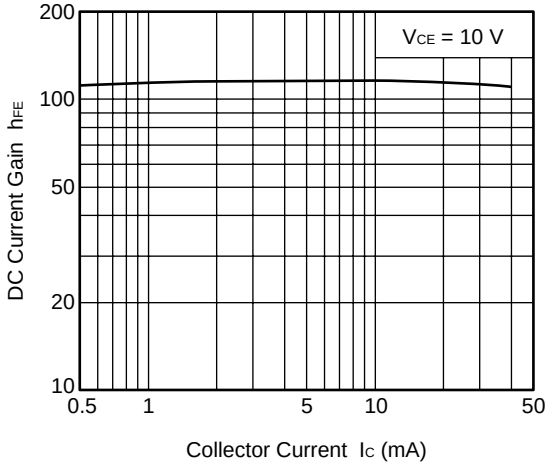
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



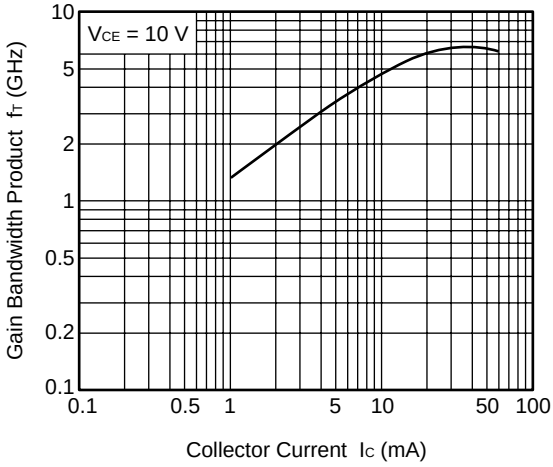
REVERSE TRANSFER CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



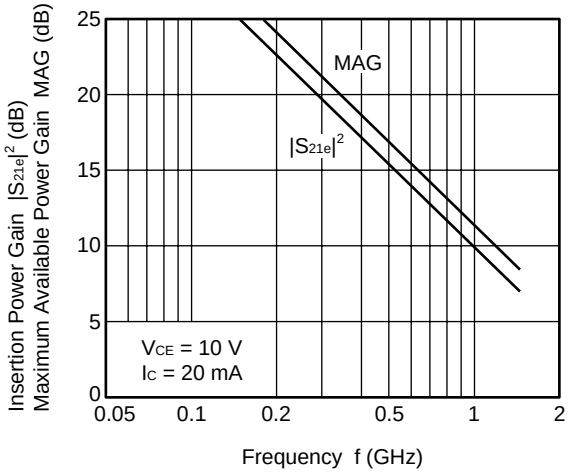
DC CURRENT GAIN vs. COLLECTOR CURRENT



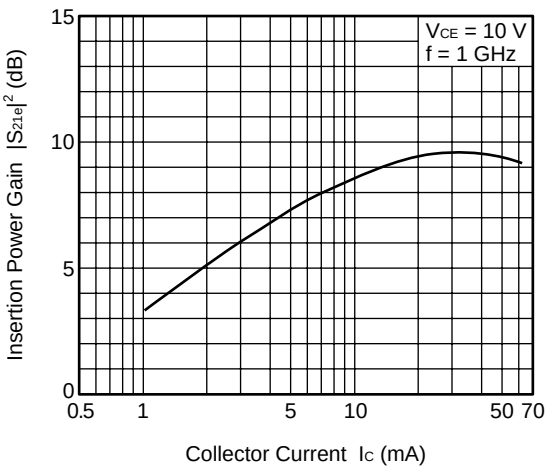
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



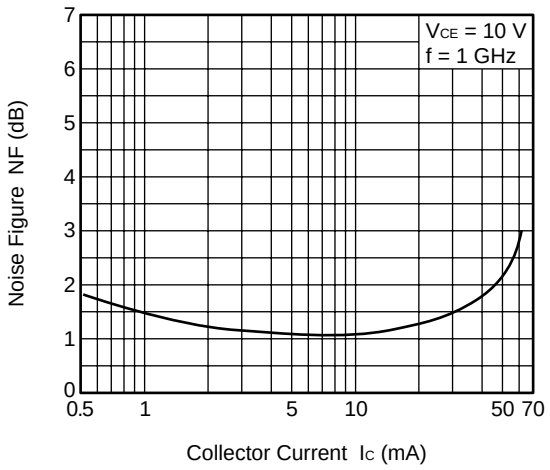
INSERTION POWER GAIN, MAG vs. FREQUENCY



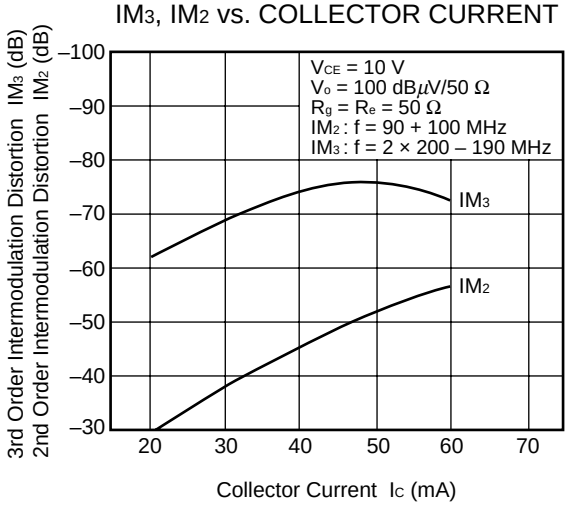
INSERTION POWER GAIN vs. COLLECTOR CURRENT



NOISE FIGURE vs.
COLLECTOR CURRENT



IM_3, IM_2 vs. COLLECTOR CURRENT



Remark The graphs indicate nominal characteristics.

S-PARAMETERS

S-parameters/Noise parameters are provided on the NEC Compound Semiconductor Devices Web site in a form (S2P) that enables direct import to a microwave circuit simulator without keyboard input.

Click here to download S-parameters.

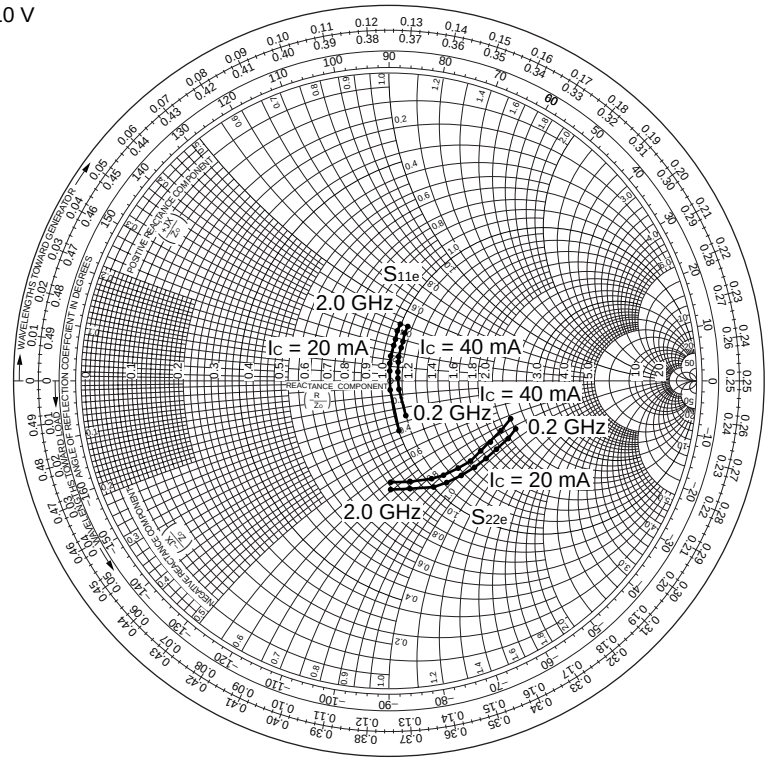
[RF and Microwave] → [Device Parameters]

URL http://www.csd-nec.com/

SMITH CHART

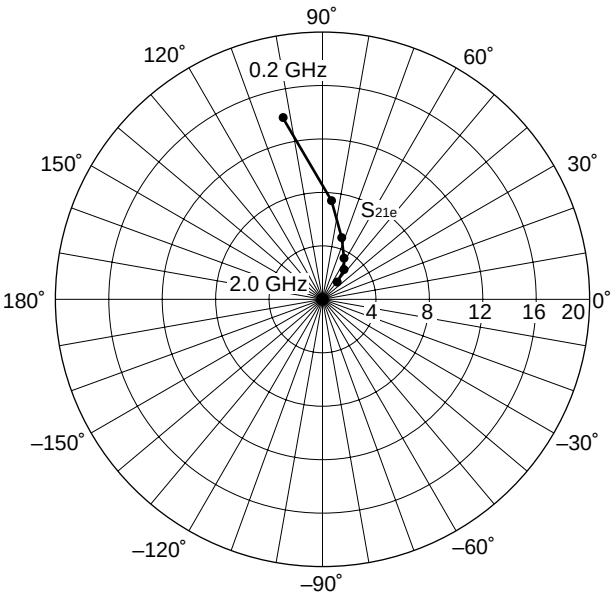
S_{11e}, S_{22e}-FREQUENCY

CONDITION : V_{CE} = 10 V



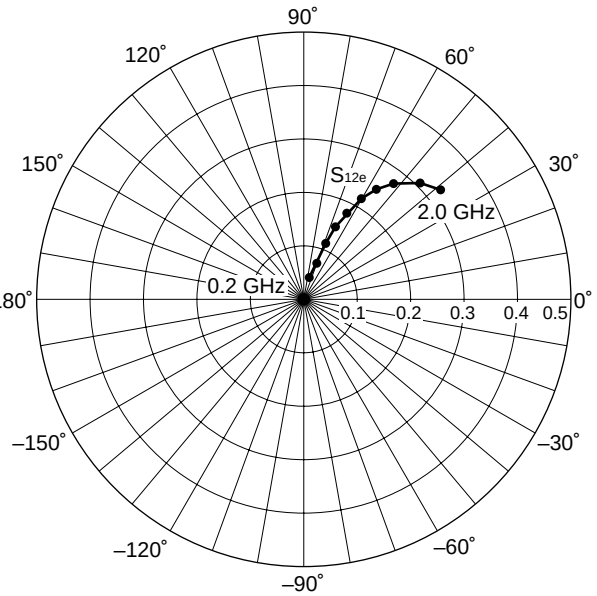
S_{21e}-FREQUENCY

CONDITION : V_{CE} = 10 V, I_C = 40 mA



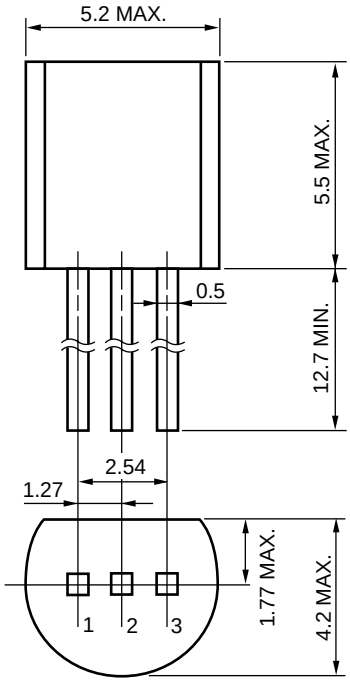
S_{12e}-FREQUENCY

CONDITION : V_{CE} = 10 V, I_C = 40 mA



★ **PACKAGE DIMENSIONS**

TO-92 (UNIT: mm)



PIN CONNECTIONS

1. Base
2. Emitter
3. Collector

EIAJ : SC-43B
JEDEC : TO-92
IEC : PA33

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  (Note)

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