

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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Phase-out/Discontinued

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 large dynamic range and good current characteristic.

FEATURES

- Low noise and high gain
 $NF = 1.1 \text{ dB TYP.}, G_a = 8.0 \text{ dB TYP. @ } V_{CE} = 10 \text{ V}, I_c = 7 \text{ mA}, f = 1 \text{ GHz}$
 $NF = 1.8 \text{ dB TYP.}, G_a = 9.0 \text{ dB TYP. @ } V_{CE} = 10 \text{ V}, I_c = 40 \text{ mA}, f = 1 \text{ GHz}$
- High power gain : $MAG = 11 \text{ dB TYP. @ } V_{CE} = 10 \text{ V}, I_c = 20 \text{ mA}, f = 1 \text{ GHz}$

★ 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 ($T_A = +25^\circ\text{C}$)

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	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65 to +150	$^\circ\text{C}$

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

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 Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

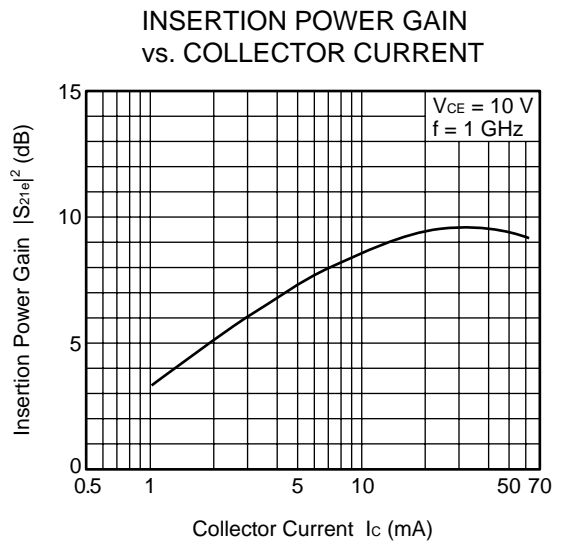
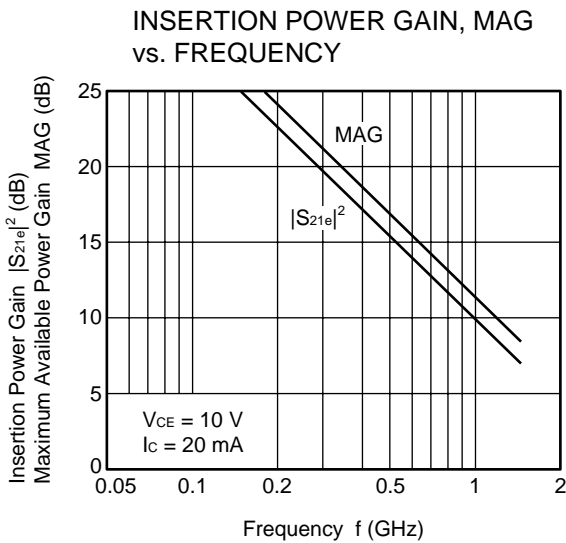
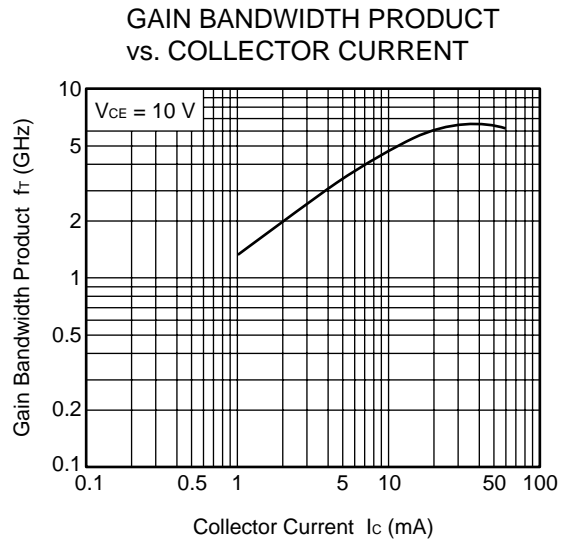
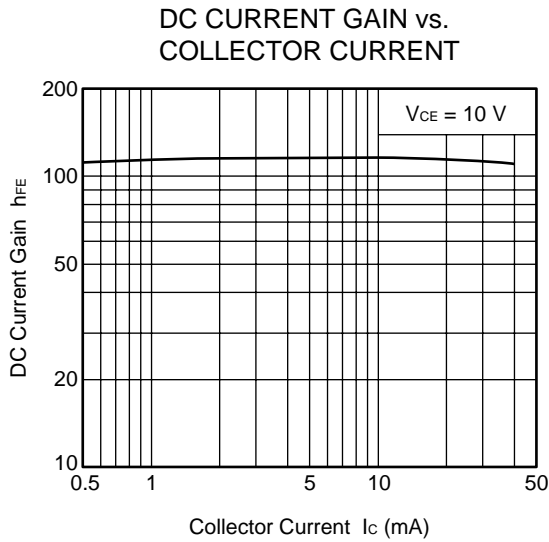
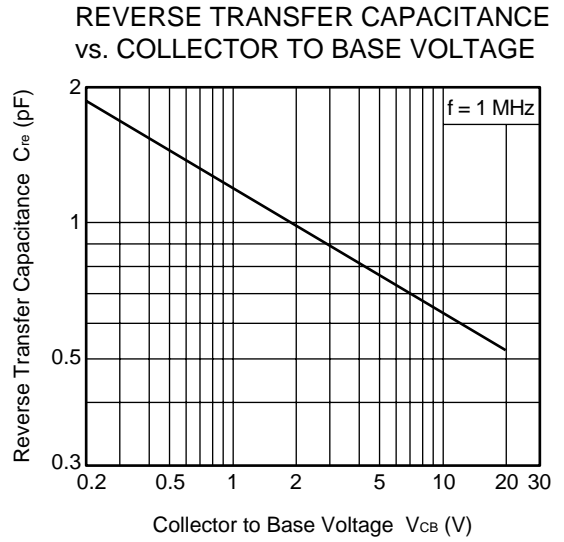
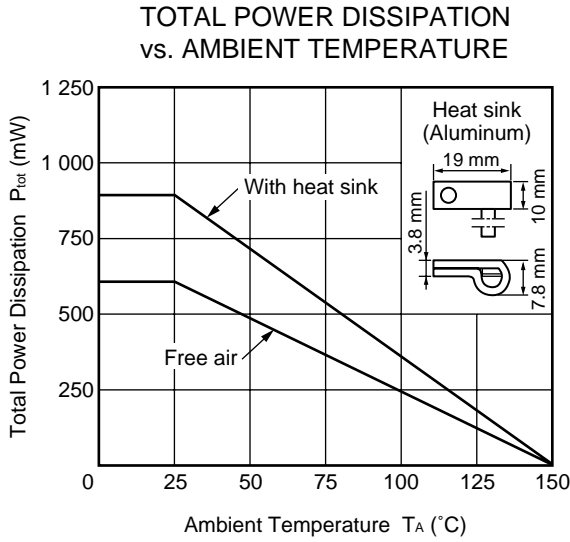
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Collector Cut-off Current	I _{CBO}	V _{CB} = 10 V, I _E = 0 mA	–	–	1.0	μA
Emitter Cut-off Current	I _{EBO}	V _{EB} = 1.0 V, I _C = 0 mA	–	–	1.0	μA
DC Current Gain	h _{FE} ^{Note 1}	V _{CE} = 10 V, I _C = 20 mA	50	120	300	–
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

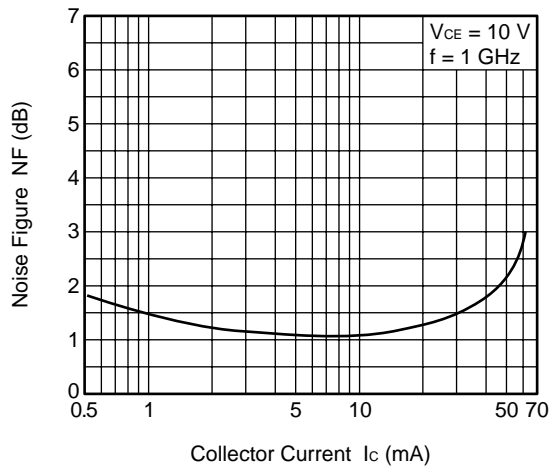
h_{FE} CLASSIFICATION

Rank	K
Marking	K
h _{FE} Value	50 to 300

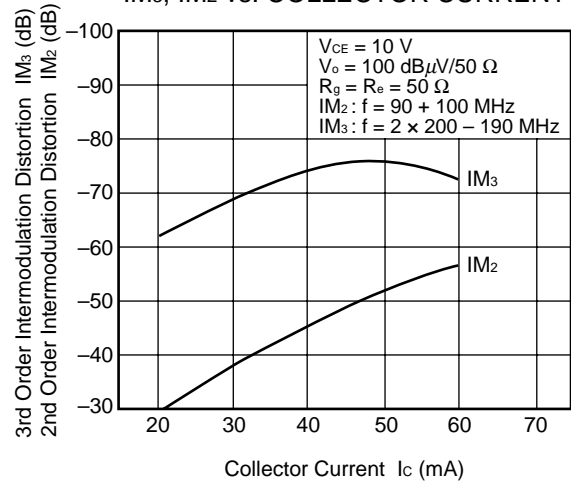
TYPICAL CHARACTERISTICS (T_A = +25°C, unless otherwise specified)



NOISE FIGURE vs. COLLECTOR CURRENT



IM₃, IM₂ 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.

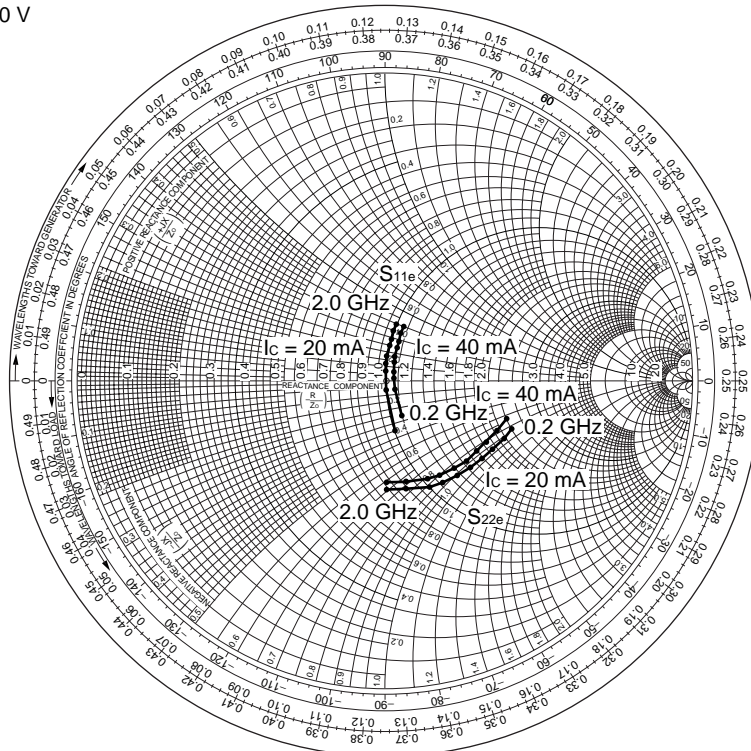
[RF and Microwave] → [Device Parameters]

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

SMITH CHART

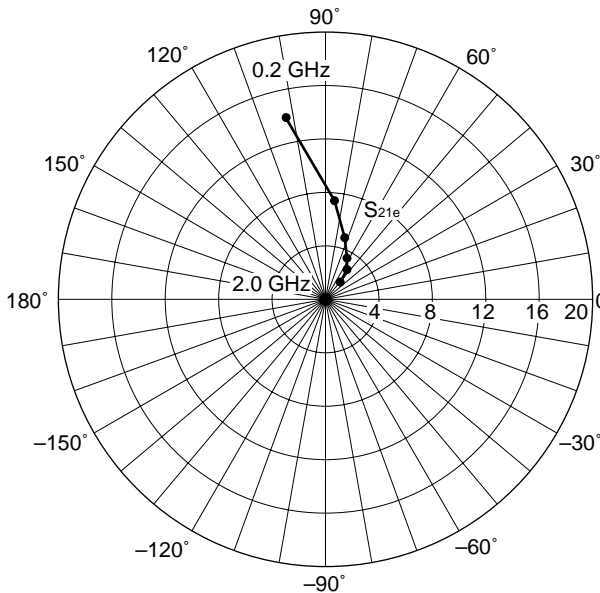
S_{11e}, S_{22e}-FREQUENCY

CONDITION : V_{CE} = 10 V



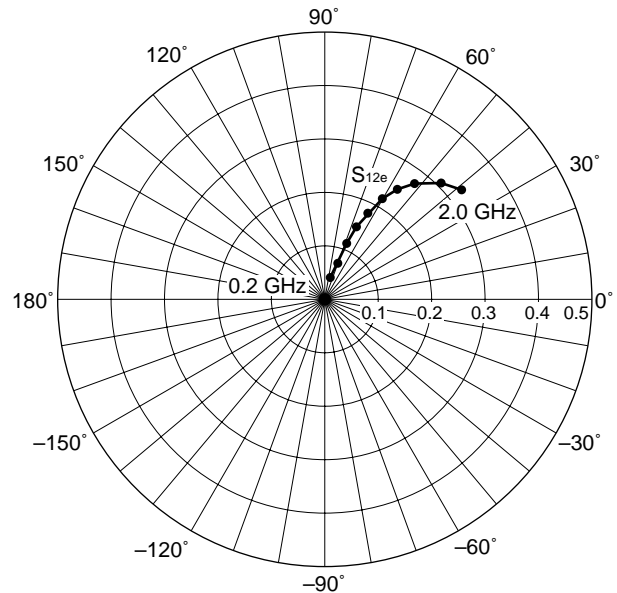
S_{21e}-FREQUENCY

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



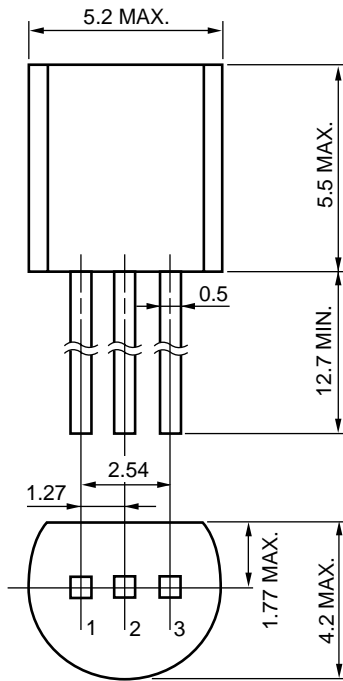
S_{12e}-FREQUENCY

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



★ PACKAGE DIMENSIONS

TO-92 (UNIT: mm)



PIN CONNECTIONS

- 1. Base EIAJ : SC-43B
- 2. Emitter JEDEC: TO-92
- 3. Collector IEC : PA33

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M8E 00.4-0110

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