

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 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.

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.
 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)

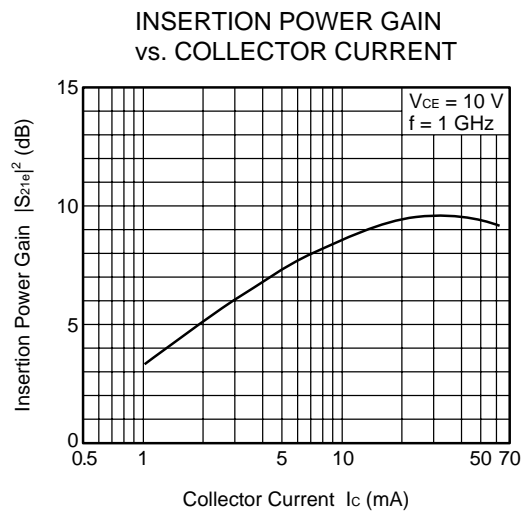
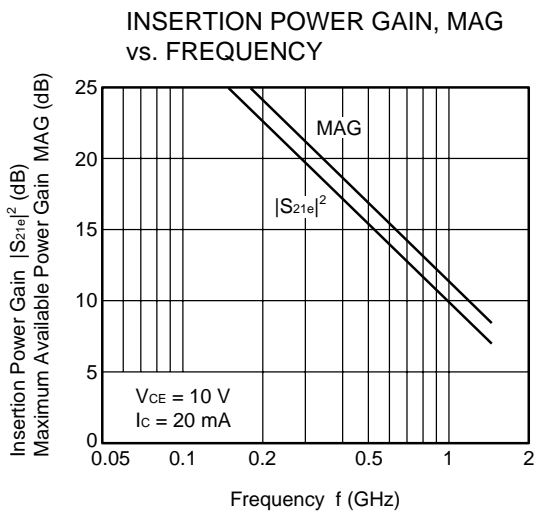
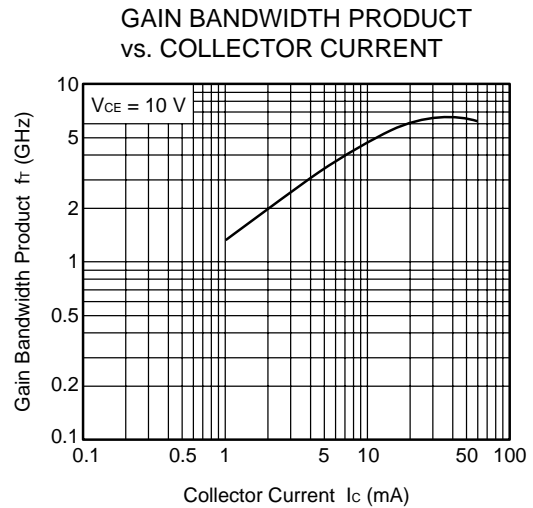
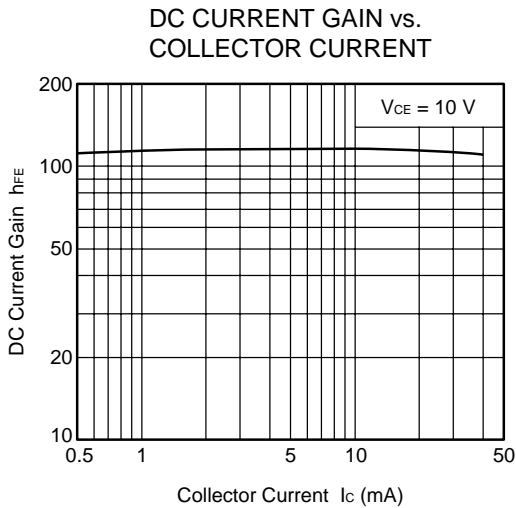
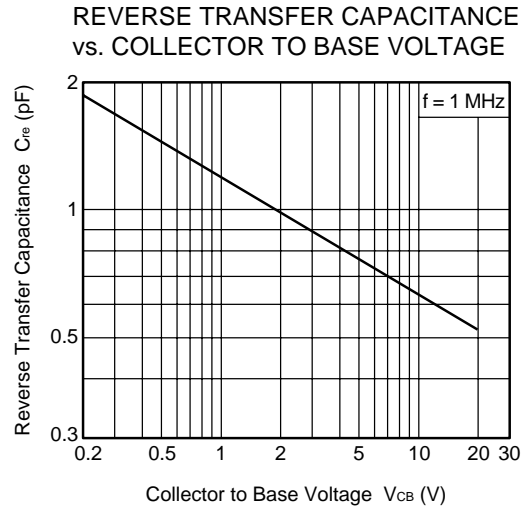
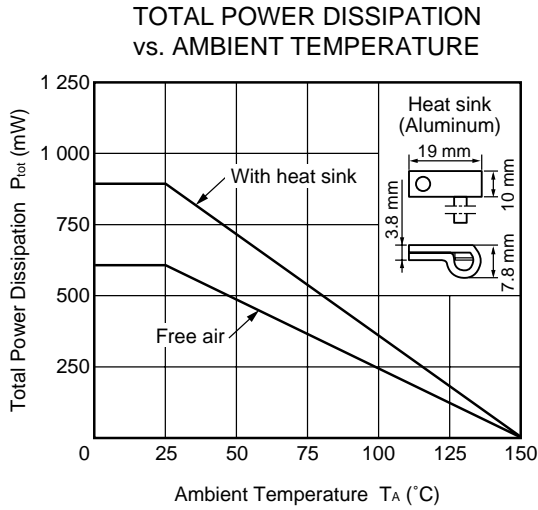
| Parameter | Symbol | Test Conditions | MIN. | TYP. | MAX. | Unit |
|---------------------------|-----------------------------------|---|------|------|------|------|
| DC Characteristics | | | | | | |
| Collector Cut-off Current | I _{CBO} | V _{CB} = 10 V, I _E = 0 mA | – | – | 1.0 | μA |
| Emitter 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

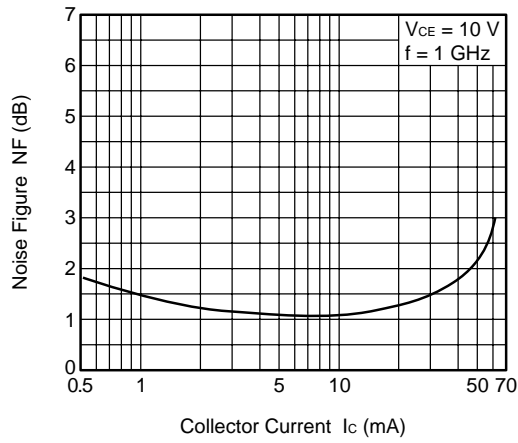
h_{FE} CLASSIFICATION

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

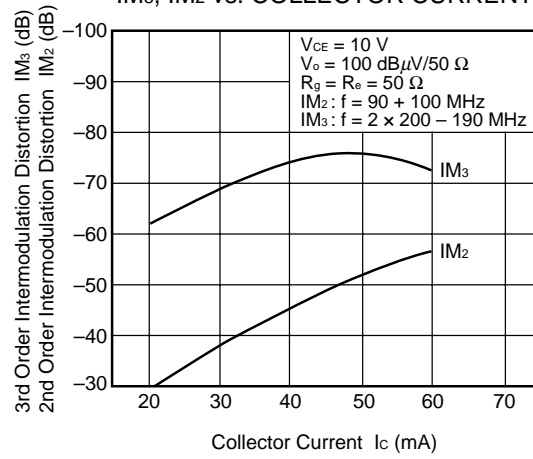
TYPICAL CHARACTERISTICS (T_A = +25°C, unless otherwise specified)



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.

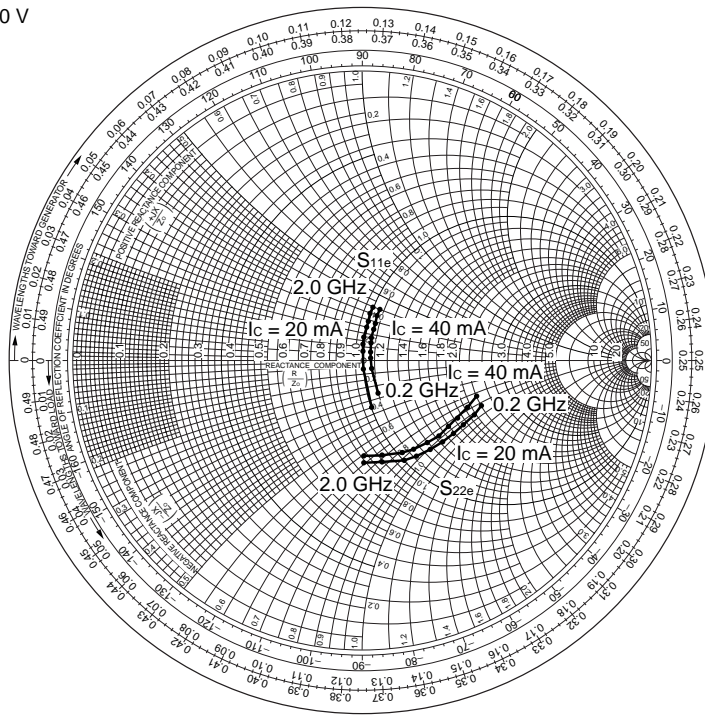
[RF and Microwave] → [Device Parameters]

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

SMITH CHART

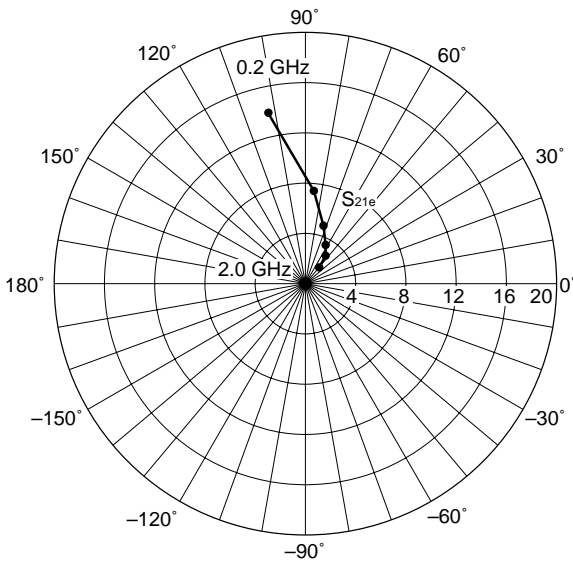
S_{11e}, S_{22e}-FREQUENCY

CONDITION : V_{CE} = 10 V



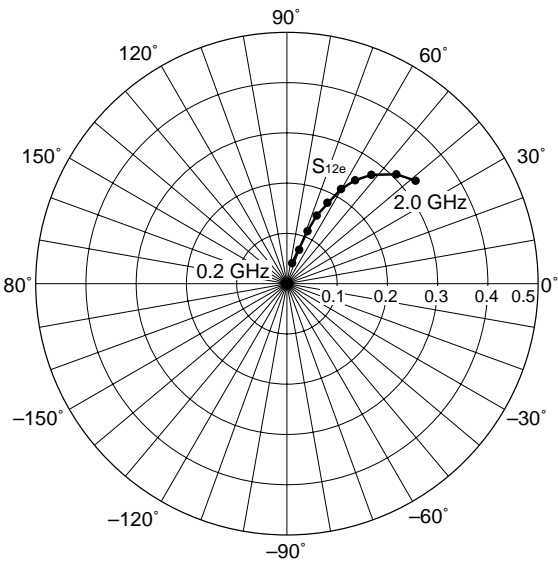
S_{21e}-FREQUENCY

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



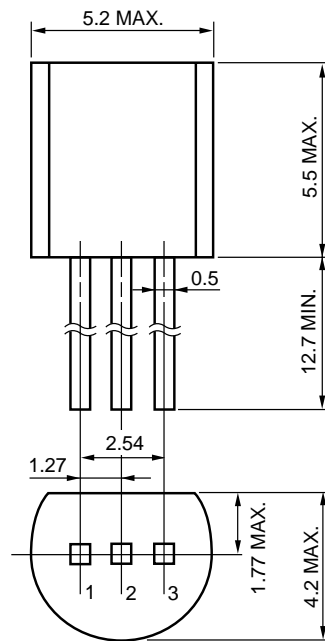
S_{12e}-FREQUENCY

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

► For further information, please contact

NEC Compound Semiconductor Devices, Ltd.

5th Sales Group, Sales Division TEL: +81-44-435-1588 FAX: +81-44-435-1579 E-mail: salesinfo@csd-nec.com

NEC Compound Semiconductor Devices Hong Kong Limited

Hong Kong Head Office TEL: +852-3107-7303 FAX: +852-3107-7309 E-mail: ncsd-hk@elhk.nec.com.hk

Taipei Branch Office TEL: +886-2-8712-0478 FAX: +886-2-2545-3859

Korea Branch Office TEL: +82-2-558-2120 FAX: +82-2-558-5209

NEC Electronics (Europe) GmbH <http://www.ee.nec.de/>

TEL: +49-211-6503-01 FAX: +49-211-6503-487

California Eastern Laboratories, Inc. <http://www.cel.com/>

TEL: +1-408-988-3500 FAX: +1-408-988-0279