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DATA SHEET



NPN SILICON RF TRANSISTOR NE68539 / 2SC4957

JEITA
Part No.

NPN EPITAXIAL SILICON RF TRANSISTOR FOR HIGH-FREQUENCY LOW-NOISE AMPLIFICATION 4-PIN MINIMOLD

FEATURES

- Low Noise, High Gain
- Low Voltage Operation
- Low Reverse Transfer Capacitance
 $C_{re} = 0.3 \text{ pF TYP.}$
- 4-pin minimold Package

★ ORDERING INFORMATION

| Part Number | Quantity | Supplying Form |
|-------------------------------|-------------------|---|
| NE68539E-A 2SC4957 -A | 50 pcs (Non reel) | <ul style="list-style-type: none"> • 8 mm wide embossed taping • Pin 3 (Base), Pin 4 (Emitter) face to perforation side of the tape |
| NE68539E-T1-A 2SC4957-T1-A | 3 kpcs/reel | |

Remark To order evaluation samples, contact your nearby sales office.
The unit sample quantity is 50 pcs.

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

| Parameter | Symbol | Ratings | Unit |
|------------------------------|-------------------------|-------------|------------------|
| Collector to Base Voltage | V_{CBO} | 9 | V |
| Collector to Emitter Voltage | V_{CEO} | 6 | V |
| Emitter to Base Voltage | V_{EBO} | 2 | V |
| Collector Current | I_C | 30 | mA |
| Total Power Dissipation | P_{tot}^{Note} | 180 | mW |
| Junction Temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -65 to +150 | $^\circ\text{C}$ |

Note Free air

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.

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

| Parameter | Symbol | Test Conditions | MIN. | TYP. | MAX. | Unit |
|------------------------------|-----------------------------------|--|------|------|------|------|
| DC Characteristics | | | | | | |
| Collector Cut-off Current | I _{CBO} | V _{CB} = 5 V, I _E = 0 mA | - | - | 100 | nA |
| Emitter Cut-off Current | I _{EBO} | V _{EB} = 1 V, I _C = 0 mA | - | - | 100 | nA |
| DC Current Gain | h _{FE} ^{Note 1} | V _{CE} = 3 V, I _C = 10 mA | 75 | - | 150 | - |
| RF Characteristics | | | | | | |
| Gain Bandwidth Product | f _T | V _{CE} = 3 V, I _C = 10 mA | - | 12 | - | GHz |
| Insertion Power Gain | S _{21e} ² | V _{CE} = 3 V, I _C = 10 mA, f = 2.0 GHz | 9 | 11 | - | dB |
| Noise Figure | NF | V _{CE} = 3 V, I _C = 3 mA, f = 2.0 GHz | - | 1.5 | 2.5 | dB |
| Reverse Transfer Capacitance | C _{re} ^{Note 2} | V _{CB} = 3 V, I _E = 0 mA, f = 1.0 MHz | - | 0.3 | 0.5 | pF |

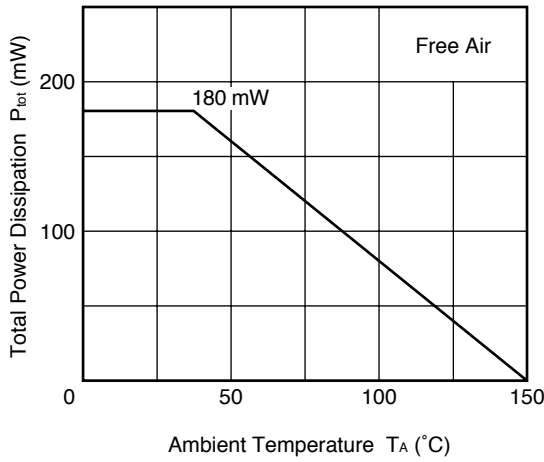
- Notes 1.** Pulse measurement: PW ≤ 350 μs, Duty Cycle ≤ 2%
2. Collector to base capacitance when the emitter grounded

h_{FE} CLASSIFICATION

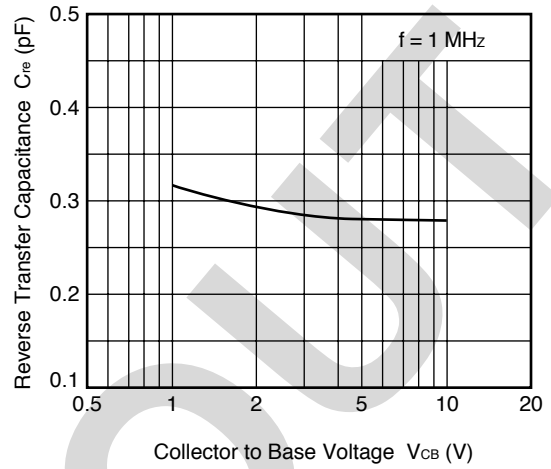
| | |
|-----------------------|-----------|
| Rank | T83 |
| Marking | T83 |
| h _{FE} Value | 75 to 150 |

TYPICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, unless otherwise specified)

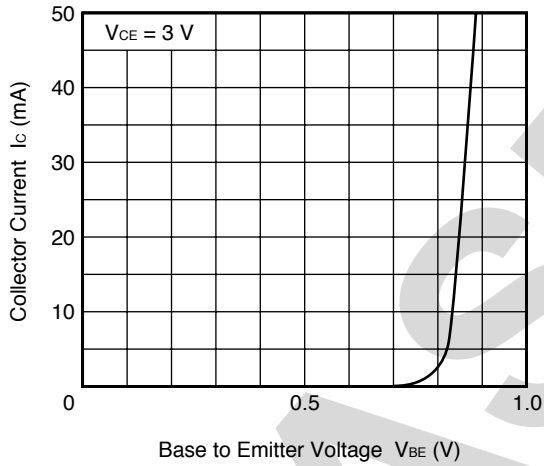
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



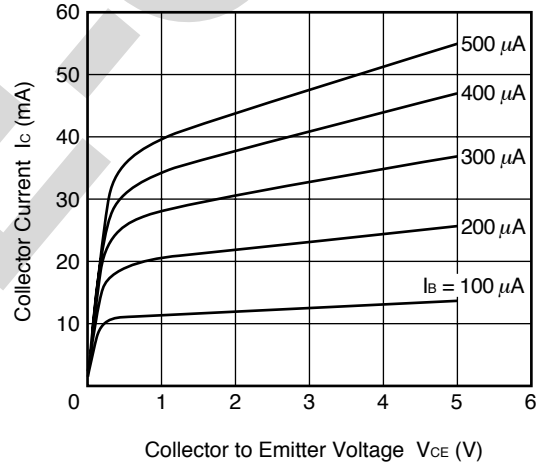
REVERSE TRANSFER CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



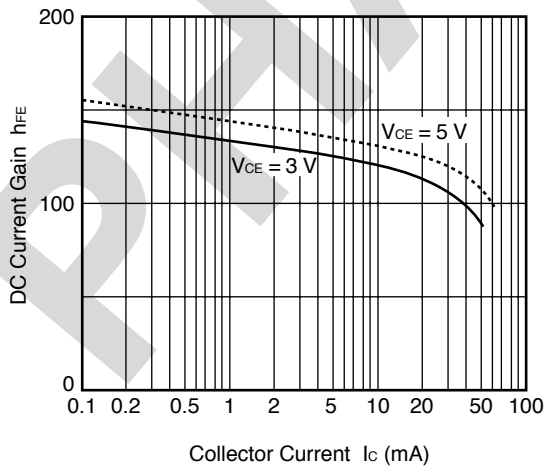
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



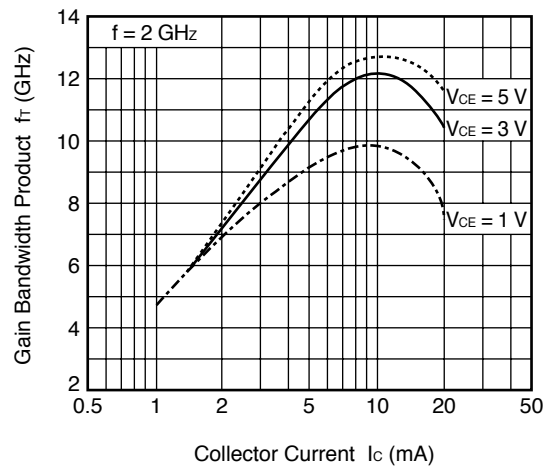
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



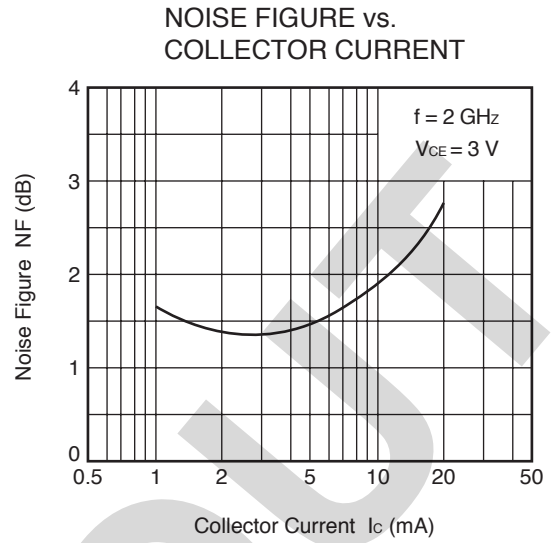
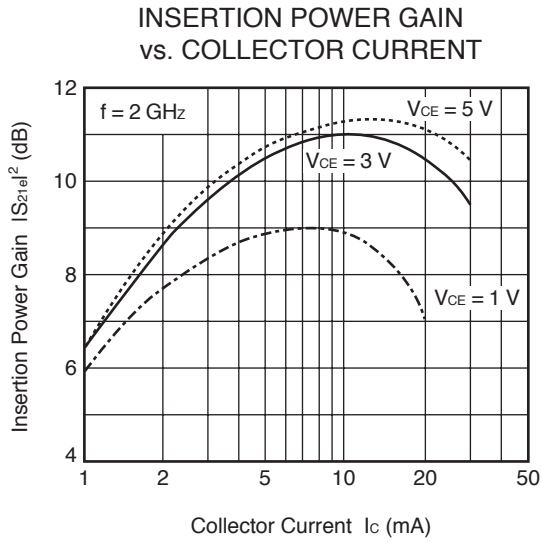
DC CURRENT GAIN vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



Remark The graphs indicate nominal characteristics.



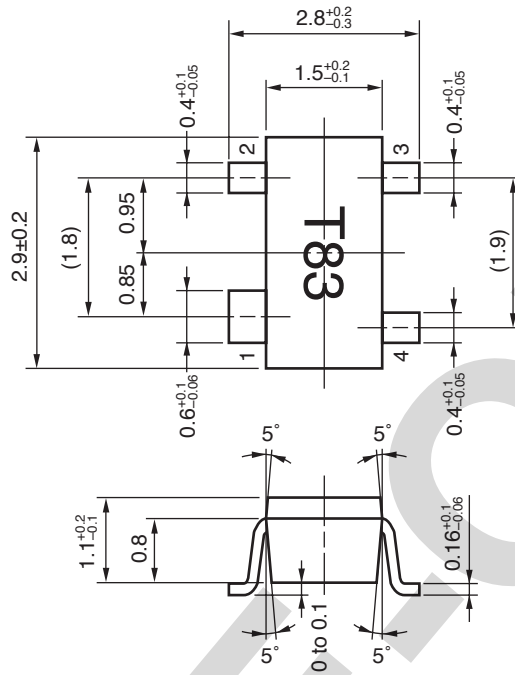
Remark The graphs indicate nominal characteristics.

★ **S-PARAMETERS**

- S-parameters and noise parameters are provided on our Web site in a format (S2P) that enables the direct import of the parameters to microwave circuit simulators without the need for keyboard inputs.
- Click here to download S-parameters.
- [RF and Microwave] ® [Device Parameters]
- URL <http://www.necel.com/microwave/en/>

★ PACKAGE DIMENSIONS

4-PIN MINIMOLD PACKAGE (UNIT: mm)



PIN CONNECTIONS

- 1. Collector
- 2. Emitter
- 3. Base
- 4. Emitter

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