#### PRELIMINARY DATA SHEET



# NPN SILICON GERMANIUM RF TRANSISTOR

# **NESG204619**

# NPN SIGE RF TRANSISTOR FOR LOW NOISE, HIGH-GAIN AMPLIFICATION 3-PIN ULTRA SUPER MINIMOLD

#### **FEATURES**

- The device is an ideal choice for low noise, high-gain amplification
   NF = 0.8 dB TYP., Ga = 11.0 dB TYP. @ VcE = 1 V, Ic = 3 mA, f = 2 GHz
- High breakdown voltage technology for SiGe Tr. adopted: VCEO (absolute maximum ratings) = 5.0 V
- · 3-pin ultra super minimold package

#### ORDERING INFORMATION

| Part Number     | Quantity          | Supplying Form  |  |
|-----------------|-------------------|---|--|
| NESG204619-A    | 50 pcs (Non reel) | 8 mm wide embossed taping                               |  |
| NESG204619-T1-A | 3 kpcs/reel       | Pin 3 (Collector) face the perforation side of the tape |  |

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

## ABSOLUTE MAXIMUM RATINGS (TA = +25°C)

| Parameter                    | Symbol                | Ratings     | Unit |
|------------------------------|-----------------------|-------------|------|
| Collector to Base Voltage    | Vсво                  | 13          | V    |
| Collector to Emitter Voltage | Vceo                  | 5           | V    |
| Emitter to Base Voltage      | VEBO                  | 1.5         | V    |
| Collector Current            | lc                    | 40          | mA   |
| Total Power Dissipation      | P <sub>tot</sub> Note | 200         | mW   |
| Junction Temperature         | Tj                    | 150         | °C   |
| Storage Temperature          | Tstg                  | -65 to +150 | °C   |

Note Mounted on 1.08 cm<sup>2</sup> × 1.0 mm (t) glass epoxy PCB

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 (TA = +25°C)

| Parameter                    | Symbol                          | Test Conditions  | MIN. | TYP. | MAX. | Unit |  |
|------------------------------|---------------------------------|--|------|------|------|------|--|
| DC Characteristics           |                                 |  |      |      |      |      |  |
| Collector Cut-off Current    | Ісво                            | VcB = 5 V, IE = 0 mA   | -    | -    | 100  | nA   |  |
| Emitter Cut-off Current      | ІЕВО                            | VEB = 0.5 V, Ic = 0 mA   | -    | -    | 100  | nA   |  |
| DC Current Gain              | hfe Note 1                      | VcE = 1 V, Ic = 2 mA   | 140  | 180  | 220  | -    |  |
| RF Characteristics           |                                 |  |      |      |      |      |  |
| Gain Bandwidth Product       | f⊤                              | VcE = 1 V, Ic = 15 mA, f = 2 GHz   | 15   | 18   | -    | GHz  |  |
| Insertion Power Gain         | S <sub>21e</sub>   <sup>2</sup> | VcE = 1 V, Ic = 15 mA, f = 2 GHz   | 10   | 12   | -    | dB   |  |
| Noise Figure                 | NF                              | $V_{CE} = 1 \text{ V}, \text{ Ic} = 3 \text{ mA}, \text{ f} = 2 \text{ GHz}, $ $Z_{S} = Z_{Sopt}, Z_{L} = Z_{Lopt}$  | -    | 0.8  | 1.5  | dB   |  |
| Associated Gain              | Ga                              | $\label{eq:Vce} \begin{array}{l} V_{\text{CE}} = 1 \text{ V, Ic} = 3 \text{ mA, f} = 2 \text{ GHz,} \\ Z_{\text{S}} = Z_{\text{Sopt}}, \ Z_{\text{L}} = Z_{\text{Lopt}} \end{array}$ | 9.0  | 11.0 | =    | dB   |  |
| Reverse Transfer Capacitance | Cre Note 2                      | VcB = 1 V, IE = 0 mA, f = 1 MHz  | ı    | 0.2  | 0.4  | pF   |  |

**Notes 1.** Pulse measurement: PW  $\leq$  350  $\mu$ s, Duty Cycle  $\leq$  2%

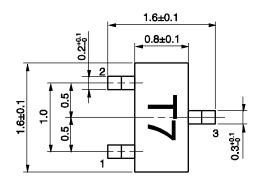
2. Collector to base capacitance when the emitter grounded

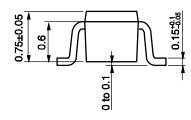
### **hfe CLASSIFICATION**

| Rank                  | FB         |  |  |
|-----------------------|------------|--|--|
| Marking               | Т7         |  |  |
| h <sub>FE</sub> Value | 140 to 220 |  |  |

## PACKAGE DIMENSIONS

# 3-PIN ULTRA SUPER MINIMOLD (UNIT: mm)





## **PIN CONNECTIONS**

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