



## 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.,  $G_a = 11.0$  dB TYP. @  $V_{CE} = 1$  V,  $I_c = 3$  mA,  $f = 2$  GHz
- High breakdown voltage technology for SiGe Tr. adopted:  $V_{CEO}$  (absolute maximum ratings) = 5.0 V
- 3-pin ultra super minimold package

#### ORDERING INFORMATION

Part Number	Quantity	Supplying Form
NESG204619	50 pcs (Non reel)	• 8 mm wide embossed taping
NESG204619-T1	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 ( $T_A = +25^\circ\text{C}$ )

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	$V_{CBO}$	13	V
Collector to Emitter Voltage	$V_{CEO}$	5	V
Emitter to Base Voltage	$V_{EBO}$	1.5	V
Collector Current	$I_c$	40	mA
Total Power Dissipation	$P_{tot}^{Note}$	200	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65 to +150	$^\circ\text{C}$

**Note** Mounted on  $1.08\text{ cm}^2 \times 1.0\text{ mm}$  (t) glass epoxy PCB

**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<sub>A</sub> = +25°C)**

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Collector Cut-off Current	I <sub>CBO</sub>	V <sub>CB</sub> = 5 V, I <sub>E</sub> = 0 mA	–	–	100	nA
Emitter Cut-off Current	I <sub>EBO</sub>	V <sub>EB</sub> = 0.5 V, I <sub>C</sub> = 0 mA	–	–	100	nA
DC Current Gain	h <sub>FE</sub> <sup>Note 1</sup>	V <sub>CE</sub> = 1 V, I <sub>C</sub> = 2 mA	140	180	220	–
RF Characteristics						
Gain Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> = 1 V, I <sub>C</sub> = 15 mA, f = 2 GHz	15	18	–	GHz
Insertion Power Gain	S <sub>21e</sub>   <sup>2</sup>	V <sub>CE</sub> = 1 V, I <sub>C</sub> = 15 mA, f = 2 GHz	10	12	–	dB
Noise Figure	NF	V <sub>CE</sub> = 1 V, I <sub>C</sub> = 3 mA, f = 2 GHz, Z <sub>S</sub> = Z <sub>Sopt</sub> , Z <sub>L</sub> = Z <sub>Lopt</sub>	–	0.8	1.5	dB
Associated Gain	G <sub>a</sub>	V <sub>CE</sub> = 1 V, I <sub>C</sub> = 3 mA, f = 2 GHz, Z <sub>S</sub> = Z <sub>Sopt</sub> , Z <sub>L</sub> = Z <sub>Lopt</sub>	9.0	11.0	–	dB
Reverse Transfer Capacitance	C <sub>re</sub> <sup>Note 2</sup>	V <sub>CB</sub> = 1 V, I <sub>E</sub> = 0 mA, f = 1 MHz	–	0.2	0.4	pF

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

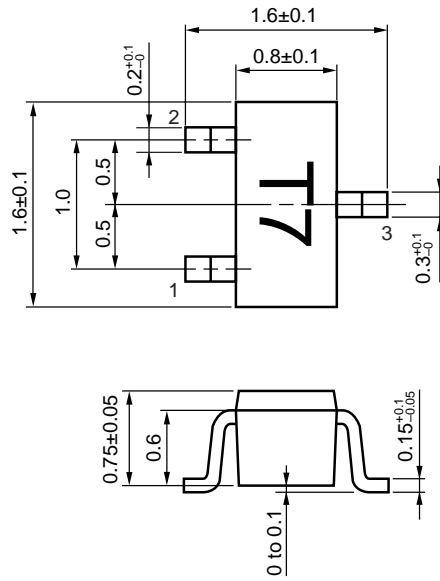
**2.** Collector to base capacitance when the emitter grounded

**h<sub>FE</sub> CLASSIFICATION**

Rank	FB
Marking	T7
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

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