

CEL

NEC's NPN SiGe TRANSISTOR  
FOR LOW NOISE, HIGH -GAIN AMPLIFICATION

NESG2046M33

## FEATURES

- IDEAL FOR LOW NOISE, HIGH-GAIN AMPLIFICATION APPLICATIONS:  
 $NF = 0.8 \text{ dB TYP.}$ ,  $G_a = 11.5 \text{ dB TYP.}$  @  $V_{CE} = 1 \text{ V}$ ,  $I_C = 3 \text{ mA}$ ,  $f = 2 \text{ GHz}$
- HIGH BREAKDOWN VOLTAGE TECHNOLOGY  
FOR SiGe TRANSISTORS :  
 $V_{CEO}$  (absolute maximum ratings) = 5.0 V
- 3-PIN SUPER LEAD-LESS MINIMOLD (M33) PACKAGE

## ORDERING INFORMATION

PART NUMBER	QUANTITY	SUPPLYING FORM
NESG2046M33-A	50 pcs (Non reel)	• 8 mm wide embossed taping
NESG2046M33-T3-A	10 kpcs/reel	• Pin 2 (Base) face the perforation side of the tape

**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	$V_{CBO}$	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	130	mW
Junction Temperature	$T_j$	150	°C
Storage Temperature	$T_{stg}$	-65 to +150	°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.

# NESG2046M33

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## ELECTRICAL CHARACTERISTICS (TA = +25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>DC Characteristics</b>						
Collector Cut-off Current	I <sub>CB0</sub>	V <sub>CB</sub> = 5 V, I <sub>E</sub> = 0 mA	–	–	100	nA
Emitter Cut-off Current	I <sub>EB0</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	–
<b>RF Characteristics</b>						
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	11	13	–	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>Opt</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>Opt</sub> , Z <sub>L</sub> = Z <sub>Lopt</sub>	9.5	11.5	–	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%

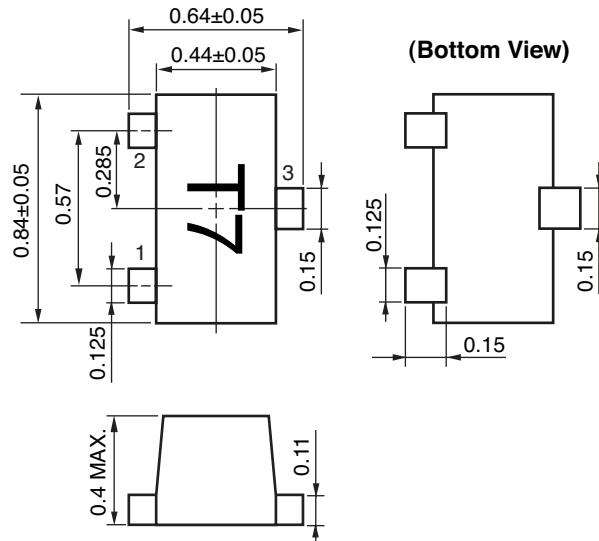
**2.** Collector to base capacitance when the emitter grounded

## h<sub>FE</sub> CLASSIFICATION

RANK	FB
Marking	T7
h <sub>FE</sub> Value	140 to 220

## PACKAGE DIMENSIONS

## 3-PIN SUPER LEAD-LESS MINIMOLD (M33) (UNIT: mm)



## PIN CONNECTIONS

1. Emitter
2. Base
3. Collector

## Life Support Applications

These NEC products are not intended for use in life support devices, appliances, or systems where the malfunction of these products can reasonably be expected to result in personal injury. The customers of CEL using or selling these products for use in such applications do so at their own risk and agree to fully indemnify CEL for all damages resulting from such improper use or sale.