



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

NESG2046M33

FEATURES

- **IDEAL FOR LOW NOISE, HIGH-GAIN AMPLIFICATION APPLICATIONS:**
NF = 0.8 dB TYP., $G_a = 11.5$ dB TYP. @ $V_{CE} = 1$ V, $I_c = 3$ mA, $f = 2$ 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 • Pin 2 (Base) face the perforation side of the tape
NESG2046M33-T3-A	10 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}	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	$^\circ\text{C}$
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.

ELECTRICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC Characteristics						
Collector Cut-off Current	I_{CBO}	$V_{CB} = 5\text{ V}, I_E = 0\text{ mA}$	–	–	100	nA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 0.5\text{ V}, I_C = 0\text{ mA}$	–	–	100	nA
DC Current Gain	h_{FE} ^{Note 1}	$V_{CE} = 1\text{ V}, I_C = 2\text{ mA}$	140	180	220	–
RF Characteristics						
Gain Bandwidth Product	f_T	$V_{CE} = 1\text{ V}, I_C = 15\text{ mA}, f = 2\text{ GHz}$	15	18	–	GHz
Insertion Power Gain	$ S_{21e} ^2$	$V_{CE} = 1\text{ V}, I_C = 15\text{ mA}, f = 2\text{ GHz}$	11	13	–	dB
Noise Figure	NF	$V_{CE} = 1\text{ V}, I_C = 3\text{ mA}, f = 2\text{ GHz},$ $Z_S = Z_{Sopt}, Z_L = Z_{Lopt}$	–	0.8	1.5	dB
Associated Gain	G_a	$V_{CE} = 1\text{ V}, I_C = 3\text{ mA}, f = 2\text{ GHz},$ $Z_S = Z_{Sopt}, Z_L = Z_{Lopt}$	9.5	11.5	–	dB
Reverse Transfer Capacitance	C_{re} ^{Note 2}	$V_{CB} = 1\text{ V}, I_E = 0\text{ mA}, f = 1\text{ MHz}$	–	0.2	0.4	pF

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

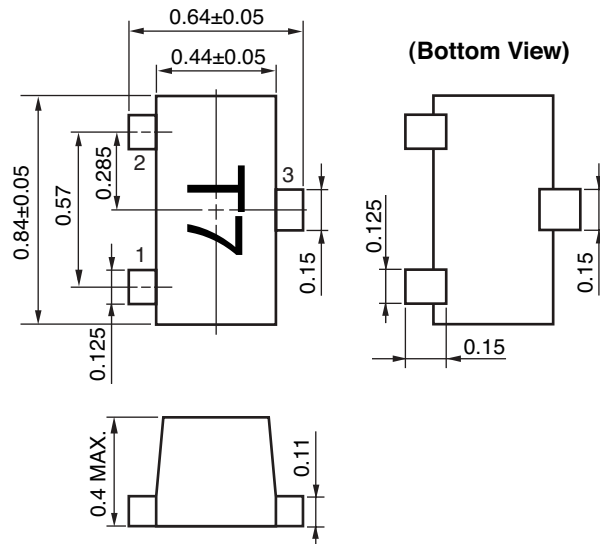
2. Collector to base capacitance when the emitter grounded

hFE CLASSIFICATION

RANK	FB
Marking	T7
h_{FE} 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.

CEL California Eastern Laboratories, Your source for NEC RF, Microwave, Optoelectronic, and Fiber Optic Semiconductor Devices.

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