CEL

NEC's NPN SiGe HIGH FREQUENCY TRANSISTOR

NESG3031M14

FEATURES

- **LOW NOISE FIGURE AND HIGH-GAIN**
  NF = 0.95 dB TYP, G_a = 10 dB TYP @ V_{CE} = 2 V, I_C = 6 mA, f = 5.2 GHz
  NF = 1.1 dB TYP, G_a = 9.5 dB TYP @ V_{CE} = 2 V, I_C = 6 mA, f = 5.8 GHz
- **MAXIMUM STABLE POWER GAIN:**
  MSG = 15.0 dB TYP @ V_{CE} = 3 V, I_C = 20 mA, f = 5.8 GHz
- **SiGe HBT TECHNOLOGY:**
  USH3 process, f_{max} = 110 GHz
- **M14 PACKAGE:**
  4-pin lead-less minimold package

ORDERING INFORMATION

PART NUMBER	QUANTITY	SUPPLYING FORM
NESG3031M14	50 pcs (Non reel)	• 8 mm wide embossed taping
NESG3031M14-T3	10 kpcs/reel	• Pin 1 (Collector), Pin 4 (Emitter) 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°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector to Base Voltage	V_{CBO}	12.0	V
Collector to Emitter Voltage	V_{CEO}	4.3	V
Emitter to Base Voltage	V_{EBO}	1.5	V
Collector Current	I_C	35	mA
Total Power Dissipation	P_{tot} **Note**	150	mW
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	−65 to +150	°C

Note Mounted on 1.08 cm^2 × 1.0 mm, (t) glass epoxy PCB

ELECTRICAL CHARACHTERISTICS (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} = 2 V, I_C = 6 mA	220	300	380	–
RF Characteristics						
Insertion Power Gain	$\|S_{21e}\|^2$	V_{CE} = 3 V, I_C = 20 mA, f = 5.8 GHz	6.5	9.0	–	dB
Noise Figure (1)	NF	V_{CE} = 2 V, I_C = 6 mA, f = 5.2 GHz, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$	–	0.95	–	dB
Noise Figure (2)	NF	V_{CE} = 2 V, I_C = 6 mA, f = 5.8 GHz, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$	–	1.1	1.5	dB
Associated Gain (1)	G_a	V_{CE} = 2 V, I_C = 6 mA, f = 5.2 GHz, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$	–	10.0	–	dB
Associated Gain (2)	G_a	V_{CE} = 2 V, I_C = 6 mA, f = 5.8 GHz, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$	7.5	9.5	–	dB
Reverse Transfer Capacitance	C_{re} Note 2	V_{CB} = 2 V, I_E = 0 mA, f = 1 MHz	–	0.15	0.25	pF
Maximum Stable Power Gain	MSG Note 3	V_{CE} = 3 V, I_C = 20 mA, f = 5.8 GHz	12.0	15.0	–	dB
Gain 1 dB Compression Output Power	$P_{O\ (1\ dB)}$	V_{CE} = 3 V, $I_{C\ (set)}$ = 20 mA, f = 5.8 GHz, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$	–	13.0	–	dBm
3rd Order Intermodulation Distortion Output Intercept Point	OIP_3	V_{CE} = 3 V, $I_{C\ (set)}$ = 20 mA, f = 5.8 GHz, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$	–	18.0	–	dBm

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

2. Collector to base capacitance when the emitter grounded

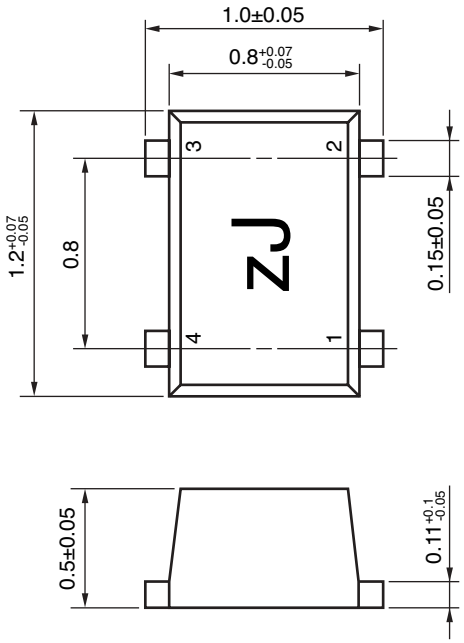
3. $MSG = \left| \frac{S_{21}}{S_{12}} \right|$

h_{FE} CLASSIFICATION

RANK	FB
Marking	zJ
h_{FE} Value	220 to 380

PACKAGE DIMENSIONS (Units in mm)

4-PIN LEAD-LESS MINIMOLD (M14, 1208 PACKAGE)



PIN CONNECTIONS

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

CEL California Eastern Laboratories, Your source for NEC RF, Microwave, Optoelectronic, and Fiber Optic Semiconductor Devices.
4590 Patrick Henry Drive • Santa Clara, CA 95054-1817 • (408) 988-3500 • FAX (408) 988-0279 • **www.cel.com**