

NEC's NPN SiGe HIGH FREQUENCY TRANSISTOR

NESG3031M05

FEATURES

LOW NOISE FIGURE AND HIGH-GAIN

 $NF = 0.95 \, dB \, TYP, \, Ga = 10 \, dB \, TYP @ \, VCE = 2 \, V, \, IC = 6 \, mA, \, f = 5.2 \, GHz$ $NF = 1.1 \, dB \, TYP, \, Ga = 9.5 \, dB \, TYP @ \, VCE = 2 \, V, \, IC = 6 \, mA, \, f = 5.8 \, GHz$

MAXIMUM STABLE POWER GAIN:

MSG = 14.0 dB TYP @ VCE = 3 V, IC = 20 mA, f = 5.8 GHz

SiGe HBT TECHNOLOGY:

USH3 process, fmax = 110 GHz

M05 PACKAGE:

Flat-lead 4 pin thin-type super minimold package

ORDERING INFORMATION

PART NUMBER	QUANTITY	SUPPLYING FORM	
NESG3031M05	50 pcs (Non reel)	8 mm wide embossed taping	
NESG3031M05-T1	3 kpcs/reel	Pin 3 (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 (TA =+25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector to Base Voltage	Vсво	12.0	V
Collector to Emitter Voltage	Vceo	4.3	V
Emitter to Base Voltage	VEBO	1.5	V
Collector Current	lc	35	mA
Total Power Dissipation	P _{tot} Note	150	mW
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-65 to +150	°C

Note Mounted on 38×38 mm, t = 0.4 mm polyimide PCB

NESG3031M05

ELECTRICAL CHARACHTERISTICS (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	Ієво	V _{EB} = 1 V, I _C = 0 mA	-	-	100	nA
DC Current Gain	hfe Note 1	Vce = 2 V, Ic = 6 mA	220	300	380	-
RF Characteristics						
Insertion Power Gain	S _{21e} ²	Vce = 3 V, Ic = 20 mA, f = 5.8 GHz	6.0	8.5	_	dB
Noise Figure (1)	NF	Vce = 2 V, Ic = 6 mA, f = 5.2 GHz,	_	0.95	_	dB
		$Z_S = Z_{Sopt}, Z_L = Z_{Lopt}$				
Noise Figure (2)	NF	$V_{CE} = 2 \text{ V, Ic} = 6 \text{ mA, f} = 5.8 \text{ GHz},$	_	1.1	1.5	dB
		$Z_S = Z_{Sopt}, Z_L = Z_{Lopt}$				
Associated Gain (1)	Ga	$V_{CE} = 2 \text{ V, Ic} = 6 \text{ mA, f} = 5.2 \text{ GHz},$	_	10.0	_	dB
		$Z_S = Z_{Sopt}, Z_L = Z_{Lopt}$				
Associated Gain (2)	Ga	Vce = 2 V, Ic = 6 mA, f = 5.8 GHz,	7.5	9.5	-	dB
		$Z_S = Z_{Sopt}, Z_L = Z_{Lopt}$				
Reverse Transfer Capacitance	Cre Note 2	VcB = 2 V, IE = 0 mA, f = 1 MHz	-	0.15	0.25	pF
Maximum Stable Power Gain	MSG ^{Note 3}	Vce = 3 V, Ic = 20 mA, f = 5.8 GHz	11.0	14.0	-	dB
Gain 1 dB Compression Output	Po (1 dB)	$V_{CE} = 3 \text{ V, Ic}$ (set) = 20 mA,	_	13.0	_	dBm
Power		$f = 5.8 \text{ GHz}, Z_S = Z_{Sopt}, Z_L = Z_{Lopt}$				
3rd Order Intermodulation	OIP ₃	Vce = 3 V, Ic (set) = 20 mA,	_	18.0	_	dBm
Distortion Output Intercept Point		f = 5.8 GHz, Zs = Zsopt, ZL = ZLopt				

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

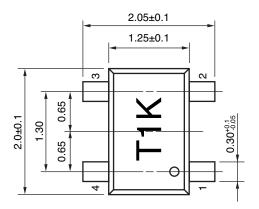
2. Collector to base capacitance when the emitter grounded

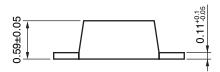
3. MSG =
$$\frac{S21}{S12}$$

hfe CLASSIFICATION

RANK	FB		
Marking	T1K		
h _{FE} Value	220 to 380		

FLAT LEAD 4-PIN THIN TYPE SUPER MINIMOLD (M05, 2012 PACKAGE





PIN CONNECTIONS

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

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.

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