

PRELIMINARY DATA SHEET

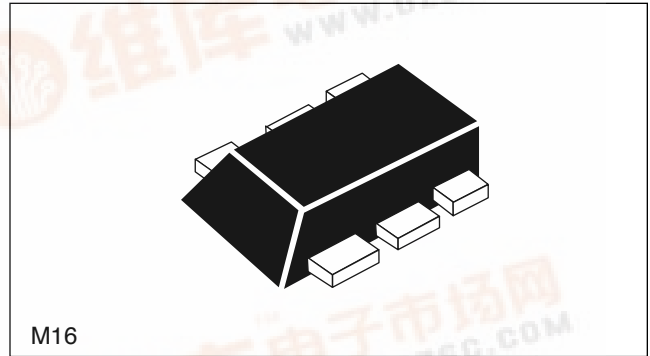


NEC's NPN SiGe
HIGH FREQUENCY TRANSISTOR

NESG2021M16

FEATURES

- **HIGH BREAKDOWN VOLTAGE SiGe TECHNOLOGY**
V_{CEO} = 5 V (Absolute Maximum)
- **LOW NOISE FIGURE:**
NF = 0.9 dB at 2 GHz
NF = 1.3 dB at 5.2 GHz
- **HIGH MAXIMUM STABLE GAIN:**
MSG = 22.5 dB at 2 GHz
- **LOW PROFILE M16 PACKAGE:**
6-pin lead-less minimold



DESCRIPTION

NEC's NESG2021M16 is fabricated using NEC's high voltage Silicon Germanium process (UHS2-HV), and is designed for a wide range of applications including low noise amplifiers, medium power amplifiers, and oscillators.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

PART NUMBER		PACKAGE OUTLINE		NESG2021M16 M16			
SYMBOLS		PARAMETERS AND CONDITIONS		UNITS	MIN	TYP	MAX
RF	NF	Noise Figure at V _{CE} = 2 V, I _C = 3 mA, f = 5.2 GHz, Z _S = Z _{SOPT} , Z _L = Z _{LOPT}		dB		1.3	
	G _a	Associated Gain at V _{CE} = 2 V, I _C = 3 mA, f = 5.2 GHz, Z _S = Z _{SOPT} , Z _L = Z _{LOPT}		dB		10.0	
	NF	Noise Figure at V _{CE} = 2 V, I _C = 3 mA, f = 2 GHz, Z _S = Z _{SOPT} , Z _L = Z _{LOPT}		dB		0.9	1.2
	G _a	Associated Gain at V _{CE} = 2 V, I _C = 3 mA, f = 2 GHz, Z _S = Z _{SOPT} , Z _L = Z _{LOPT}		dB	15.0	18.0	
	MSG	Maximum Stable Gain ¹ at V _{CE} = 3 V, I _C = 10 mA, f = 2 GHz		dB	20.0	22.5	
	IS ₂₁ EI ²	Insertion Power Gain at V _{CE} = 3 V, I _C = 10 mA, f = 2 GHz		dB	17.0	19.0	
	P _{1dB}	Output Power at 1dB Compression Point at V _{CE} = 3 V, I _{CQ} = 12 mA, f = 2 GHz		dBm		9	
	OIP ₃	Output 3rd Order Intercept Point at V _{CE} = 3 V, I _{CQ} = 12 mA, f = 2 GHz		dBm		17	
	f _T	Gain Bandwidth Product at V _{CE} = 3 V, I _C = 10 mA, f = 2 GHz		GHz	20	25	
	C _{re}	Reverse Transfer Capacitance ² at V _{CB} = 2 V, I _E = 0 mA, f = 1 GHz		pF		0.1	0.2
DC	I _{CBO}	Collector Cutoff Current at V _{CB} = 5V, I _E = 0		nA			100
	I _{EBO}	Emitter Cutoff Current at V _{EB} = 1 V, I _C = 0		nA			100
	h _{FE}	DC Current Gain ³ at V _{CE} = 2 V, I _C = 5 mA			130	190	260

Notes:

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

2. Collector to base capacitance when the emitter grounded.

3. Pulsed measurement, pulse width ≤ 350 μs, duty cycle ≤ 2 %.

NESG2021M16

ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{CBO}	Collector to Base Voltage	V	13.0
V _{CEO}	Collector to Emitter Voltage	V	5.0
V _{EB0}	Emitter to Base Voltage	V	1.5
I _C	Collector Current	mA	35
P _T ²	Total Power Dissipation	mW	175
T _J	Junction Temperature	°C	150
T _{STG}	Storage Temperature	°C	-65 to +150

Note:

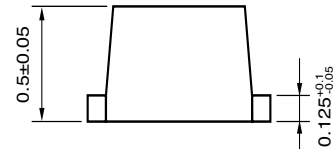
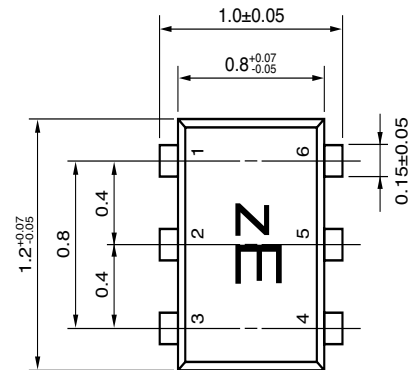
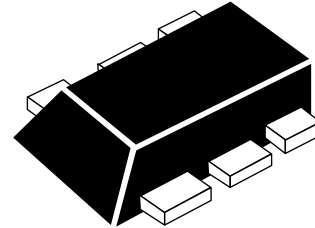
1. Operation in excess of any one of these parameters may result in permanent damage.
2. Mounted on 1.08 cm² x 1.0 mm (t) glass epoxy PCB.

ORDERING INFORMATION

PART NUMBER	QUANTITY	SUPPLYING FORM
NESG2021M16-T3-A	10 K pcs reel	Pin 1 (Collector), Pin 6 (Emitter) face the perforation side of the tape

OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE M16 6-PIN LEAD-LESS MINIMOLD



PIN CONNECTIONS

- | | |
|--------------|------------|
| 1. Collector | 4. Base |
| 2. Emitter | 5. Emitter |
| 3. Emitter | 6. Emitter |

Life Support Applications

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Subject: Compliance with EU Directives

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CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL’s understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
		-A	-AZ
Lead (Pb)	< 1000 PPM	Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

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