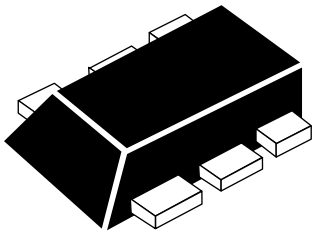
CEL

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



M16

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	
	$\|S_{21E}\|^2$	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 %.

ABSOLUTE MAXIMUM RATINGS[1] (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_{EBO}	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

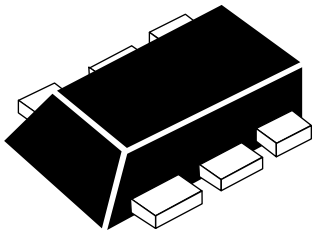
Note:
1. Operation in excess of any one of these parameters may result in permanent damage.
2. Mounted on 1.08 cm^2 x 1.0 mm (t) glass epoxy PCB.

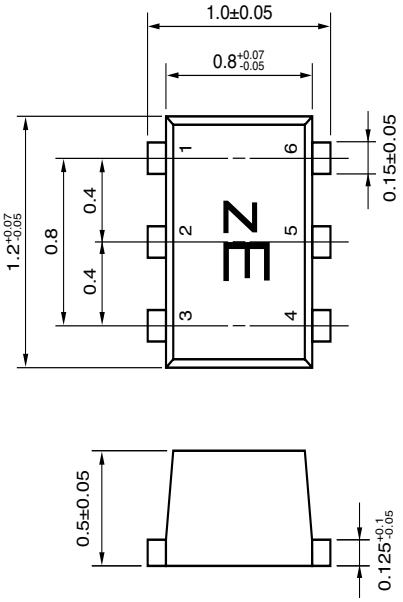
ORDERING INFORMATION

PART NUMBER	QUAN-TITY	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
2. Emitter
3. Emitter
4. Base
5. Emitter
6. Emitter

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Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

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	
Lead (Pb)	< 1000 PPM	-A	-AZ
		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	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.