CEL NEC'S NPN SILICON TRANSISTOR

NE681M13

FEATURES

NEW MINIATURE M13 PACKAGE:

- Small transistor outline –
- 1.0 X 0.5 X 0.5 mm
- Low profile / 0.50 mm package height
- Flat lead style for better RF performance

HIGH GAIN BANDWIDTH PRODUCT:

fT = 7 GHz

LOW NOISE FIGURE:

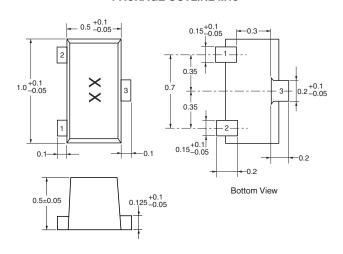
NF = 1.4 dB

DESCRIPTION

NEC's NE681M13 transistor is ideal for low noise, high gain, and low cost amplifier applications. NEC's new low profile/ flat lead style "M13" package is ideal for today's portable wireless applications. The NE681 is also available in chip, Micro-x, and six different low cost plastic surface mount package styles.

OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE M13



PIN CONNECTIONS

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

ELECTRICAL CHARACTERISTICS (TA = 25°C)

PART NUMBER EIAJ¹ REGISTERED NUMBER PACKAGE OUTLINE			NE681M13 2SC5615 M13			
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX	
f⊤	Gain Bandwidth at VcE = 3 V, Ic = 7 mA, f = 1 GHz	GHz	4.5	7		
NF	Noise Figure at VcE = 3 V, Ic = 7 mA, f = 1 GHz	dB		1.4	2.7	
IS21El ²	Insertion Power Gain at VcE = 3 V, Ic = 7 mA, f = 1 GHz	dB	10	12		
hFE ²	Forward Current Gain at VcE = 3 V, Ic = 7 mA		80		145	
Ісво	Collector Cutoff Current at VcB = 10 V, IE = 0	μΑ			0.8	
І ЕВО	Emitter Cutoff Current at VEB = 1 V, IC = 0	μΑ			0.8	
CRE ³	Feedback Capacitance at VcB = 3 V, IE = 0, f = 1 MHz	pF			0.9	

Notes:

- 1. Electronic Industrial Association of Japan.
- 2. Pulsed measurement, pulse width \leq 350 µs, duty cycle \leq 2 %.
- 3. Capacitance is measured with emitter and case connected to the guard terminal at the bridge.

ABSOLUTE MAXIMUM RATINGS¹ (TA = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
Vсво	Collector to Base Voltage	V	20
VCEO	Collector to Emitter Voltage	V	10
VEBO	Emitter to Base Voltage	V	1.5
Ic	Collector Current	mA	65
PT ²	Total Power Dissipation	mW	140
TJ	Junction Temperature	°C	150
Тѕтс	Storage Temperature	°C	-65 to +150

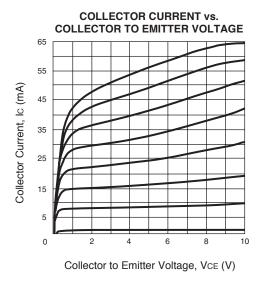
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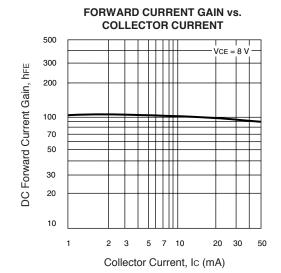
PART NUMBER	QUANTITY
NE681M13-A	
NE681M13-T3-A	

Notes:

- Operation in excess of any one of these parameters may result in permanent damage.
- 2. With device mounted on 1.08 cm² X 1.2 mm glass epoxy board.

TYPICAL PERFORMANCE CURVES (TA = 25°C)





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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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)		on contained devices	
Lead (Pb)	< 1000 PPM	-A Not Detected	-AZ (*)	
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.

Important Information and Disclaimer: Information provided by CEL on its website or in other communications concerting the substance content of its products represents knowledge and belief as of the date that it is provided. CEL bases its knowledge and belief on information provided by third parties and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. CEL has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. CEL and CEL suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall CEL's liability arising out of such information exceed the total purchase price of the CEL part(s) at issue sold by CEL to customer on an annual basis.

See CEL Terms and Conditions for additional clarification of warranties and liability.