

# NPN SILICON RF TRANSISTOR

# NE85618 / 2SC5011 JEITA Part No.

# NPN EPITAXIAL SILICON RF TRANSISTOR FOR HIGH-FREQUENCY LOW-NOISE AMPLIFICATION 4-PIN SUPER MINIMOLD

#### **FEATURES**

- High Gain Bandwidth Product (fT = 6.5 GHz TYP.)
- · Low Noise, High Gain
- · Low Voltage Operation
- · 4-pin super mini mold Package

#### **★** ORDERING INFORMATION

Part Number	Quantity	Supplying Form
NE85618-A 2SC5011-A	50 pcs (Non reel)	• 8 mm wide embossed taping
NE85618-T1-A 2SC5011-T1-A	3 kpcs/reel	• Pin 3 (Base), Pin 4 (Emitter) face to perforation side of the tape

**Remark** To order evaluation samples, contact your nearby sales office. The unit sample quantity is 50 pcs.

### ABSOLUTE MAXIMUM RATINGS (TA = +25°C)

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	Vсво	20	V
Collector to Emitter Voltage	Vceo	12	V
Emitter to Base Voltage	VEBO	3	V
Collector Current	lc	100	mA
Total Power Dissipation	P <sub>tot</sub> Note	150	mW
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-65 to +150	°C

Note Free air

Caution: Observe precautions when handling because these devices are sensitive to electrostatic discharge

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.

# ELECTRICAL CHARACTERISTICS (TA = +25°C)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit	
DC Characteristics							
Collector Cut-off Current	Ісво	VcB = 10 V, IE = 0 mA	-	-	1.0	μΑ	
Emitter Cut-off Current	Ієво	VEB = 1 V, Ic = 0 mA	-	-	1.0	μΑ	
DC Current Gain	hfe Note 1	Vce = 10 V, Ic = 20 mA	50	120	250	-	
RF Characteristics							
Gain Bandwidth Product	f⊤	Vce = 10 V, Ic = 20 mA	-	6.5	_	GHz	
Insertion Power Gain	S <sub>21e</sub>   <sup>2</sup>	Vce = 10 V, Ic = 20 mA, f = 1.0 GHz	11	13	-	dB	
Noise Figure	NF	Vce = 10 V, Ic = 7 mA, f = 1.0 GHz	-	1.1	2.0	dB	
Reverse Transfer Capacitance	Cre Note 2	Vcb = 10 V, IE = 0 mA, f = 1.0 MHz	-	0.5	0.9	pF	

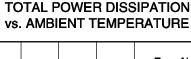
**Notes 1.** Pulse measurement: PW  $\leq$  350  $\mu$ s, Duty Cycle  $\leq$  2%

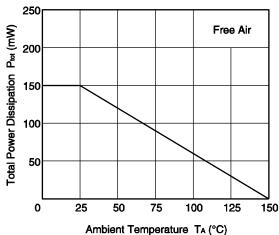
2. Collector to base capacitance when the emitter grounded

### **hfe CLASSIFICATION**

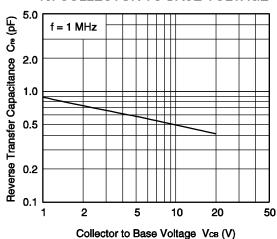
Rank	EB	FB	GB
Marking	R26	R27	R28
h <sub>FE</sub> Value	50 to 100	80 to 160	125 to 250

### TYPICAL CHARACTERISTICS (TA = +25°C, unless otherwise specified)

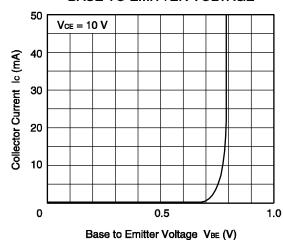




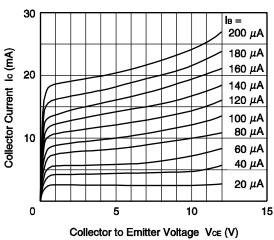
REVERSE TRANSFER CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



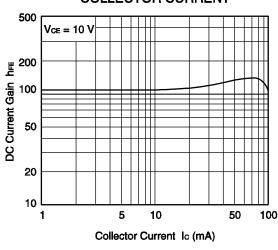
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



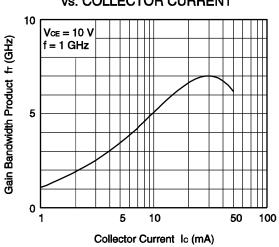
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



DC CURRENT GAIN vs.
COLLECTOR CURRENT

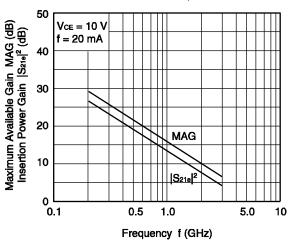


GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT

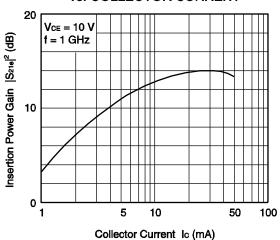


**Remark** The graphs indicate nominal characteristics.

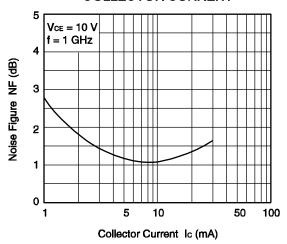
# MAXIMUM AVAILABLE GAIN/INSERTION POWER GAIN vs. FREQUENCY



# INSERTION POWER GAIN vs. COLLECTOR CURRENT



# NOISE FIGURE vs. COLLECTOR CURRENT



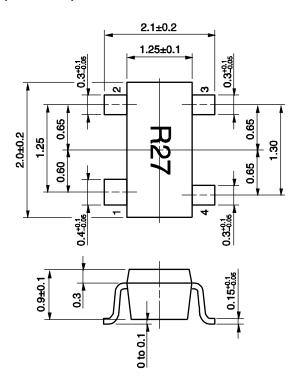
Remark The graphs indicate nominal characteristics.

### **★ S-PARAMETERS**

- S-parameters and noise parameters are provided on our Web site in a format (S2P) that enables the direct import of the parameters to microwave circuit simulators without the need for keyboard inputs.
- · Click here to download S-parameters.
- [RF and Microwave] ® [Device Parameters]
- · URL http://www.necel.com/microwave/en/

### **★ PACKAGE DIMENSIONS**

# 4-PIN SUPER MINIMOLD (UNIT: mm)



## **PIN CONNECTIONS**

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

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