

# DATA SHEET



## NPN SILICON RF TRANSISTOR NE46234 / 2SC4703 JEITA Part No.

### NPN EPITAXIAL SILICON RF TRANSISTOR FOR HIGH-FREQUENCY LOW DISTORTION AMPLIFIER 3-PIN POWER MINIMOLD

#### DESCRIPTION

The NE46234 / 2SC4703 is designed for low distortion, low noise RF amplifier operating with low supply voltage ( $V_{CE} = 5\text{ V}$ ). This low distortion characteristic makes it suitable for CATV, tele-communication and other use. It employs surface mount type plastic package, power minimold (SOT-89).

#### FEATURES

- Low distortion, low voltage:  $IM_2 = 55\text{ dBc TYP.}$ ,  $IM_3 = 76\text{ dBc TYP.}$  @  $V_{CE} = 5\text{ V}$ ,  $I_C = 50\text{ mA}$ ,  $V_O = 105\text{ dB}\mu\text{V}/75\Omega$
- Large  $P_{tot}$  :  $P_{tot} = 1.8\text{ W}$  (Mounted on double-sided copper-clad  $16\text{ cm}^2 \times 0.7\text{ mm}$  (t) ceramic substrate)
- Small package : 3-pin power minimold package

#### ★ ORDERING INFORMATION

Part Number	Quantity	Supplying Form
NE46234-AZ 2SC4703-AZ	25 pcs (Non reel)	<ul style="list-style-type: none"> <li>• 12 mm wide embossed taping</li> <li>• Collector face the perforation side of the tape</li> </ul>
NE46234-T1-AZ 2SC4703-T1-AZ	1 kpcs/reel	

**Remark** To order evaluation samples, contact your nearby sales office.  
The unit sample quantity is 25 pcs.

#### ABSOLUTE MAXIMUM RATINGS ( $T_A = +25^\circ\text{C}$ )

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	$V_{CBO}$	25	V
Collector to Emitter Voltage	$V_{CEO}$	12	V
Emitter to Base Voltage	$V_{EBO}$	2.5	V
Collector Current	$I_C$	150	mA
Total Power Dissipation	$P_{tot}$ <small>Note</small>	1.8	W
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65 to +150	$^\circ\text{C}$

**Note** Mounted on double-sided copper-clad  $16\text{ cm}^2 \times 0.7\text{ mm}$  (t) ceramic substrate

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

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**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = +25°C)**

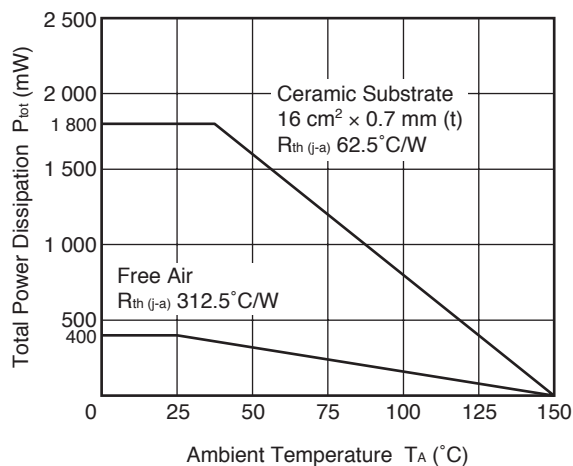
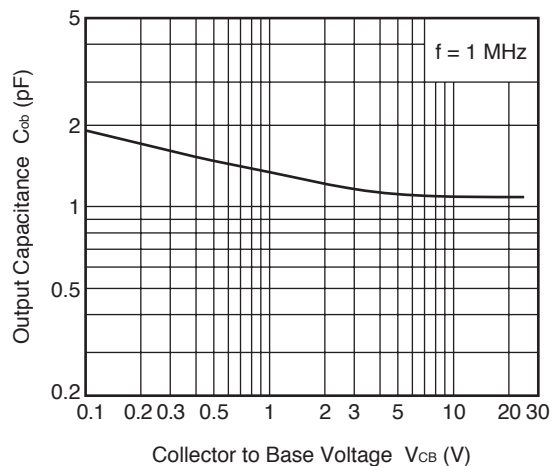
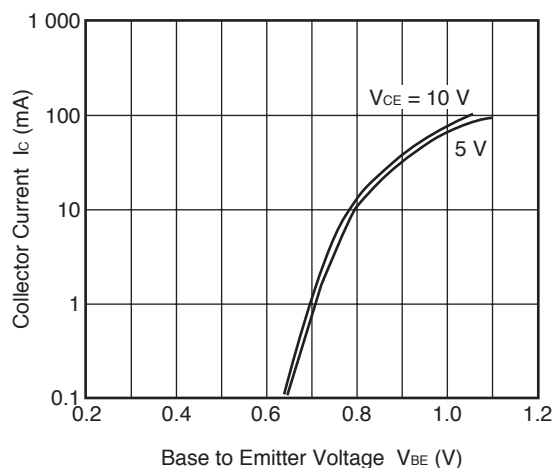
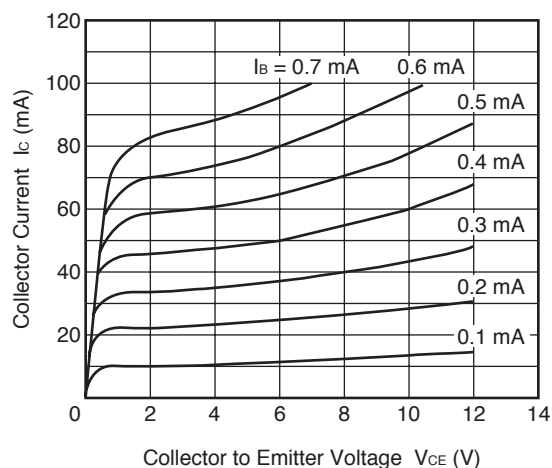
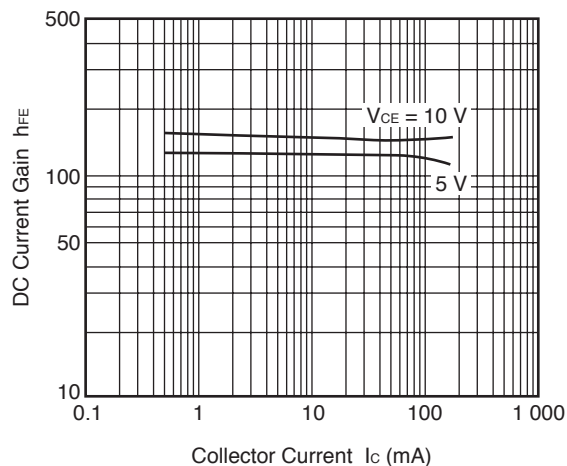
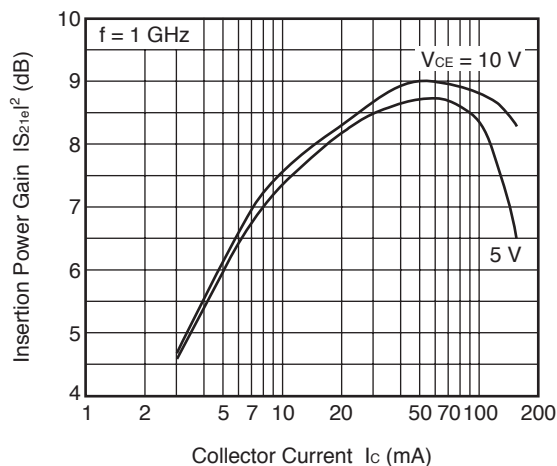
	Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics							
	Collector Cut-off Current	I <sub>CBO</sub>	V <sub>CB</sub> = 20 V, I <sub>E</sub> = 0 mA	–	–	1.5	μA
	Emitter Cut-off Current	I <sub>EBO</sub>	V <sub>EB</sub> = 2 V, I <sub>C</sub> = 0 mA	–	–	1.5	μA
★	DC Current Gain	h <sub>FE</sub> <sup>Note 1</sup>	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 50 mA	50	–	250	–
RF Characteristics							
★	Gain Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 50 mA	–	6.0	–	GHz
	Insertion Power Gain (1)	S <sub>21e</sub>   <sup>2</sup>	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 50 mA, f = 1 GHz	6.5	8.3	–	dB
	Insertion Power Gain (2)	S <sub>21e</sub>   <sup>2</sup>	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 20 mA, f = 1 GHz	–	8.5	–	dB
	Noise Figure	NF	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 50 mA, f = 1 GHz	–	2.3	3.5	dB
	Collector Capacitance	C <sub>ob</sub> <sup>Note 2</sup>	V <sub>CB</sub> = 5 V, I <sub>E</sub> = 0 mA, f = 1 MHz	–	1.5	2.5	pF
★	2nd Order Intermodulation Distortion	IM <sub>2</sub>	I <sub>C</sub> = 50 mA, V <sub>O</sub> = 105 dBμV/75 Ω, f = 190 – 90 MHz	V <sub>CE</sub> = 5 V	–	55	–
				V <sub>CE</sub> = 10 V	–	63	–
★	3rd Order Intermodulation Distortion	IM <sub>3</sub>	I <sub>C</sub> = 50 mA, V <sub>O</sub> = 105 dBμV/75 Ω, f = 2 × 190 – 200 MHz	V <sub>CE</sub> = 5 V	–	76	–
				V <sub>CE</sub> = 10 V	–	81	–

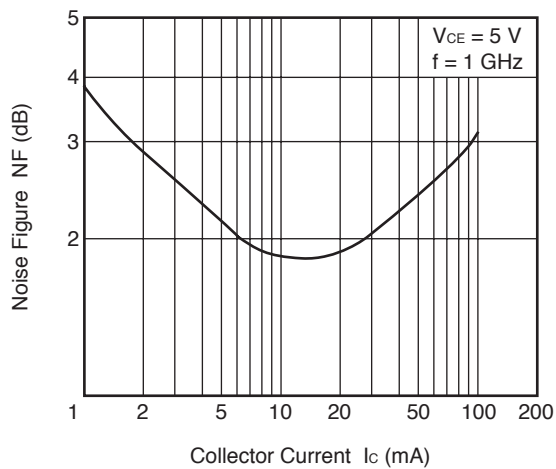
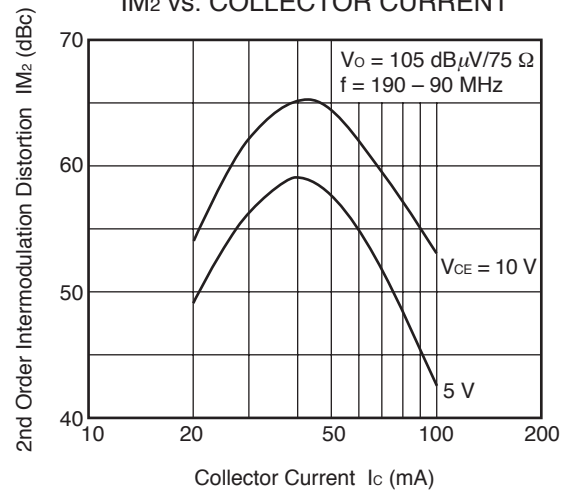
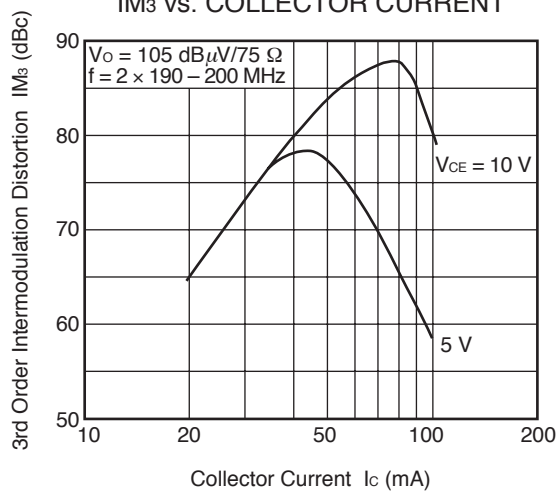
**Notes 1.** Pulse measurement: PW ≤ 350 μs, Duty Cycle ≤ 2%

**2.** Collector to base capacitance when the emitter grounded

**h<sub>FE</sub> CLASSIFICATION**

Rank	SH	SF	SE
Marking	SH	SF	SE
h <sub>FE</sub> Value	50 to 100	80 to 160	125 to 250

★ TYPICAL CHARACTERISTICS ( $T_A = +25^\circ\text{C}$ )TOTAL POWER DISSIPATION  
vs. AMBIENT TEMPERATUREOUTPUT CAPACITANCE vs.  
COLLECTOR TO BASE VOLTAGECOLLECTOR CURRENT vs.  
BASE TO EMITTER VOLTAGECOLLECTOR CURRENT vs.  
COLLECTOR TO EMITTER VOLTAGEDC CURRENT GAIN vs.  
COLLECTOR CURRENTINSERTION POWER GAIN  
vs. COLLECTOR CURRENT

NOISE FIGURE vs.  
COLLECTOR CURRENTIM<sub>2</sub> vs. COLLECTOR CURRENTIM<sub>3</sub> vs. COLLECTOR CURRENT

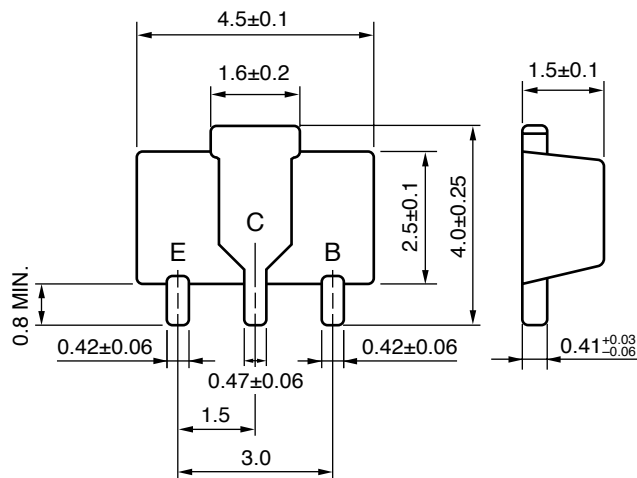
**Remark** The graphs indicate nominal characteristics.

## 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**

**3-PIN POWER MINIMOLD (UNIT: mm)**



**PIN CONNECTIONS**

E : Emitter  
C : Collector (Fin)  
B : Base

(IEC : SOT-89)

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