

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"> • 12 mm wide embossed taping • Collector face the perforation side of the tape
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}^{Note}	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_A = +25°C)

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

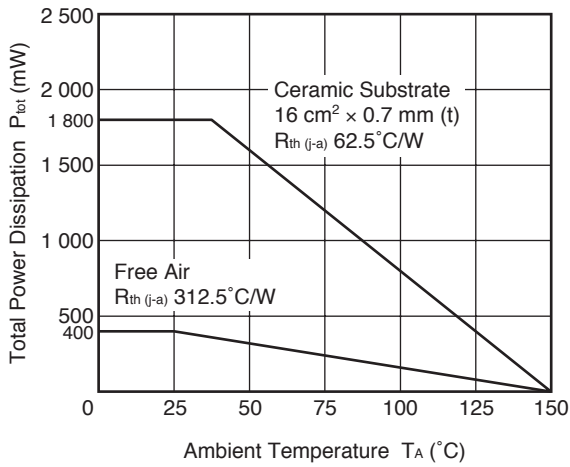
- Notes** 1. Pulse measurement: PW ≤ 350 μs, Duty Cycle ≤ 2%
 2. Collector to base capacitance when the emitter grounded

h_{FE} CLASSIFICATION

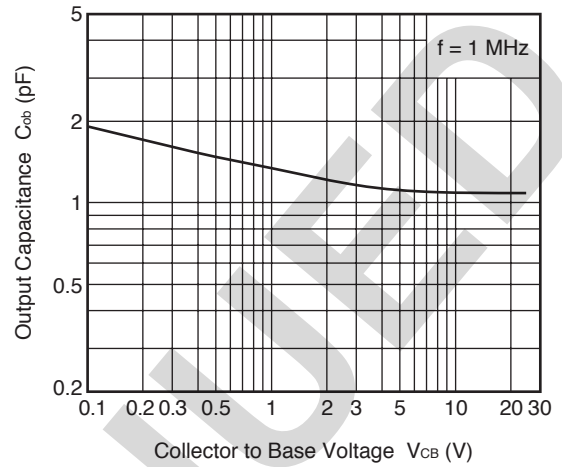
Rank	SH	SF	SE
Marking	SH	SF	SE
h _{FE} Value	50 to 100	80 to 160	125 to 250

★ TYPICAL CHARACTERISTICS (T_A = +25°C)

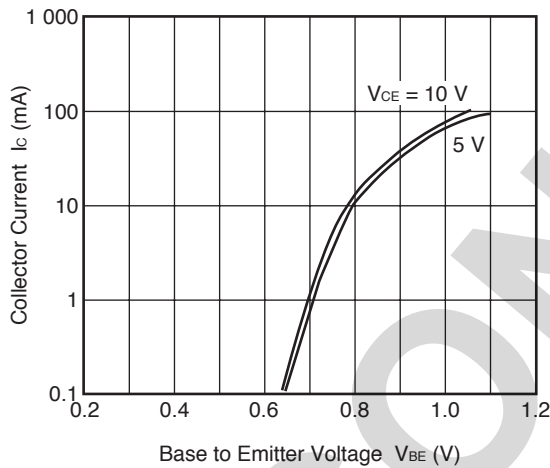
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



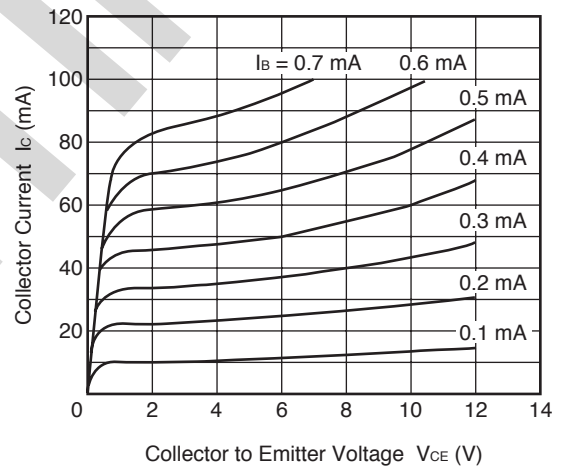
OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



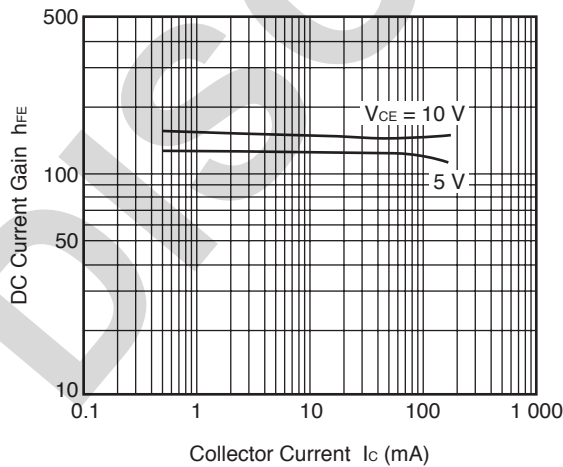
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



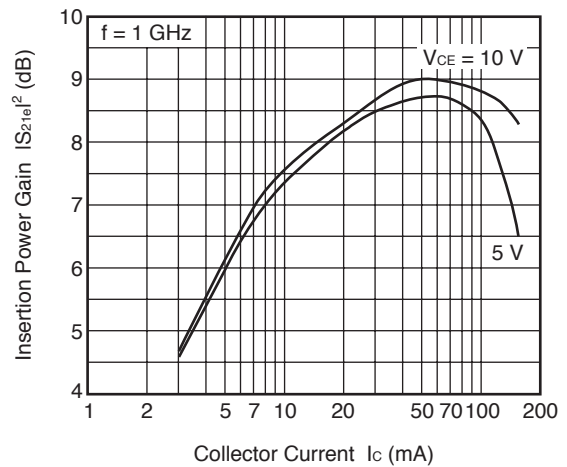
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



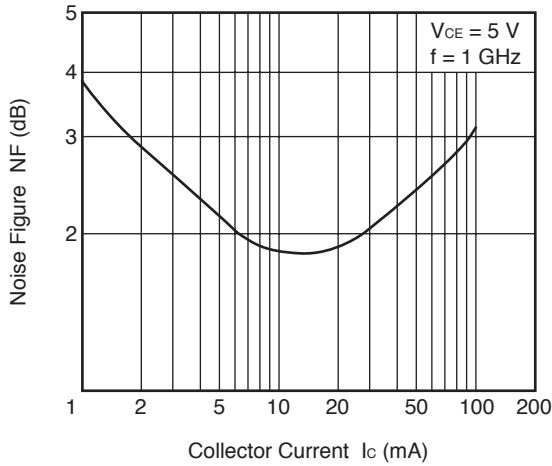
DC CURRENT GAIN vs. COLLECTOR CURRENT



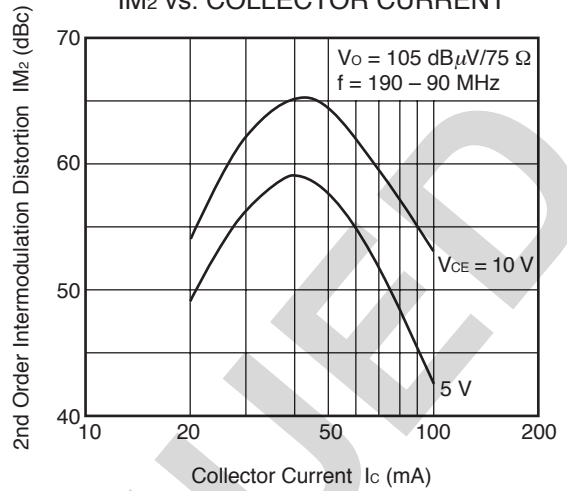
INSERTION POWER GAIN vs. COLLECTOR CURRENT



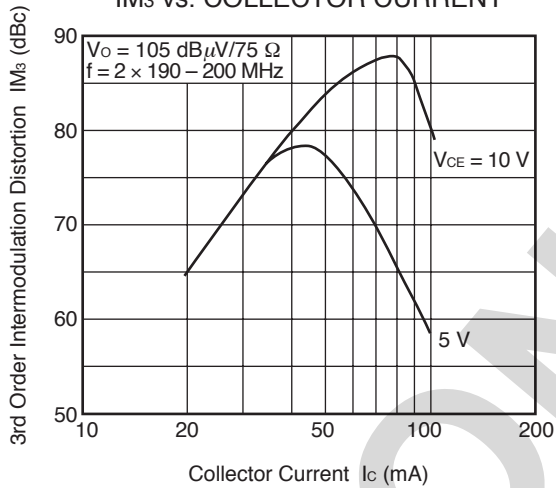
NOISE FIGURE vs. COLLECTOR CURRENT



IM₂ vs. COLLECTOR CURRENT



IM₃ vs. COLLECTOR CURRENT



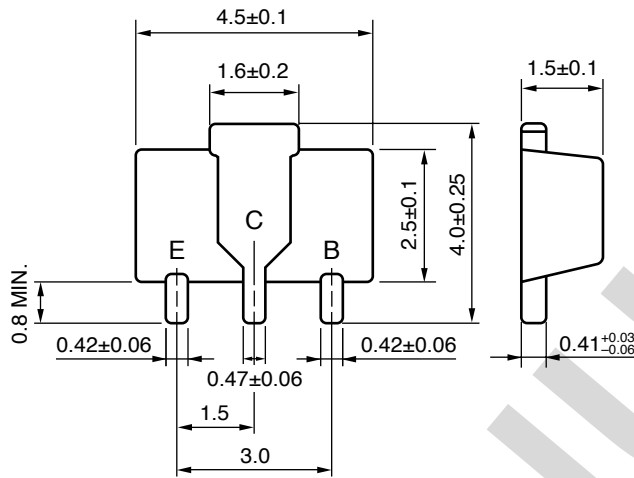
Remark The graphs indicate nominal characteristics.

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)

DISCONTINUED

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