



# NPN SILICON RF TRANSISTOR

## NE66219 / 2SC5606

JEITA  
Part No.

### NPN SILICON RF TRANSISTOR FOR LOW NOISE · HIGH-GAIN AMPLIFICATION 3-PIN ULTRA SUPER MINIMOLD (19, 1608 PKG)

#### FEATURES

- Suitable for high-frequency oscillation
- $f_T = 25$  GHz technology adopted
- 3-pin ultra super minimold (19, 1608 PKG) package

#### <R> ORDERING INFORMATION

Part Number	Order Number	Package	Quantity	Supplying Form
NE66219 2SC5606	NE66219-A 2SC5606-A	3-pin ultra super minimold (19, 1608 PKG) (Pb-Free)	50 pcs (Non reel)	• 8 mm wide embossed taping
NE66219-T1 2SC5606-T1	NE66219-T1-A 2SC5606-T1-A		3 kpcs/reel	• Pin 3 (collector) face the perforation side of the tape

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

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

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	$V_{CBO}$	15	V
Collector to Emitter Voltage	$V_{CEO}$	3.3	V
Emitter to Base Voltage	$V_{EBO}$	1.5	V
Collector Current	$I_C$	35	mA
Total Power Dissipation	$P_{tot}^{\text{Note}}$	115	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65 to +150	$^\circ\text{C}$

**Note** Mounted on  $1.08\text{ cm}^2 \times 1.0\text{ mm}$  (t) glass epoxy substrate

**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 (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> = 5 V, I <sub>E</sub> = 0 mA	–	–	200	nA
Emitter Cut-off Current	I <sub>EB0</sub>	V <sub>EB</sub> = 1 V, I <sub>C</sub> = 0 mA	–	–	200	nA
DC Current Gain	h <sub>FE</sub> <sup>Note 1</sup>	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 5 mA	60	80	100	–
RF Characteristics						
Gain Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 20 mA, f = 2 GHz	–	21	–	GHz
Insertion Power Gain	S <sub>21e</sub>   <sup>2</sup>	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 20 mA, f = 2 GHz	10	12.5	–	dB
Noise Figure	NF	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 5 mA, f = 2 GHz, Z <sub>S</sub> = Z <sub>opt</sub>	–	1.2	1.5	dB
Reverse Transfer Capacitance	C <sub>re</sub> <sup>Note 2</sup>	V <sub>CB</sub> = 2 V, I <sub>E</sub> = 0 mA, f = 1 MHz	–	0.21	0.3	pF
Maximum Available Power Gain	MAG <sup>Note 3</sup>	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 20 mA, f = 2 GHz	–	14	–	dB
Maximum Stable Power Gain	MSG <sup>Note 4</sup>	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 20 mA, f = 2 GHz	–	15	–	dB

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

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

$$3. \text{ MAG} = \left| \frac{S_{21}}{S_{12}} \right| (K - \sqrt{K^2 - 1})$$

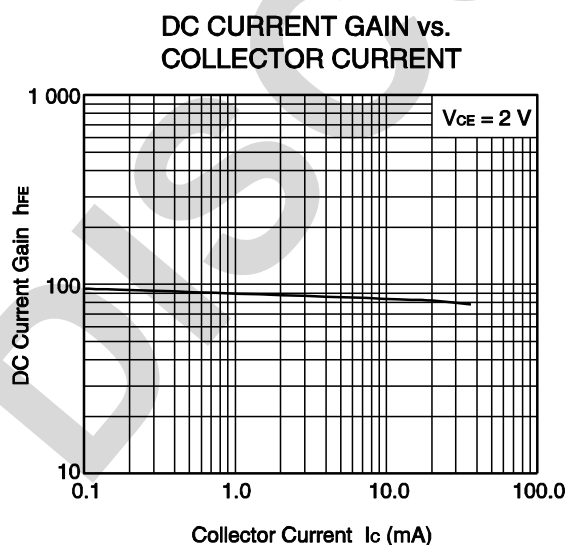
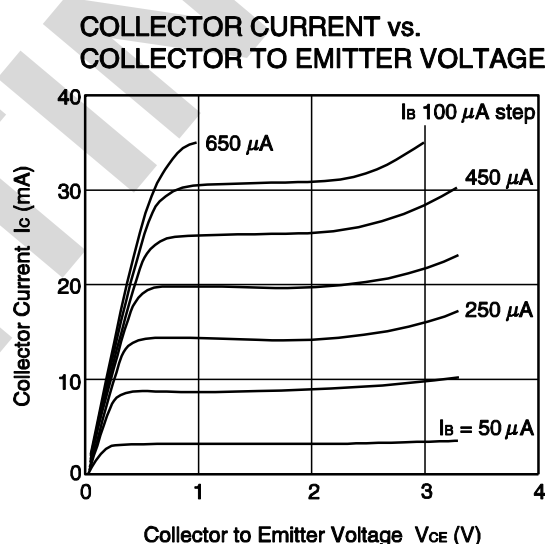
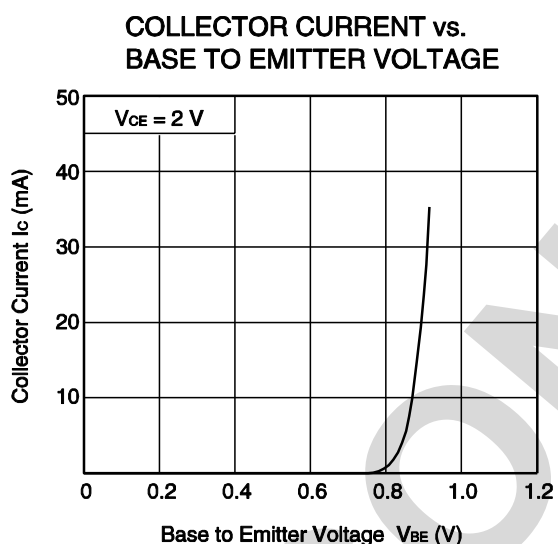
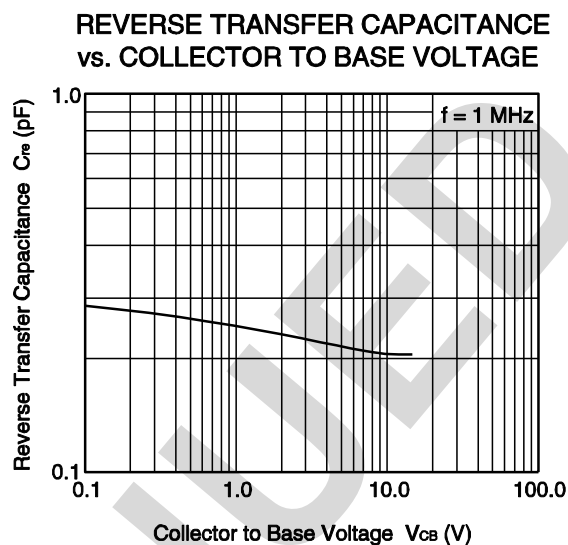
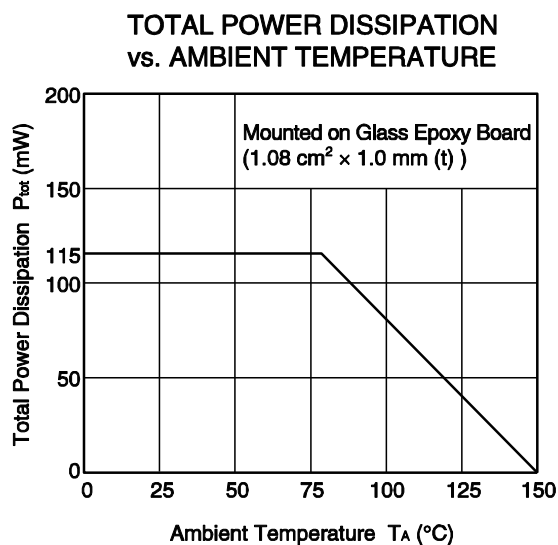
$$4. \text{ MSG} = \left| \frac{S_{21}}{S_{12}} \right|$$

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

&lt;R&gt;

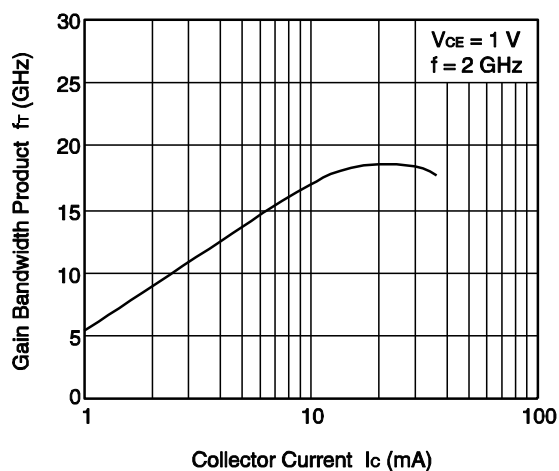
Rank	FB/YFB
Marking	UA
h <sub>FE</sub>	60 to 100

<R> TYPICAL CHARACTERISTICS (Unless otherwise specified,  $T_A = +25^\circ\text{C}$ )

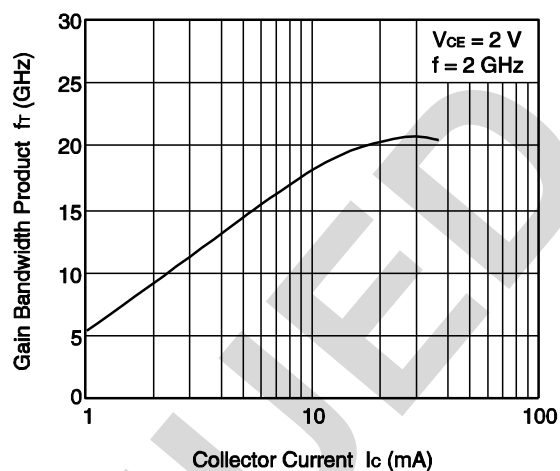


**Remark** The graphs indicate nominal characteristics.

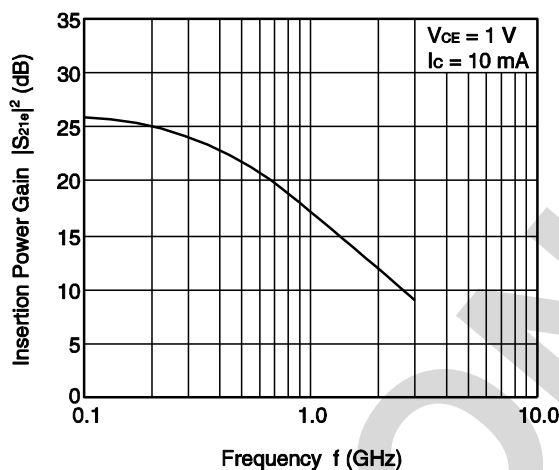
**GAIN BANDWIDTH PRODUCT  
vs. COLLECTOR CURRENT**



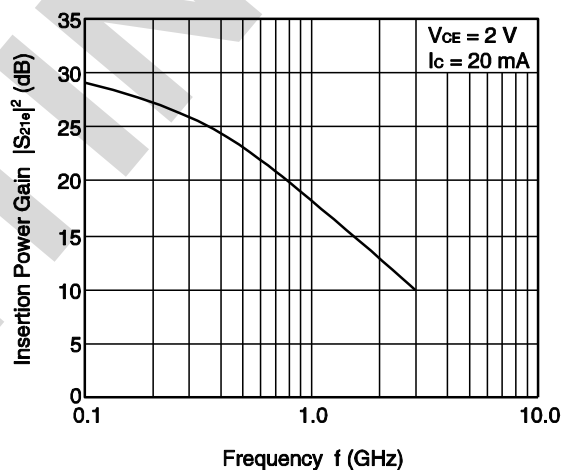
**GAIN BANDWIDTH PRODUCT  
vs. COLLECTOR CURRENT**



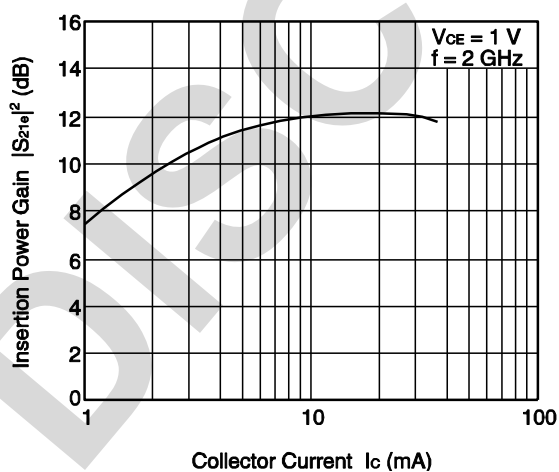
**INSERTION POWER GAIN  
vs. FREQUENCY**



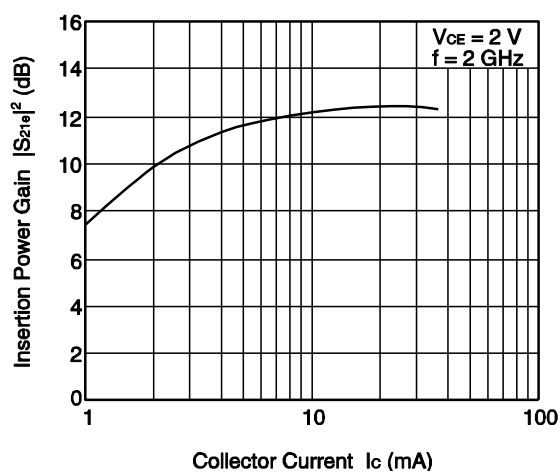
**INSERTION POWER GAIN  
vs. FREQUENCY**



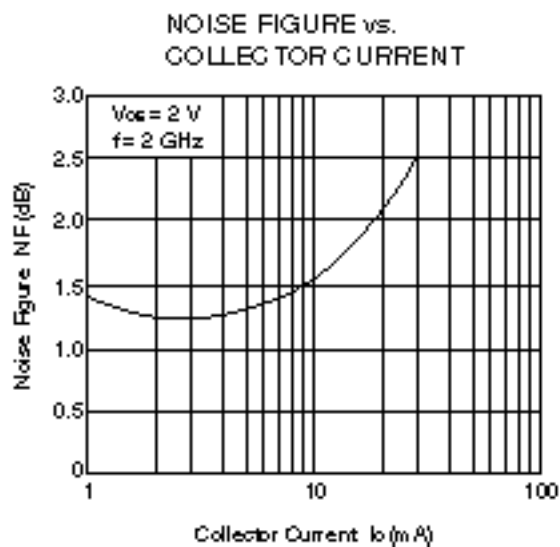
**INSERTION POWER GAIN  
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**INSERTION POWER GAIN  
vs. COLLECTOR CURRENT**



**Remark** The graphs indicate nominal characteristics.



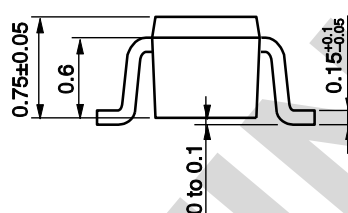
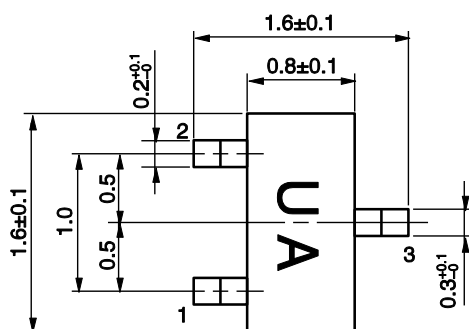
**Remark** The graph indicates nominal characteristics.

<R> **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 ULTRA SUPER MINIMOLD (19, 1608 PKG) (UNIT: mm)**



**PIN CONNECTIONS**

1. Emitter
2. Base
3. Collector

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