

NPN EPITAXIAL SILICON RF TRANSISTOR FOR LOW-NOISE MICROWAVE AMPLIFICATION 3-PIN ULTRA SUPER MINIMOLD

FEATURES

- Low noise
 $NF = 1.3 \text{ dB TYP. @ } V_{CE} = 2 \text{ V, } I_C = 3 \text{ mA, } f = 2 \text{ GHz}$
 $NF = 1.3 \text{ dB TYP. @ } V_{CE} = 1 \text{ V, } I_C = 3 \text{ mA, } f = 2 \text{ GHz}$
- 3-pin ultra super minimold package

ORDERING INFORMATION

Part Number	Quantity	Supplying Form
NE68719-A	50 pcs (Non reel)	• 8 mm wide embossed taping • Pin 3 (collector) face the perforation side of the tape
NE68719-T1-A	3 kpcs/reel	

Remark To order evaluation samples, 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}	5	V
Collector to Emitter Voltage	V_{CEO}	3	V
Emitter to Base Voltage	V_{EBO}	2	V
Collector Current	I_C	30	mA
Total Power Dissipation	P_{tot} ^{Note}	90	mW
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65 to +150	$^\circ\text{C}$

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 ($T_A = +25^\circ\text{C}$)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Collector Cut-off Current	I_{CBO}	$V_{CB} = 5\text{ V}, I_E = 0\text{ mA}$	–	–	100	nA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 1\text{ V}, I_C = 0\text{ mA}$	–	–	100	nA
DC Current Gain	h_{FE} ^{Note 1}	$V_{CE} = 2\text{ V}, I_C = 20\text{ mA}$	70	–	140	–
RF Characteristics						
Gain Bandwidth Product (1)	f_T	$V_{CE} = 2\text{ V}, I_C = 20\text{ mA}, f = 2\text{ GHz}$	9	11	–	GHz
Gain Bandwidth Product (2)	f_T	$V_{CE} = 1\text{ V}, I_C = 10\text{ mA}, f = 2\text{ GHz}$	7	9	–	GHz
Insertion Power Gain (1)	$ S_{21e} ^2$	$V_{CE} = 2\text{ V}, I_C = 20\text{ mA}, f = 2\text{ GHz}$	8.5	10	–	dB
Insertion Power Gain (2)	$ S_{21e} ^2$	$V_{CE} = 1\text{ V}, I_C = 10\text{ mA}, f = 2\text{ GHz}$	6.0	7.5	–	dB
Noise Figure (1)	NF	$V_{CE} = 2\text{ V}, I_C = 3\text{ mA}, f = 2\text{ GHz}$	–	1.3	2.0	dB
Noise Figure (2)	NF	$V_{CE} = 1\text{ V}, I_C = 3\text{ mA}, f = 2\text{ GHz}$	–	1.3	2.0	dB
Reverse Transfer Capacitance	C_{re} ^{Note 2}	$V_{CB} = 2\text{ V}, I_E = 0\text{ mA}, f = 1\text{ MHz}$	–	0.4	0.8	pF

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

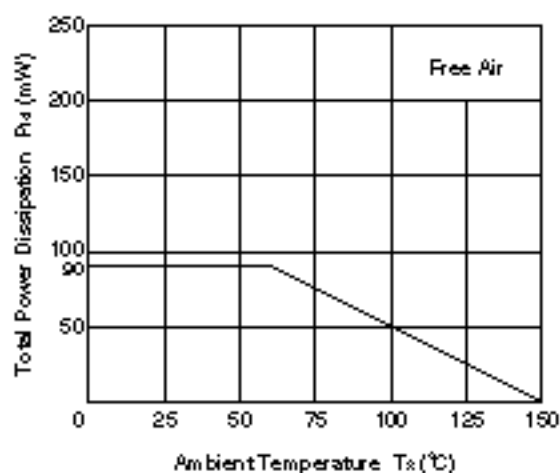
2. Collector to base capacitance when the emitter grounded

 h_{FE} CLASSIFICATION

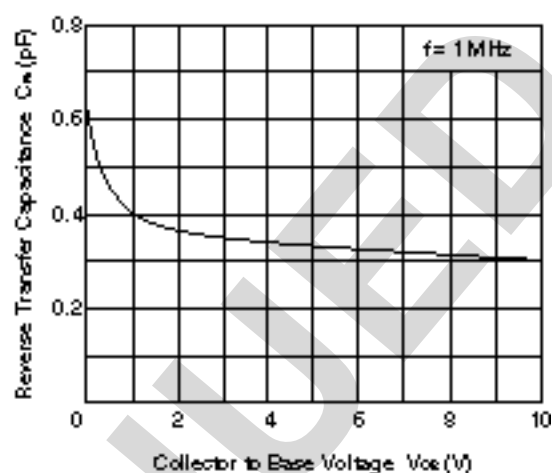
Rank	FB
Marking	86
h_{FE} Value	70 to 140

• TYPICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, unless otherwise specified)

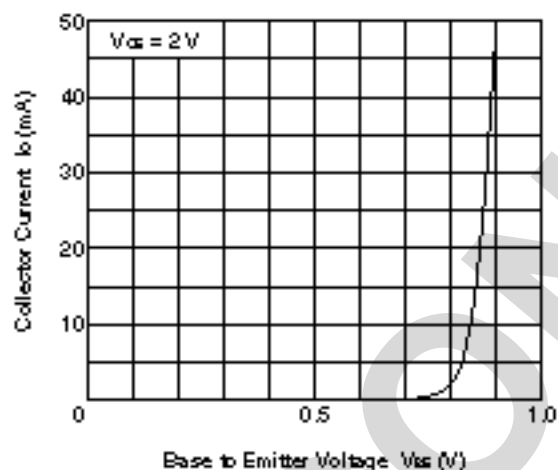
TOTAL POWER DISSIPATION
vs. AMBIENT TEMPERATURE



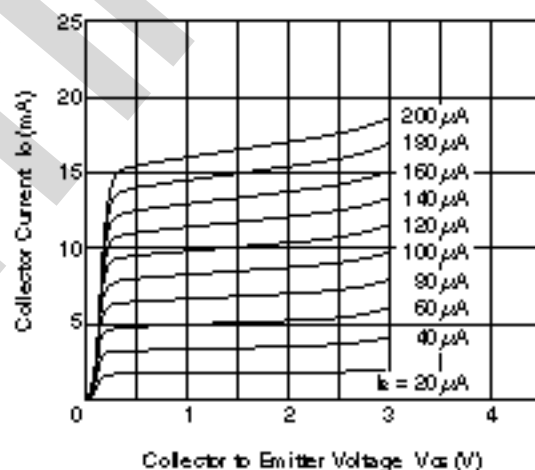
REVERSE TRANSFER CAPACITANCE
vs. COLLECTOR TO BASE VOLTAGE



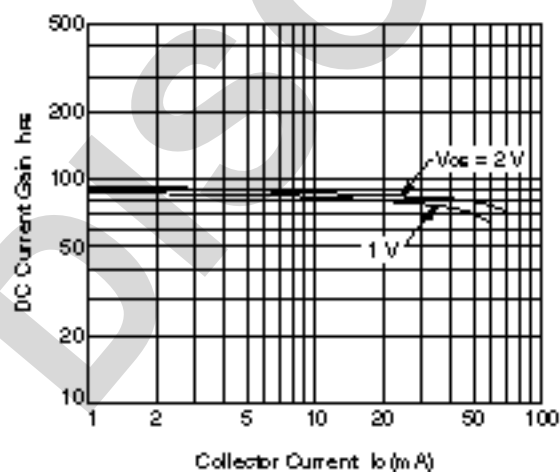
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



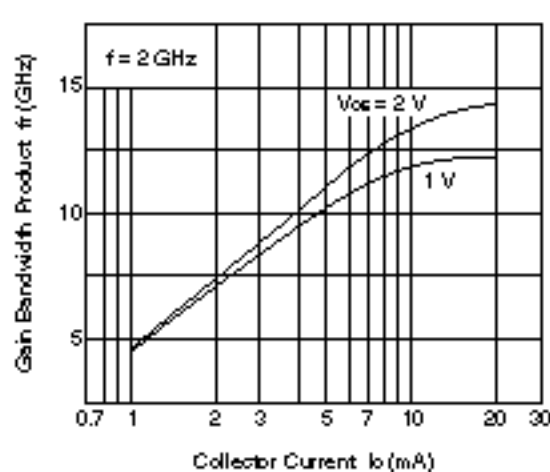
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE

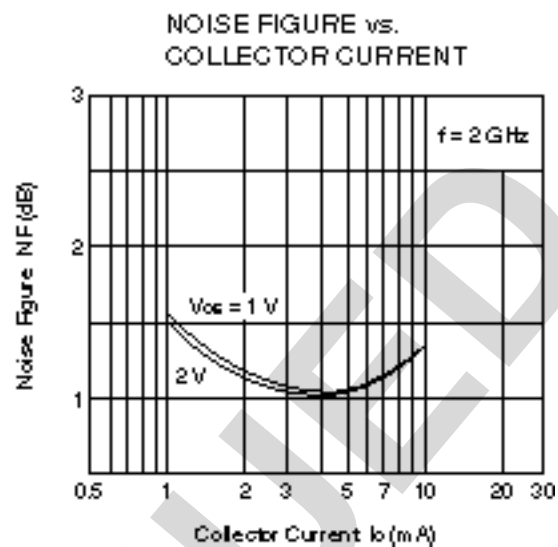
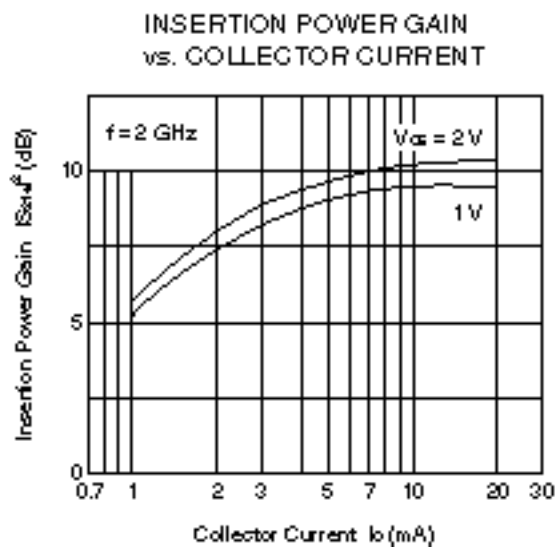


DC CURRENT GAIN vs.
COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT
vs. COLLECTOR CURRENT





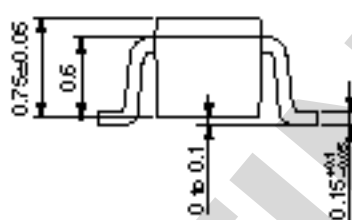
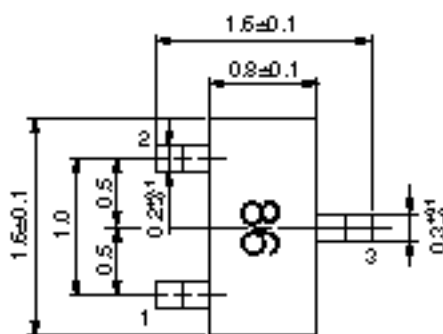
Remark The graphs indicate nominal characteristics.

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 (UNIT: mm)



PIN CONNECTIONS

1. Emitter
2. Base
3. Collector