To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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NPN SILICON RF TRANSISTOR
NE851M33

Phase-out/Discontinued

NPN SILICON RF TRANSISTOR FOR HIGH-FREQUENCY LOW NOISE 3-PIN SUPER LEAD-LESS MINIMOLD (M33, 0804 PKG)

FEATURES

- Low phase distortion, low voltage operation
- Ideal for OSC applications
- 3-pin super lead-less minimold (M33, 0804 PKG) package

<R> ORDERING INFORMATION

Part Number	Order Number	Package	Quantity	Supplying Form
NE851M33	NE851M33-A	3-pin super lead-less minimold (M33, 0804 PKG) (Pb-Free)	50 pcs (Non reel)	• 8 mm wide embossed taping • Pin 2 (Base) face the perforation side of the tape
NE851M33-T3	NE851M33-T3-A		10 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°C)

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	V_{CBO}	9.0	V
Collector to Emitter Voltage	V_{CEO}	5.5	V
Emitter to Base Voltage	V_{EBO}	1.5	V
Collector Current	I_C	100	mA
Total Power Dissipation	P_{tot} Note	130	mW
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	−65 to +150	°C

Note Mounted on 1.08 cm^2 × 1.0 mm (t) glass epoxy PCB

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

Document No. PU10343EJ03V0DS (3rd edition)
Date Published January 2008 NS
Printed in Japan

The mark <R> shows major revised points.

The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Collector Cut-off Current	I_{CBO}	V_{CB} = 5 V, I_E = 0 mA	–	–	600	nA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 1 V, I_C = 0 mA	–	–	600	nA
DC Current Gain	h_{FE} Note 1	V_{CE} = 1 V, I_C = 5 mA	100	120	145	–
RF Characteristics						
Gain Bandwidth Product (1)	f_T	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz	3.0	4.5	–	GHz
Gain Bandwidth Product (2)	f_T	V_{CE} = 1 V, I_C = 15 mA, f = 2 GHz	5.0	6.5	–	GHz
Insertion Power Gain (1)	$\lvert S_{21e} \rvert^2$	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz	3.0	4.0	–	dB
Insertion Power Gain (2)	$\lvert S_{21e} \rvert^2$	V_{CE} = 1 V, I_C = 15 mA, f = 2 GHz	4.5	5.5	–	dB
Noise Figure	NF	V_{CE} = 1 V, I_C = 10 mA, f = 2 GHz, $Z_S = Z_{opt}$	–	1.9	2.5	dB
Reverse Transfer Capacitance	C_{re} Note 2	V_{CB} = 0.5 V, I_E = 0 mA, f = 1 MHz	–	0.6	0.8	pF

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

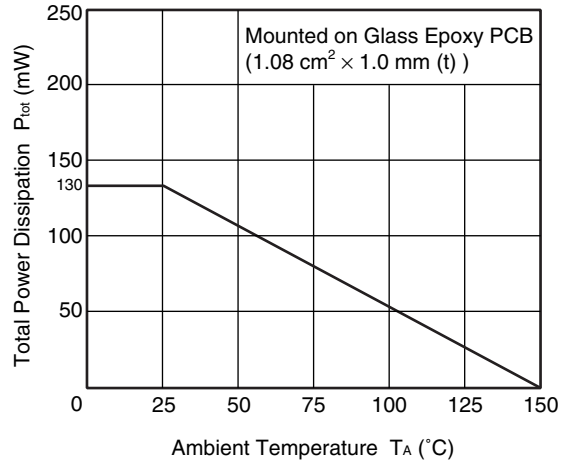
2. Collector to base capacitance when the emitter grounded

h_{FE} CLASSIFICATION

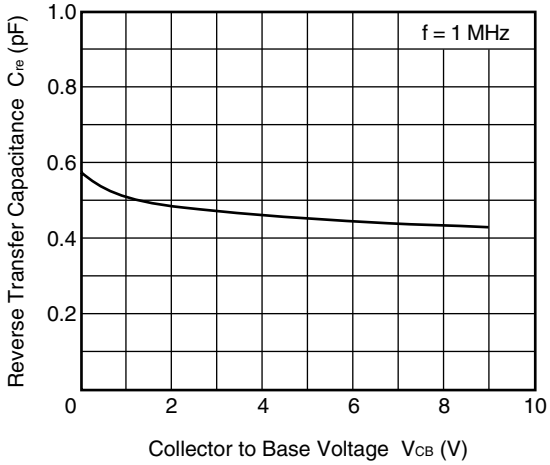
Rank	FB
Marking	E7
h_{FE} Value	100 to 145

<R> **TYPICAL CHARACTERISTICS (T_A = +25°C, unless otherwise specified)**

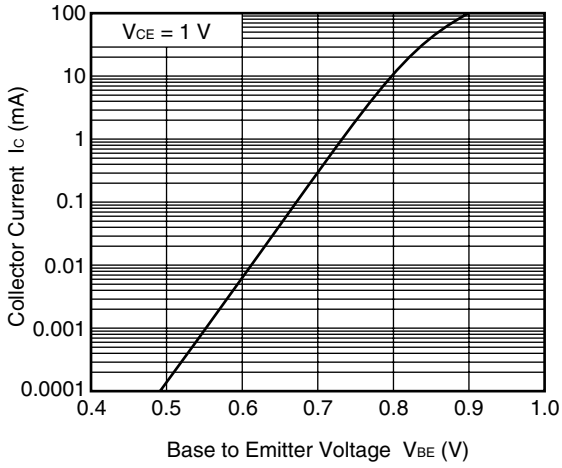
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



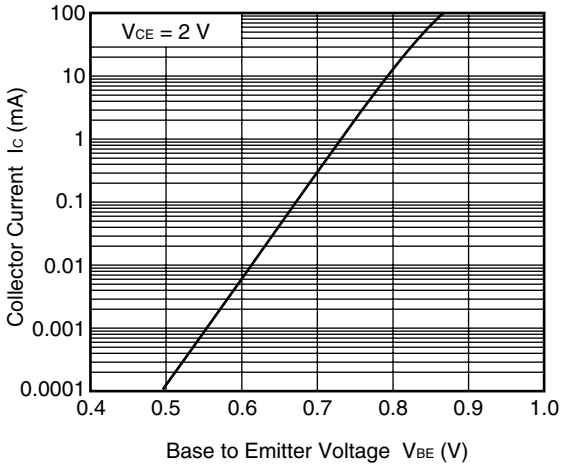
REVERSE TRANSFER CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



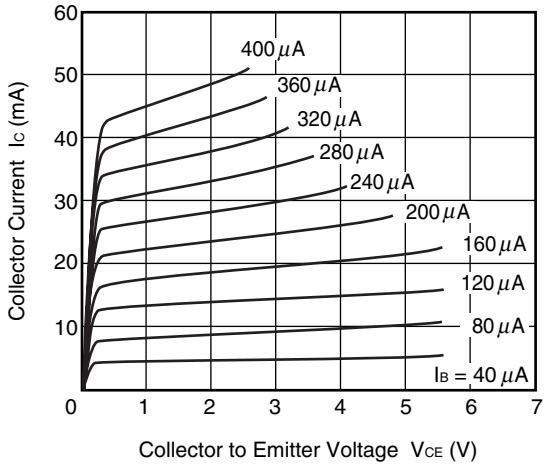
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE

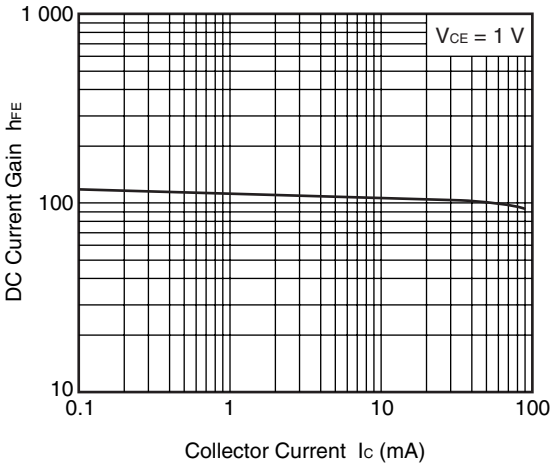


COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE

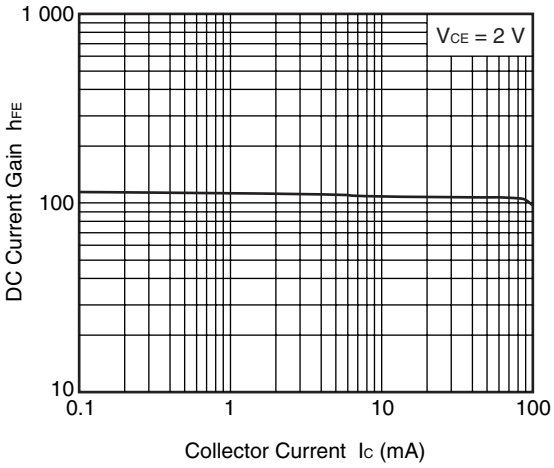


Remark The graphs indicate nominal characteristics.

DC CURRENT GAIN vs.
COLLECTOR CURRENT

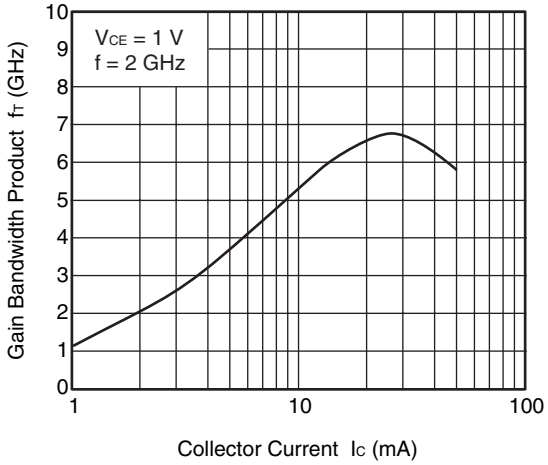


DC CURRENT GAIN vs.
COLLECTOR CURRENT

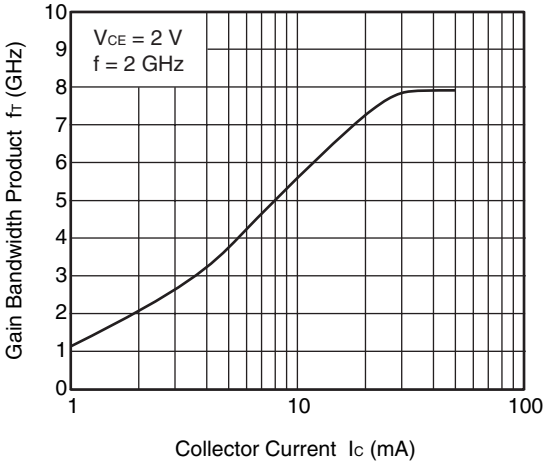


Remark The graphs indicate nominal characteristics.

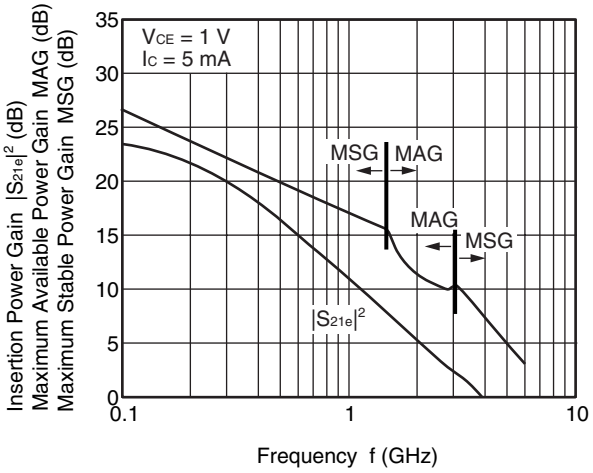
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



INSERTION POWER GAIN, MAG, MSG vs. FREQUENCY



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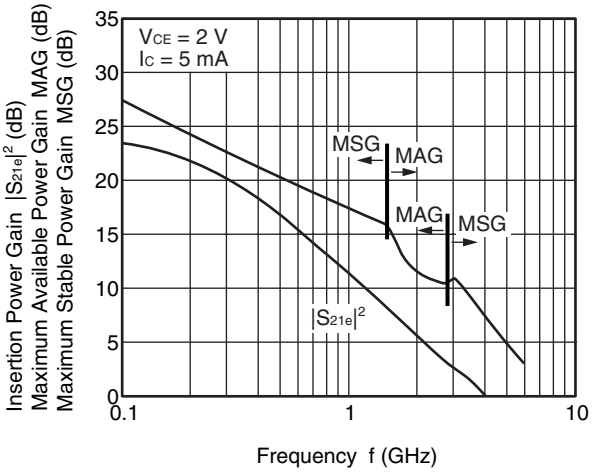
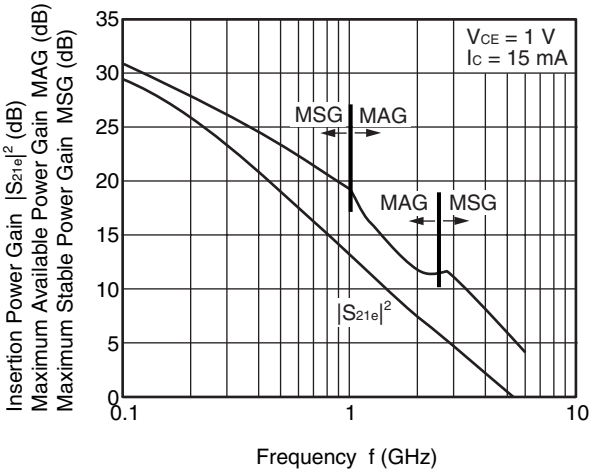
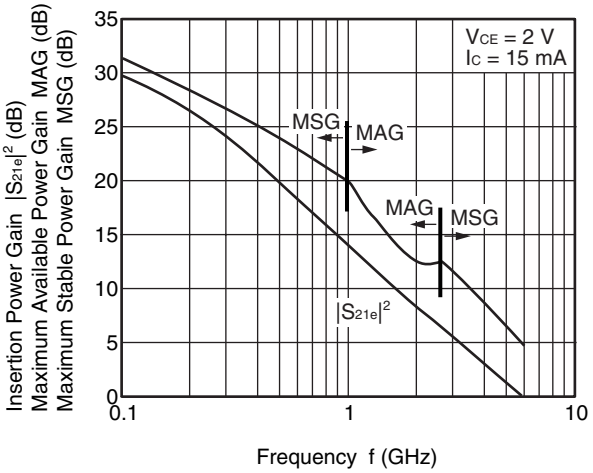


INSERTION POWER GAIN, MAG, MSG vs. FREQUENCY



INSERTION POWER GAIN, MAG, MSG vs. FREQUENCY



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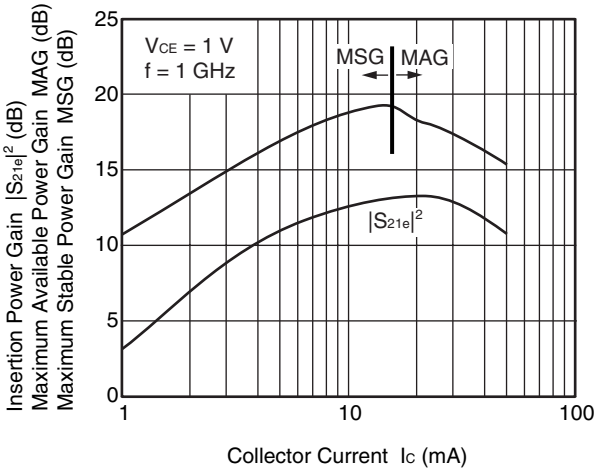
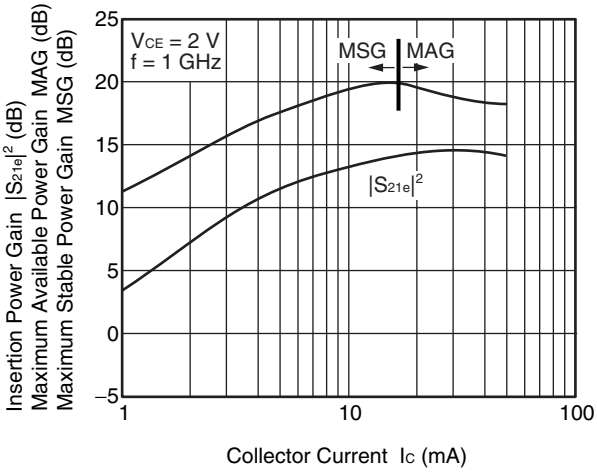
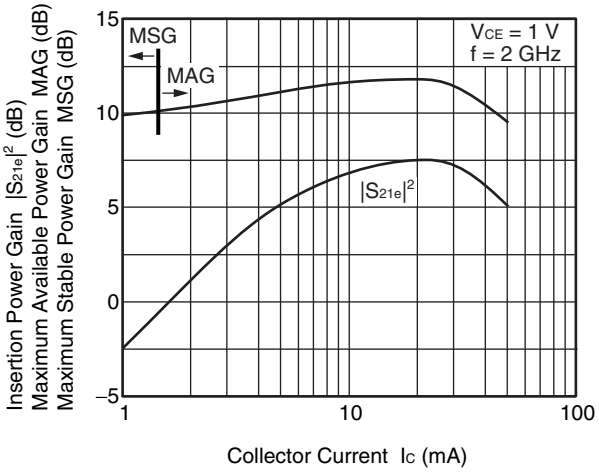
INSERTION POWER GAIN, MAG, MSG vs. COLLECTOR CURRENT



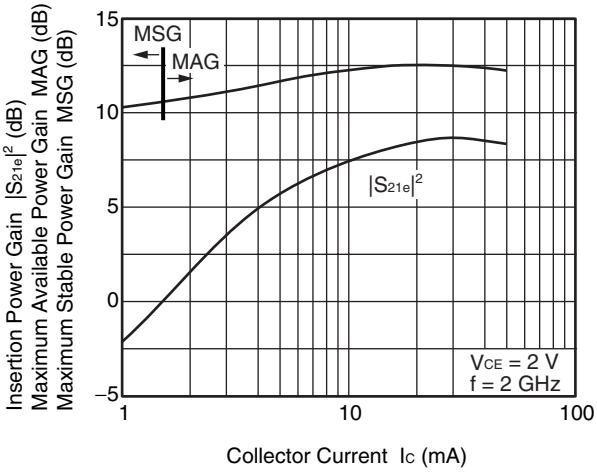
INSERTION POWER GAIN, MAG, MSG vs. COLLECTOR CURRENT



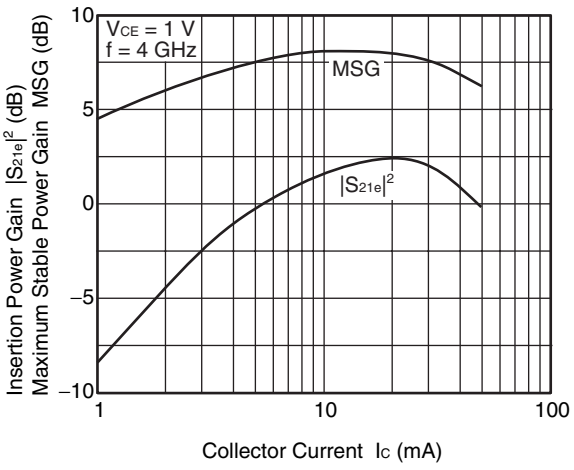
INSERTION POWER GAIN, MAG, MSG vs. COLLECTOR CURRENT



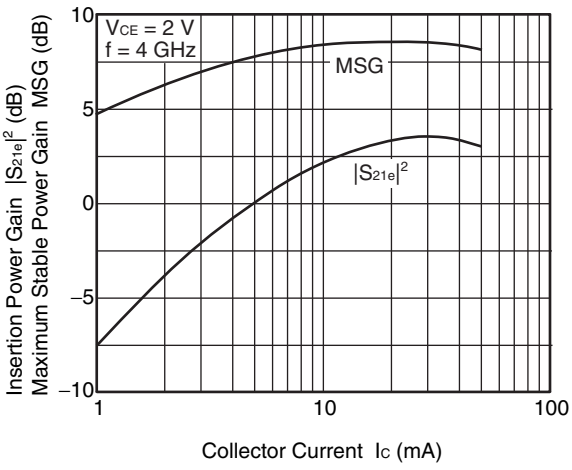
INSERTION POWER GAIN, MAG, MSG vs. COLLECTOR CURRENT



INSERTION POWER GAIN, MSG vs. COLLECTOR CURRENT



INSERTION POWER GAIN, MSG vs. COLLECTOR CURRENT



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<R> **S-PARAMETERS**

S-parameters/Noise parameters are provided on our web site in a form (S2P) that enables direct import to a microwave circuit simulator without keyboard input.

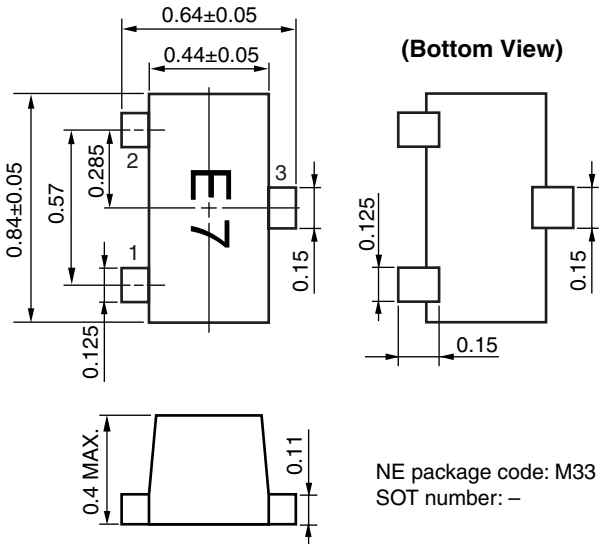
Click here to download S-parameters.

[RF and Microwave] → [Device Parameters]

URL http://www.ncsd.necel.com/microwave/index.html

<R> **PACKAGE DIMENSIONS**

3-PIN SUPER LEAD-LESS MINIMOLD (M33, 0804 PKG) (UNIT: mm)



NE package code: M33
SOT number: –

PIN CONNECTIONS

1. Emitter
2. Base
3. Collector

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