NESG210719

NPN SiGe RF Transistor for Low Noise, High-Gain Amplification 3-Pin Ultra Super Minimold (19, 1608 PKG)

R09DS0051EJ0400
Rev.4.00
Sep 24, 2012

<R> **FEATURES**

- The NESG210719 is an ideal choice for OSC, low noise, high-gain amplification
- High breakdown voltage technology for SiGe Tr.
- 3-pin ultra super minimold (19, 1608 PKG)

<R> **ORDERING INFORMATION**

Part Number	Order Number	Package	Quantity	Supplying Form
NESG210719	NESG210719-A	3-pin ultra super minimold (19, 1608 PKG) (Pb-Free)	50 pcs (Non reel)	• 8 mm wide embossed taping • Pin 3 (Collector) face the perforation side of the tape
NESG210719-T1	NESG210719-T1-A		3 kpcs/reel	

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

<R> **ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)**

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	V_{CBO}	13.0	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	200	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.

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.

<R> 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	–	–	100	nA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 0.5 V, I_C = 0	–	–	100	nA
DC Current Gain	h_{FE} Note 1	V_{CE} = 1 V, I_C = 5 mA	140	180	220	–
RF Characteristics						
Gain Bandwidth Product (1)	f_T	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz	7	10	–	GHz
Gain Bandwidth Product (2)	f_T	V_{CE} = 1 V, I_C = 20 mA, f = 2 GHz	–	12	–	GHz
Insertion Power Gain (1)	$\lvert S_{21e} \rvert^2$	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz	6.5	8	–	dB
Insertion Power Gain (2)	$\lvert S_{21e} \rvert^2$	V_{CE} = 1 V, I_C = 20 mA, f = 2 GHz	–	9	–	dB
Noise Figure	NF	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz, $Z_S = Z_{opt}$	–	0.9	1.5	dB
Associated Gain	G_a	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz, $Z_S = Z_{opt}$	6	9	–	dB
Reverse Transfer Capacitance	C_{re} Note 2	V_{CB} = 1 V, I_E = 0, f = 1 MHz	–	0.5	0.7	pF

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

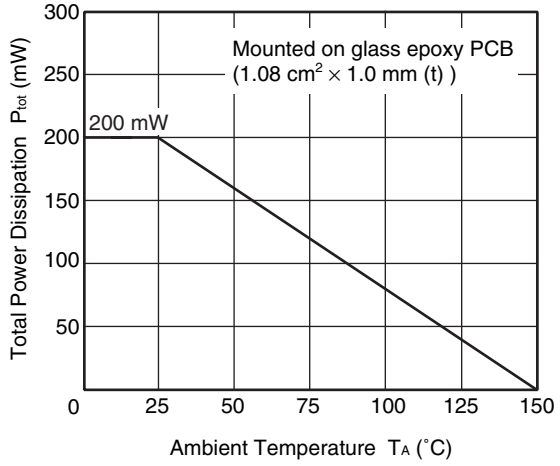
2. Collector to base capacitance when the emitter grounded

<R> h_{FE} CLASSIFICATION

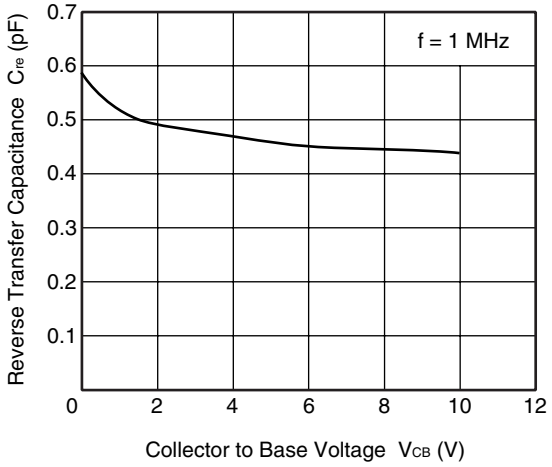
Rank	FB/YFB
Marking	D7
h_{FE} Value	140 to 220

TYPICAL CHARACTERISTICS (T_A = +25°C, unless otherwise specified)

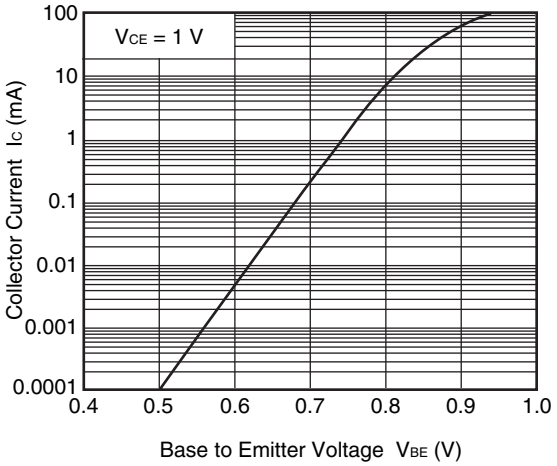
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



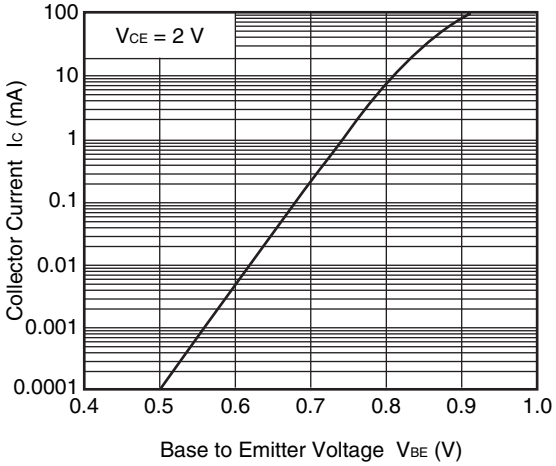
REVERSE TRANSFER CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



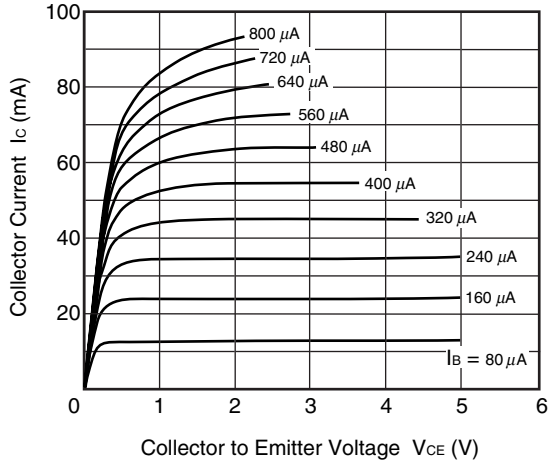
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE

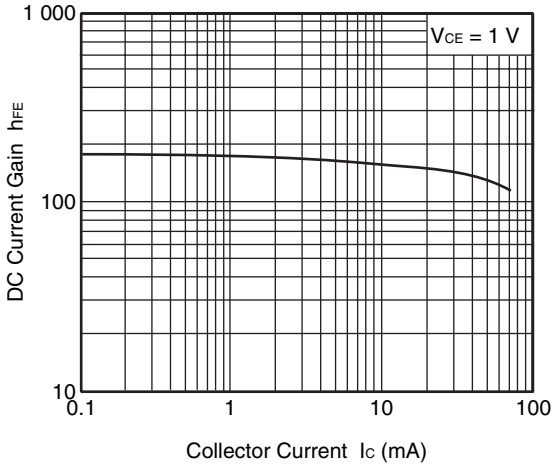


COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE

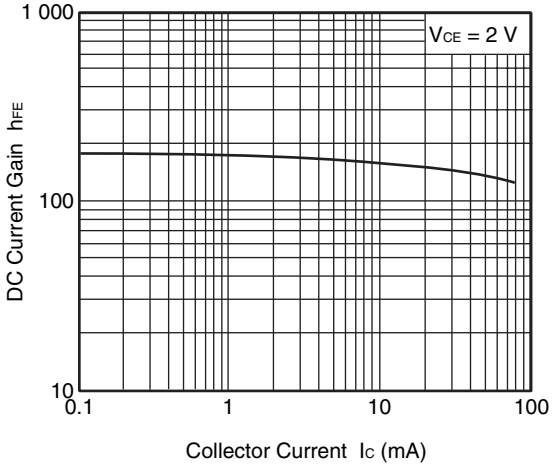


Remark The graphs indicate nominal characteristics.

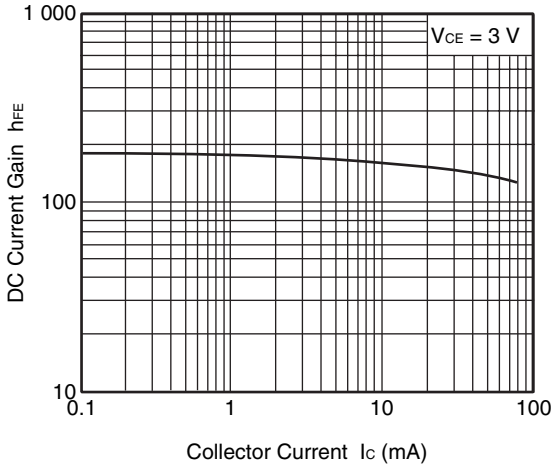
DC CURRENT GAIN vs.
COLLECTOR CURRENT



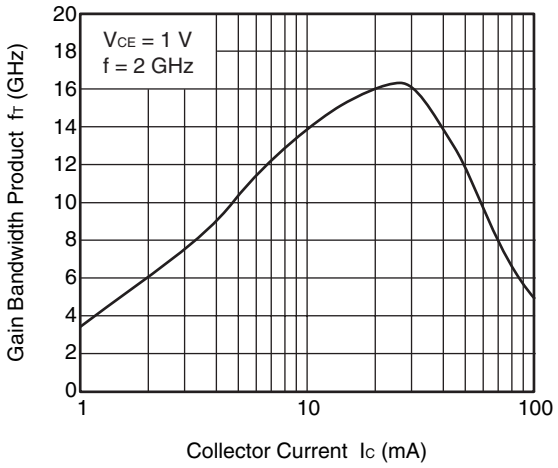
DC CURRENT GAIN vs.
COLLECTOR CURRENT



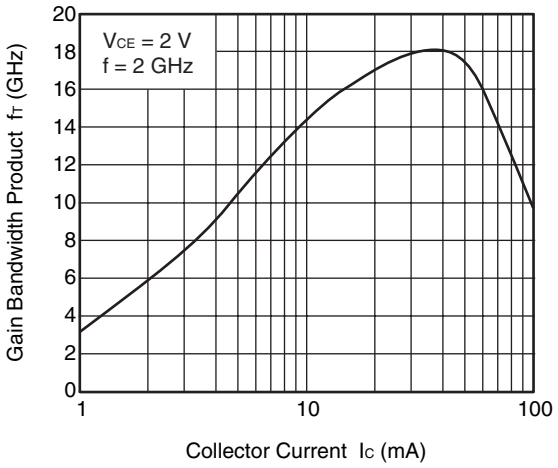
DC CURRENT GAIN vs.
COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT
vs. COLLECTOR CURRENT

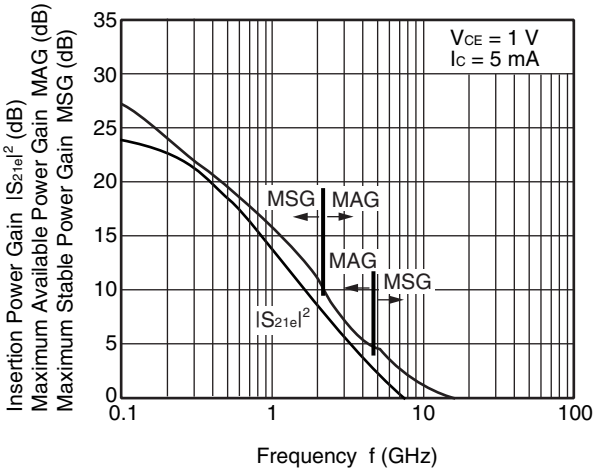


GAIN BANDWIDTH PRODUCT
vs. COLLECTOR CURRENT

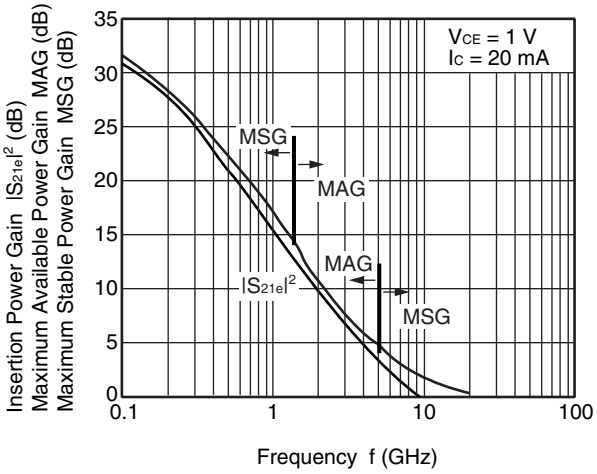


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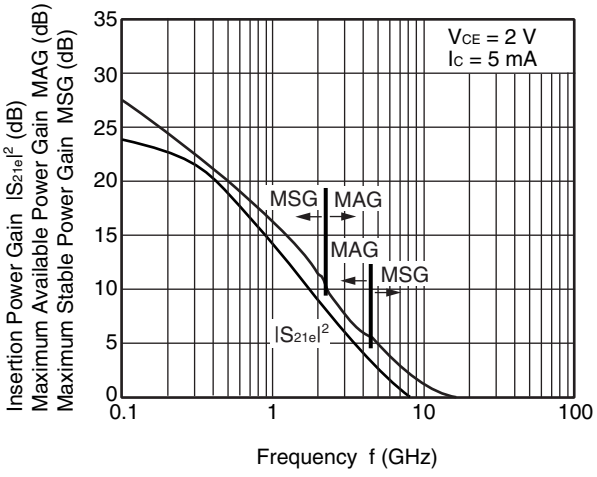
INSERTION POWER GAIN,
MAG, MSG vs. FREQUENCY



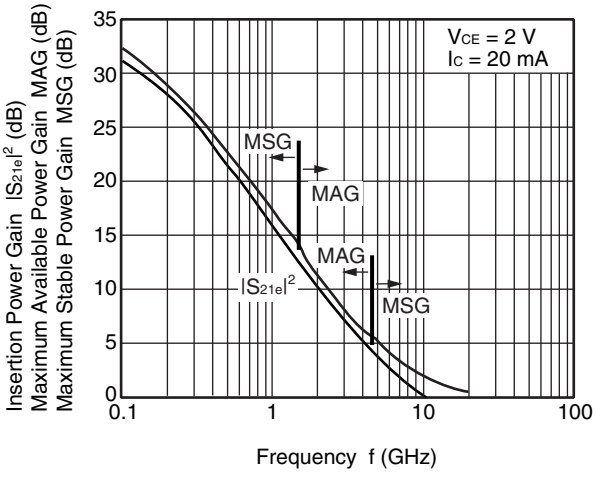
INSERTION POWER GAIN,
MAG, MSG vs. FREQUENCY



INSERTION POWER GAIN,
MAG, MSG vs. FREQUENCY

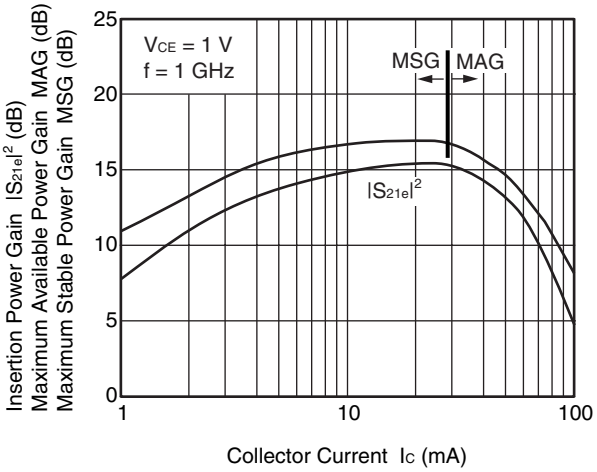


INSERTION POWER GAIN,
MAG, MSG vs. FREQUENCY

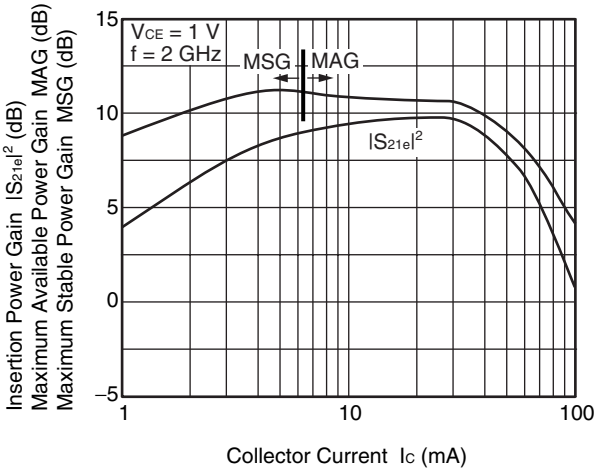


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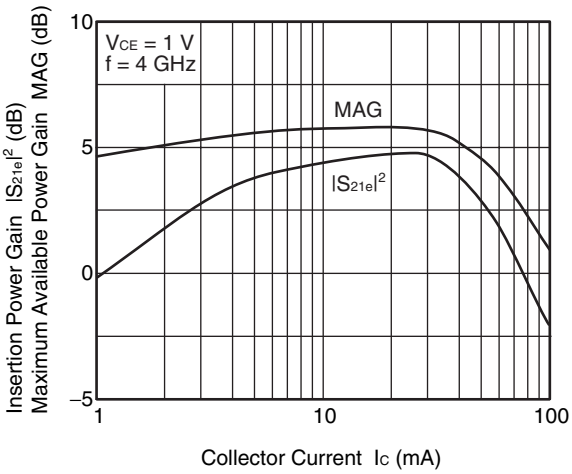
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



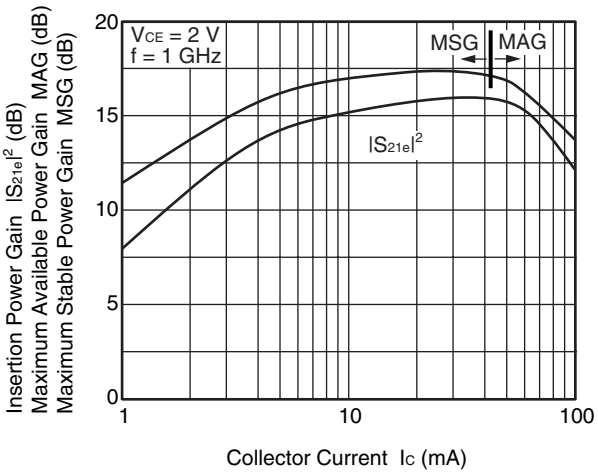
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



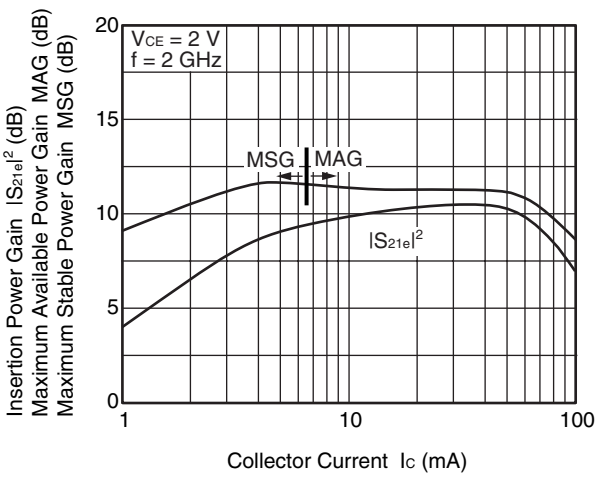
INSERTION POWER GAIN, MAG
vs. COLLECTOR CURRENT



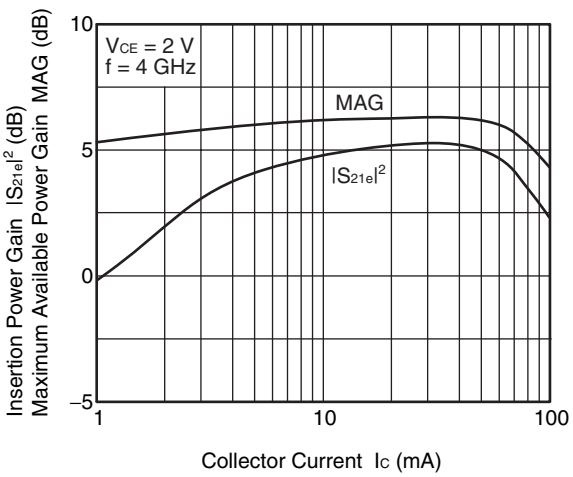
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



INSERTION POWER GAIN, MAG
vs. COLLECTOR CURRENT



Remark The graphs indicate nominal characteristics.

<R> **S-PARAMETERS**

S-parameters and noise parameters are provided on our web site in a form (S2P) that enables direct import of the parameters to microwave circuit simulators without the need for keyboard inputs.

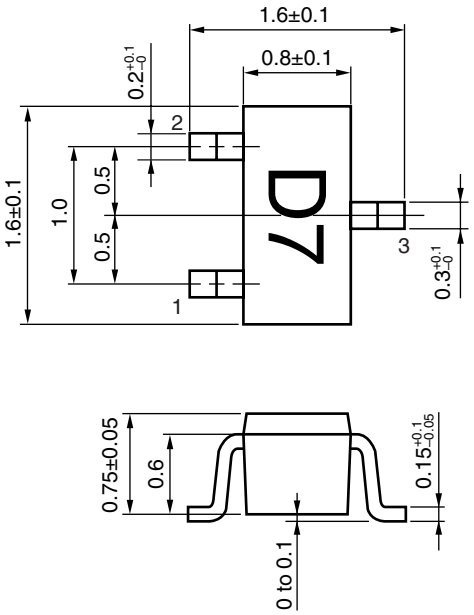
Click here to download S-parameters.

[Products] → [RF Devices] → [Device Parameters]

URL http://www.renesas.com/products/microwave/

PACKAGE DIMENSIONS

3-PIN ULTRA SUPER MINIMOLD (19, 1608 PKG) (UNIT: mm)



PIN CONNECTIONS

1. Emitter
2. Base
3. Collector

Revision History	NESG210719 Data Sheet

Rev.	Date	Description	
		Page	Summary
0.01	Oct 15, 2003	–	Preliminary edition issued
1.00	Oct 13, 2004	–	First edition issued
2.00	Aug 23, 2005	–	Second edition issued
3.00	Jan 21, 2008	–	Third edition issued
4.00	Sep 24, 2012	Throughout	The company name is changed to Renesas Electronics Corporation.
		p.1	Modification of FEATURES
		p.1	Modification of ORDERING INFORMATION
		p.1	Modification of ABSOLUTE MAXIMUM RATINGS
		p.2	Modification of ELECTRICAL CHARACTERISTICS
		p.2	Modification of h_{FE} CLASSIFICATION
		p.7	Modification of method for obtaining S-parameters

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[Colophon 2.2]