

To our customers,

Old Company Name in Catalogs and Other Documents

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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 EPITAXIAL SILICON RF TRANSISTOR
FOR HIGH-FREQUENCY LOW-NOISE AMPLIFICATION
3-PIN MINIMOLD**

FEATURES

- Low Voltage Operation, Low Phase Distortion
- Low Noise
NF = 1.5 dB TYP. @ $V_{CE} = 3\text{ V}$, $I_C = 7\text{ mA}$, $f = 2\text{ GHz}$
NF = 1.7 dB TYP. @ $V_{CE} = 1\text{ V}$, $I_C = 3\text{ mA}$, $f = 2\text{ GHz}$
- Large Absolute Maximum Collector Current
 $I_C = 100\text{ mA}$
- 3-pin minimold Package

★ **ORDERING INFORMATION**

Part Number	Quantity	Supplying Form
2SC5191	50 pcs (Non reel)	<ul style="list-style-type: none"> • 8 mm wide embossed taping • Pin 3 (collector) face to perforation side of the tape
2SC5191-T1B	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}	9	V
Collector to Emitter Voltage	V_{CEO}	6	V
Emitter to Base Voltage	V_{EBO}	2	V
Collector Current	I_C	100	mA
Total Power Dissipation	P_{tot}^{Note}	200	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.

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Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

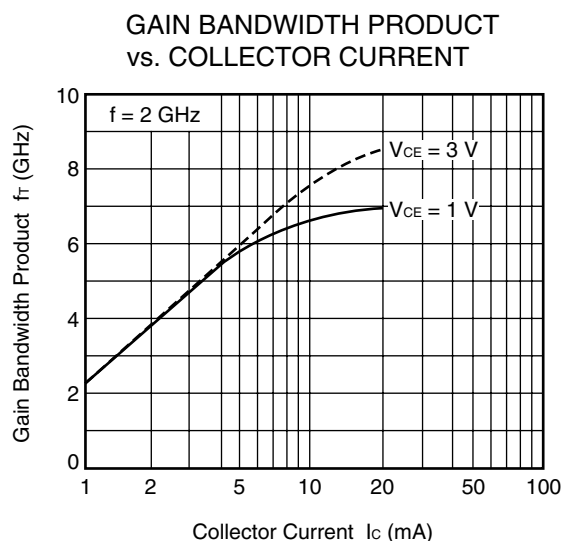
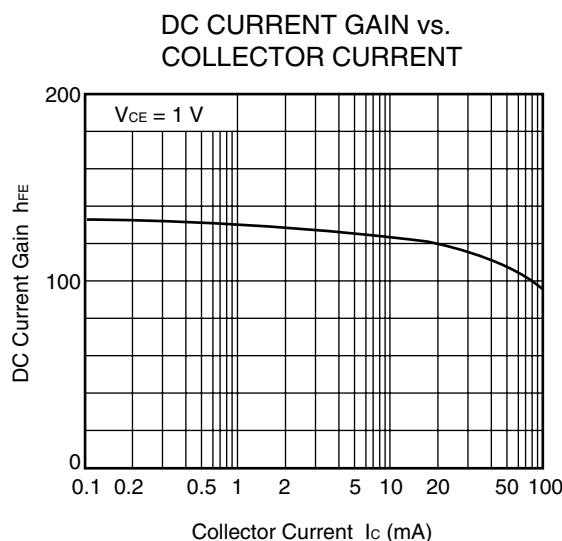
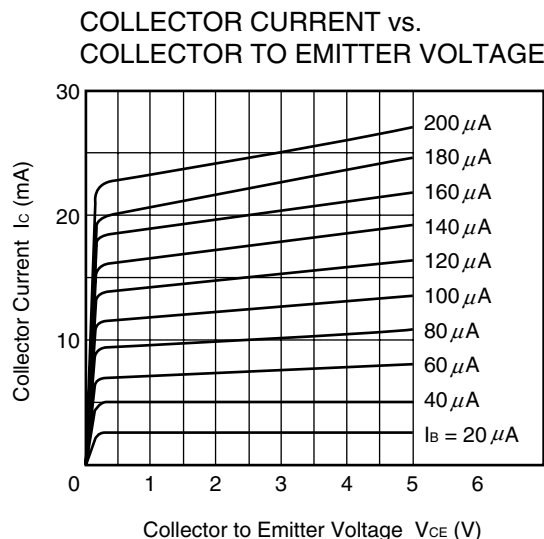
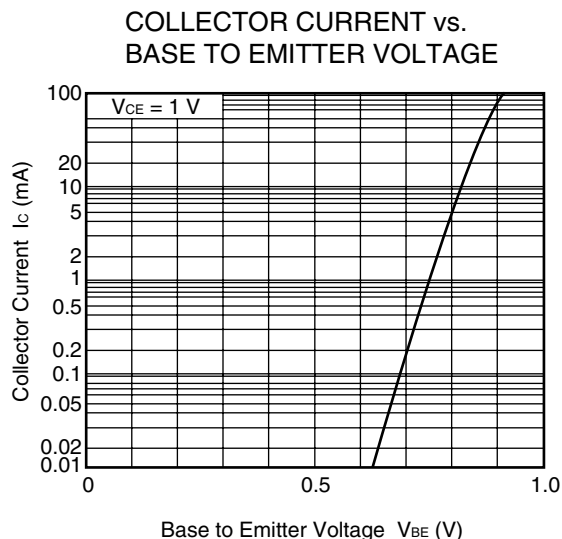
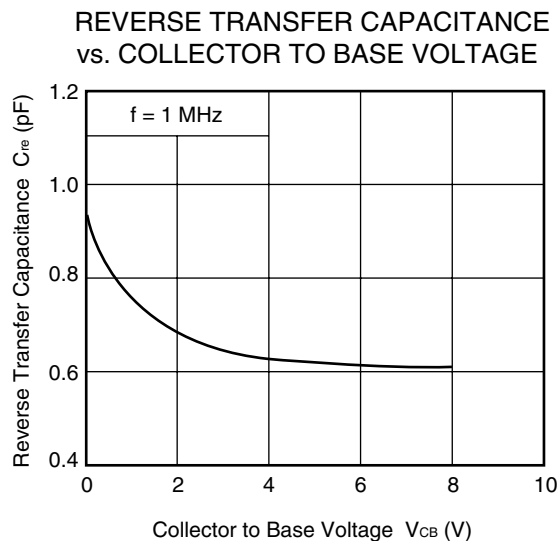
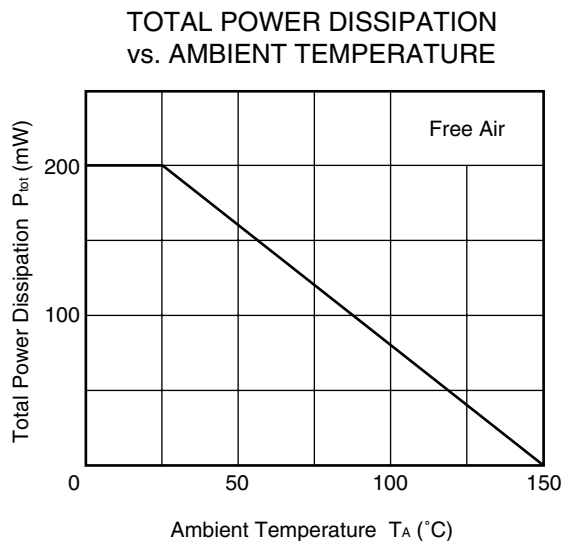
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Collector Cut-off Current	I _{CBO}	V _{CB} = 5 V, I _E = 0 mA	–	–	100	nA
Emitter Cut-off Current	I _{EBO}	V _{EB} = 1 V, I _C = 0 mA	–	–	100	nA
DC Current Gain	h _{FE} ^{Note 1}	V _{CE} = 1 V, I _C = 3 mA	80	–	160	–
RF Characteristics						
Gain Bandwidth Product (1)	f _T	V _{CE} = 1 V, I _C = 3 mA, f = 2.0 GHz	4.0	4.5	–	GHz
Gain Bandwidth Product (2)	f _T	V _{CE} = 3 V, I _C = 20 mA, f = 2.0 GHz	–	8.5	–	GHz
Insertion Power Gain (1)	S _{21e} ²	V _{CE} = 1 V, I _C = 3 mA, f = 2.0 GHz	2.5	3.5	–	dB
Insertion Power Gain (2)	S _{21e} ²	V _{CE} = 3 V, I _C = 20 mA, f = 2.0 GHz	–	6.5	–	dB
Noise Figure (1)	NF	V _{CE} = 1 V, I _C = 3 mA, f = 2.0 GHz	–	1.7	2.5	dB
Noise Figure (2)	NF	V _{CE} = 3 V, I _C = 7 mA, f = 2.0 GHz	–	1.5	–	dB
Reverse Transfer Capacitance	C _{re} ^{Note 2}	V _{CB} = 1 V, I _E = 0 mA, f = 1.0 MHz	–	0.75	0.85	pF

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

h_{FE} CLASSIFICATION

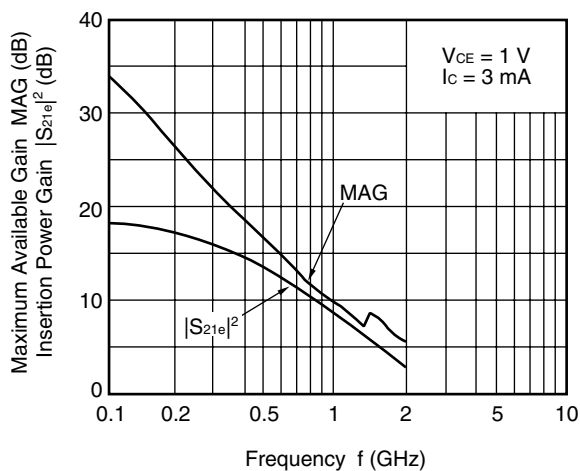
Rank	FB
Marking	T88
h _{FE} Value	80 to 160

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

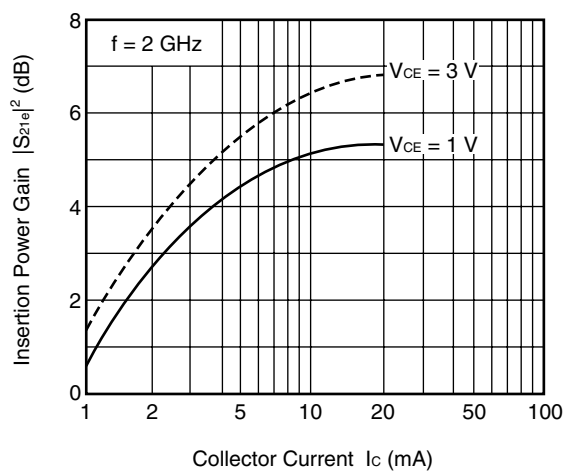


Remark The graphs indicate nominal characteristics.

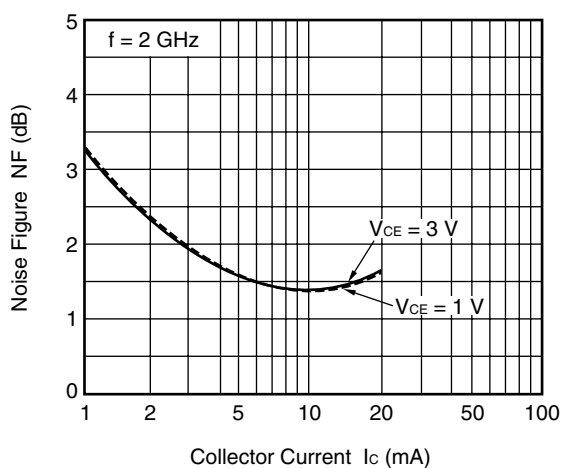
MAXIMUM AVAILABLE GAIN/INSERTION POWER GAIN vs. FREQUENCY



INSERTION POWER GAIN vs. COLLECTOR CURRENT



NOISE FIGURE vs. COLLECTOR CURRENT



Remark The graphs indicate nominal characteristics.

★ S-PARAMETERS

S-parameters/Noise parameters are provided on the NEC Compound Semiconductor Devices Web site in a form (S2P) that enables direct import to a microwave circuit simulator without keyboard input.

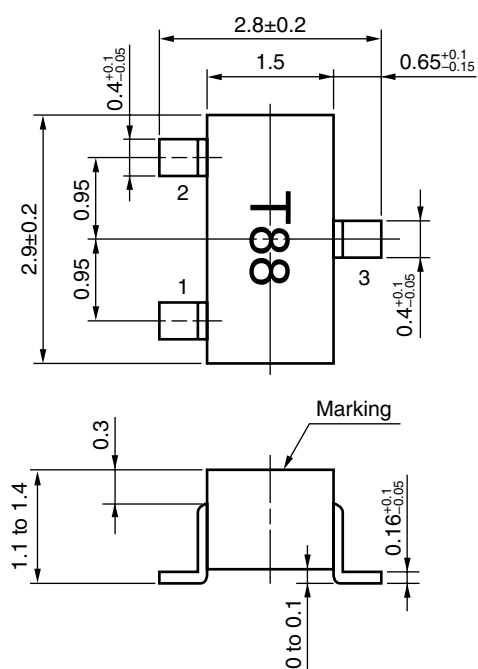
Click here to download S-parameters.

[RF and Microwave] → [Device Parameters]

URL <http://www.ncsd.necel.com/>

★ PACKAGE DIMENSIONS

3-PIN MINIMOLD (UNIT: mm)



PIN CONNECTIONS

1. Emitter
2. Base
3. Collector

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 "Special": Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)
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► For further information, please contact

NEC Compound Semiconductor Devices, Ltd. <http://www.ncsd.necel.com/>

E-mail: salesinfo@ml.ncsd.necel.com (sales and general)

techinfo@ml.ncsd.necel.com (technical)

Sales Division TEL: +81-44-435-1588 FAX: +81-44-435-1579

NEC Compound Semiconductor Devices Hong Kong Limited

E-mail: ncsd-hk@elhk.nec.com.hk (sales, technical and general)

Hong Kong Head Office TEL: +852-3107-7303 FAX: +852-3107-7309

Taipei Branch Office TEL: +886-2-8712-0478 FAX: +886-2-2545-3859

Korea Branch Office TEL: +82-2-558-2120 FAX: +82-2-558-5209

NEC Electronics (Europe) GmbH <http://www.ee.nec.de/>

TEL: +49-211-6503-0 FAX: +49-211-6503-1327

California Eastern Laboratories, Inc. <http://www.cel.com/>

TEL: +1-408-988-3500 FAX: +1-408-988-0279