

To our customers,

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## Old Company Name in Catalogs and Other Documents

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On April 1<sup>st</sup>, 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 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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

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NPN SILICON EPITAXIAL TRANSISTOR  
MINI MOLD

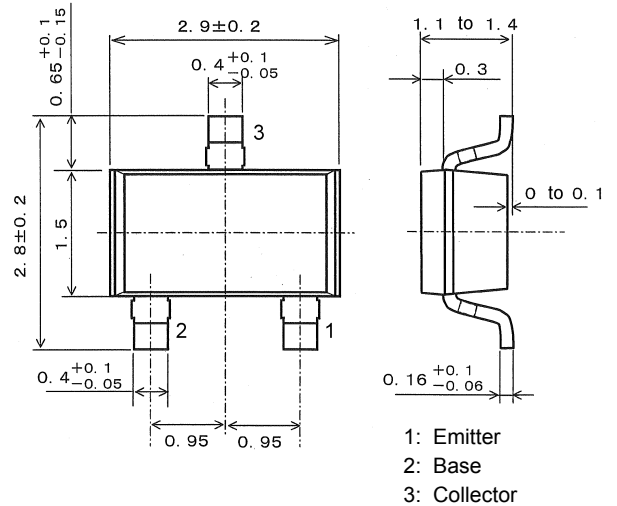
FEATURES

- High DC Current Gain:  
h<sub>FE</sub> = 200 TYP. (V<sub>CE</sub> = 6.0 V, I<sub>C</sub> = 1.0 mA)
- High Voltage: V<sub>CEO</sub> = 50 V

ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

Collector to Base Voltage	V <sub>CB0</sub>	60	V
Collector to Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter to Base Voltage	V <sub>EB0</sub>	5.0	V
Collector Current (DC)	I <sub>C</sub>	100	mA
Total Power Dissipation	P <sub>T</sub>	200	mW
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature Range	T <sub>stg</sub>	-55 to +150	°C

PACKAGE DRAWING (Unit: mm)



ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cut-off Current	I <sub>CBO</sub>			0.1	μA	V <sub>CB</sub> = 60 V, I <sub>E</sub> = 0 A
Emitter Cut-off Current	I <sub>EBO</sub>			0.1	μA	V <sub>EB</sub> = 5.0 V, I <sub>C</sub> = 0 A
DC Current Gain	h <sub>FE</sub>	90	200	600		V <sub>CE</sub> = 6.0 V, I <sub>C</sub> = 1.0 mA <sup>Note</sup>
Collector Saturation Voltage	V <sub>CE(sat)</sub>		0.15	0.3	V	I <sub>C</sub> = 100 mA, I <sub>B</sub> = 10 mA <sup>Note</sup>
Base to Saturation Voltage	V <sub>BE(sat)</sub>		0.86	1.0	V	I <sub>C</sub> = 100 mA, I <sub>B</sub> = 10 mA <sup>Note</sup>
Base to Emitter voltage	V <sub>BE</sub>	0.55	0.62	0.65	V	V <sub>CE</sub> = 6.0 V, I <sub>C</sub> = 1.0 mA <sup>Note</sup>
Gain Bandwidth Product	f <sub>r</sub>		250		MHz	V <sub>CE</sub> = 6.0 V, I <sub>E</sub> = -10 mA
Output Capacitance	C <sub>ob</sub>		3.0		pF	V <sub>CB</sub> = 6.0 V, I <sub>E</sub> = 0 A, f = 1.0 MHz

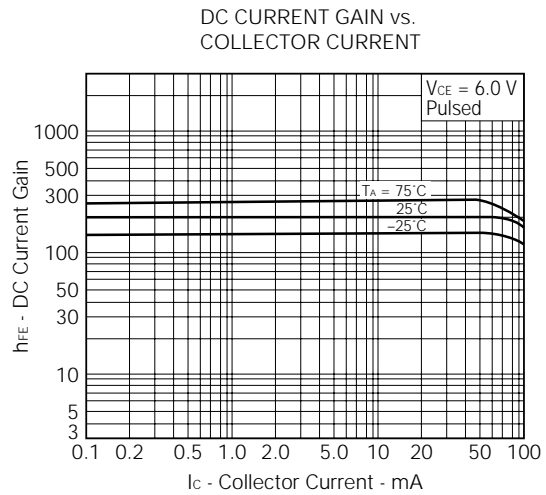
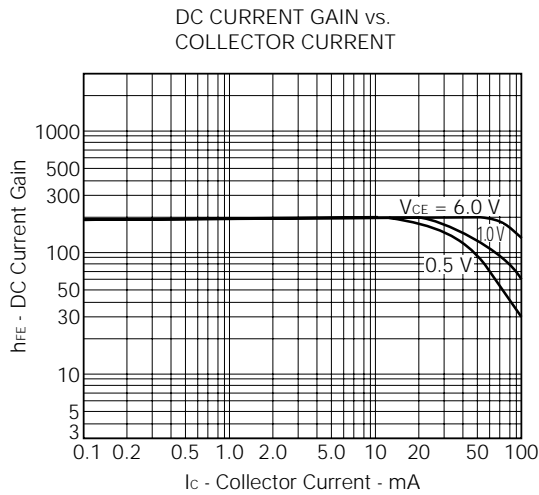
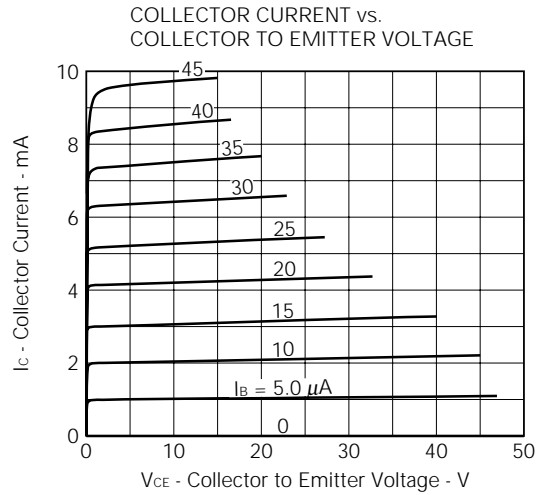
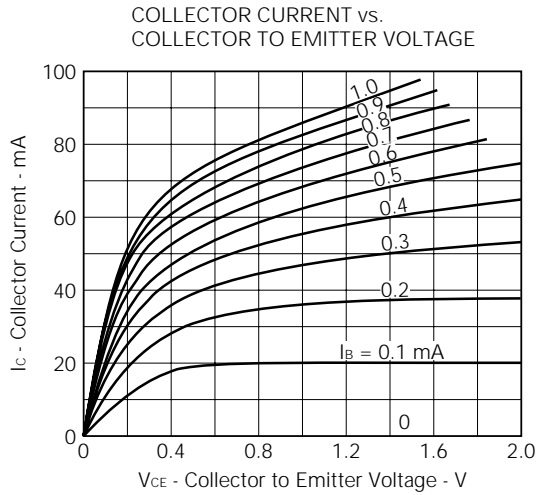
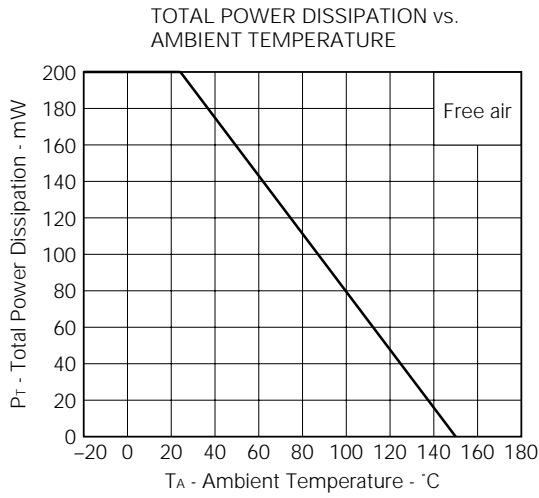
**Note** Pulsed: PW ≤ 350 μs, Duty Cycle ≤ 2%

h<sub>FE</sub> CLASSIFICATION

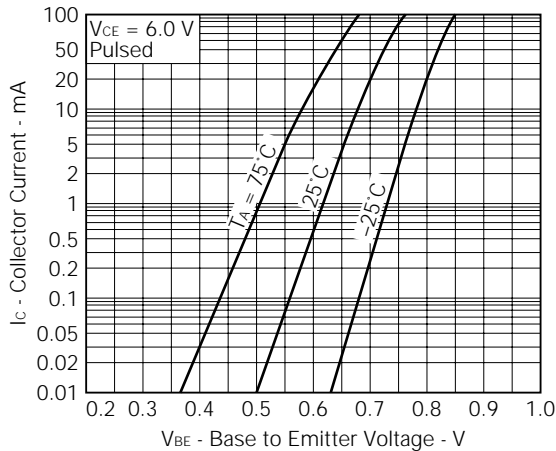
Marking	L4	L5	L6	L7
h <sub>FE</sub>	90 to 180	135 to 270	200 to 400	300 to 600

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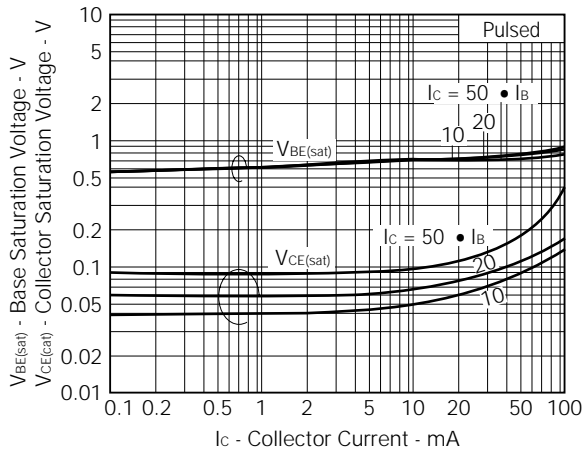
<R> TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)



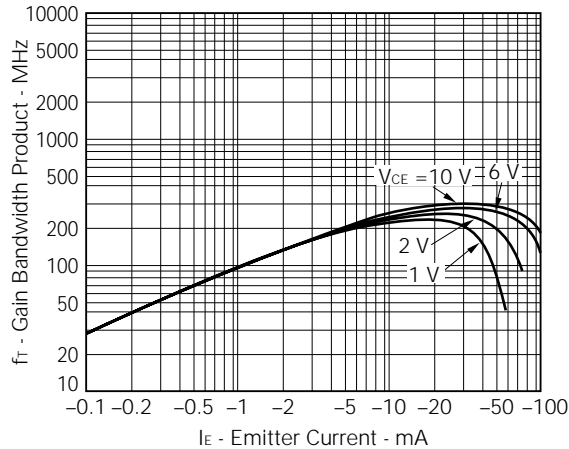
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



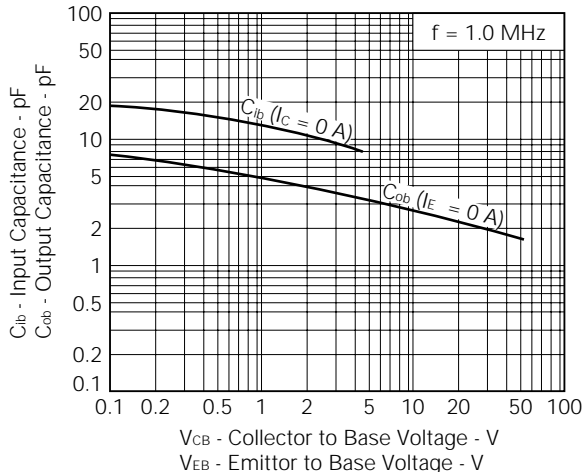
COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



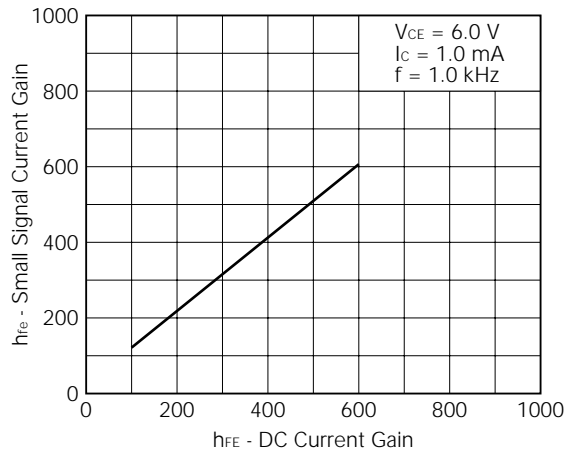
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



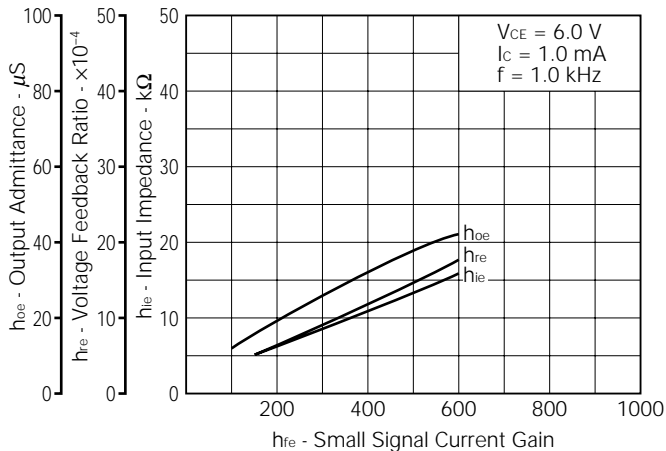
INPUT AND OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



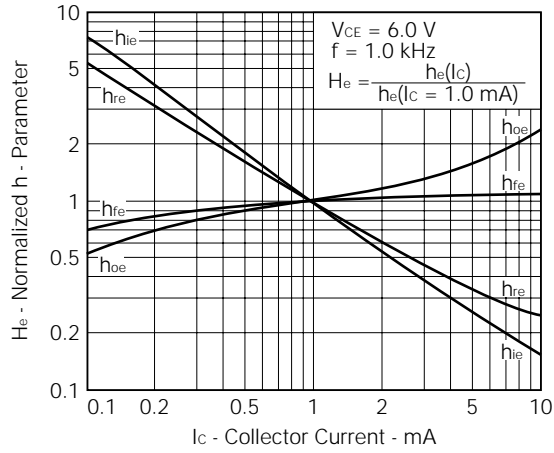
SMALL SIGNAL CURRENT GAIN vs. DC CURRENT GAIN



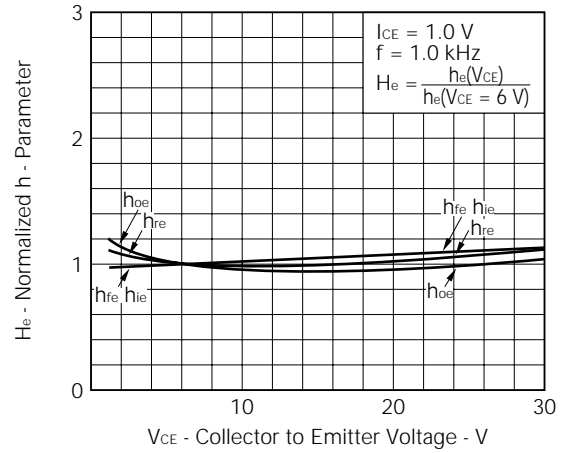
INPUT IMPEDANCE VOLTAGE FEEDBACK RATIO AND OUTPUT ADMITTANCE vs. SMALL SIGNAL CURRENT GAIN



NORMALIZED h-PARAMETER vs. COLLECTOR CURRENT



NORMALIZED h-PARAMETER vs. COLLECTOR TO EMITTER VOLTAGE



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