

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>)

Send any inquiries to <http://www.renesas.com/inquiry>.

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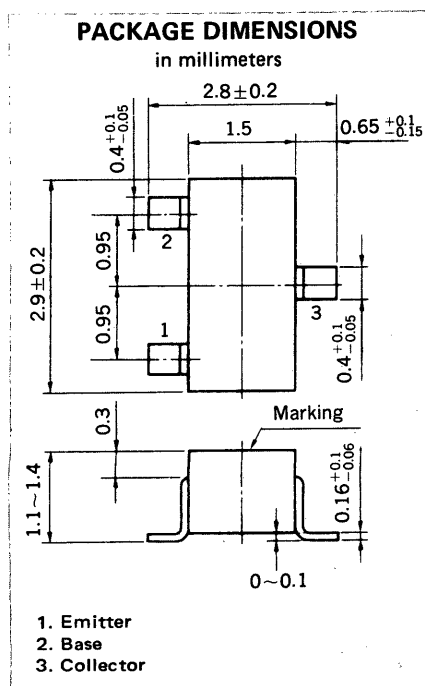
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(Note 2) “Renesas Electronics product(s)” means any product developed or manufactured by or for Renesas Electronics.

FM/AM RF AMPLIFIER, MIXER, OSCILLATOR, CONVERTER

NPN SILICON EPITAXIAL TRANSISTOR

MINI MOLD



FEATURES

- High Gain Bandwidth Product: $f_T = 250$ MHz TYP.
- Low Output Capacitance: $C_{ob} = 1.8$ pF TYP.
- Low Noise Figure: $NF = 2.5$ dB TYP.

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Current ($T_a = 25^\circ\text{C}$)

Collector to Base Voltage	V_{CBO}	50	V
Collector to Emitter Voltage	V_{CEO}	30	V
Emitter to Base Voltage	V_{EBO}	5.0	V
Collector Current (DC)	I_C	50	mA

Maximum Power Dissipation

Total Power Dissipation at 25°C Ambient Temperature	P_T	150	mW
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Maximum Temperatures

Junction Temperature	T_j	125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +125	$^\circ\text{C}$

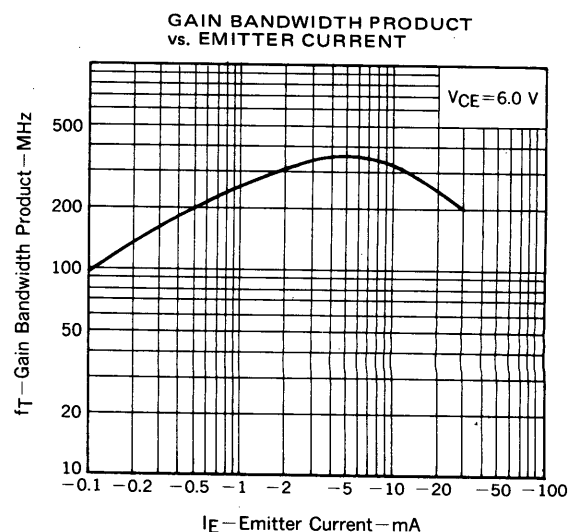
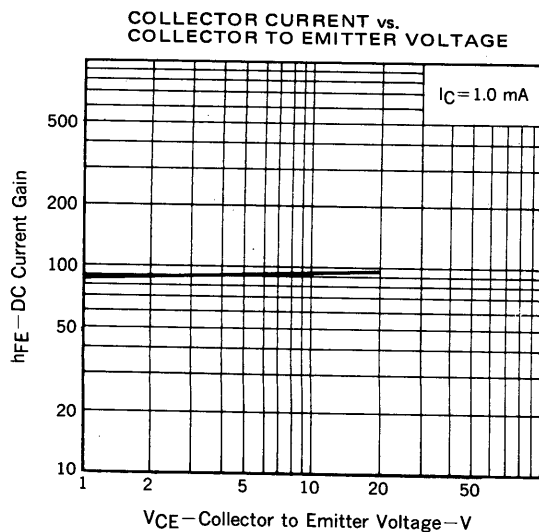
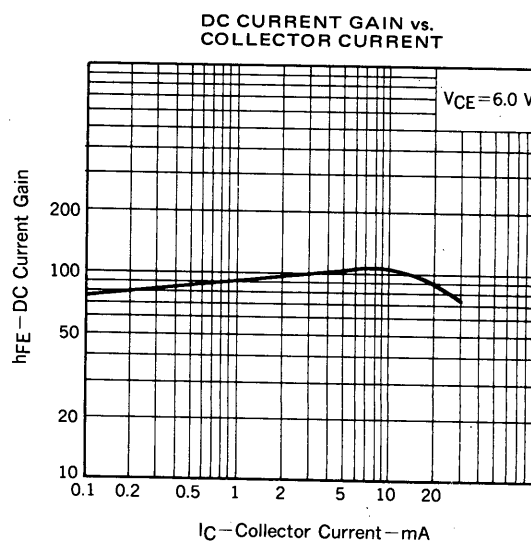
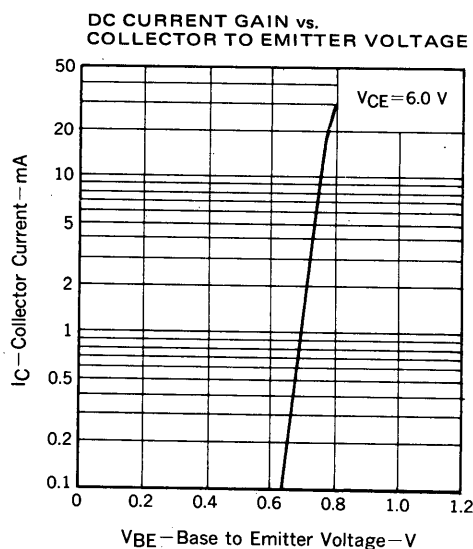
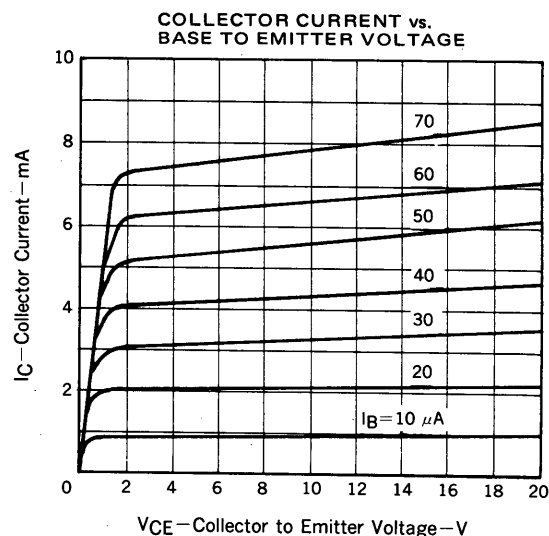
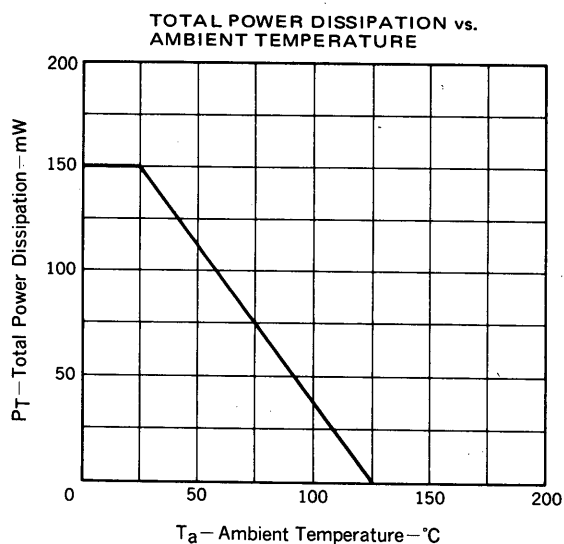
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			0.1	μA	$V_{CB} = 50$ V, $I_E = 0$
Emitter Cutoff Current	I_{EBO}			0.1	μA	$V_{EB} = 5.0$ V, $I_C = 0$
DC Current Gain	h_{FE}	60	100	180		$V_{CE} = 6.0$ V, $I_C = 1.0$ mA*
Base to Emitter Voltage	V_{BE}	0.65	0.70	0.75	V	$V_{CE} = 6.0$ V, $I_C = 1.0$ mA
Collector Saturation Voltage	$V_{CE(sat)}$		0.08	0.3	V	$I_C = 10$ mA, $I_B = 1.0$ mA
Gain Bandwidth Product	f_T	150	250		MHz	$V_{CE} = 6.0$ V, $I_E = -1.0$ mA
Output Capacitance	C_{ob}		1.9	2.2	pF	$V_{CB} = 6.0$ V, $I_E = 0$, $f = 1.0$ MHz
Collector to Base Time Constant	$C_{c-rb'b}$		10	15	ps	$V_{CB} = 6.0$ V, $I_E = -1.0$ mA, $f = 31.9$ MHz
Noise Figure	NF		2.0	4.0	dB	$V_{CE} = 6.0$ V, $I_E = -1.0$ mA, $f = 1.0$ MHz, $R_G = 500 \Omega$

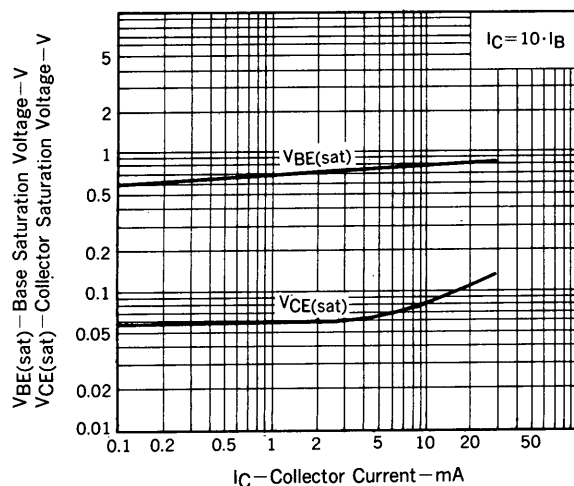
* Pulsed: $PW \leq 350 \mu\text{s}$, Duty Cycle $\leq 2\%$

h_{FE} Classification

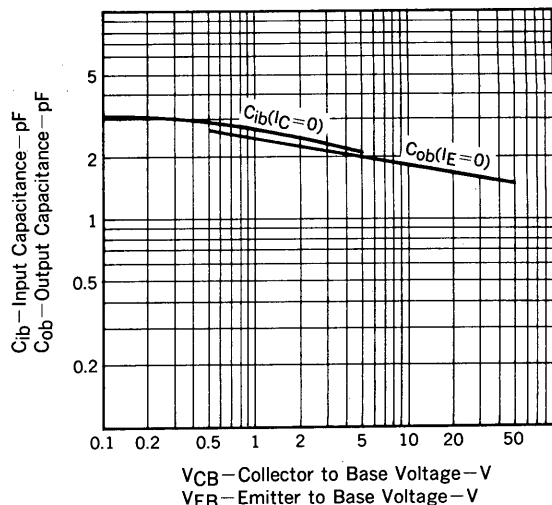
Marking	FA3	FA4
h_{FE}	60 to 120	90 to 180

TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

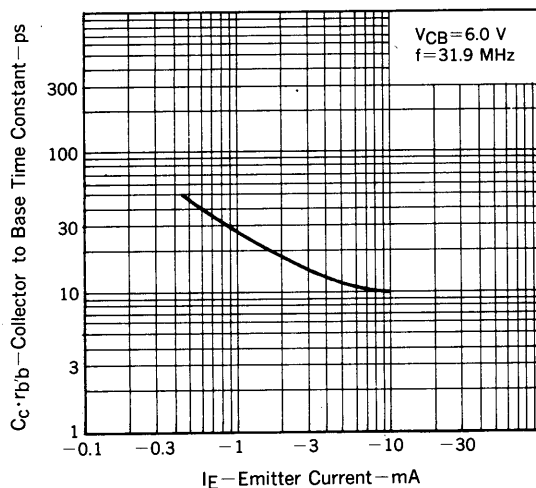
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



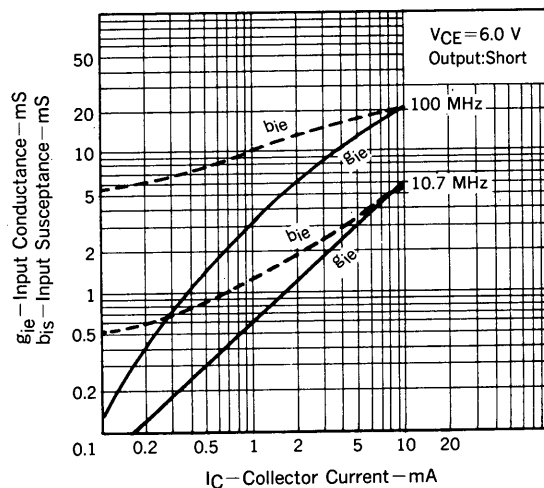
INPUT AND OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



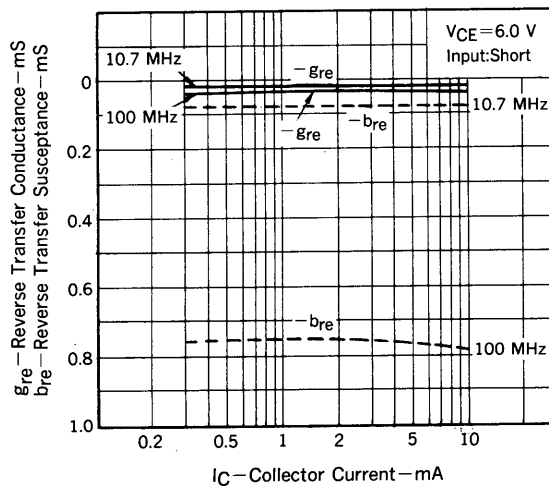
COLLECTOR TO BASE TIME CONSTANT vs. EMITTER CURRENT



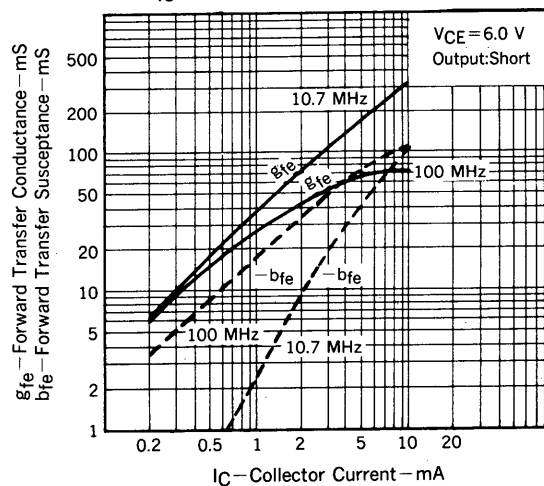
INPUT ADMITTANCE (y_{ie}) vs. COLLECTOR CURRENT

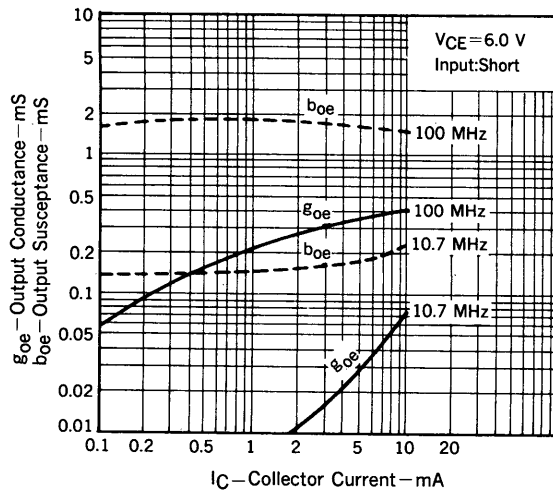
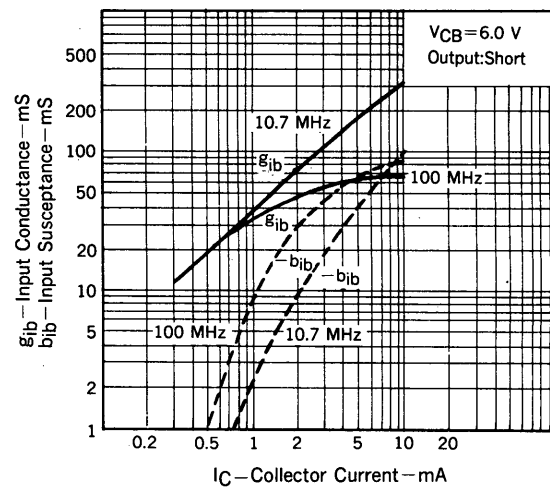
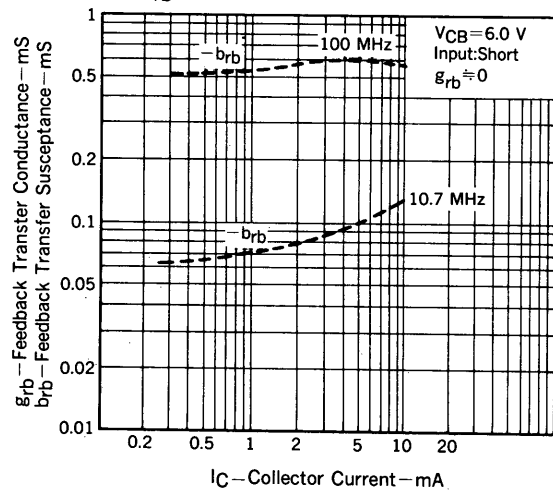
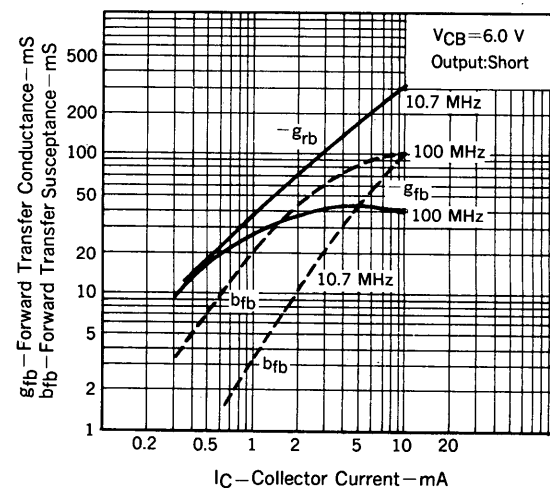


REVERSE TRANSFER ADMITTANCE (y_{re}) vs. COLLECTOR CURRENT



FORWARD TRANSFER ADMITTANCE (y_{fe}) vs. COLLECTOR CURRENT



OUTPUT ADMITTANCE (y_{oe}) vs.
COLLECTOR CURRENTINPUT ADMITTANCE (y_{ib}) vs.
COLLECTOR CURRENTREVERSE TRANSFER ADMITTANCE (y_{rb}) vs. COLLECTOR CURRENTFORWARD TRANSFER ADMITTANCE (y_{fb}) vs. COLLECTOR CURRENT

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