

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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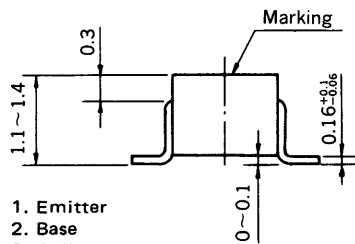
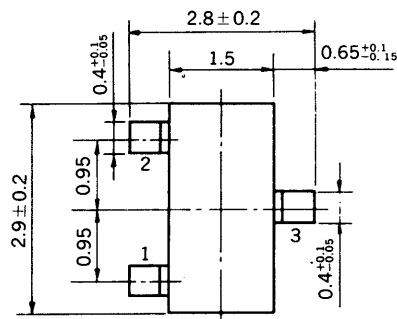
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## HIGH FREQUENCY AMPLIFIER AND SWITCHING PNP SILICON EPITAXIAL TRANSISTOR MINI MOLD

### PACKAGE DIMENSIONS

in millimeters



1. Emitter
2. Base
3. Collector

### FEATURES

- High Speed Switching:  $t_{stg} = 110$  ns
- High Gain Bandwidth Product :  $f_T = 510$  MHz
- Complementary to 2SC3734

### ABSOLUTE MAXIMUM RATINGS

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

Collector to Base Voltage	$V_{CBO}$	-40	V
Collector to Emitter Voltage	$V_{CEO}$	-40	V
Emitter to Base Voltage	$V_{EBO}$	-5	V
Collector Current (DC)	$I_C$	-200	mA

Maximum Power Dissipation

Total Power Dissipation at $25^\circ\text{C}$ Ambient Temperature	$P_T$	200	mW
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Maximum Temperatures

Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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

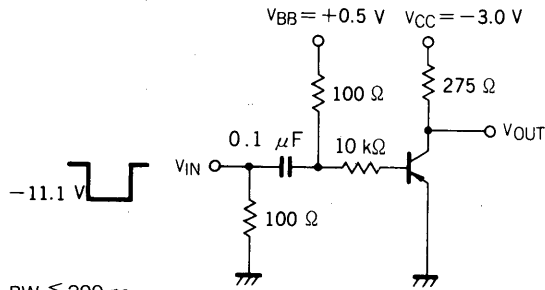
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	$I_{CBO}$			-100	nA	$V_{CB} = -30$ V, $I_E = 0$
Emitter Cutoff Current	$I_{EBO}$			-100	nA	$V_{EB} = -3.0$ V, $I_C = 0$
DC Current Gain	$h_{FE1}^*$	75	180	300		$V_{CE} = -1.0$ V, $I_C = -10$ mA
DC Current Gain	$h_{FE2}^*$	25	100			$V_{CE} = -10$ V, $I_C = -100$ mA
Collector Saturation Voltage	$V_{CE(sat)}^*$		-0.1	-0.4	V	$I_C = -50$ mA, $I_B = -5.0$ mA
Base Saturation Voltage	$V_{BE(sat)}^*$		-0.8	-0.95	V	$I_C = -50$ mA, $I_B = -5.0$ mA
Gain Bandwidth Product	$f_T$	200	510		MHz	$V_{CE} = -20$ V, $I_E = 10$ mA
Output Capacitance	$C_{ob}$		2.5	4.5	pF	$V_{CB} = -5.0$ V, $I_E = 0$ , $f = 1.0$ MHz
Turn-on Time	$t_{on}$			70	ns	$V_{CC} = -3.0$ V
Storage Time	$t_{stg}$		110	225	ns	$I_C = -10$ mA
Turn-off Time	$t_{off}$			300	ns	$I_{B1} = -I_{B2} = -1.0$ mA

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

### $h_{FE}$ Classification

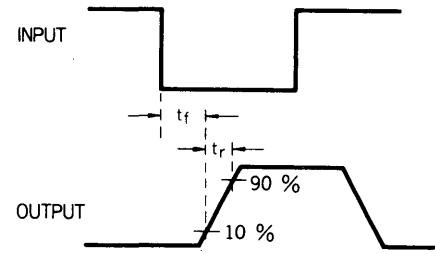
MARKING	Y22	Y23	Y24
$h_{FE1}$	75 to 150	100 to 200	150 to 300

SWITCHING TIME TEST CIRCUIT

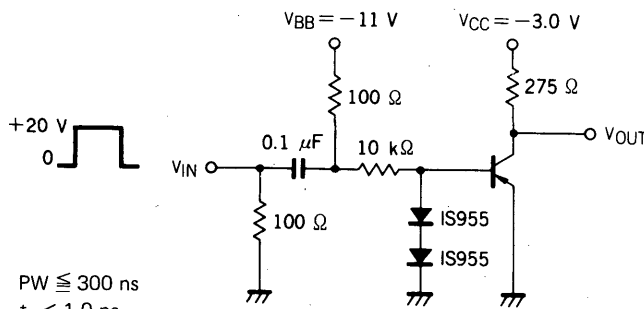


$PW \leq 300$  ns  
 $t_r < 1.0$  ns  
 $Z_{IN} = 50 \Omega$   
 Duty Cycle = 2 %

**$t_{on}$  SWITCHING**

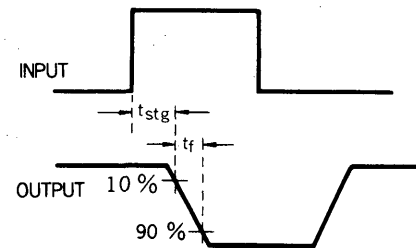


**VOLTAGE WAVEFORMS**



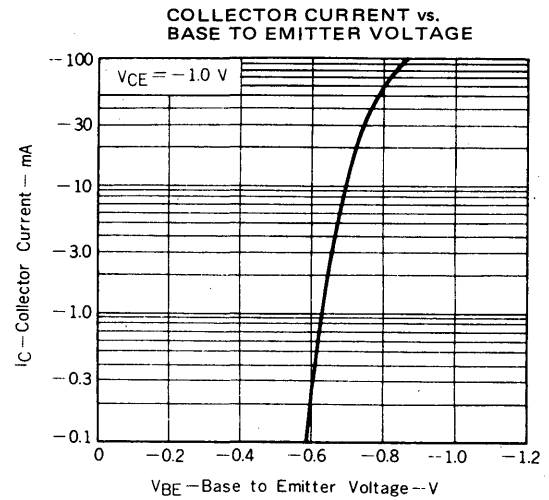
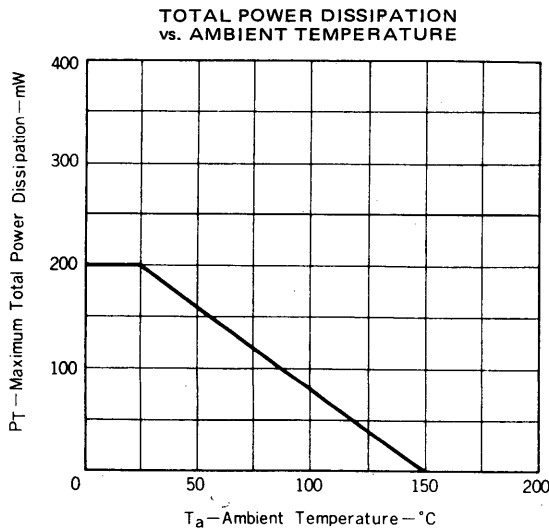
$PW \leq 300$  ns  
 $t_r < 1.0$  ns  
 Duty Cycle = 2 %

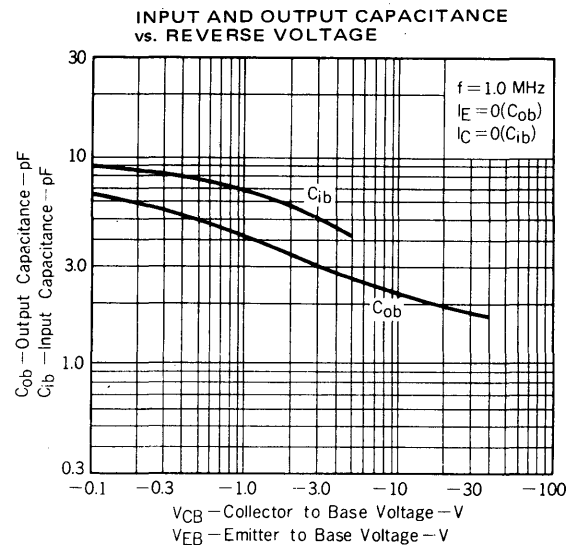
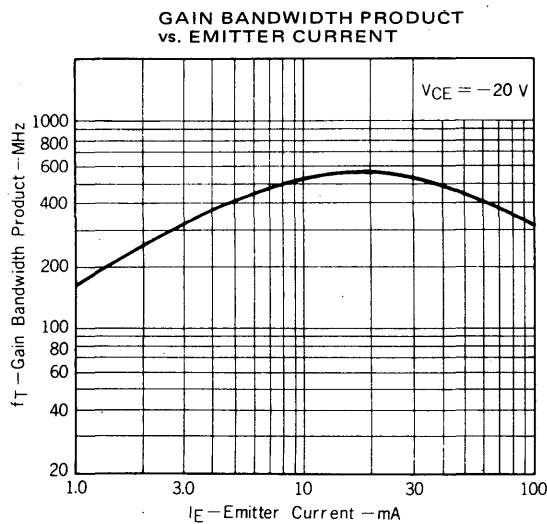
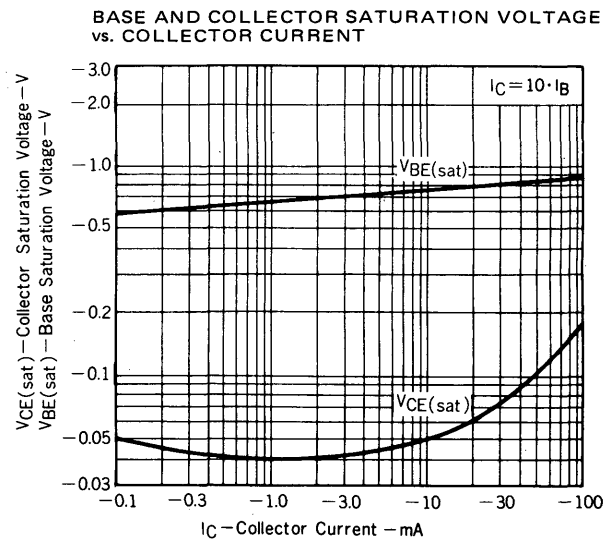
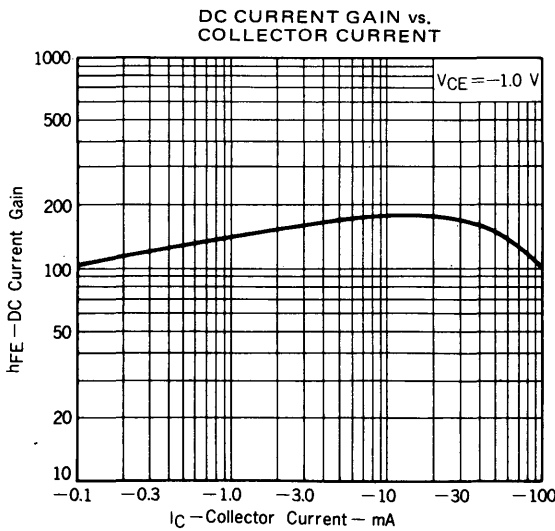
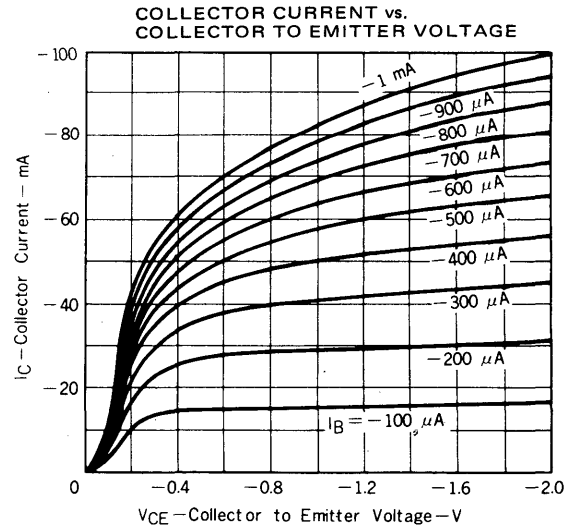
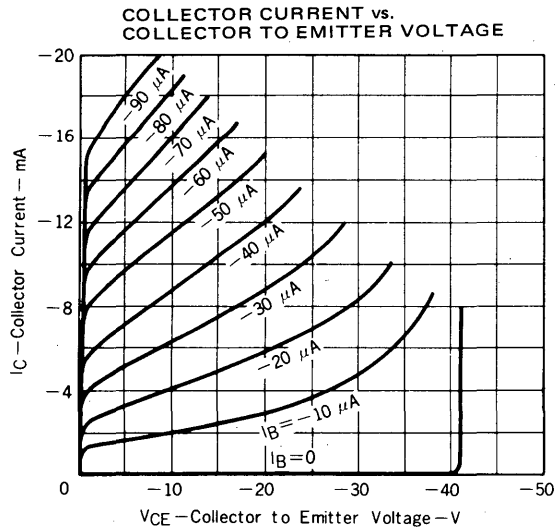
**$t_{off}$  SWITCHING**



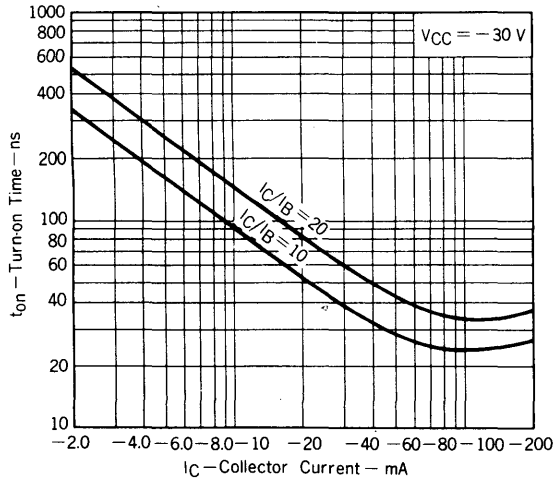
**VOLTAGE WAVEFORMS**

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

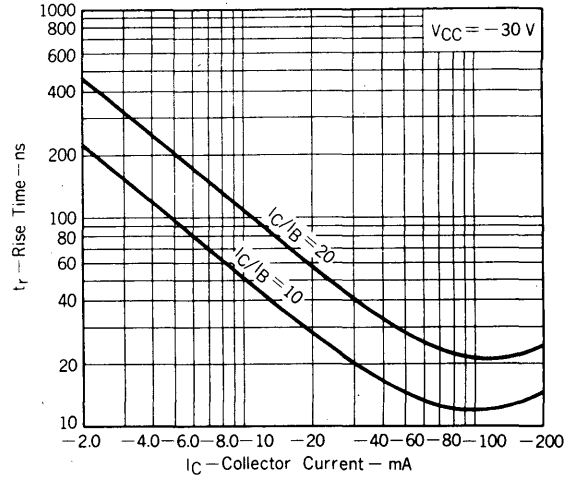




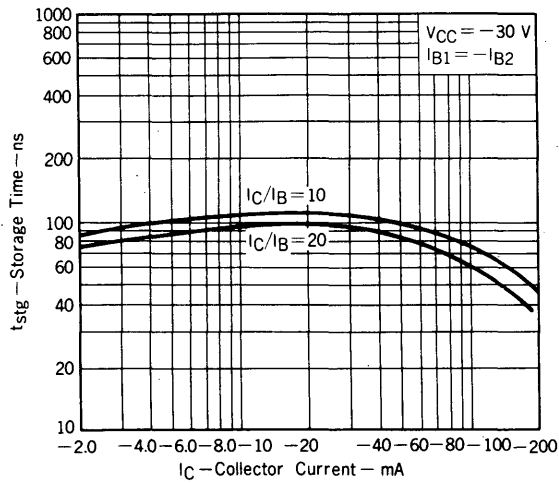
TURN-ON TIME vs. COLLECTOR CURRENT



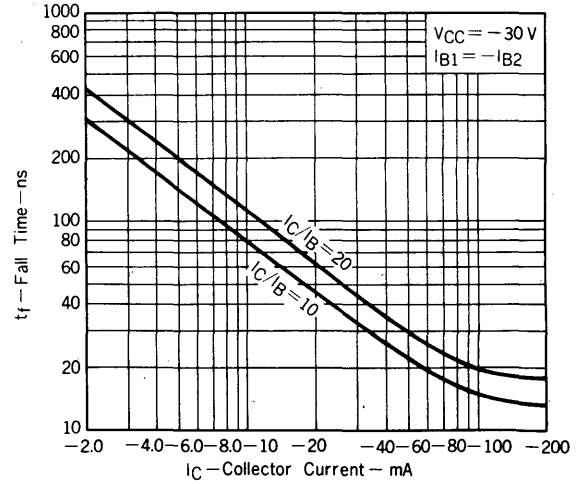
RISE TIME vs. COLLECTOR CURRENT



STORAGE TIME vs. COLLECTOR CURRENT



FALL TIME vs. COLLECTOR CURRENT



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