

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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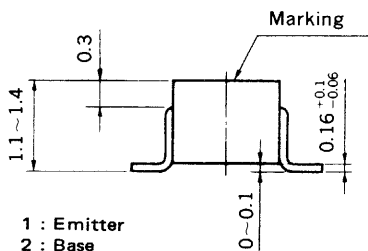
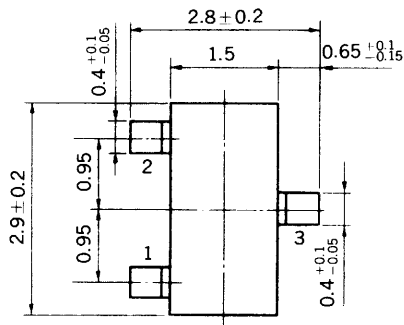
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DISPLAY TUBE DRIVE, HIGH VOLTAGE SWITCHING  
 NPN SILICON EPITAXIAL TRANSISTOR  
 MINI MOLD

**PACKAGE DIMENSIONS**

in millimeters



- 1 : Emitter
- 2 : Base
- 3 : Collector

**FEATURES**

- High Voltage  $V_{CE0}$  : 2SC1653 130 V, 2SC1654 160 V
- High DC Current Gain:  $h_{FE} = 130$  TYP. ( $V_{CE} = 3.0$  V,  $I_C = 15$  mA)

**ABSOLUTE MAXIMUM RATINGS**

Maximum Voltages and Current ( $T_a = 25^\circ\text{C}$ )	2SC1653	2SC1654
Collector to Base Voltage	$V_{CBO}$ 150	180 V
Collector to Emitter Voltage	$V_{CEO}$ 130	160 V
Emitter to Base Voltage	$V_{EBO}$	5.0 V
Collector Current (DC)	$I_C$	50 mA
Maximum Power Dissipation		
Total Power Dissipation at $25^\circ\text{C}$ Ambient Temperature	$P_T$	150 mW
Maximum Temperatures		
Junction Temperature	$T_j$	125 $^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +125 $^\circ\text{C}$

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

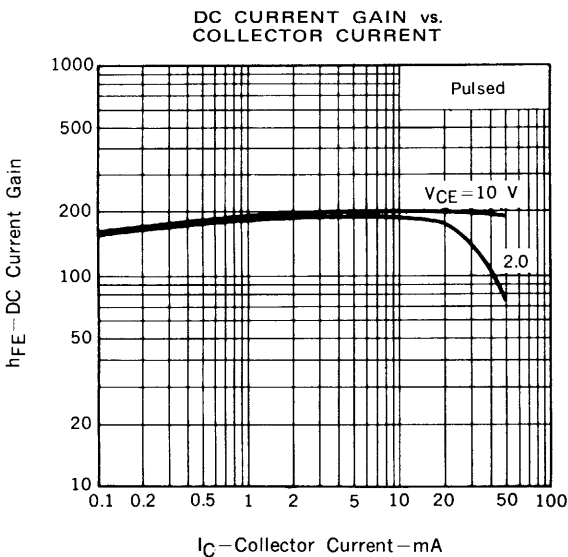
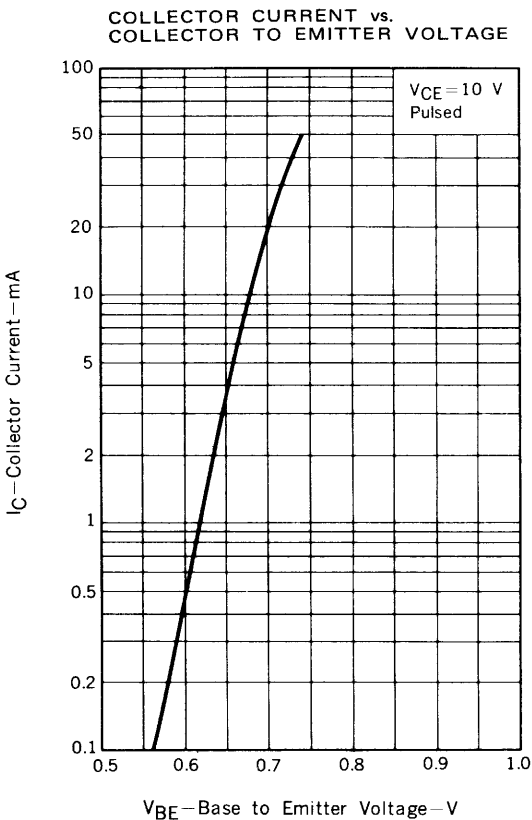
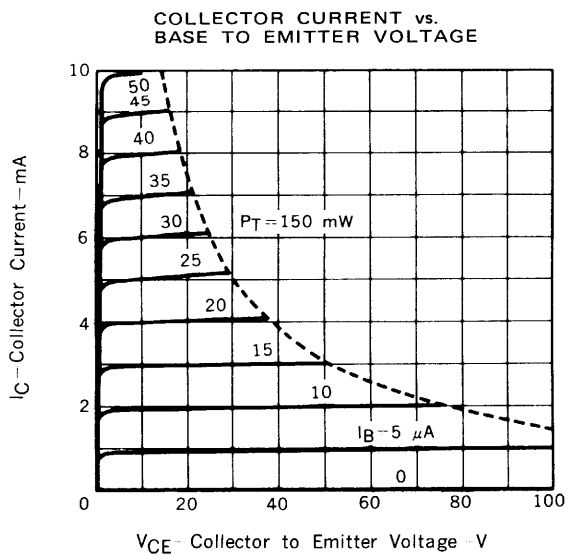
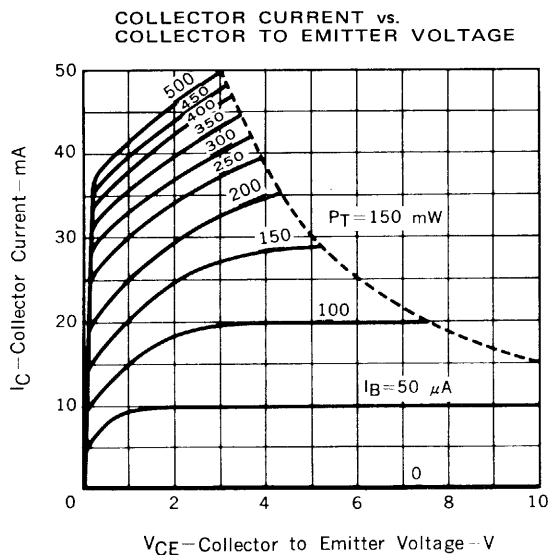
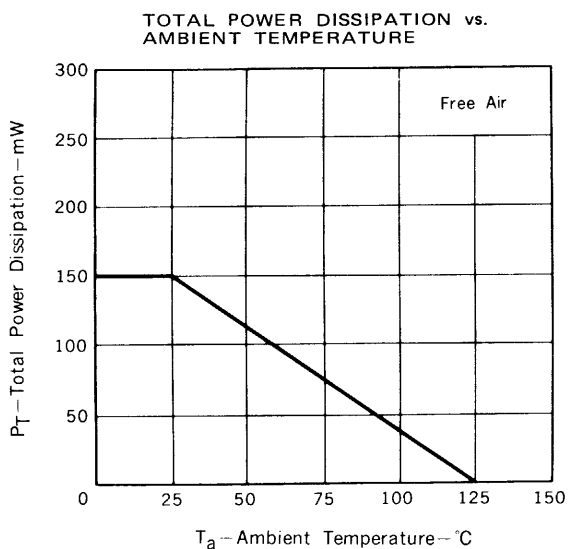
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	$I_{CBO}$			0.1	$\mu\text{A}$	$V_{CB} = 130$ V, $I_E = 0$
Emitter Cutoff Current	$I_{EBO}$			0.1	$\mu\text{A}$	$V_{EB} = 5.0$ V, $I_C = 0$
DC Current Gain	$h_{FE1}$	70	180			$V_{CE} = 3.0$ V, $I_C = 1.0$ mA
	$h_{FE2}$	90	200	400		$V_{CE} = 3.0$ V, $I_C = 15$ mA*
Collector Saturation Voltage	$V_{CE(sat)}$		0.1	0.3	V	$I_C = 50$ mA, $I_B = 5.0$ mA
Base Saturation Voltage	$V_{BE(sat)}$		0.73	1.0	V	$I_C = 50$ mA, $I_B = 5.0$ mA
Gain Bandwidth Product	$f_T$		120		MHz	$V_{CE} = 10$ V, $I_E = -10$ mA
Output Capacitance	$C_{ob}$		2.3		pF	$V_{CB} = 10$ V, $I_E = 0$ , $f = 1.0$ MHz

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

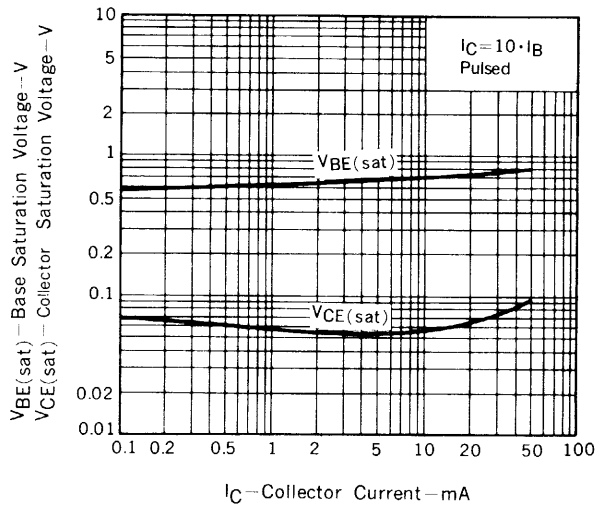
**$h_{FE2}$  Classification**

Marking	2SC1653	N2	N3	N4
	2SC1654	N5	N6	N7
$h_{FE2}$	90 to 180	135 to 270	200 to 400	

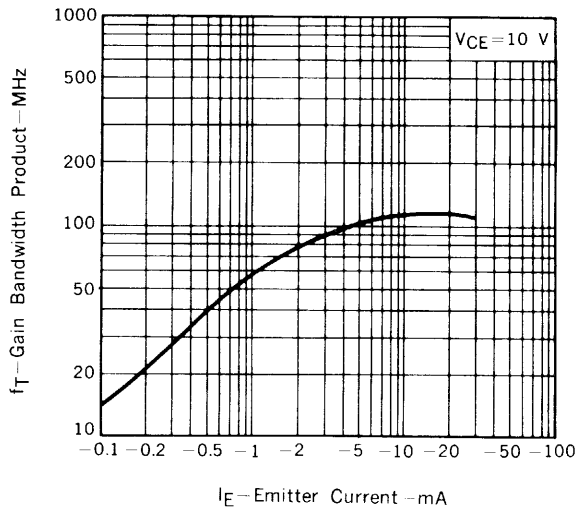
TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )



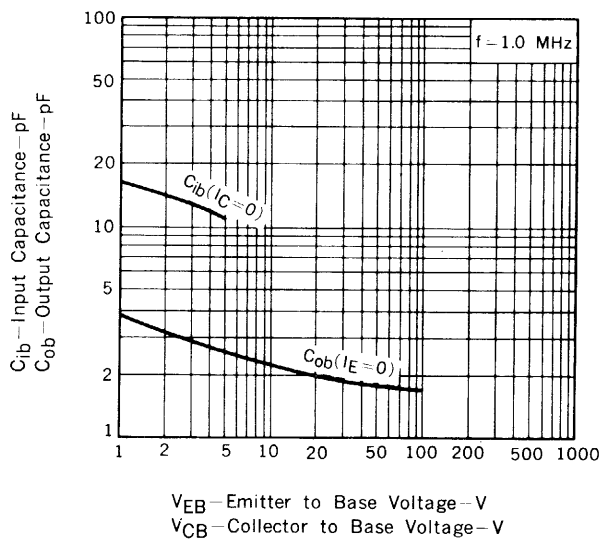
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



INPUT AND OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



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Printed in Japan