

To our customers,

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## Old Company Name in Catalogs and Other Documents

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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  
FOR HIGH-SPEED SWITCHING

The 2SC4553 is a power transistor designed especially for low collector saturation voltage and features large current switching at a low power dissipation. In addition, a high  $h_{FE}$  enables alleviation of the driver load.

FEATURES

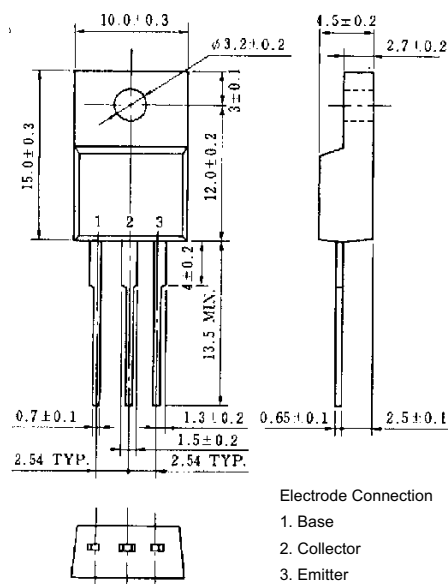
- High  $h_{FE}$  and low  $V_{CE(sat)}$ :  
 $h_{FE} \cong 800$  ( $V_{CE} = 2\text{ V}$ ,  $I_C = 3\text{ A}$ )  
 $V_{CE(sat)} \cong 0.12\text{ V}$  ( $I_C = 3\text{ A}$ ,  $I_B = 0.03\text{ A}$ )
- On-chip C to E damper diode
- Mold package that does not require an insulating board or insulation bushing

ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

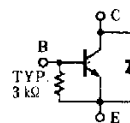
Parameter	Symbol	Ratings	Unit
Collector to base voltage	$V_{CBO}$	100	V
Collector to emitter voltage	$V_{CEO}$	100	V
Emitter to base voltage	$V_{EBO}$	7.0	V
Collector current (DC)	$I_{C(DC)}$	$\pm 7.5$	A
Collector current (pulse)	$I_{C(pulse)^*}$	$\pm 10$	A
Base current (DC)	$I_{B(DC)}$	2.0	A
Total power dissipation	$P_T$ ( $T_C = 25^\circ\text{C}$ )	30	W
Total power dissipation	$P_T$ ( $T_a = 25^\circ\text{C}$ )	2.0	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

\*  $PW \leq 10\text{ ms}$ , duty cycle  $\leq 50\%$

PACKAGE DRAWING (UNIT: mm)



EQUIVALENT CIRCUIT

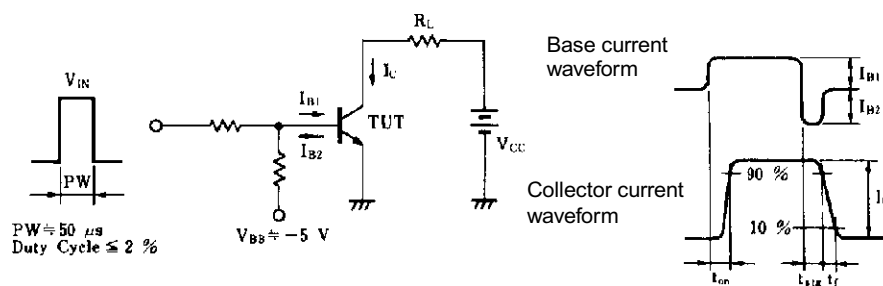


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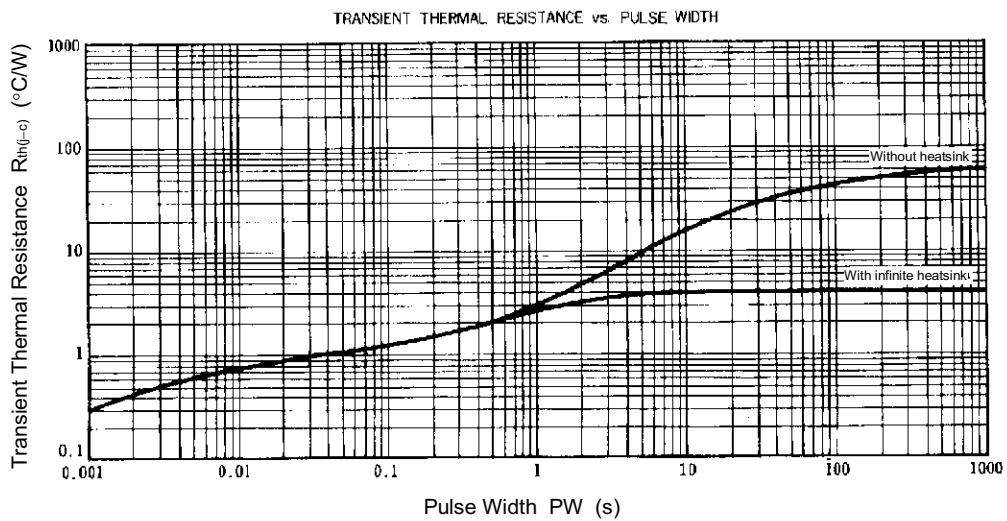
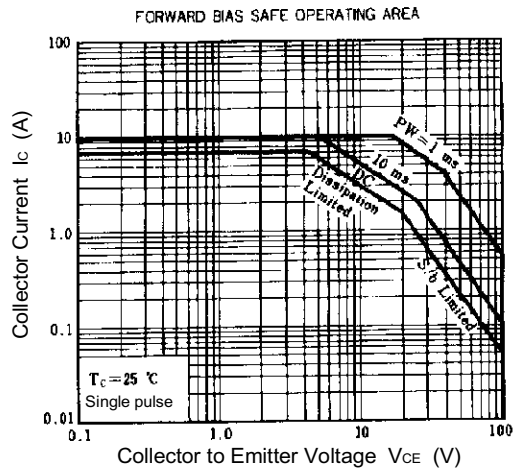
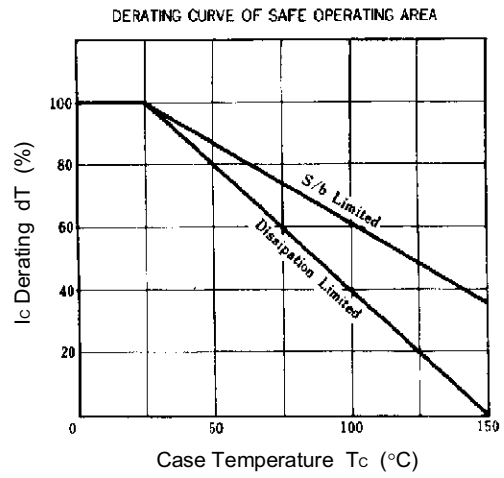
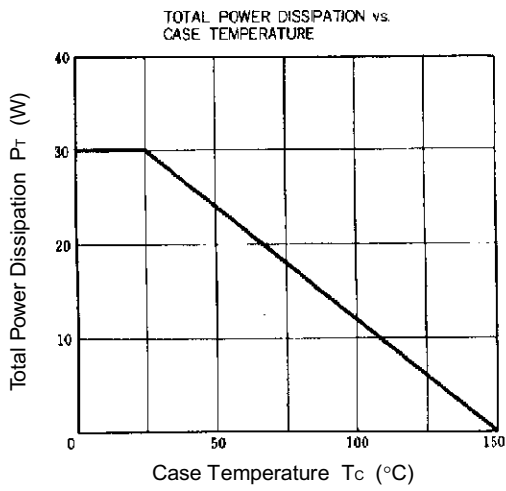
**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

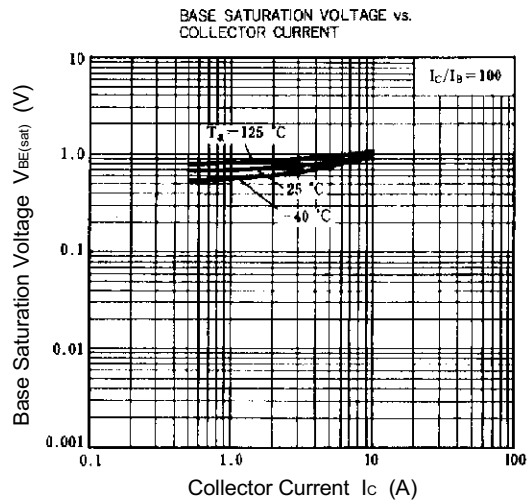
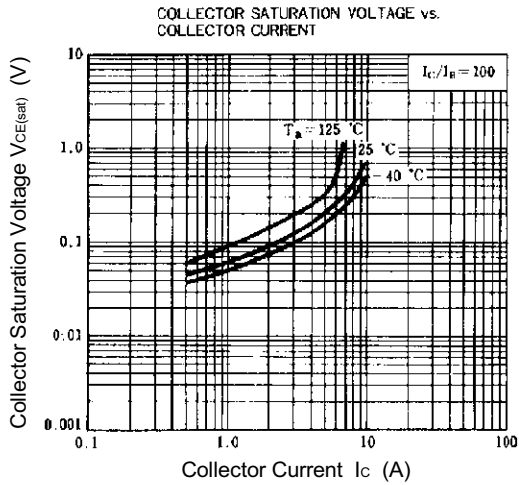
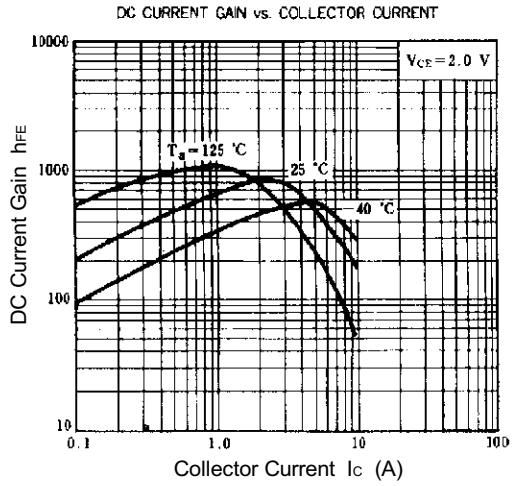
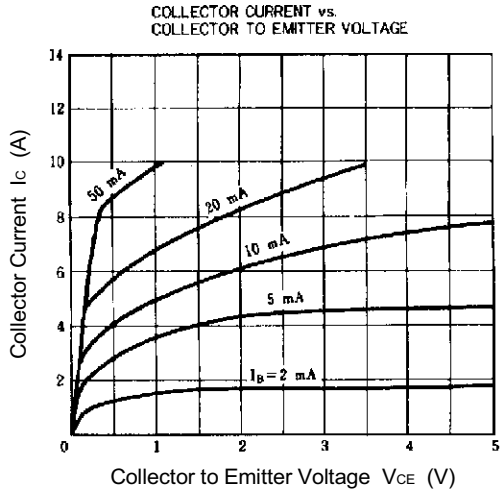
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	$I_{CBO}$	$V_{CB} = 100\text{ V}, I_E = 0$			10	$\mu\text{A}$
Emitter cutoff current	$I_{EBO}$	$V_{EB} = 5.0\text{ V}, I_C = 0$			17	mA
DC current gain	$h_{FE1}$	$V_{CE} = 2.0\text{ V}, I_C = 3.0\text{ A}$	450	800	2,000	
DC current gain	$h_{FE2}$	$V_{CE} = 2.0\text{ V}, I_C = 5.0\text{ A}$	150			
Collector saturation voltage	$V_{CE(sat)1}$	$I_C = 3.0\text{ A}, I_B = 60\text{ mA}$			0.2	V
Collector saturation voltage	$V_{CE(sat)2}$	$I_C = 3.0\text{ A}, I_B = 30\text{ mA}$		0.12	0.3	V
Collector saturation voltage	$V_{CE(sat)3}$	$I_C = 5.0\text{ A}, I_B = 100\text{ mA}$			0.4	V
Collector saturation voltage	$V_{CE(sat)4}$	$I_C = 5.0\text{ A}, I_B = 50\text{ mA}$			0.55	V
Base saturation voltage	$V_{BE(sat)}$	$I_C = 5.0\text{ A}, I_B = 50\text{ mA}$			1.2	V
Gain bandwidth product	$f_T$	$V_{CE} = 5.0\text{ V}, I_C = 0.5\text{ A}$		100		MHz
Collector capacitance	$C_{ob}$	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$		110		pF
Turn-on time	$t_{on}$	$I_C = 5.0\text{ A}, R_L = 3.0\ \Omega,$ $I_{B1} = -I_{B2} = 100\text{ mA}, V_{CC} \cong 16\text{ V}$ Refer to the test circuit.		0.5		$\mu\text{s}$
Storage time	$t_{stg}$			2.0		$\mu\text{s}$
Fall time	$t_f$			0.5		$\mu\text{s}$
Diode forward voltage	$V_{DF}$	$I_{DF} = 5.0\text{ A}$		1.4		V

**SWITCHING TIME ( $t_{on}$ ,  $t_{stg}$ ,  $t_f$ ) TEST CIRCUIT**



TYPICAL CHARACTERISTICS (Ta = 25°C)





[MEMO]

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