

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 SWITCHING

The 2SC4554 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

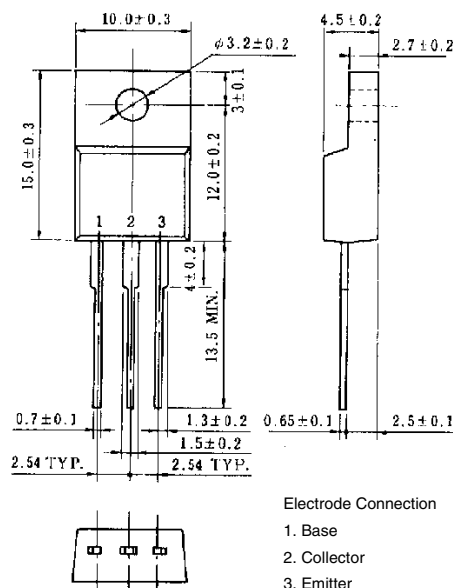
- High  $h_{FE}$  and low  $V_{CE(sat)}$ :  
 $h_{FE} \cong 800$  ( $V_{CE} = 2\text{ V}$ ,  $I_C = 5\text{ A}$ )  
 $V_{CE(sat)} \cong 0.12\text{ V}$  ( $I_C = 5\text{ A}$ ,  $I_B = 0.05\text{ A}$ )
- On-chip C to E damper diode
- Mold package that does not require an insulating board or insulation bushing

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

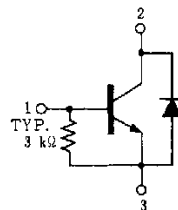
| Parameter                    | Symbol                             | Ratings     | Unit             |
|------------------------------|------------------------------------|-------------|------------------|
| Collector to base voltage    | $V_{CBO}$                          | 100         | V                |
| Collector to emitter voltage | $V_{CEO}$                          | 100         | V                |
| Emitter to base voltage      | $V_{EBO}$                          | 7.0         | V                |
| Collector current (DC)       | $I_{C(DC)}$                        | $\pm 15$    | A                |
| Collector current (pulse)    | $I_{C(pulse)^*}$                   | $\pm 22$    | A                |
| Base current (DC)            | $I_{B(DC)}$                        | 4.0         | A                |
| Total power dissipation      | $P_T$ ( $T_c = 25^\circ\text{C}$ ) | 35          | 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

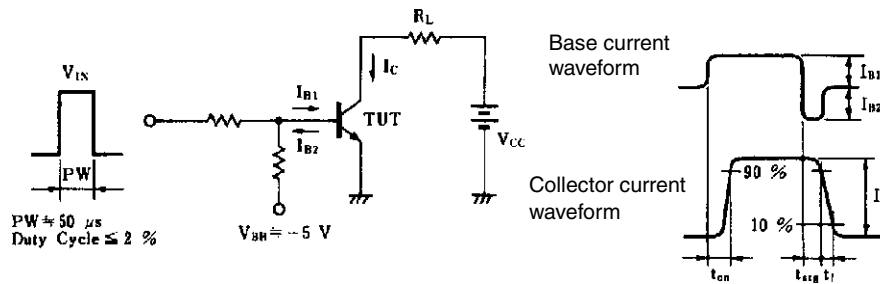


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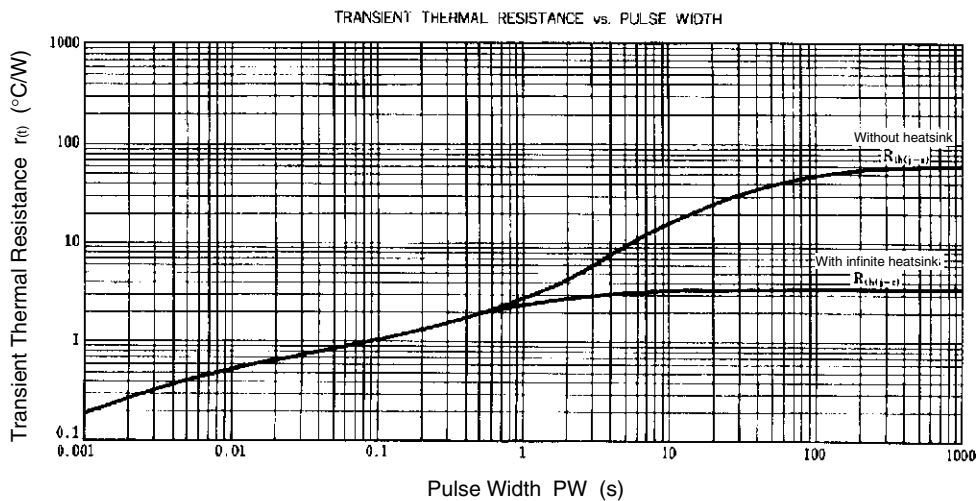
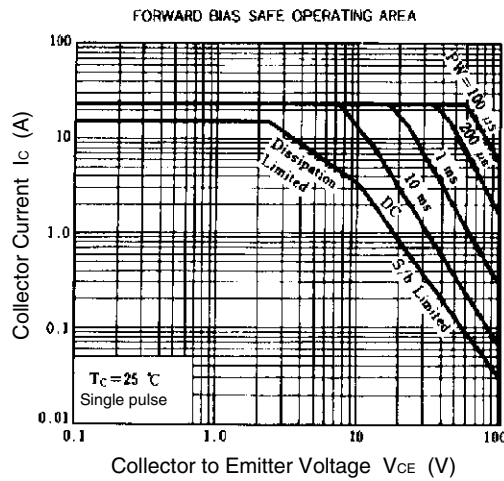
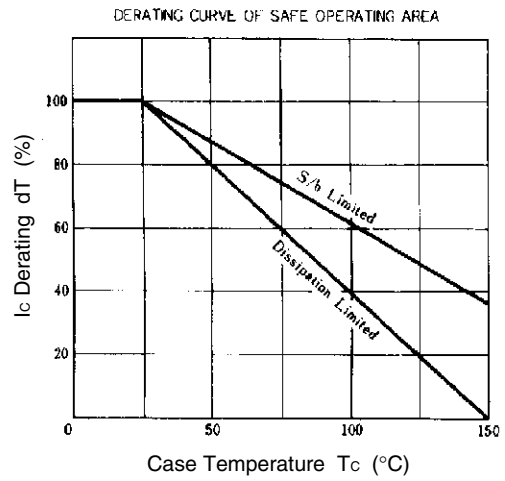
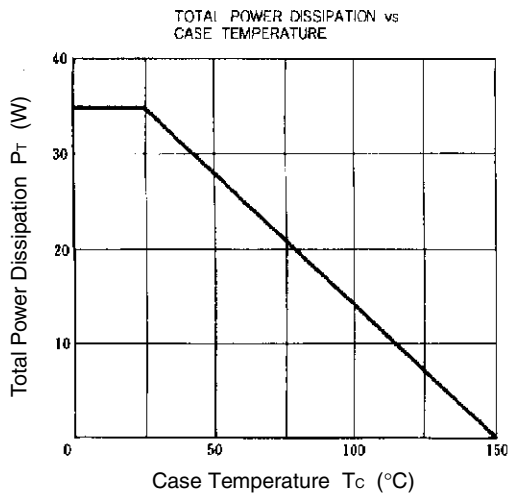
**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

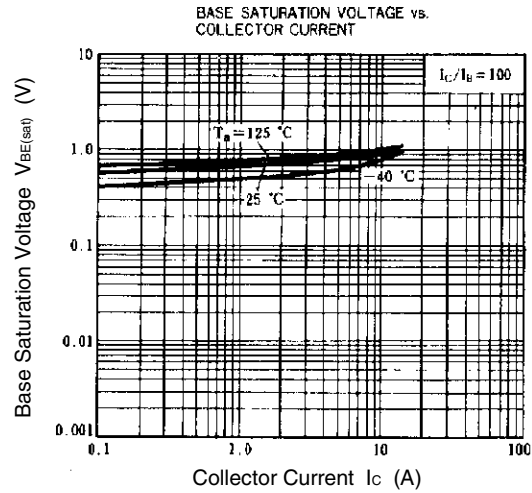
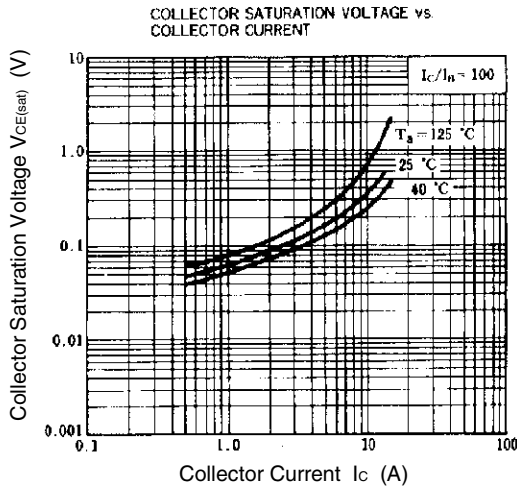
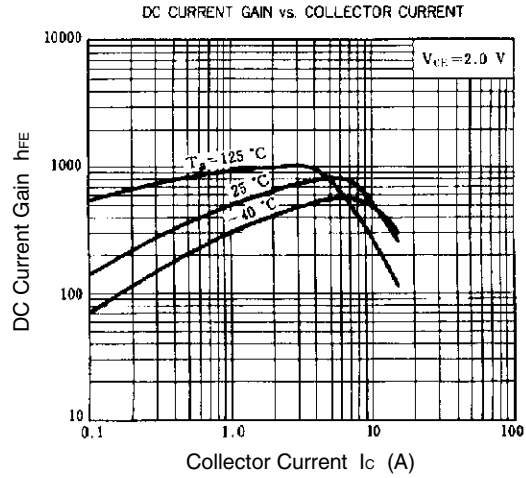
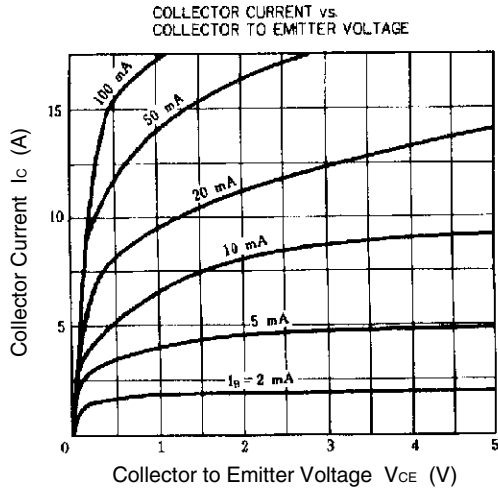
| Parameter                    | Symbol         | Conditions  | MIN. | TYP. | MAX.          | Unit          |
|------------------------------|----------------|---|------|------|---------------|---------------|
| Collector cutoff current     | $I_{CBO}$      | $V_{CB} = 100\text{ V}, I_E = 0$  |      |      | 10            | $\mu\text{A}$ |
| Emitter cutoff current       | $I_{EBO}$      | $V_{EB} = 5.0\text{ V}, I_C = 0$  |      |      | 17            | mA            |
| DC current gain              | $h_{FE1}$      | $V_{CE} = 2.0\text{ V}, I_C = 5.0\text{ A}$   | 450  | 800  | 2,000         |               |
| DC current gain              | $h_{FE2}$      | $V_{CE} = 2.0\text{ V}, I_C = 10\text{ A}$  | 150  |      |               |               |
| Collector saturation voltage | $V_{CE(sat)1}$ | $I_C = 5.0\text{ A}, I_B = 100\text{ mA}$   |      |      | 0.25          | V             |
| Collector saturation voltage | $V_{CE(sat)2}$ | $I_C = 5.0\text{ A}, I_B = 50\text{ mA}$  |      | 0.12 | 0.3           | V             |
| Collector saturation voltage | $V_{CE(sat)3}$ | $I_C = 10\text{ A}, I_B = 200\text{ mA}$  |      |      | 0.4           | V             |
| Collector saturation voltage | $V_{CE(sat)4}$ | $I_C = 10\text{ A}, I_B = 100\text{ mA}$  |      |      | 0.75          | V             |
| Base saturation voltage      | $V_{BE(sat)}$  | $I_C = 10\text{ A}, I_B = 100\text{ mA}$  |      |      | 1.2           | V             |
| Gain bandwidth product       | $f_T$          | $V_{CE} = 5.0\text{ V}, I_C = 1.0\text{ A}$   |      | 100  |               | MHz           |
| Collector capacitance        | $C_{ob}$       | $V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$   |      | 210  |               | pF            |
| Turn-on time                 | $t_{on}$       | $I_C = 8.0\text{ A}, R_L = 2.0\ \Omega,$<br>$I_{B1} = -I_{B2} = 80\text{ mA}, V_{CC} \cong 16\text{ V}$<br>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        | $V_{DF}$       | $I_{DF} = 10\text{ A}$  |      | 1.6  |               | V             |

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



TYPICAL CHARACTERISTICS (Ta = 25°C)





[MEMO]

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