

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>)

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SILICON POWER TRANSISTOR

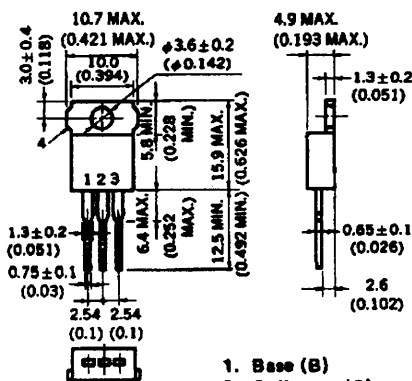
NTC2654

HIGH SPEED HIGH CURRENT SWITCHING NPN SILICON EPITAXIAL TRANSISTOR INDUSTRIAL USE

DESCRIPTION

Suitable for Lamp Driver, DC-DC converter and ultrasonic appliance applications.

PACKAGE DIMENSIONS in millimeters (inches)



FEATURES

- Low collector saturation voltage. ($V_{CE(sat)} = 0.3 \text{ V MAX. at } I_C = 3.0 \text{ A}$)
- High speed switching.

ABSOLUTE MAXIMUM RATINGS

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

Collector to Emitter Voltage	V_{CEX}	100	V
Collector to Emitter Sustaining Voltage	$V_{CEO(SUS)}$	40	V
Emitter to Base Voltage	V_{EBO}	7.0	V
Continuous Collector Current	$I_C(DC)$	10	A
Peak Collector Current	$I_C(pulse)^*$	20	A
Continuous Base Current	$I_B(DC)$	5	A

Maximum Power Dissipations

Total Power Dissipation	$P_T (T_c = 25^\circ \text{C})$	40	W
Total Power Dissipation	$P_T (T_a = 25^\circ \text{C})$	2.0	W

Maximum Temperatures

Junction Temperature	T_j	150	$^\circ \text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ \text{C}$
Lead Temperature	T_L	260	$^\circ \text{C}$
3.18 mm (1/8 inch) from case for 10 seconds			

Thermal Resistances

Junction to Case	$R_{th(j-c)}$	3.125	$^\circ \text{C/W}$
Junction to Ambient	$R_{th(j-a)}$	62.5	$^\circ \text{C/W}$

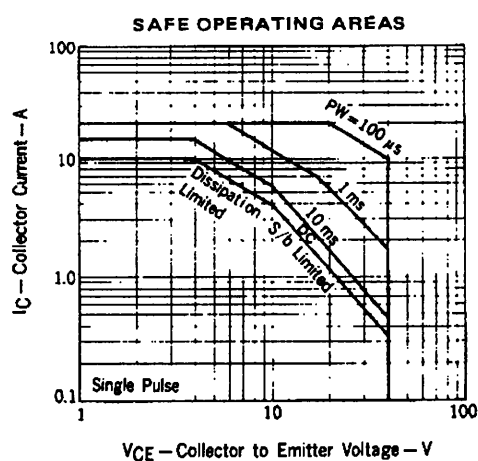
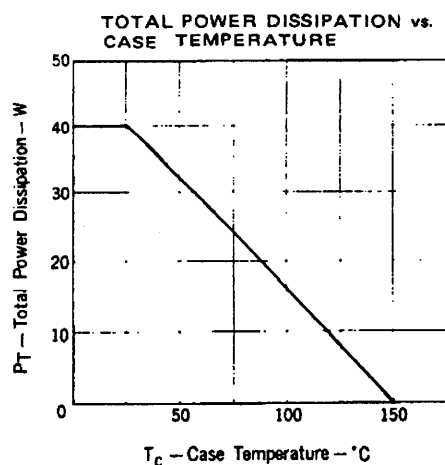
* Pulse Condition $PW \leq 300 \mu s$, Duty Cycle $\leq 10 \%$

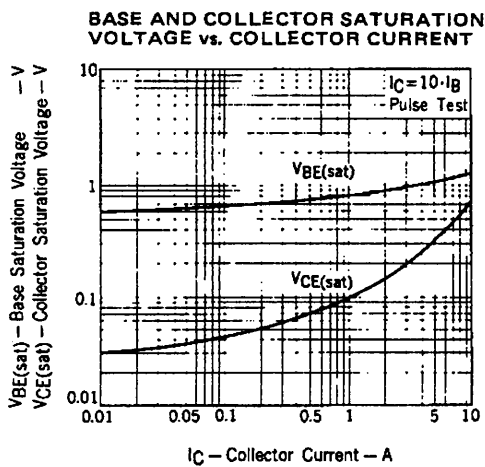
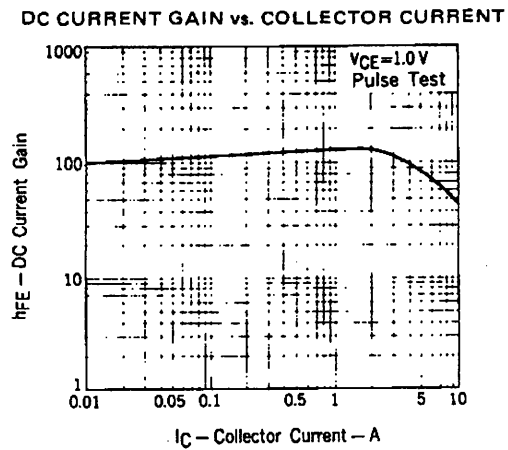
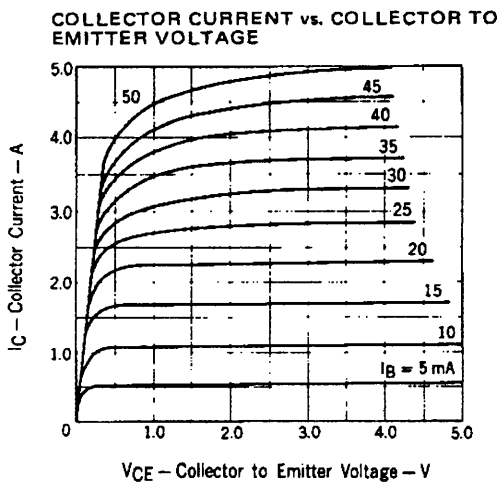
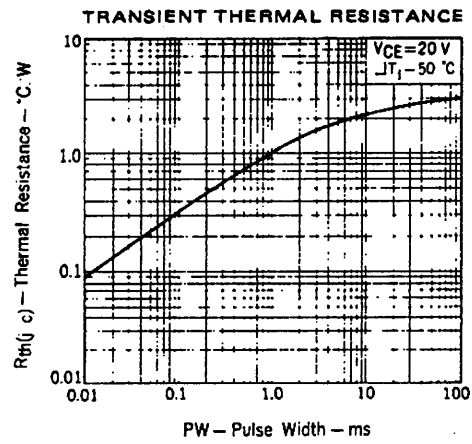
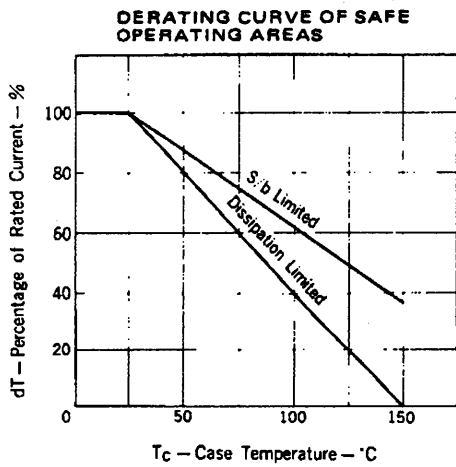
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$ unless otherwise noted.)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO1}			10	μA	$V_{CB}=40\text{ V}, I_E=0$
	I_{CBO2}				μA	$V_{CB}=40\text{ V}, I_E=0$ $T_a=125^\circ\text{C}$
	I_{CER}			1.0	mA	$V_{CE}=40\text{ V}, R_{BE}=51\ \Omega, T_a=125^\circ\text{C}$
Emitter Cutoff Current	I_{EBO}			10	μA	$V_{EB}=5.0\text{ V}, I_C=0$
DC Current Gain	h_{FE1}	40		320		$V_{CE}=1.0\text{ V}, I_C=3.0\text{ A}$ *
	h_{FE2}	40				$V_{CE}=1.0\text{ V}, I_C=5.0\text{ A}$ *
Collector Saturation Voltage	$V_{CE(sat)1}$			0.3	V	$I_C=3.0\text{ A}, I_B=0.1\text{ A}$ *
	$V_{CE(sat)2}$			0.6	V	$I_C=5.0\text{ A}, I_B=0.5\text{ A}$ *
Base Saturation Voltage	$V_{BE(sat)1}$			1.5	V	$I_C=3.0\text{ A}, I_B=0.1\text{ A}$ *
	$V_{BE(sat)2}$			2.0	V	$I_C=5.0\text{ A}, I_B=0.5\text{ A}$ *
Turn On Time	t_{on}			1.0	μs	$I_C=5.0\text{ A}, I_{B1}=-I_{B2}=0.5\text{ A}$ $V_{BE(OFF)}=-5.0\text{ V}, R_L=4\ \Omega$ $V_{CC}=20\text{ V}$
Storage Time	t_{stg}			2.5	μs	
Fall Time	t_f			1.0	μs	

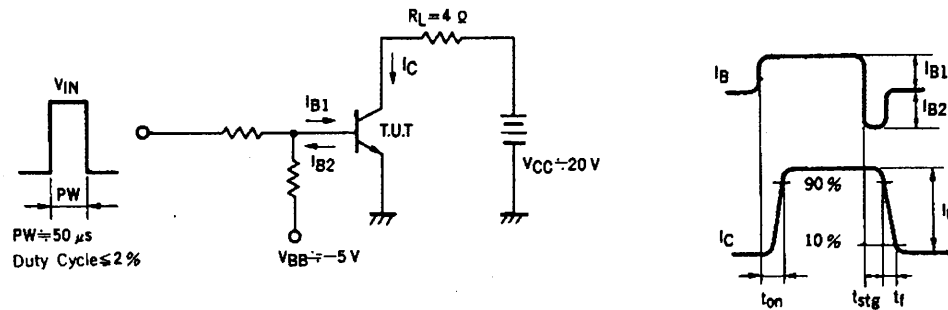
* Pulsed $PW \leq 350\ \mu\text{s}$, Duty Cycle $\leq 2\%$

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





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



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