

To all our customers

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Renesas Technology Corp.  
Customer Support Dept.  
April 1, 2003

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Keep safety first in your circuit designs!

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# 2SC2816

Silicon NPN Triple Diffused

## RENESAS

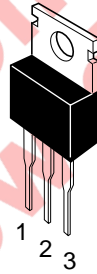
ADE-208-887 (Z)  
1st. Edition  
September 2000

### Application

High voltage, high speed and high power switching

### Outline

TO-220AB



1. Base
2. Collector (Flange)
3. Emitter

### Absolute Maximum Ratings (Ta = 25°C)

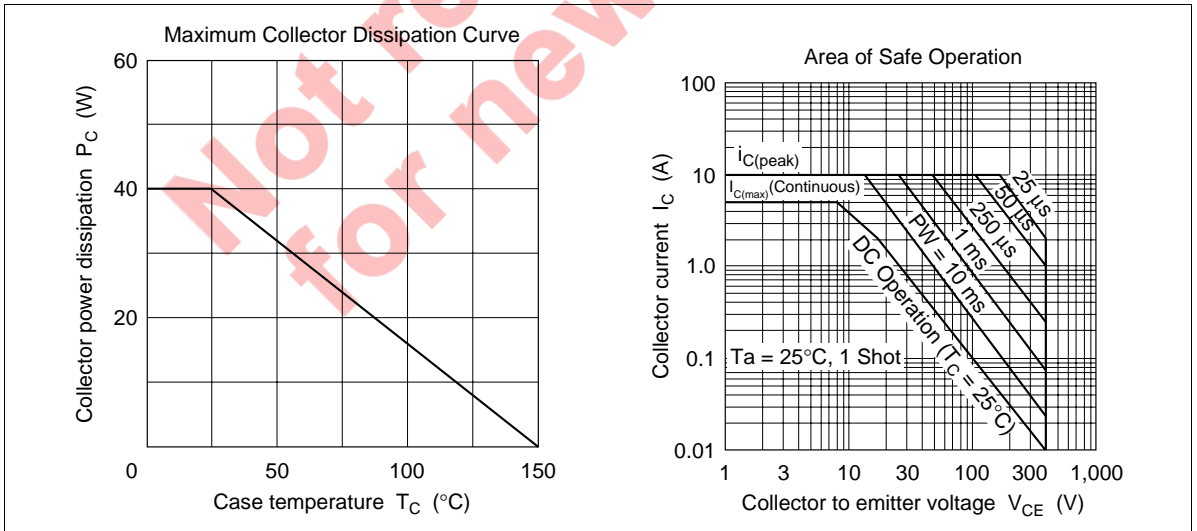
Item	Symbol	Ratings	Unit
Collector to base voltage	$V_{CBO}$	500	V
Collector to emitter voltage	$V_{CEO}$	400	V
Emitter to base voltage	$V_{EBO}$	7	V
Collector current	$I_C$	5	A
Collector peak current	$I_{C(\text{peak})}$	10	A
Base current	$I_B$	2.5	A
Collector power dissipation	$P_C^{*1}$	40	W
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{\text{stg}}$	-55 to +150	°C

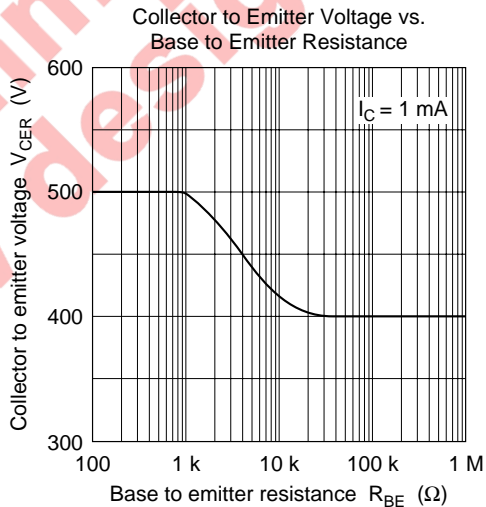
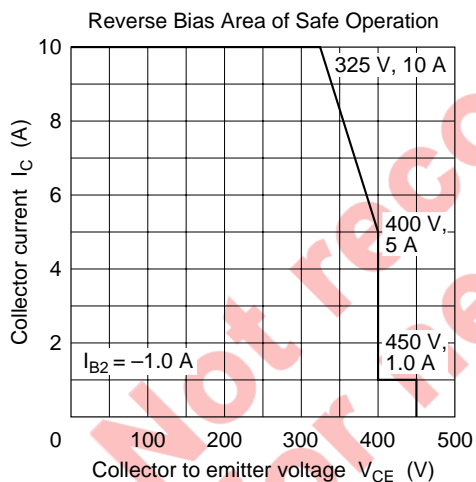
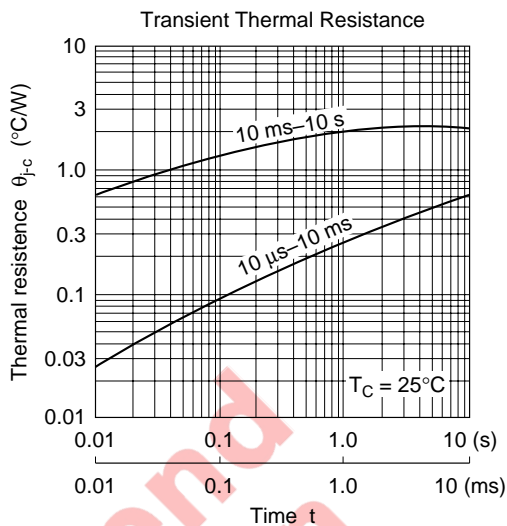
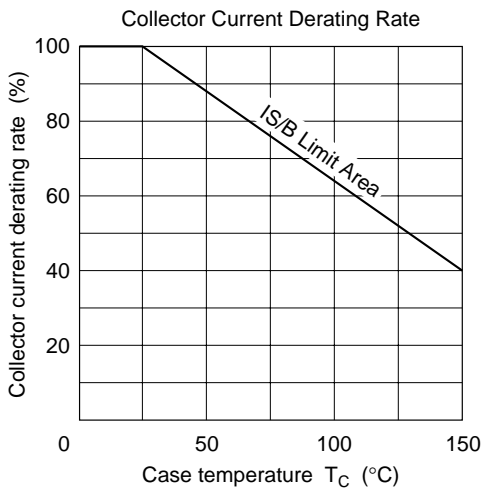
Note: 1. Value at  $T_C = 25^\circ\text{C}$ .

## Electrical Characteristics (Ta = 25°C)

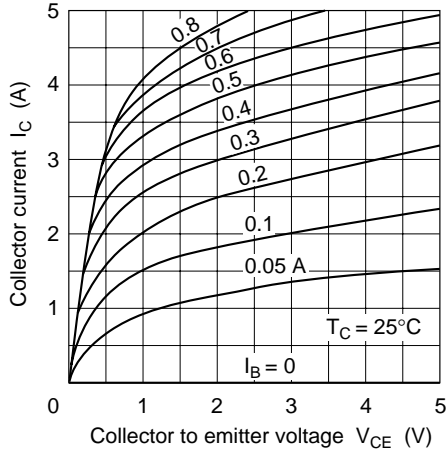
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to emitter sustain voltage	$V_{CEO(sus)}$	400	—	—	V	$I_C = 0.2 \text{ A}$ , $R_{BE} = \infty$ , $L = 100 \text{ mH}$
	$V_{CEX(sus)}$	400	—	—	V	$I_C = 5 \text{ A}$ , $I_{B1} = -I_{B2} = 1.0 \text{ A}$ $V_{BE} = -5.0 \text{ V}$ , $L = 180 \text{ } \mu\text{H}$ , Clamped
Emitter to base breakdown voltage	$V_{(BR)EBO}$	7	—	—	V	$I_E = 10 \text{ mA}$ , $I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	50	$\mu\text{A}$	$V_{CB} = 400 \text{ V}$ , $I_E = 0$
	$I_{CEO}$	—	—	50	$\mu\text{A}$	$V_{CE} = 350 \text{ V}$ , $R_{BE} = \infty$
DC current transfer ratio	$h_{FE1}$	15	—	—		$V_{CE} = 5.0 \text{ V}$ , $I_C = 2.5 \text{ A}^{*1}$
	$h_{FE2}$	7	—	—		$V_{CE} = 5.0 \text{ V}$ , $I_C = 5 \text{ A}^{*1}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	1.0	V	$I_C = 2.5 \text{ A}$ , $I_B = 0.5 \text{ A}^{*1}$
Base to emitter saturation voltage	$V_{BE(sat)}$	—	—	1.5	V	$I_C = 2.5 \text{ A}$ , $I_B = 0.5 \text{ A}^{*1}$
Turn on time	$t_{on}$	—	—	0.5	$\mu\text{s}$	$I_C = 5 \text{ A}$ , $I_{B1} = -I_{B2} = 1.0 \text{ A}$ ,
Storage time	$t_{stg}$	—	—	1.5	$\mu\text{s}$	$V_{CC} \cong 150 \text{ V}$
Fall time	$t_f$	—	0.3	0.5	$\mu\text{s}$	

Note: 1. Pulse test.

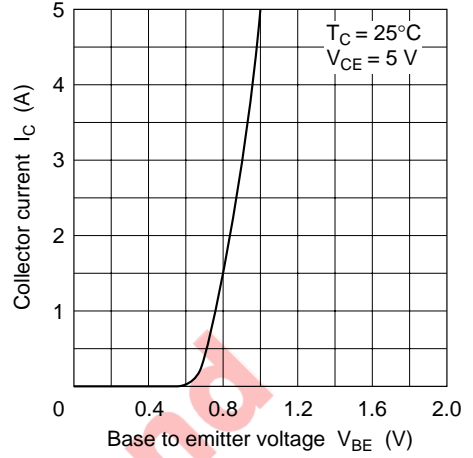




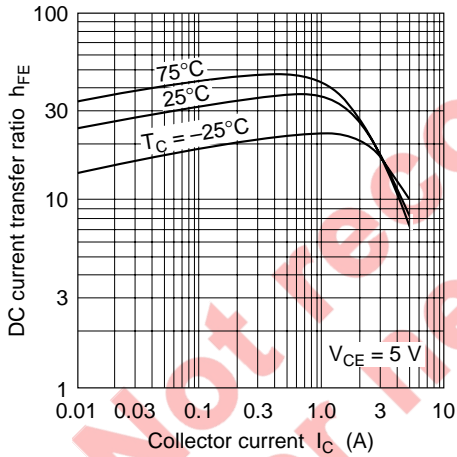
Typical Output Characteristics



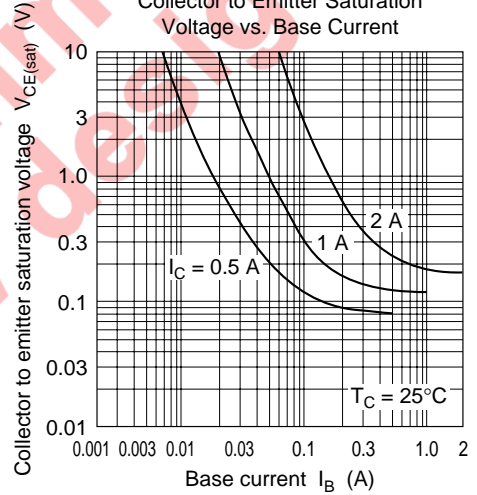
Typical Transfer Characteristics

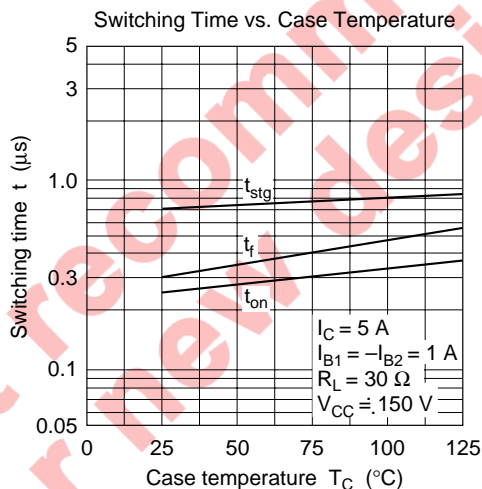
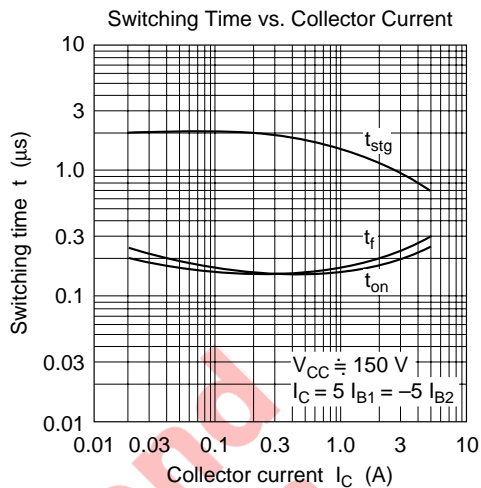
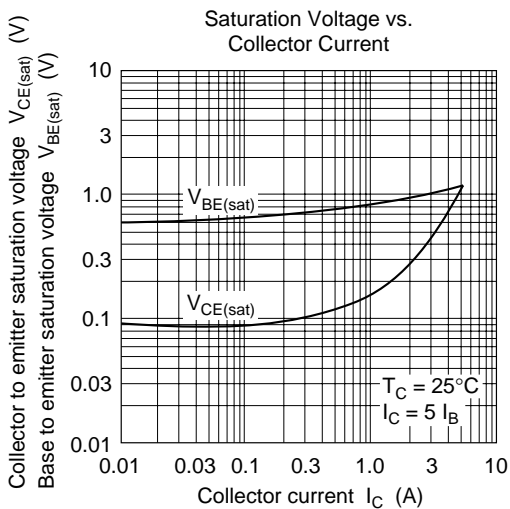


DC Current Transfer Ratio vs. Collector Current



Collector to Emitter Saturation Voltage vs. Base Current





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