2SC2816

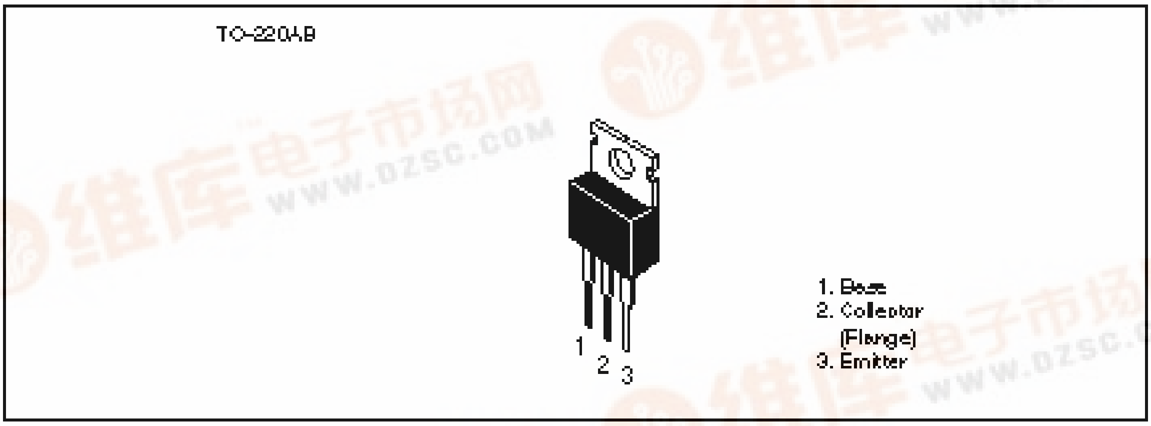
Silicon NPN Triple Diffused

HITACHI

Application

High voltage, high speed and high power switching

Outline



Absolute Maximum Ratings (Ta = 25°C)

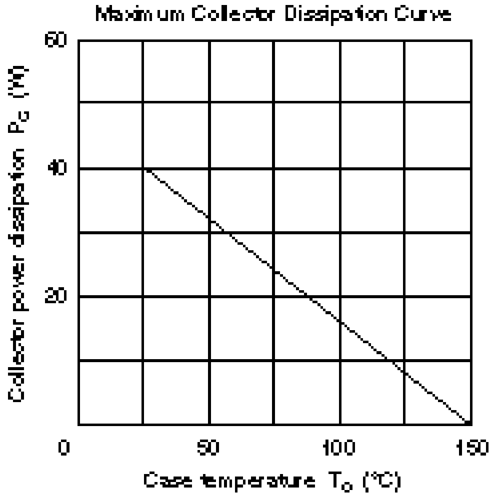
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	500	V
Collector to emitter voltage	V_{CEO}	400	V
Emitter to base voltage	V_{EBO}	7	V
Collector current	I_C	5	A
Collector peak current	$I_{C(peak)}$	10	A
Base current	I_B	2.5	A
Collector power dissipation	P_C*[1]	40	W
Junction temperature	Tj	150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

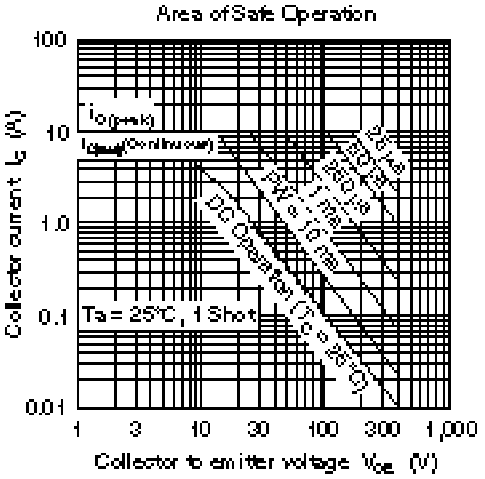
Note: 1. Value at T_C = 25°C.

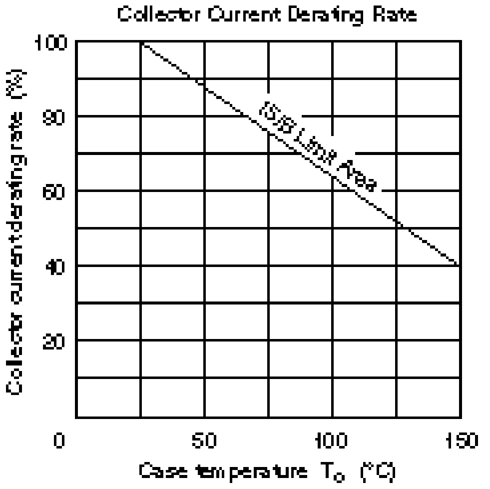
Electrical Characteristics (Ta = 25°C)

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

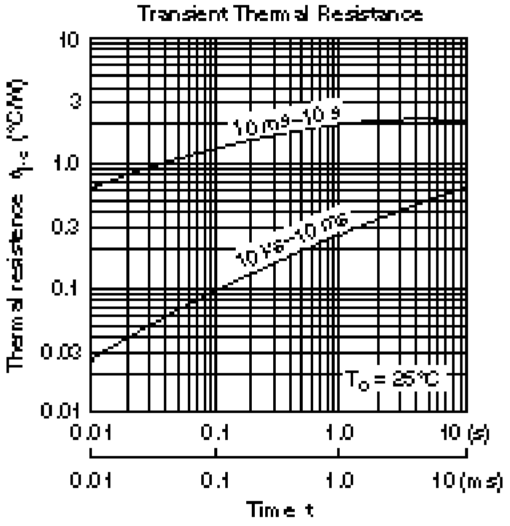
Note: 1. Pulse test.



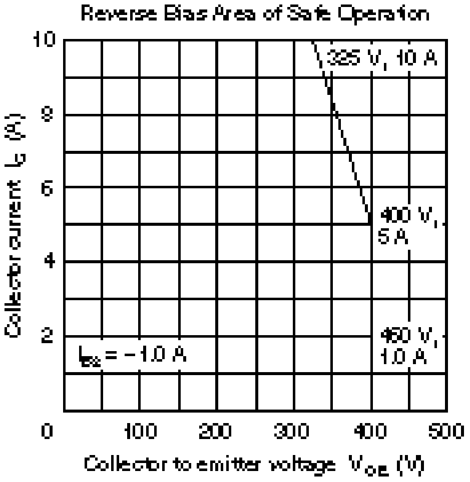




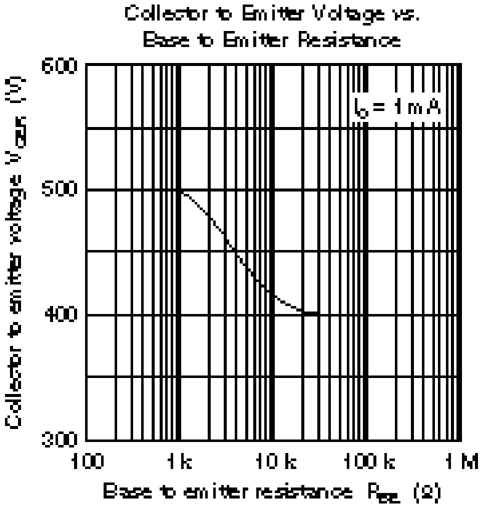
Collector Current Derating Rate



Transient Thermal Resistance

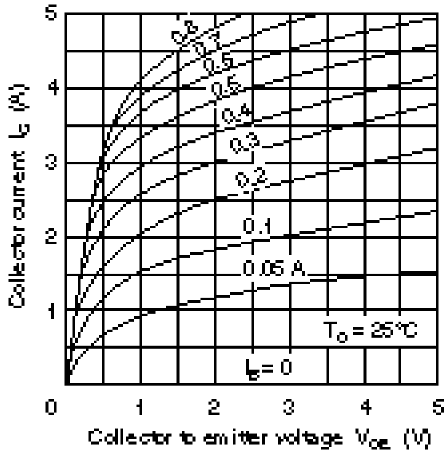


Reverse Bias Area of Safe Operation

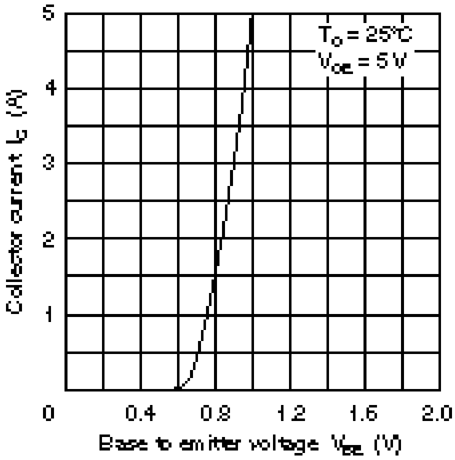


Collector to Emitter Voltage vs. Base to Emitter Resistance

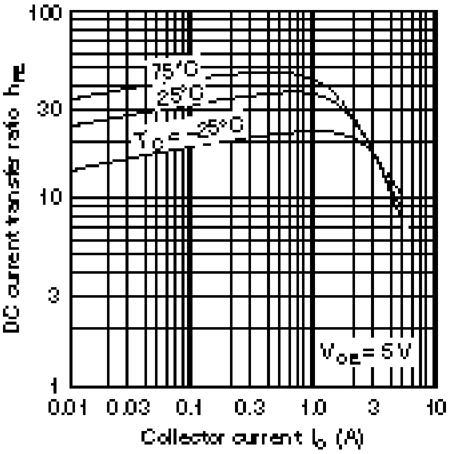
Typical Output Characteristics



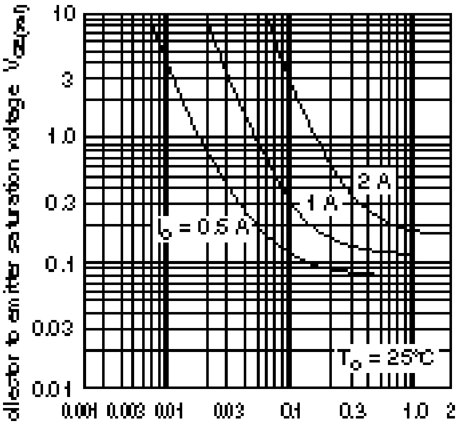
Typical Transfer Characteristics

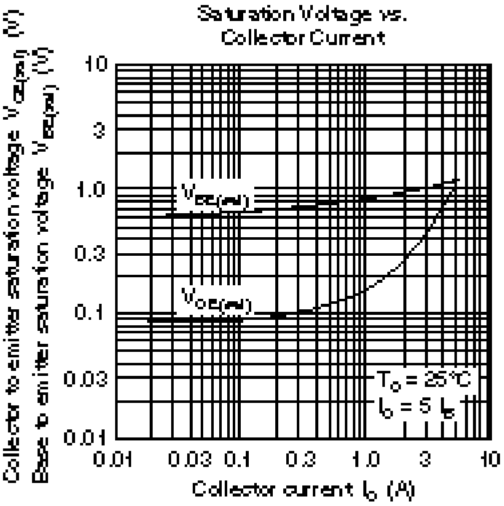


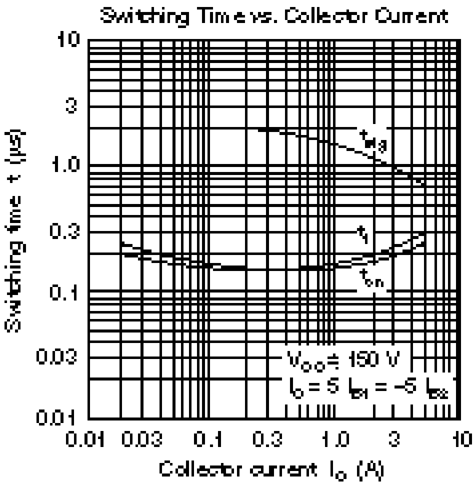
DC Current Transfer Ratio vs. Collector Current

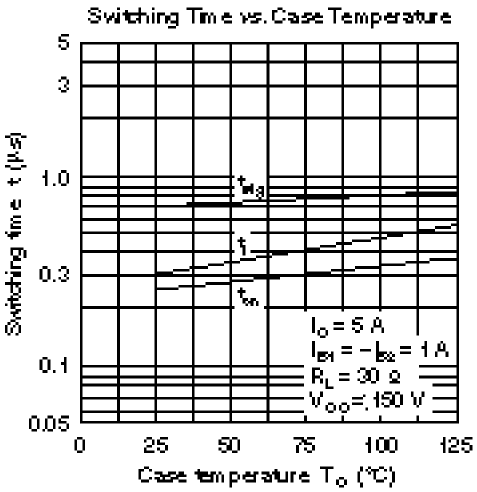


Collector to Emitter Saturation Voltage vs. Base Current




Saturation Voltage vs.
Collector Current
Collector to emitter saturation voltage V_CE(sat) (V)
Base to emitter saturation voltage V_BE(sat) (V)
10
3
1.0
0.3
0.1
0.03
0.01
0.01
0.03
0.1
0.3
1.0
3
10
V_BE(sat)
V_CE(sat)
T_C = 25°C
I_C = 5 I_B
Collector current I_C (A)


Switching Time vs. Collector Current
Switching time t (μs)
10
3
1.0
0.3
0.1
0.03
0.01
0.01
0.03
0.1
0.3
1.0
3
10
t_stg
t_f
t_on
V_CC = 150 V
I_C = 5 I_B1 = −5 I_B2
Collector current I_C (A)


Switching Time vs. Case Temperature
Switching time t (μs)
5
3
1.0
0.3
0.1
0.05
0
25
50
75
100
125
t_stg
t_f
t_on
I_C = 5 A
I_B1 = −I_B2 = 1 A
R_L = 30 Ω
V_CC = 150 V
Case temperature T_C (°C)

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