2SD1976

Silicon NPN Triple Diffused

HITACHI

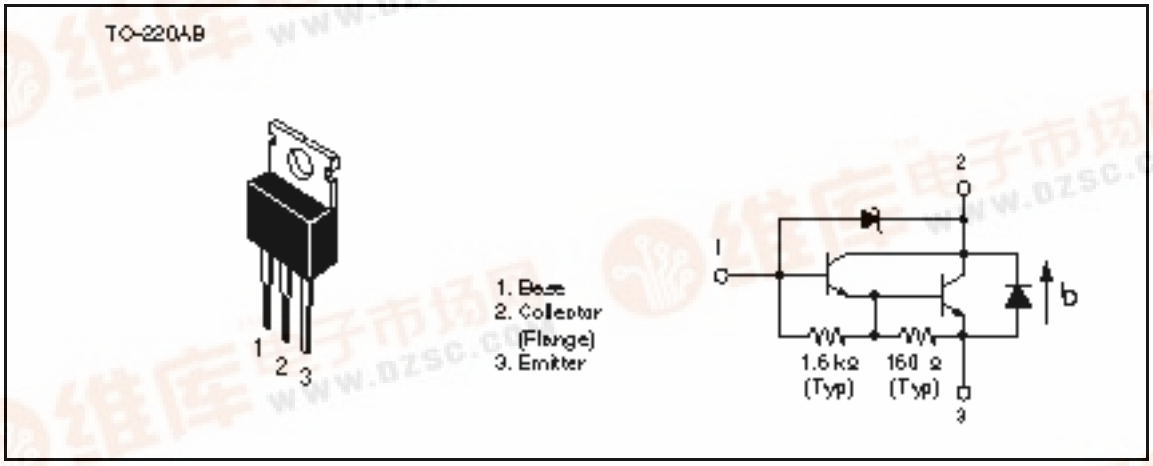
Application

High voltage switching, igniter

Feature

- Built-in High voltage zener diode (300 V)
- High Speed switching

Outline



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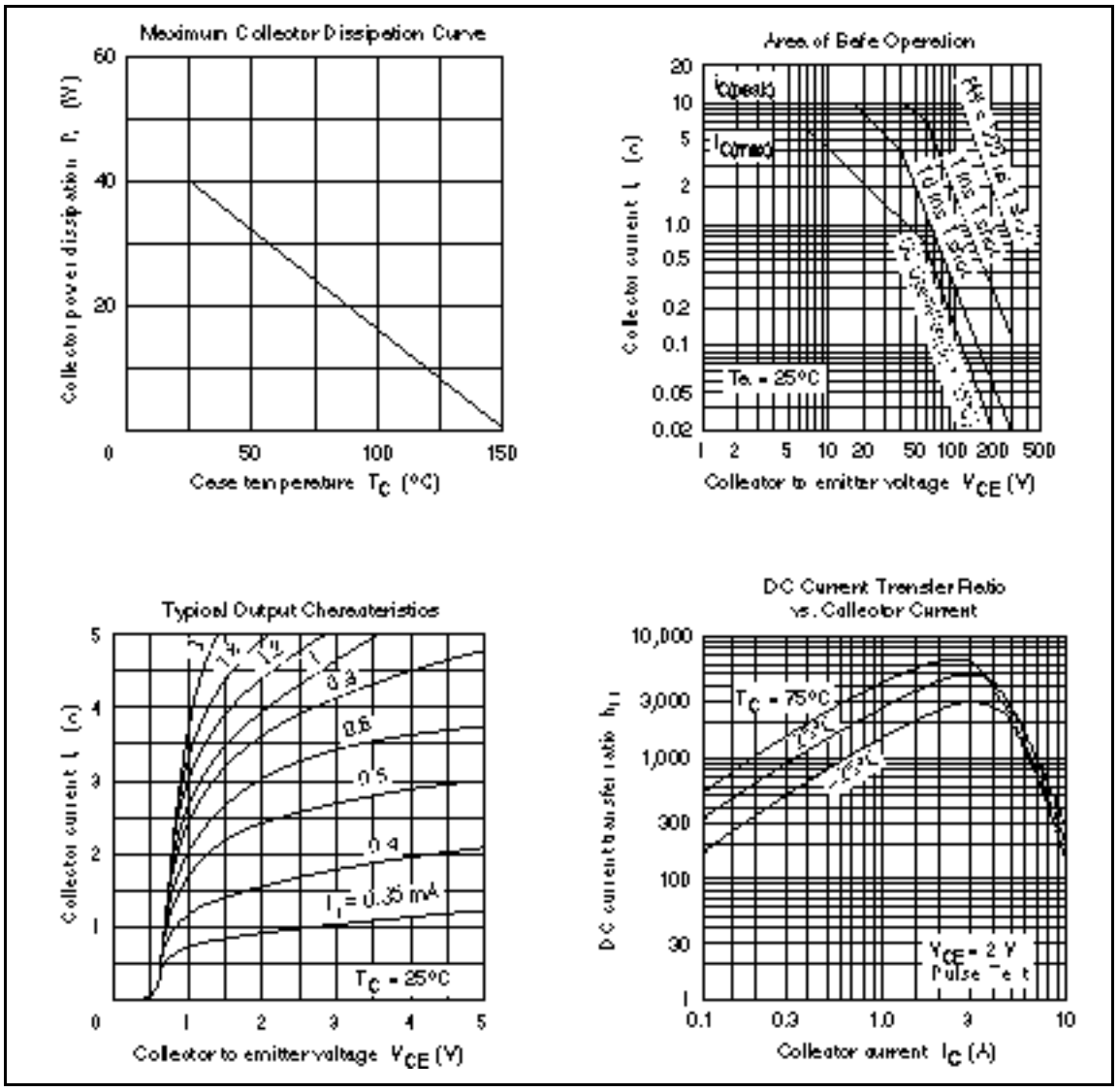
Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Rating	Unit
Collector to base voltage	V_{CBO}	300	V
Collector to emitter voltage	V_{CEO}	300	V
Emitter to base voltage	V_{EBO}	7	V
Collector current	I_C	6	A
Diode current	I_D*[1]	6	A
Collector peak current	$I_{C(peak)}$	10	A
Collector power dissipation	P_C*[1]	40	W
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

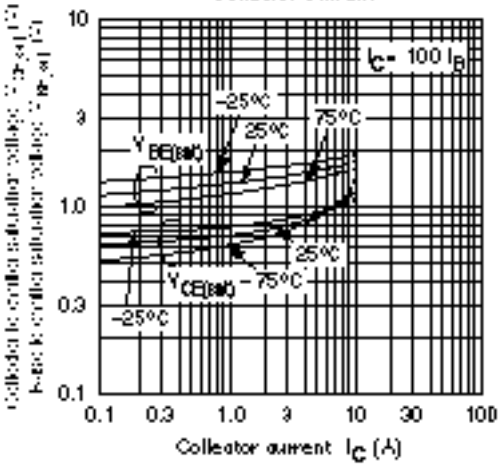
Note: 1. Value at T_C = 25°C.

Electrical Characteristics (Ta = 25°C)

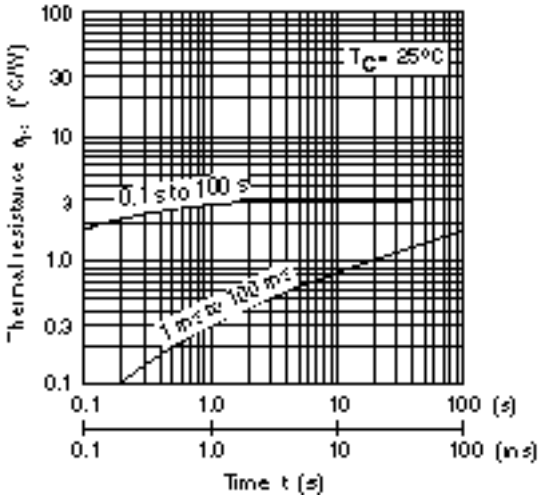
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	300	—	420	V	I_C = 0.1 mA, I_E = 0
Collector to emitter sustain voltage	$V_{CEO(SUS)}$	300	—	—	V	I_C = 3 A, R_{BE} = ∞, L = 10 mH
Emitter to base breakdown voltage	$V_{(BR)EBO}$	7	—	—	V	I_E = 50 mA, I_C = 0
Collector cutoff current	I_{CEO}	—	—	100	µA	V_{CE} = 300 V, R_{BE} = ∞
DC current transfer ratio	h_{FE}	500	—	—		V_{CE} = 2 V, I_C = 4 A
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	1.5	V	I_C = 4 A, I_B = 40 mA
Base to emitter saturation voltage	$V_{BE(sat)}$	—	—	2.0	V	I_C = 4 A, I_B = 40 mA
Emitter to collector diode forward voltage	V_{ECF}	—	—	3.5	V	I_F = 6 A
Turn on time	t_{on}	—	1.2	—	µs	I_C = 4 A, V_{CC} = 20 V
Storage time	t_{stg}	—	8.0			I_{B1} = –I_{B2} = 40 mA
Fall time	t_f	—	8.0	—		


Maximum Collector Dissipation Curve
Collector power dissipation P_C (W)
60
40
20
0
50
100
150
Case temperature T_C (°C)
Area of Safe Operation
Collector current I_C (A)
20
10
5
2
1.0
0.5
0.2
0.1
0.05
0.02
$I_{C(peak)}$
$I_{C(max)}$
T_a = 25°C
1
2
5
10
20
50
100
200
500
Collector to emitter voltage V_{CE} (V)
Typical Output Characteristics
Collector current I_C (A)
5
4
3
2
1
0
0.8
0.6
0.5
0.4
I_B = 0.35 mA
T_C = 25°C
1
2
3
4
5
Collector to emitter voltage V_{CE} (V)
DC Current Transfer Ratio
vs. Collector Current
DC current transfer ratio h_{FE}
10,000
3,000
1,000
300
100
30
1
T_C = 75°C
25°C
−25°C
V_{CE} = 2 V
Pulse Test
0.1
0.3
1.0
3
10
Collector current I_C (A)

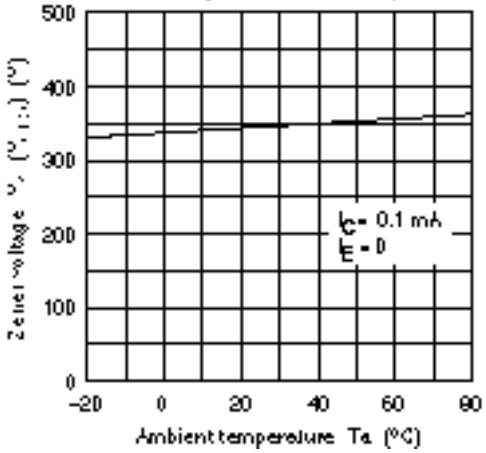
Saturation Voltage vs.
Collector Current



Transient Thermal Resistance



Zener Voltage vs. Ambient Temperature



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