2SC2899

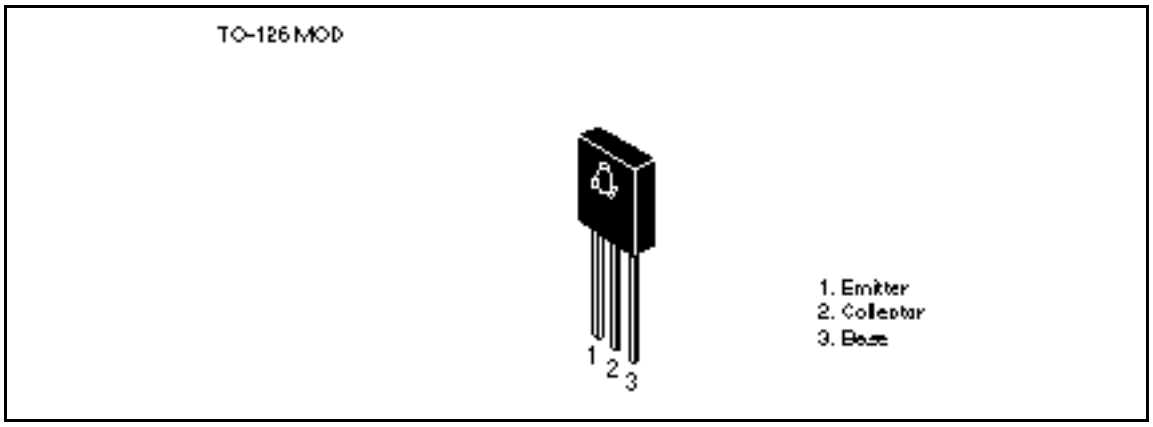
Silicon NPN Triple Diffused

HITACHI

Application

High speed and high voltage 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}	10	V
Collector current	I_C	0.5	A
Collector peak current	$I_{C(peak)}$	1.0	A
Collector power dissipation	P_C	0.75	W
	P_C*[1]	10	W
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

Note: 1. Value at T_C = 25°C.

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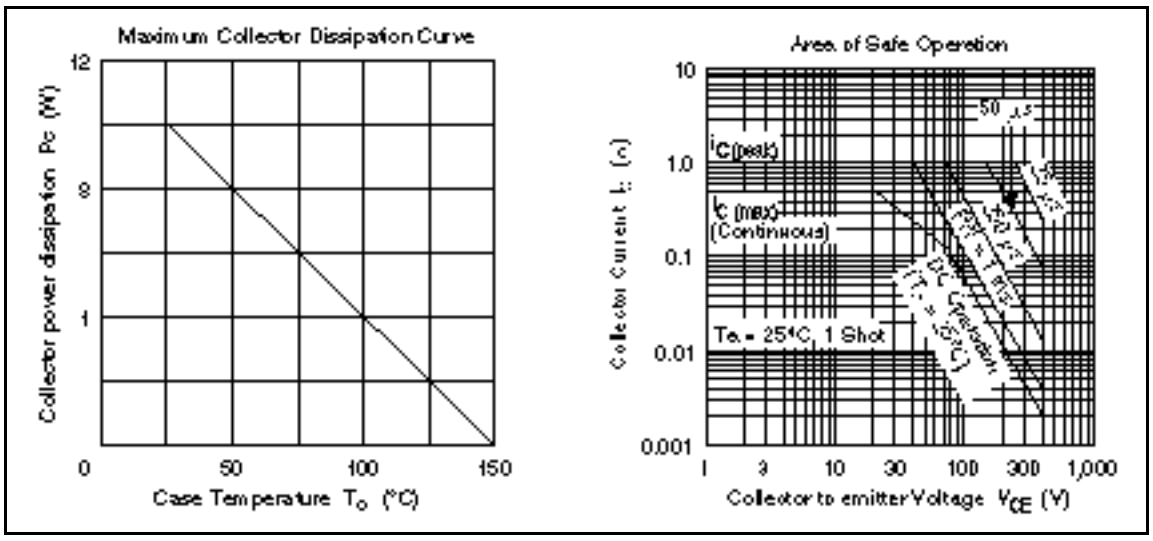
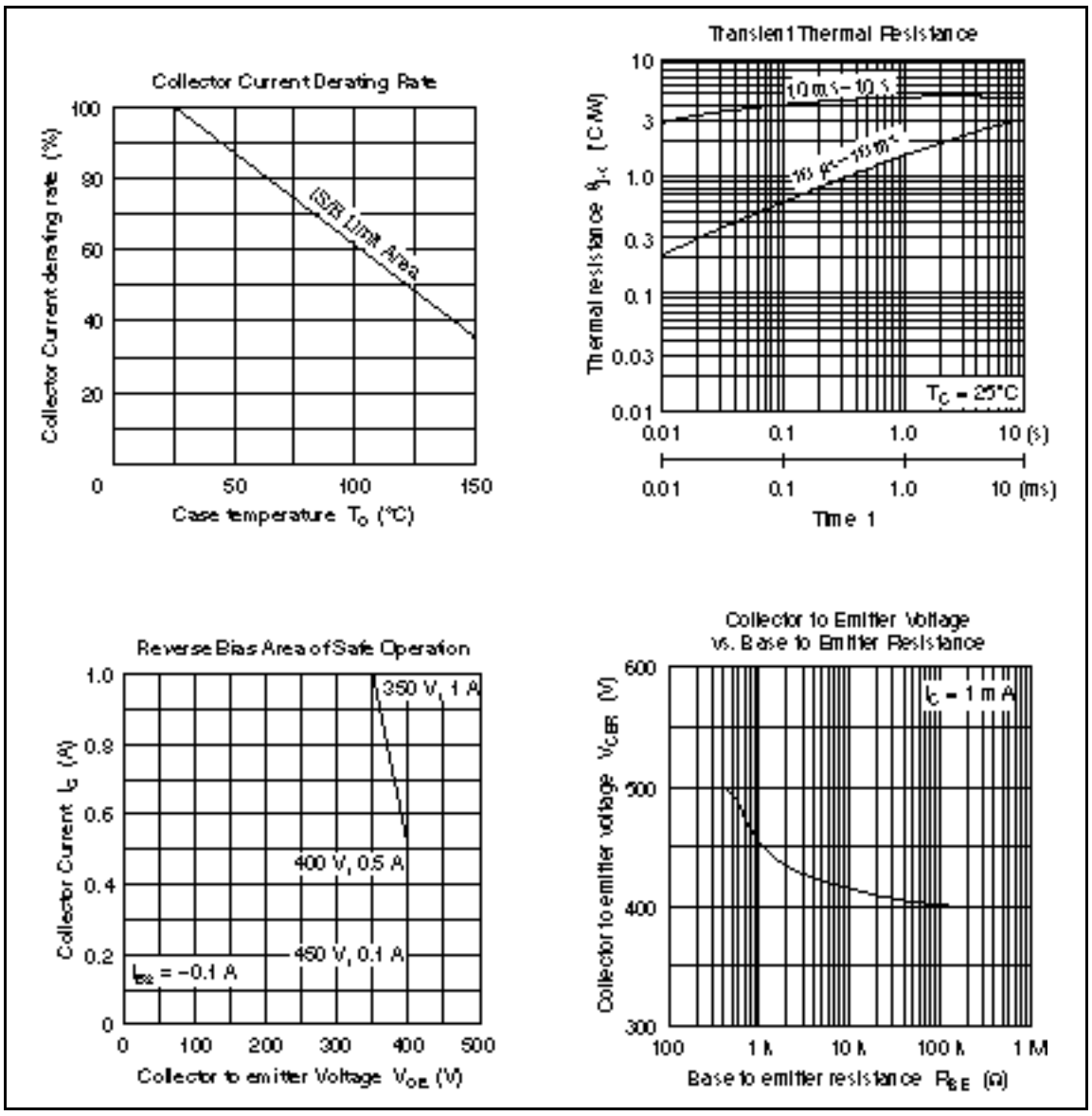
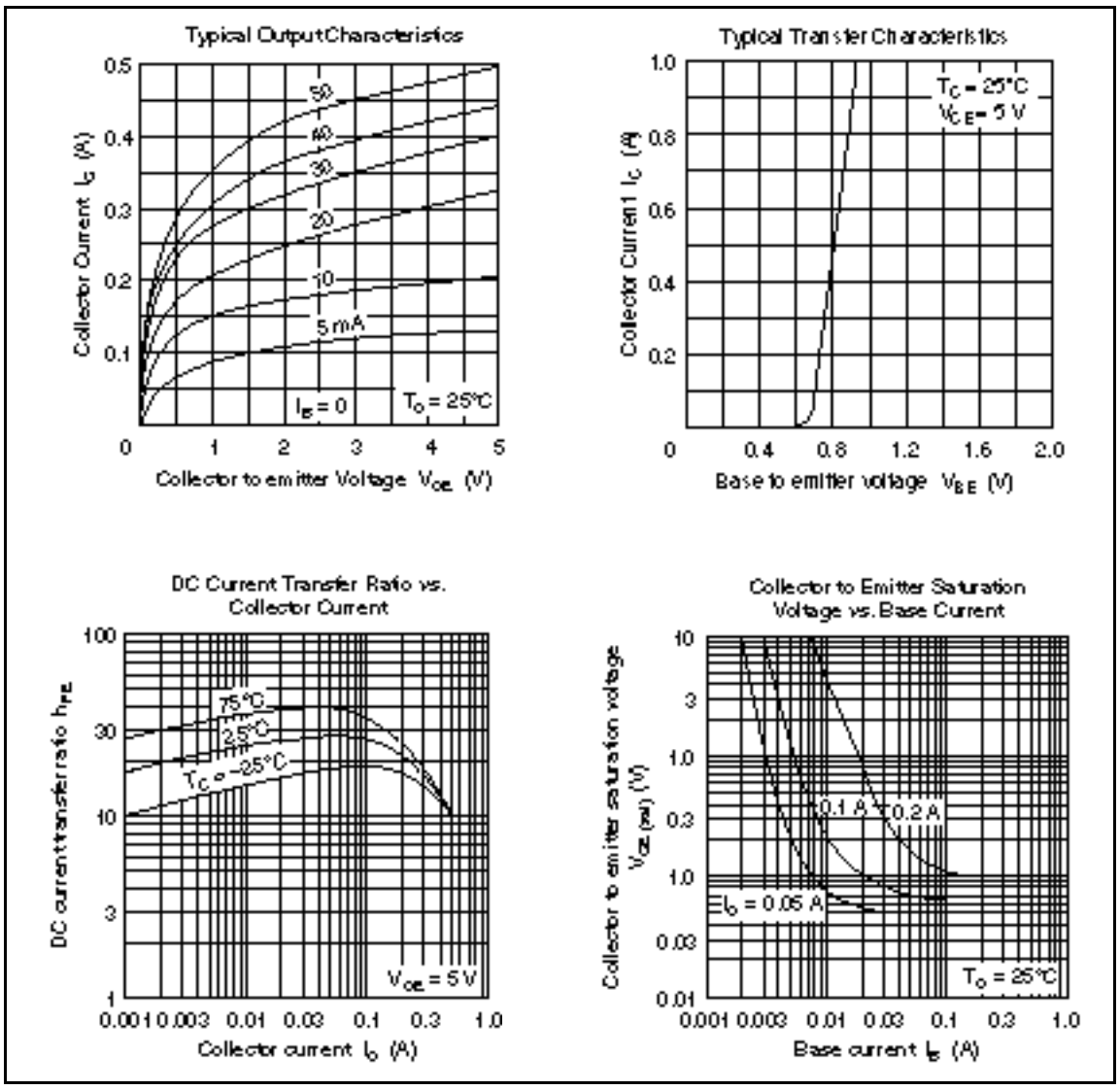
Electrical Characteristics (Ta = 25°C)

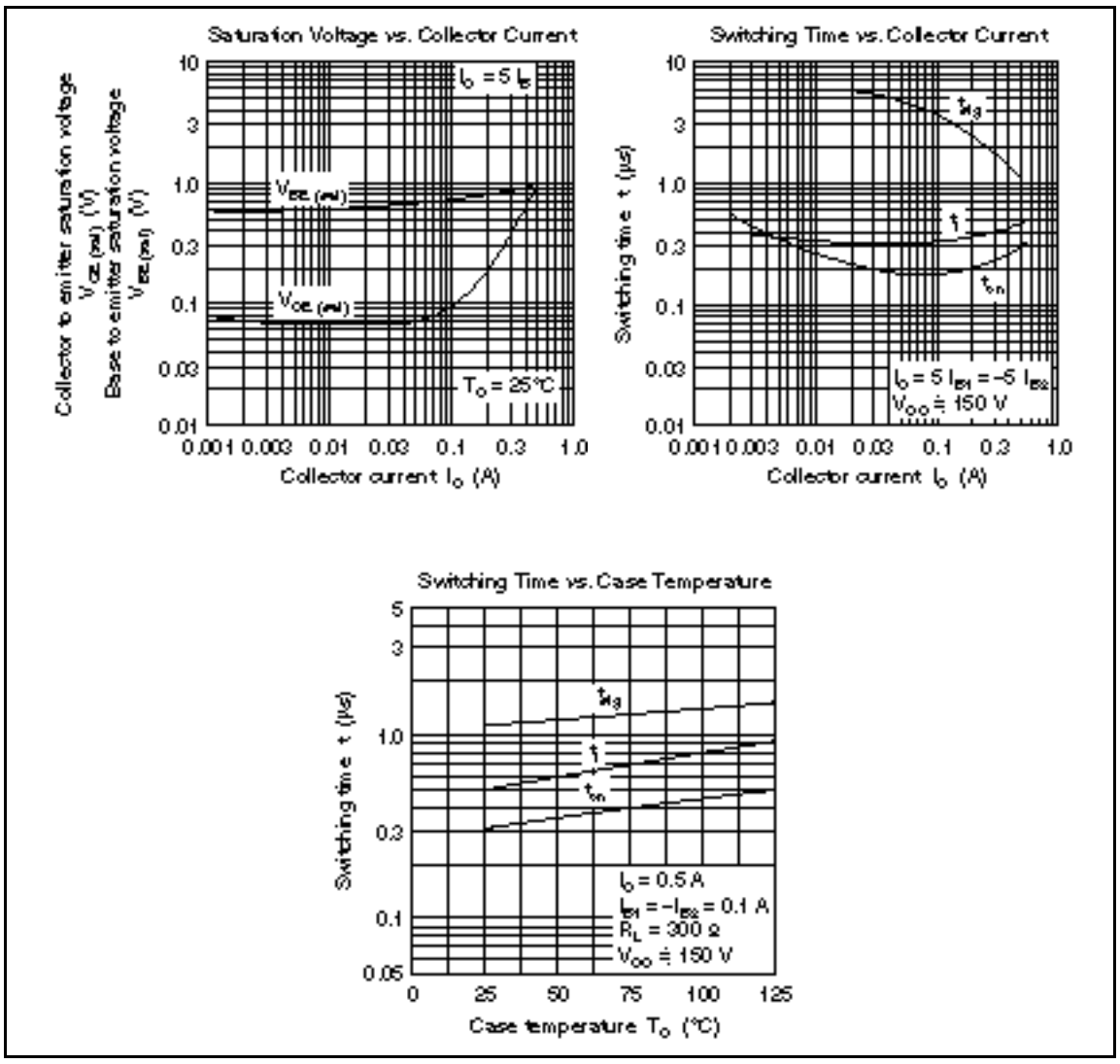
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to emitter sustain voltage	$V_{CEO(sus)}$	400	—	—	V	I_C = 0.1 A, R_{BE} = ∞, L = 100 mH
	$V_{CEX(sus)}$	400	—	—	V	I_C = 0.5 A, I_{B1} = $-I_{B2}$ = 0.1 A, V_{BE} = –5 V, L = 180 µH, Clamped
Emitter to base breakdown voltage	$V_{(BR)EBO}$	10	—	—	V	I_E = 10 mA, I_C = 0
Collector cutoff current	I_{CBO}	—	—	20	µA	V_{CB} = 400 V, I_C = 0
	I_{CEO}	—	—	50	µA	V_{CE} = 350 V, R_{BE} = ∞
DC current transfer ratio	h_{FE1}	15	—	—		V_{CE} = 5 V, I_C = 0.25 A*[1]
	h_{FE2}	7	—	—		V_{CE} = 5 V, I_C = 0.5 A*[1]
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	1.0	V	I_C = 0.25 A, I_B = 0.05 A*[1]
Base to emitter saturation voltage	$V_{BE(sat)}$	—	—	1.5	V	
Turn on time	t_{on}	—	—	1.0	µs	I_C = 0.5 A, I_{B1} = $-I_{B2}$ = 0.1 A,
Storage time	t_{stg}	—	—	2.0	µs	V_{CC} 150 V
Fall time	t_f	—	—	1.0	µs	

Note: 1. Pulse test




Collector Current Derating Rate
Collector Current derating rate (%)
100
80
60
40
20
0
50
100
150
Case temperature T_C (°C)
I(S/B Limit Area
Transient Thermal Resistance
Thermal resistance θ_{j-c} (°C/W)
10
3
1.0
0.3
0.1
0.03
0.01
10 ms – 10 s
T_C = 25°C
0.01
0.1
1.0
10 (s)
0.01
0.1
1.0
10 (ms)
Time 1
Reverse Bias Area of Safe Operation
Collector Current I_C (A)
1.0
0.9
0.6
0.4
0.2
0
350 V, 1 A
400 V, 0.5 A
450 V, 0.1 A
I_{B2} = –0.1 A
0
100
200
300
400
500
Collector to emitter Voltage V_{CE} (V)
Collector to Emitter Voltage
vs. Base to Emitter Resistance
Collector to emitter voltage V_{CER} (V)
600
500
400
300
I_C = 1 mA
100
1 k
10 k
100 k
1 M
Base to emitter resistance R_{BE} (Ω)


Typical Output Characteristics
Collector Current I_C (A)
Collector to emitter Voltage V_{CE} (V)
50
40
30
20
10
5 mA
I_B = 0
T_C = 25°C
Typical Transfer Characteristics
Collector Current I_C (A)
Base to emitter voltage V_{BE} (V)
T_C = 25°C
V_{CE} = 5 V
DC Current Transfer Ratio vs. Collector Current
DC current transfer ratio h_{FE}
Collector current I_C (A)
75°C
25°C
T_C = −25°C
V_{CE} = 5 V
Collector to Emitter Saturation Voltage vs. Base Current
Collector to emitter saturation voltage V_{CE} (sat) (V)
Base current I_B (A)
0.1 A
0.2 A
I_C = 0.05 A
T_C = 25°C


Saturation Voltage vs. Collector Current
Collector to emitter saturation voltage $V_{CE(sat)}$ (V)
Base to emitter saturation voltage $V_{BE(sat)}$ (V)
$I_C = 5\ I_B$
$V_{BE(sat)}$
$V_{CE(sat)}$
$T_C = 25°C$
Collector current I_C (A)
Switching Time vs. Collector Current
Switching time t (µs)
t_{stg}
t_f
t_{on}
$I_C = 5\ I_{B1} = -5\ I_{B2}$
$V_{CC} \fallingdotseq 150$ V
Collector current I_C (A)
Switching Time vs. Case Temperature
Switching time t (µs)
t_{stg}
t_f
t_{on}
$I_C = 0.5$ A
$I_{B1} = -I_{B2} = 0.1$ A
$R_L = 300\ \Omega$
$V_{CC} \fallingdotseq 150$ V
Case temperature T_C (°C)

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