

TOSHIBA Transistor Silicon NPN Epitaxial Type

2SC5738

Industrial Applications

Unit: mm

High-Speed Switching Applications

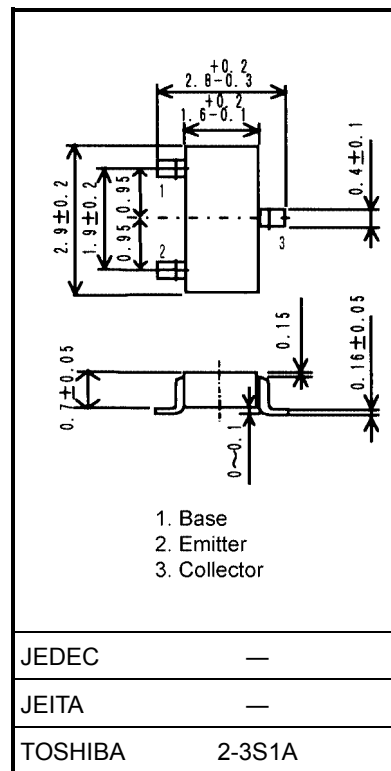
DC-DC Converter Applications

- High DC current gain: $h_{FE} = 400$ to 1000 ($I_C = 0.5$ A)
- Low collector-emitter saturation voltage: $V_{CE(sat)} = 0.15$ V (max)
- High-speed switching: $t_f = 90$ ns (typ.)

Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	40	V
Collector-emitter voltage		V_{CEX}	30	V
Collector-emitter voltage		V_{CEO}	20	V
Emitter-base voltage		V_{EBO}	7	V
Collector current	DC	I_C	3.5	A
	Pulse	I_{CP}	6.0	
Base current		I_B	350	mA
Collector power dissipation	DC	P_C (Note)	625	mW
	$t = 10$ s		1000	
Junction temperature		T_j	150	$^\circ\text{C}$
Storage temperature range		T_{stg}	-55 to 150	$^\circ\text{C}$

Note: Mounted on FR4 board (glass epoxy, 1.6 mm thick, Cu area: 645 mm^2)



Weight: 0.01 g (typ.)

Electrical Characteristics ($T_a = 25^\circ\text{C}$)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	$V_{CB} = 40$ V, $I_E = 0$	—	—	100	nA
Emitter cut-off current		I_{EBO}	$V_{EB} = 7$ V, $I_C = 0$	—	—	100	nA
Collector-emitter breakdown voltage		$V_{(BR)CEO}$	$I_C = 10$ mA, $I_B = 0$	20	—	—	V
DC current gain		$h_{FE}(1)$	$V_{CE} = 2$ V, $I_C = 0.5$ A	400	—	1000	
		$h_{FE}(2)$	$V_{CE} = 2$ V, $I_C = 1.6$ A	200	—	—	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 1.6$ A, $I_B = 32$ mA	—	—	0.15	V
Base-emitter saturation voltage		$V_{BE(sat)}$	$I_C = 1.6$ A, $I_B = 32$ mA	—	—	1.10	V
Collector output capacitance		C_{ob}	$V_{CB} = 10$ V, $I_E = 0$, $f = 1$ MHz	—	18	—	pF
Switching time	Rise time	t_r	See Figure 1 circuit diagram.	—	100	—	ns
	Storage time	t_{stg}	$V_{CC} \approx 12$ V, $R_L = 7.5\ \Omega$	—	350	—	
	Fall time	t_f	$I_{B1} = -I_{B2} = 53$ mA	—	90	—	

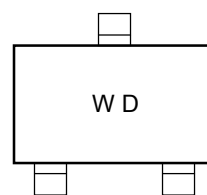
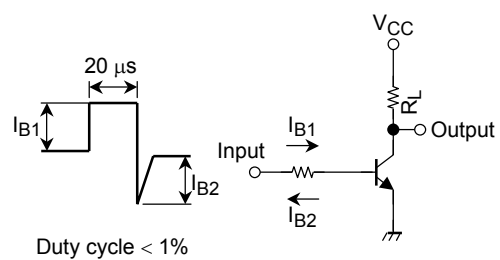
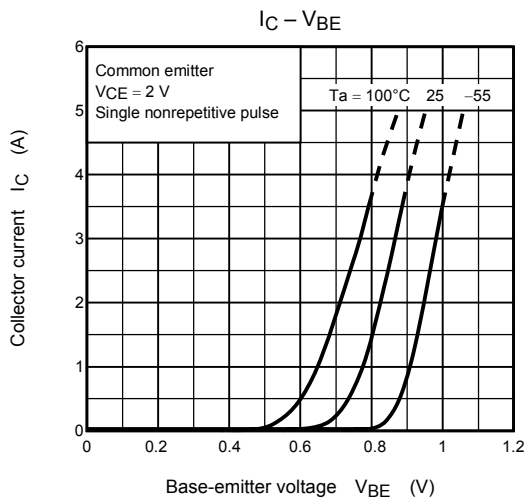
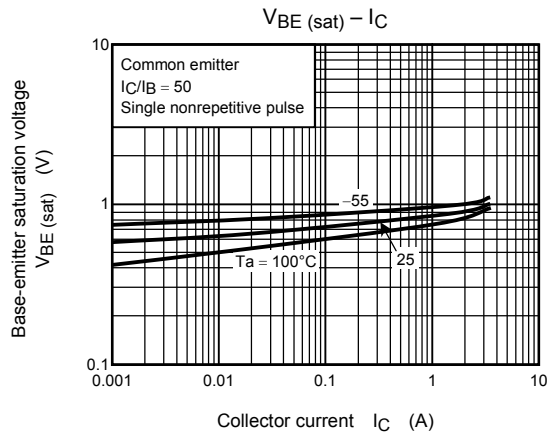
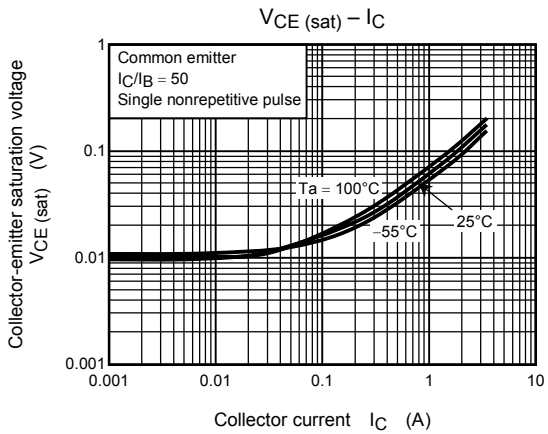
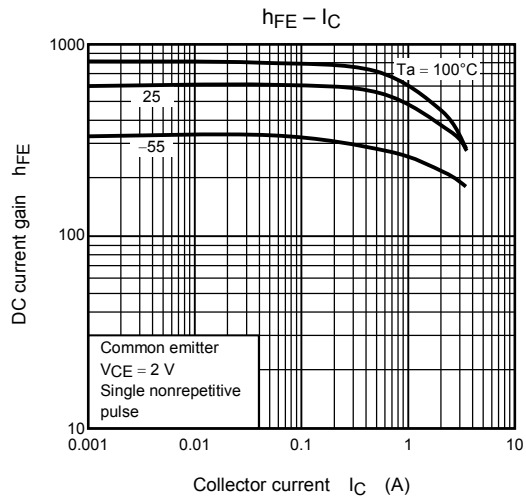
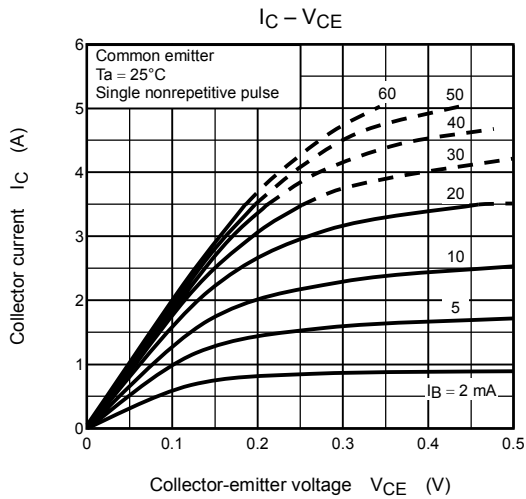
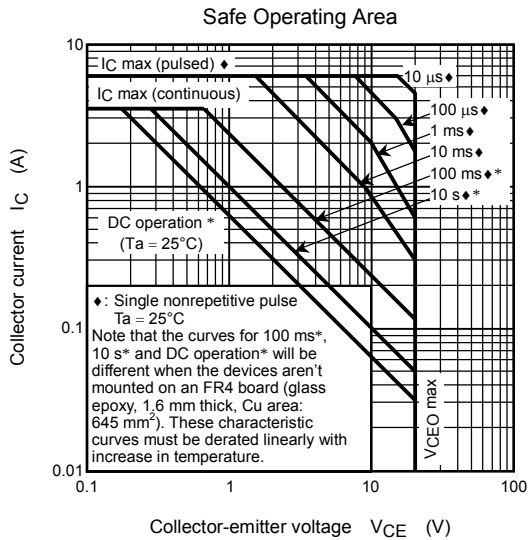
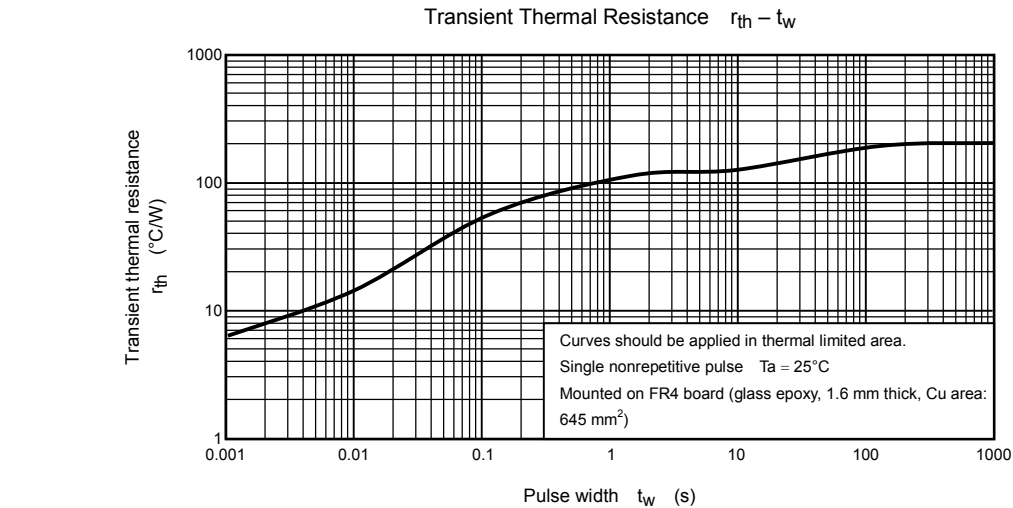
Marking


Figure 1 Switching Time Test Circuit & Timing Chart





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