

TOSHIBA Transistor Silicon NPN Epitaxial Type

TTC007

Unit: mm

High-Speed Switching Applications

DC-DC Converter Applications

- High DC current gain: $h_{FE} = 400$ to 1000 ($I_C = 0.1$ A)
- Low collector-emitter saturation voltage: $V_{CE(sat)} = 0.12$ V (max)
- High-speed switching : $t_f = 85$ ns (typ.)

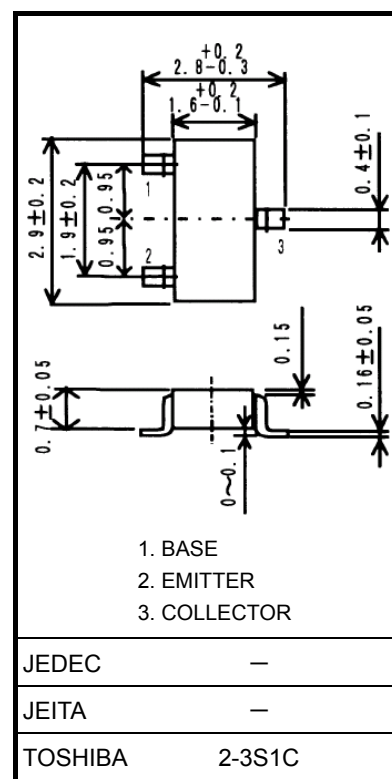
Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	100	V
Collector-emitter voltage		V_{CEO}	50	V
Emitter-base voltage		V_{EBO}	7	V
Collector current	DC	I_C	1	A
	Pulse	I_{CP}	2	
Base current		I_B	0.1	A
Collector power dissipation	$t = 10$ s	P_C	1.1	W
	DC	(Note 1)	0.7	
Junction temperature		T_j	150	$^\circ\text{C}$
Storage temperature range		T_{stg}	-55 to 150	$^\circ\text{C}$

Note1: Mounted on FR4 board (glass epoxy; 645 mm^2 , 1.6 mm thick; Cu area: 645 mm^2)

Note2: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).



Weight: 0.01 g (typ.)

Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	$V_{CB} = 100\text{ V}, I_E = 0$	—	—	100	nA
Emitter cut-off current		I_{EBO}	$V_{EB} = 7\text{ V}, I_C = 0$	—	—	100	nA
Collector-emitter breakdown voltage		$V_{(BR) CEO}$	$I_C = 10\text{ mA}, I_B = 0$	50	—	—	V
DC current gain		$h_{FE} (1)$	$V_{CE} = 2\text{ V}, I_C = 0.1\text{ A}$	400	—	1000	—
		$h_{FE} (2)$	$V_{CE} = 2\text{ V}, I_C = 0.3\text{ A}$	200	—	—	
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 0.3\text{ A}, I_B = 6\text{ mA}$	—	—	0.12	V
Base-emitter saturation voltage		$V_{BE (sat)}$	$I_C = 0.3\text{ A}, I_B = 6\text{ mA}$	—	—	1.1	V
Collector output capacitance		C_{ob}	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	5	—	pF
Switching time	Rise time	t_r	See Figure 1 $V_{CC} = 30\text{ V}, R_L = 100\ \Omega$ $I_{B1} = I_{B2} = 10\text{ mA}$	—	35	—	ns
	Storage time	t_{stg}		—	680	—	
	Fall time	t_f		—	85	—	

Marking

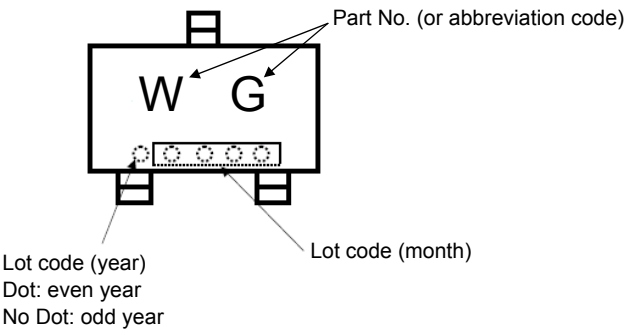
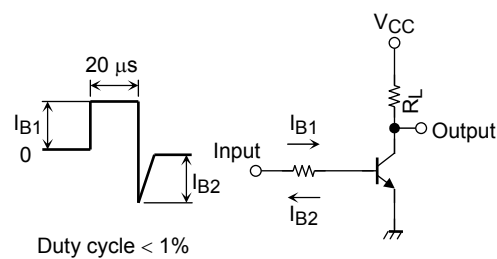
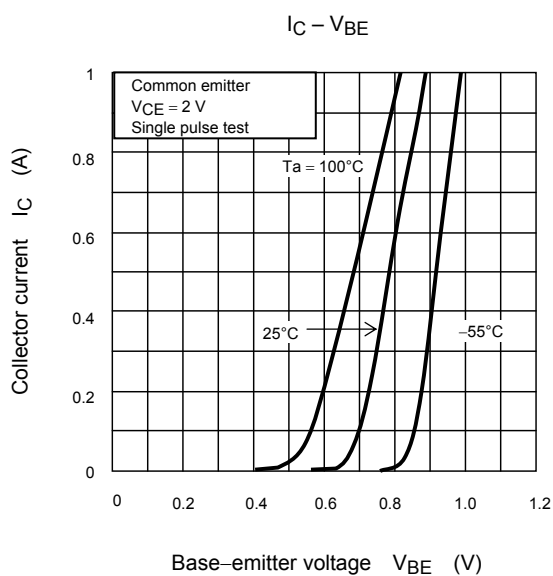
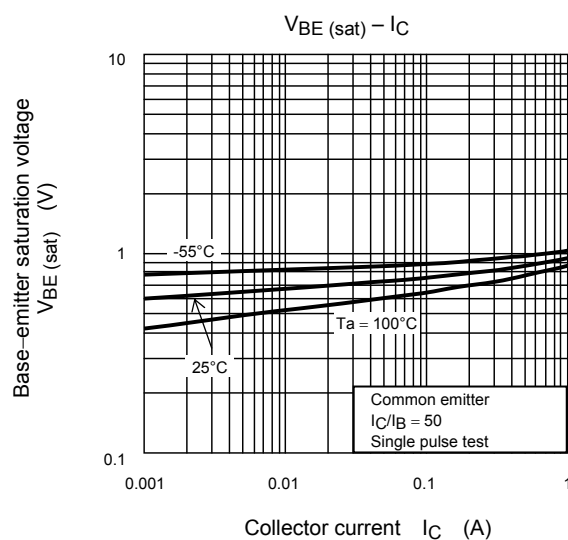
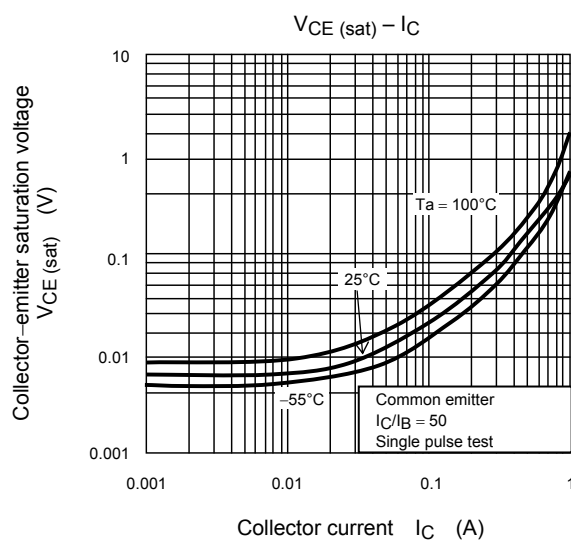
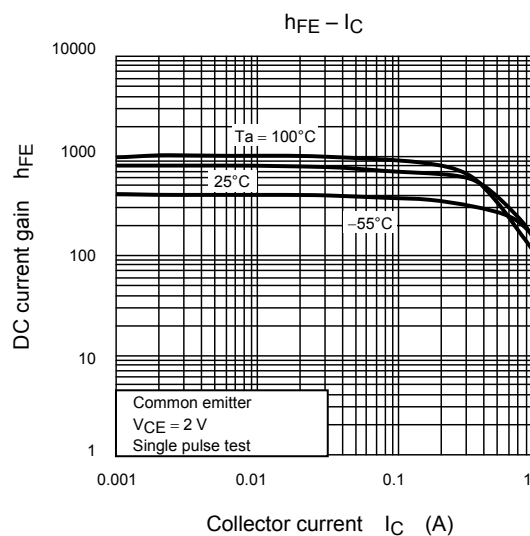
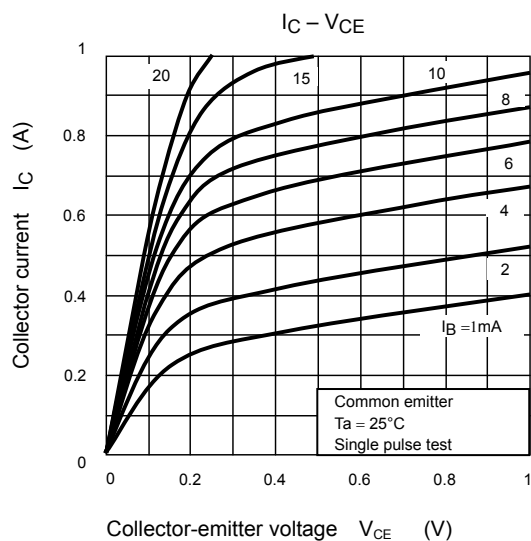
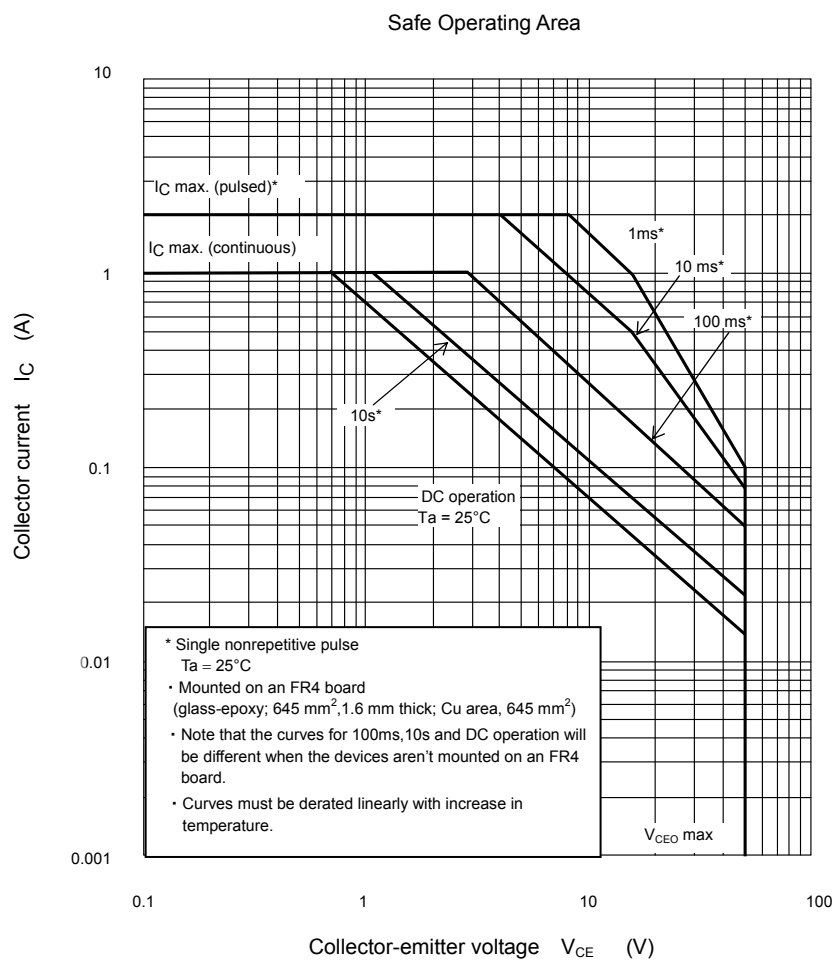
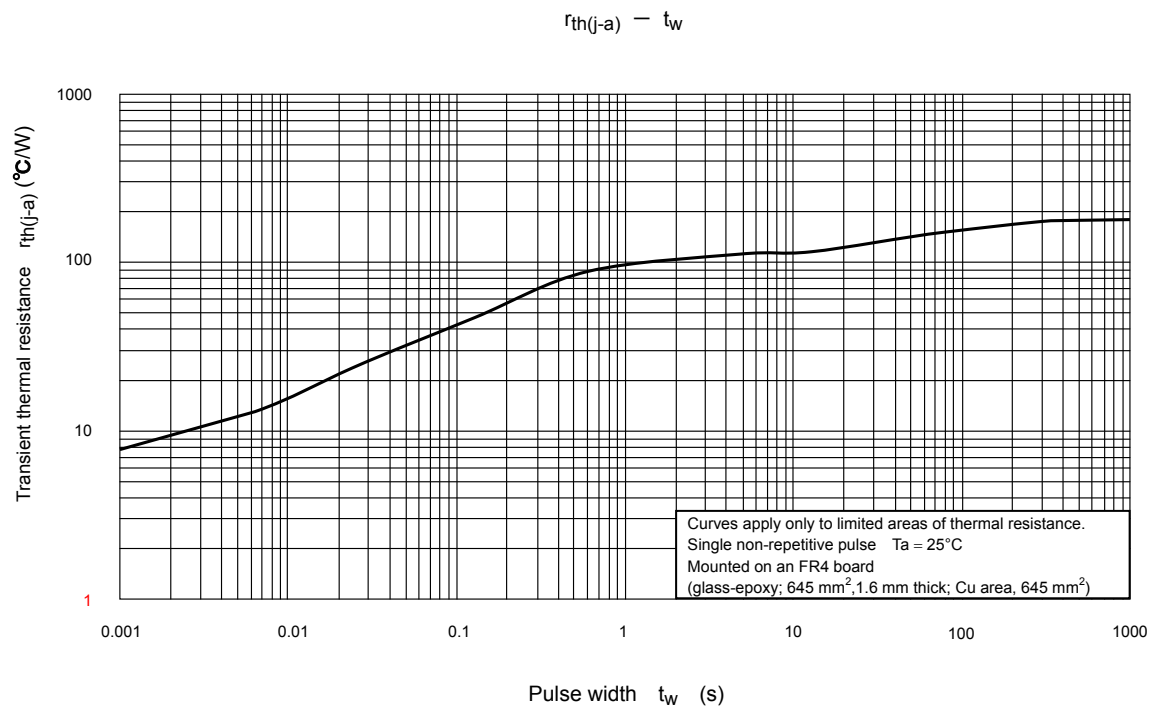


Figure 1. Switching Time Test Circuit





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