

TOSHIBA Transistor Silicon NPN Epitaxial Type

2SC5819

High-Speed Switching Applications  
DC-DC Converter Applications

- High DC current gain:  $h_{FE} = 400$  to  $1000$  ( $I_C = 0.15$  A)
- Low collector-emitter saturation voltage:  $V_{CE(sat)} = 0.12$  V (max)
- High-speed switching:  $t_f = 45$  ns (typ.)

Absolute 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	$I_C$	1.5	A
	Pulse	$I_{CP}$	2.5	
Base current		$I_B$	150	mA
Collector power dissipation	$t = 10$ s	$P_C$ (Note 1)	2.0	W
	DC		1.0	
Junction temperature		$T_j$	150	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	-55 to 150	$^{\circ}\text{C}$

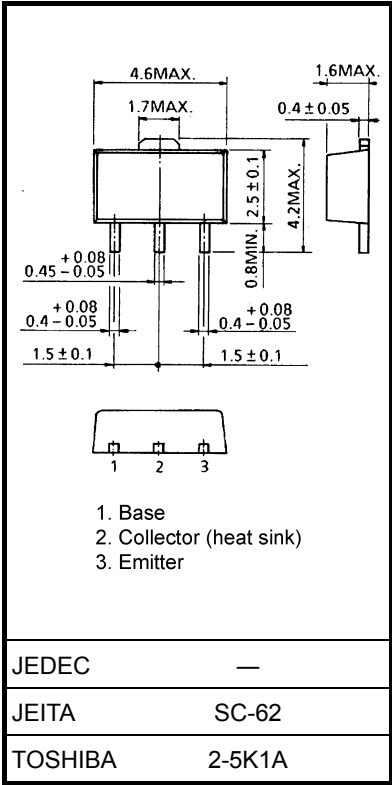
Note 1: Mounted on an FR4 board (glass epoxy, 1.6 mm thick, Cu area: 645 mm<sup>2</sup>)

Note 2: 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).

Industrial Applications

Unit: mm



Weight: 0.05 g (typ.)

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		ICBO	V <sub>CB</sub> = 40 V, I <sub>E</sub> = 0	—	—	100	nA
Emitter cut-off current		IEBO	V <sub>EB</sub> = 7 V, I <sub>C</sub> = 0	—	—	100	nA
Collector-emitter breakdown voltage		V (BR) CEO	I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0	20	—	—	V
DC current gain		h <sub>FE</sub> (1)	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 0.15 A	400	—	1000	
		h <sub>FE</sub> (2)	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 0.5 A	200	—	—	
Collector-emitter saturation voltage		V <sub>CE</sub> (sat)	I <sub>C</sub> = 0.5 A, I <sub>B</sub> = 10 mA	—	—	0.12	V
Base-emitter saturation voltage		V <sub>BE</sub> (sat)	I <sub>C</sub> = 0.5 A, I <sub>B</sub> = 10 mA	—	—	1.10	V
Collector output capacitance		C <sub>ob</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1 MHz	—	18	—	pF
Switching time	Rise time	t <sub>r</sub>	See Figure 1. V <sub>CC</sub> ≈ 12 V, R <sub>L</sub> = 24 Ω I <sub>B1</sub> = -I <sub>B2</sub> = 17 mA	—	43	—	ns
	Storage time	t <sub>stg</sub>		—	295	—	
	Fall time	t <sub>f</sub>		—	45	—	

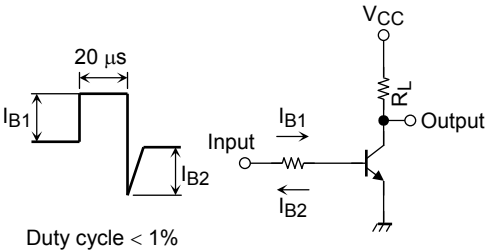
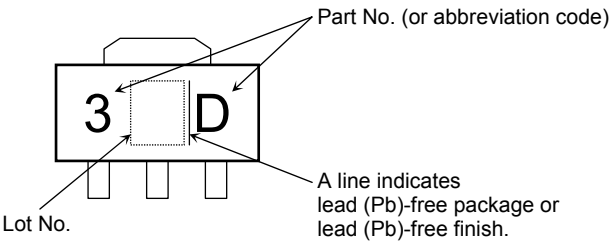
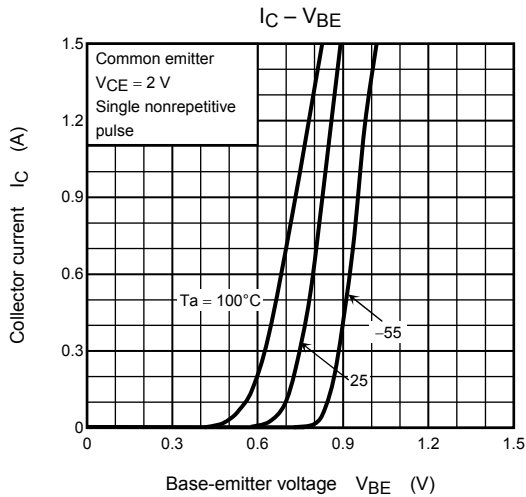
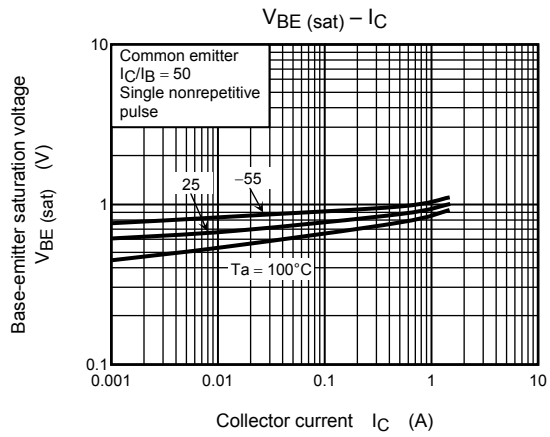
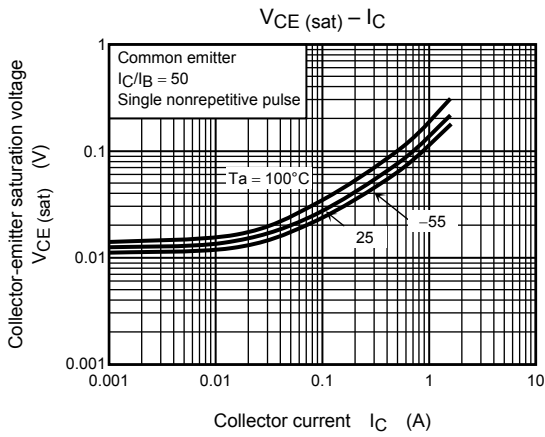
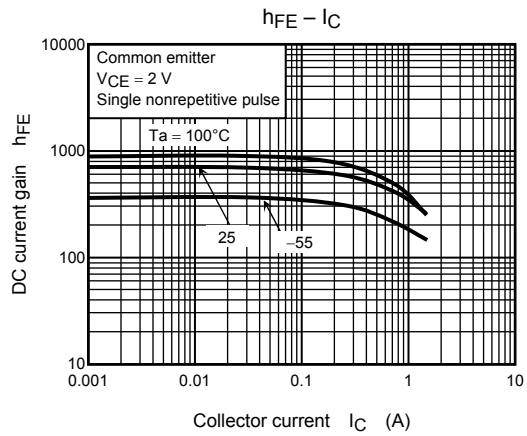
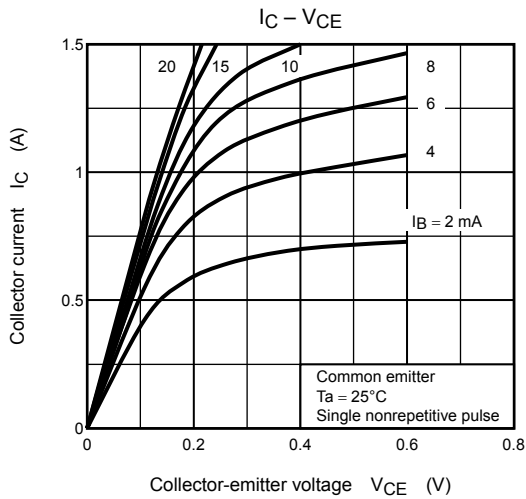
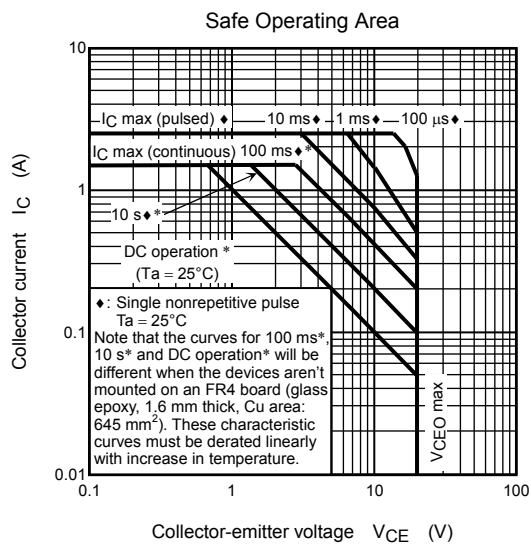
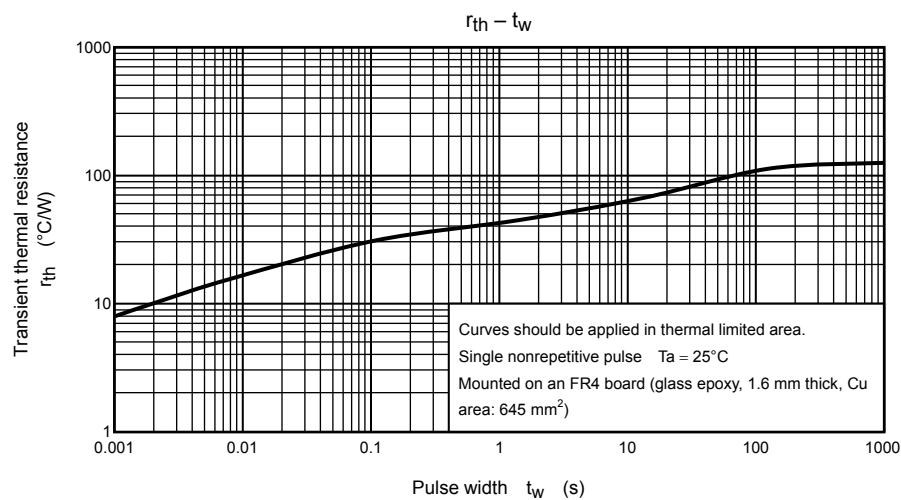


Figure 1 Switching Time Test Circuit & Timing Chart

Marking







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