

TOSHIBA Transistor Silicon NPN Epitaxial Type

2SC5819

High-Speed Switching Applications
DC-DC Converter Applications

- High DC current gain: $hFE = 400$ to 1000 ($I_C = 0.15$ A)
- Low collector-emitter saturation voltage: $V_{CE}(\text{sat}) = 0.12$ 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	A
	Pulse	I_{CP}	
Base current	I_B	150	mA
Collector power dissipation	$t = 10$ s	P_C (Note 1)	2.0
	DC		1.0
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55 to 150	$^\circ\text{C}$

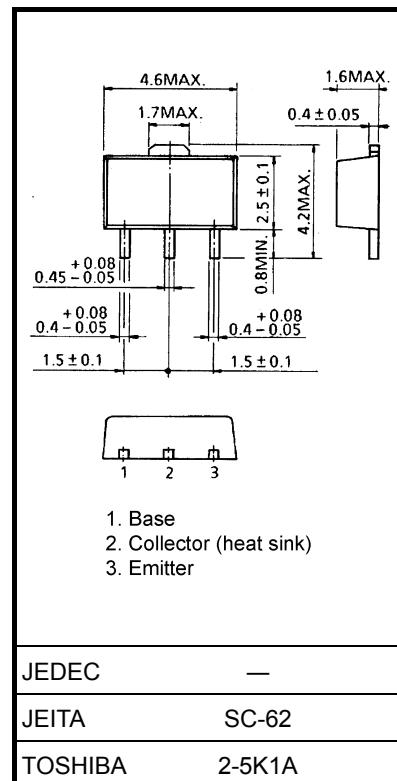
Note 1: Mounted on an FR4 board (glass epoxy, 1.6 mm thick, Cu area: 645 mm^2)

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

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 40\text{ V}$, $I_E = 0$	—	—	100	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = 7\text{ V}$, $I_C = 0$	—	—	100	nA
Collector-emitter breakdown voltage	$V_{(BR)\text{CEO}}$	$I_C = 10\text{ mA}$, $I_B = 0$	20	—	—	V
DC current gain	h_{FE} (1)	$V_{CE} = 2\text{ V}$, $I_C = 0.15\text{ A}$	400	—	1000	
	h_{FE} (2)	$V_{CE} = 2\text{ V}$, $I_C = 0.5\text{ A}$	200	—	—	
Collector-emitter saturation voltage	$V_{CE(\text{sat})}$	$I_C = 0.5\text{ A}$, $I_B = 10\text{ mA}$	—	—	0.12	V
Base-emitter saturation voltage	$V_{BE(\text{sat})}$	$I_C = 0.5\text{ A}$, $I_B = 10\text{ mA}$	—	—	1.10	V
Collector output capacitance	C_{ob}	$V_{CB} = 10\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$	—	18	—	pF
Switching time	Rise time	t_r	See Figure 1.	—	43	—
	Storage time	t_{stg}	$V_{CC} \approx 12\text{ V}$, $R_L = 24\Omega$	—	295	—
	Fall time	t_f	$I_{B1} = -I_{B2} = 17\text{ mA}$	—	45	—

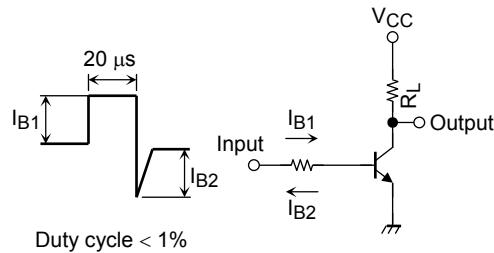
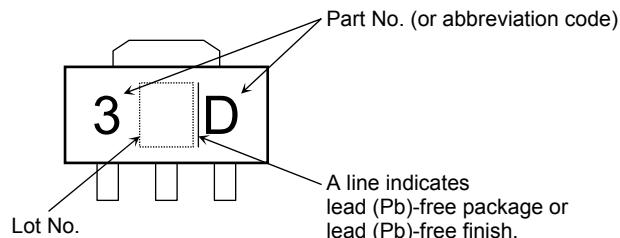
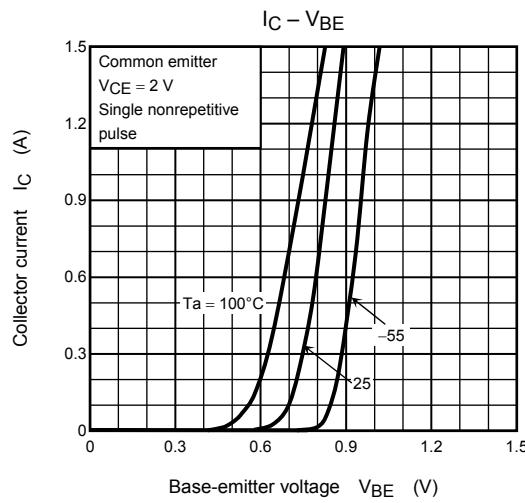
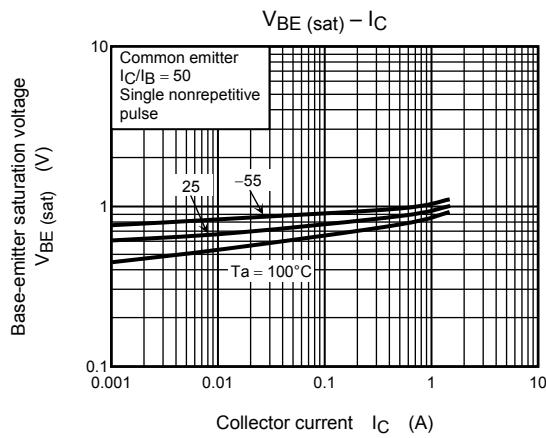
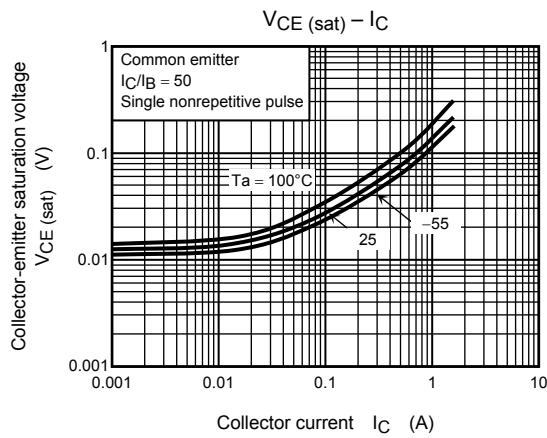
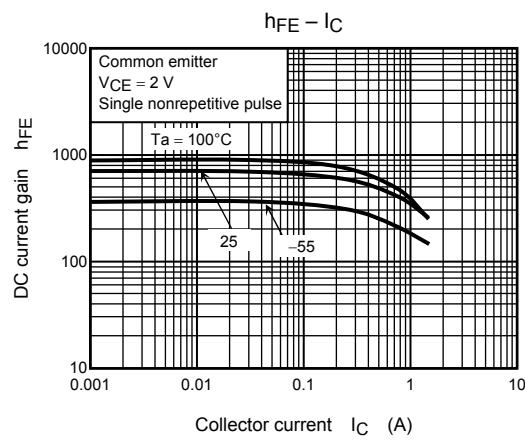
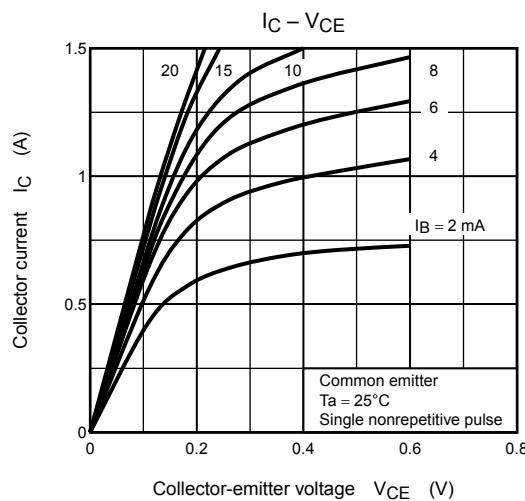
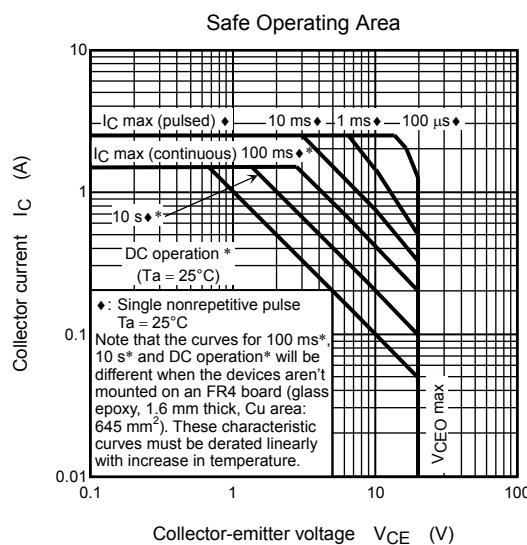
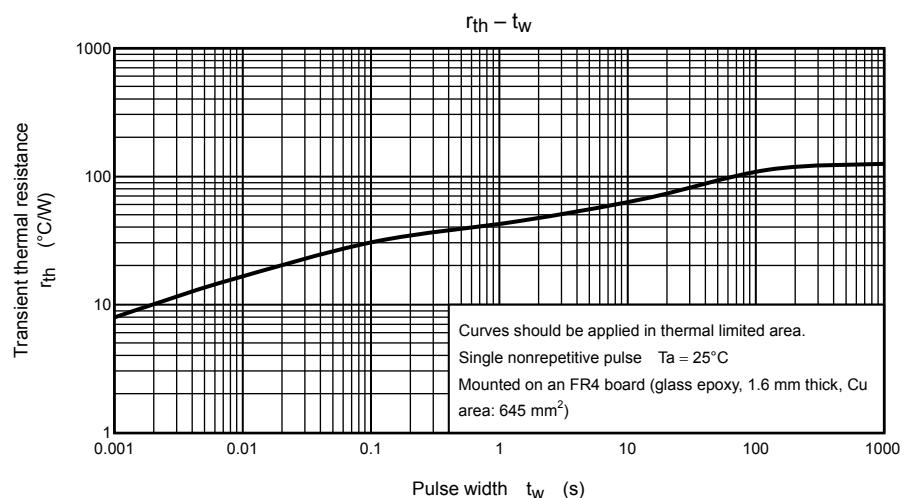


Figure 1 Switching Time Test Circuit & Timing Chart

Marking







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