

TOSHIBA Transistor Silicon NPN Epitaxial Type

# 2SC5810

High-Speed Switching Applications

DC-DC Converter Applications

Strobe Applications

- High DC current gain:  $h_{FE} = 400$  to  $1000$  ( $I_C = 0.1$  A)
- Low collector-emitter saturation voltage:  $V_{CE(sat)} = 0.17$  V (max)
- High-speed switching:  $t_f = 85$  ns (typ.)

## Maximum Ratings (Ta = 25°C)

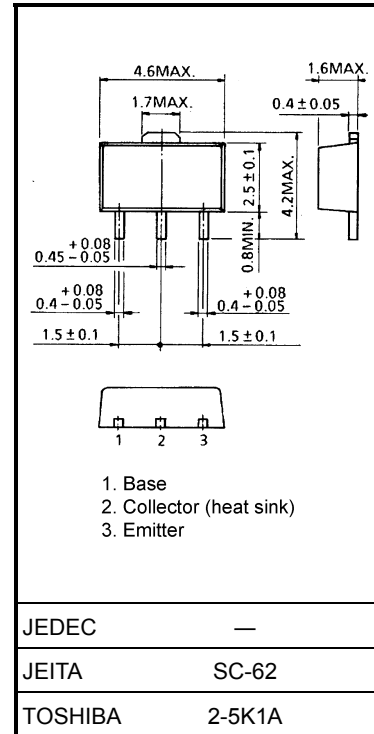
Characteristics		Symbol	Rating	Unit
Collector-base voltage		$V_{CBO}$	100	V
Collector-emitter voltage		$V_{CEX}$	80	V
		$V_{CEO}$	50	
Emitter-base voltage		$V_{EBO}$	7	V
Collector current	DC	$I_C$	1.0	A
	Pulse	$I_{CP}$	2.0	
Base current		$I_B$	0.1	A
Collector power dissipation	DC	$P_C$ (Note)	2.0	W
	t = 10 s		1.0	
Junction temperature		$T_j$	150	°C
Storage temperature range		$T_{stg}$	-55 to 150	°C

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

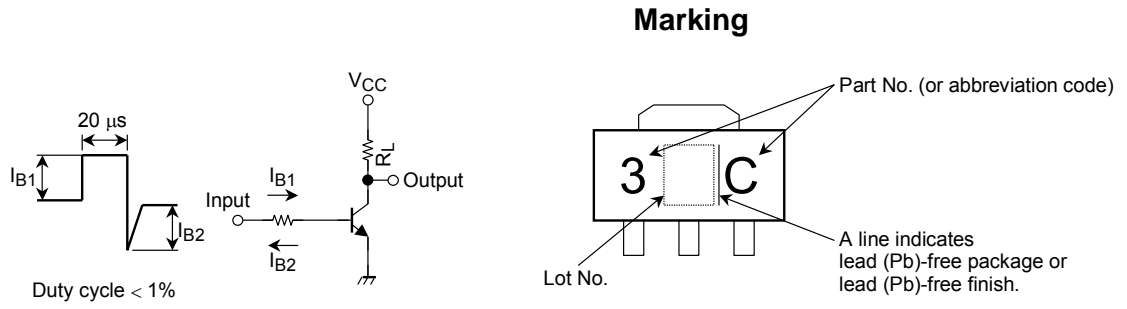
## Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		$I_{CBO}$	$V_{CB} = 100$ 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, $I_B = 0$	50	—	—	V
DC current gain		$h_{FE}(1)$	$V_{CE} = 2$ V, $I_C = 0.1$ A	400	—	1000	
		$h_{FE}(2)$	$V_{CE} = 2$ V, $I_C = 0.3$ A	200	—	—	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 300$ mA, $I_B = 6$ mA	—	—	0.17	V
Base-emitter saturation voltage		$V_{BE(sat)}$	$I_C = 300$ mA, $I_B = 6$ mA	—	—	1.10	V
Collector output capacitance		$C_{ob}$	$V_{CB} = 10$ V, $I_E = 0$ , f = 1 MHz	—	5	—	pF
Switching time	Rise time	$t_r$	See Figure 1. $V_{CC} \approx 30$ V, $R_L = 100$ Ω $I_{B1} = -I_{B2} = 10$ mA	—	35	—	ns
	Storage time	$t_{stg}$		—	680	—	
	Fall time	$t_f$		—	85	—	

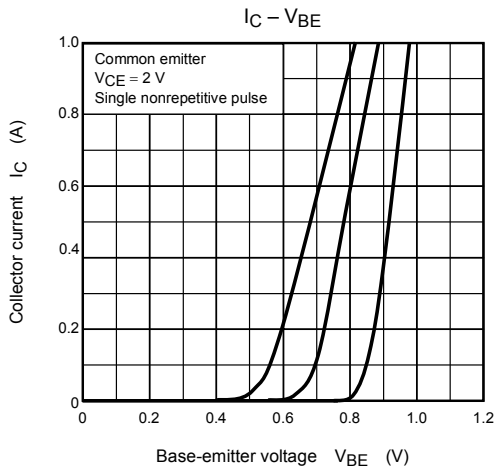
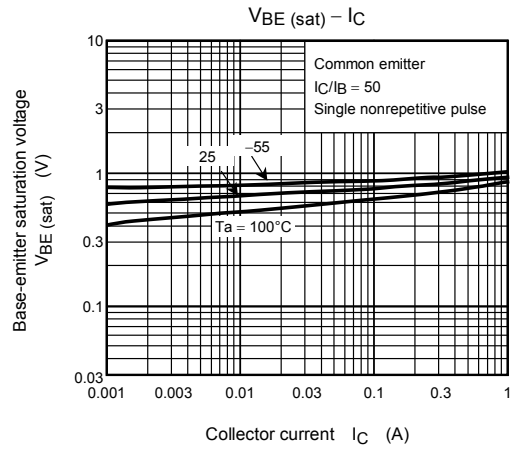
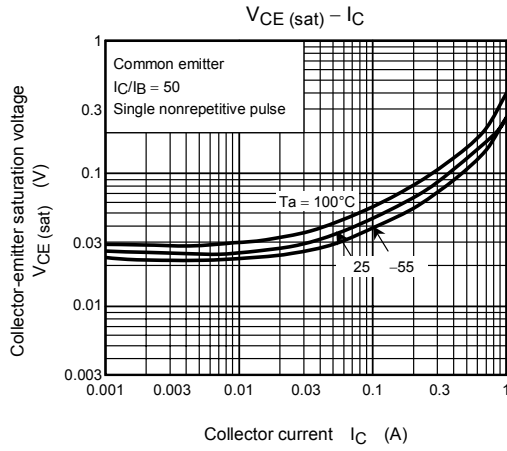
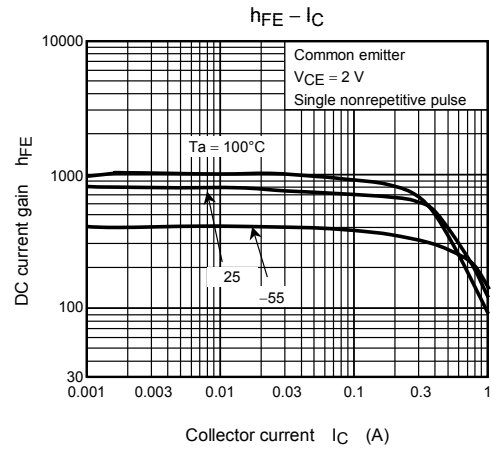
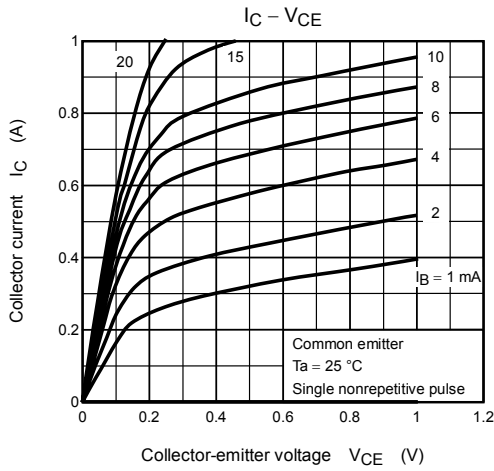
Unit: mm

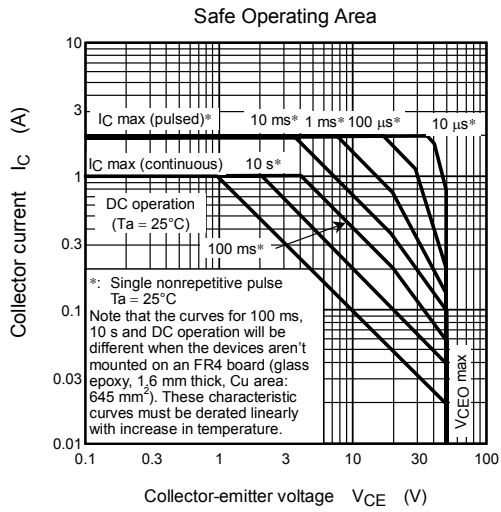
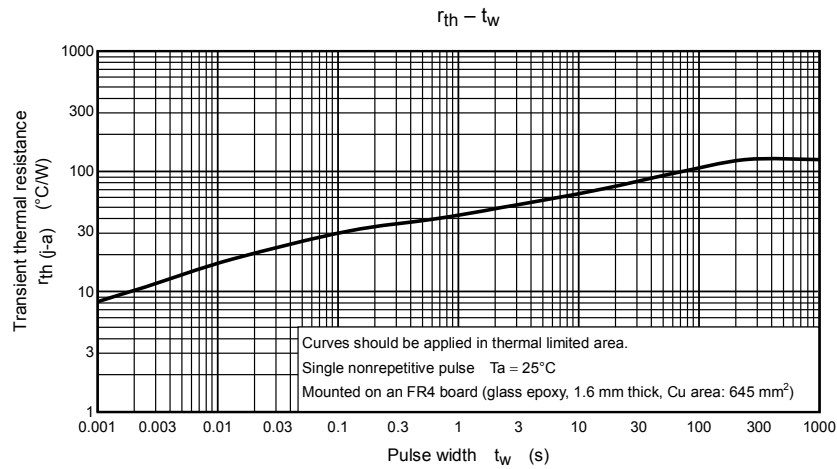


Weight: 0.05 g (typ.)



**Figure 1 Switching Time Test Circuit & Timing Chart**





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