

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.)

### Absolute Maximum Ratings (Ta = 25°C)

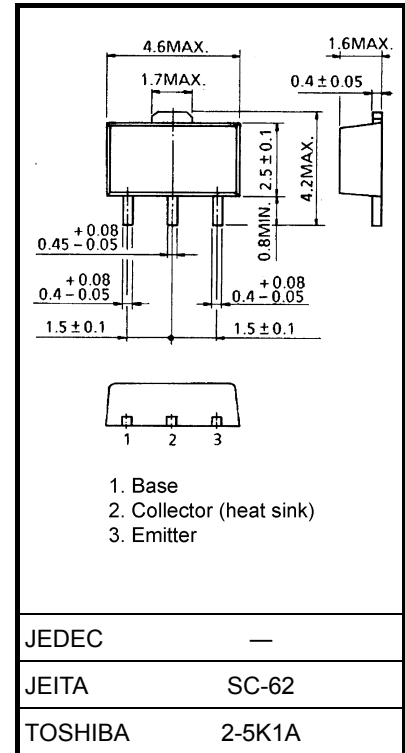
Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	100	V
Collector-emitter voltage	$V_{CEX}$	80	V
	$V_{CEO}$	50	
Emitter-base voltage	$V_{EBO}$	7	V
Collector current	DC	$I_C$	A
	Pulse	$I_{CP}$	
Base current	$I_B$	0.1	A
Collector power dissipation	DC	$P_C$ (Note 1)	W
	$t = 10$ s		
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-55 to 150	°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).

Unit: mm



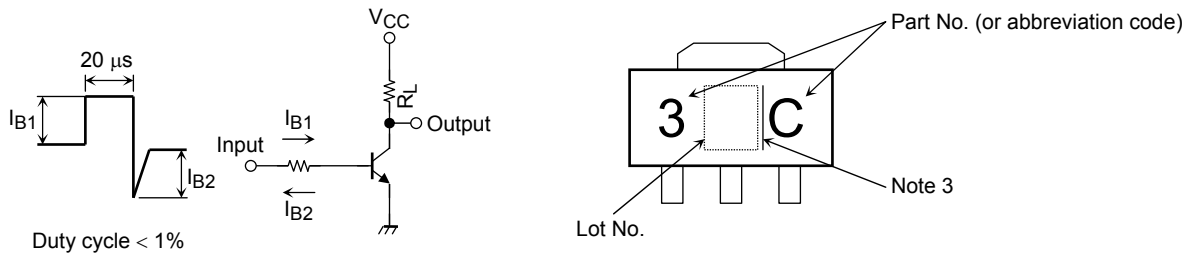
Weight: 0.05 g (typ.)

Start of commercial production  
2001-06

**Electrical Characteristics (Ta = 25°C)**

Characteristics		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		$V_{CE(sat)}$	$I_C = 300\text{ mA}, I_B = 6\text{ mA}$	—	—	0.17	V
Base-emitter saturation voltage		$V_{BE(sat)}$	$I_C = 300\text{ mA}, I_B = 6\text{ mA}$	—	—	1.10	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. $V_{CC} = 30\text{ V}, R_L = 100\ \Omega$ $I_{B1} = 10\text{ mA}, I_{B2} = 10\text{ mA}$	—	35	—	ns
	Storage time	$t_{stg}$		—	680	—	
	Fall time	$t_f$		—	85	—	

**Marking**



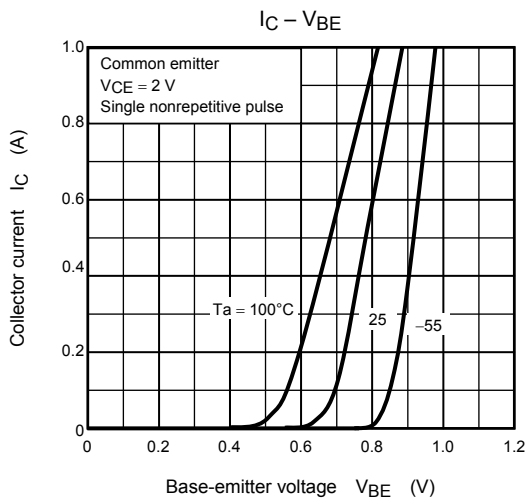
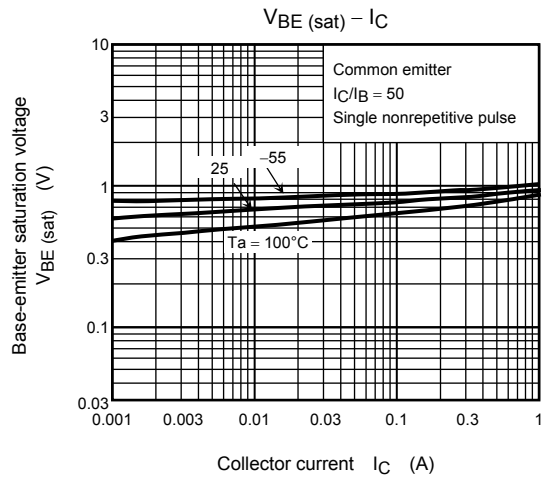
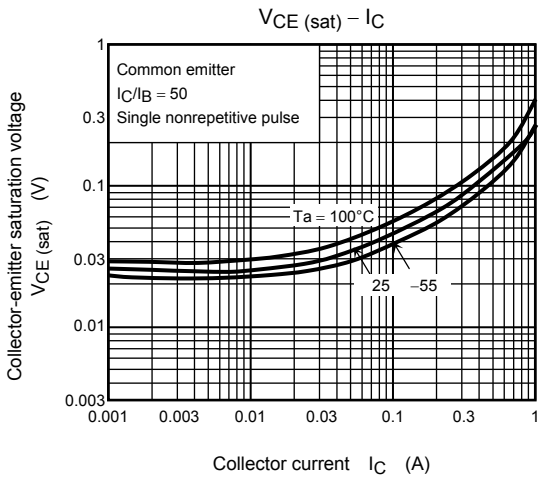
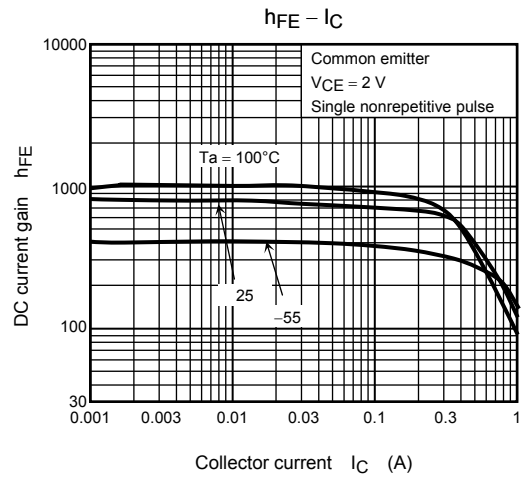
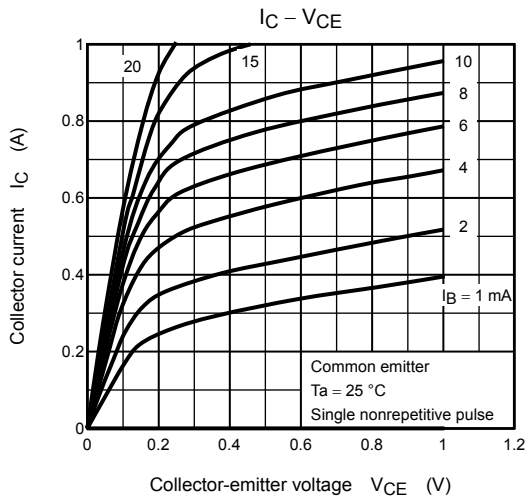
**Figure 1 Switching Time Test Circuit & Timing Chart**

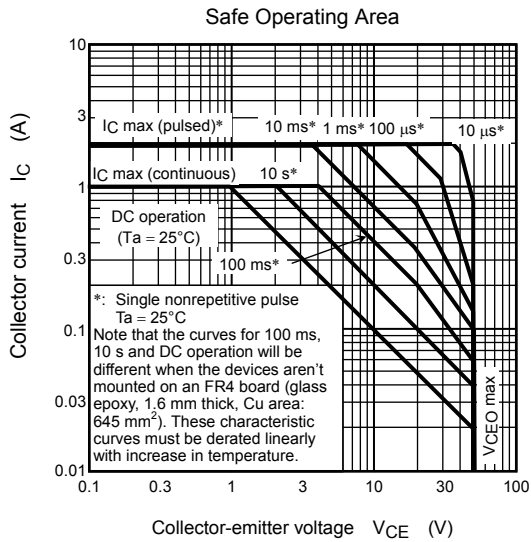
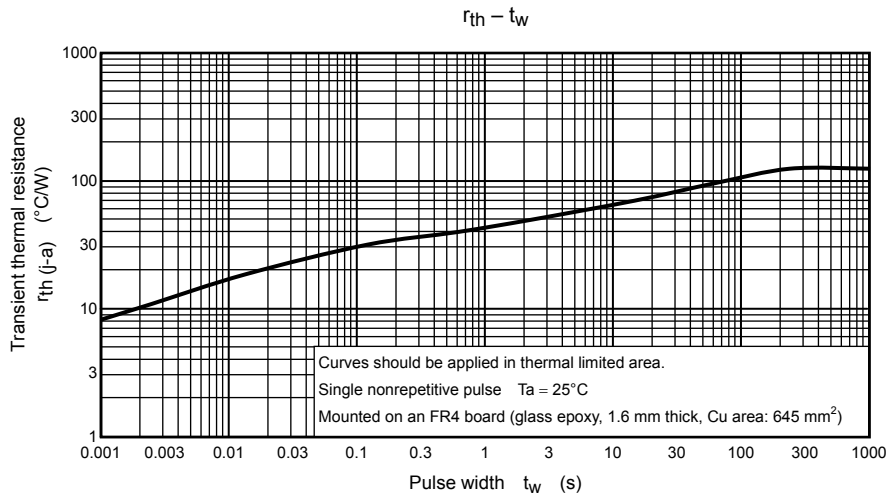
Note 3: A line to the right of a Lot No. identifies the indication of product Labels.

Without a line:  $[[Pb]]/INCLUDES > MCV$

With a line:  $[[G]]/RoHS COMPATIBLE$  or  $[[G]]/RoHS [[Pb]]$

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. The RoHS is the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.





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