

TOSHIBA Transistor Silicon NPN Epitaxial Type

# 2SC5713

High-Speed Switching Applications  
 DC-DC Converter Applications  
 Strobe Applications

- High DC current gain:  $h_{FE} = 400$  to  $1000$  ( $I_C = 0.5$  A)
- Low collector-emitter saturation voltage:  $V_{CE(sat)} = 0.15$  V (max)
- High-speed switching:  $t_f = 50$  ns (typ.)

### Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	20	V
Collector-emitter voltage	$V_{CEX}$	15	V
Collector-emitter voltage	$V_{CEO}$	10	V
Emitter-base voltage	$V_{EBO}$	7	V
Collector current	DC	$I_C$	4
	Pulse	$I_{CP}$	7
Base current	$I_B$	400	mA
Collector power dissipation	DC	$P_C$	1.0
	$t = 10$ s	(Note)	2.5
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-55 to 150	°C

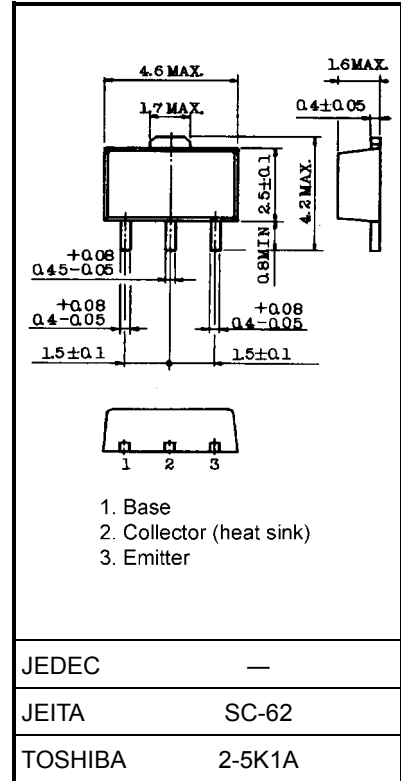
Note: Mounted on FR4 board (glass epoxy, 1.6 mm thick, Cu area: 645 mm<sup>2</sup>)

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

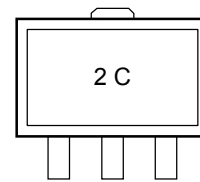
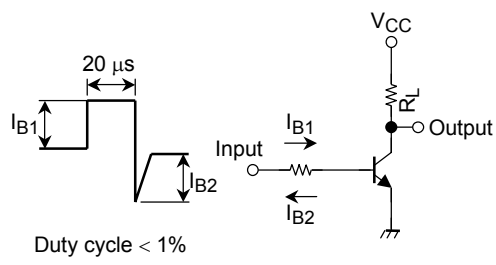
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = 20$ V, $I_E = 0$	—	—	100	nA
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 7$ V, $I_C = 0$	—	—	100	nA
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 10$ mA, $I_B = 0$	10	—	—	V
DC current gain	$h_{FE(1)}$	$V_{CE} = 2$ V, $I_C = 0.5$ A	400	—	1000	
	$h_{FE(2)}$	$V_{CE} = 2$ V, $I_C = 1.6$ A	200	—	—	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 1.6$ A, $I_B = 32$ mA	—	—	0.15	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 1.6$ A, $I_B = 32$ mA	—	—	1.10	V
Collector output capacitance	$C_{ob}$	$V_{CB} = 10$ V, $I_E = 0$ , $f = 1$ MHz	—	28	—	pF
Switching time	Rise time	$t_r$	—	110	—	ns
	Storage time	$t_{stg}$	—	150	—	
	Fall time	$t_f$	—	50	—	

Industrial Applications

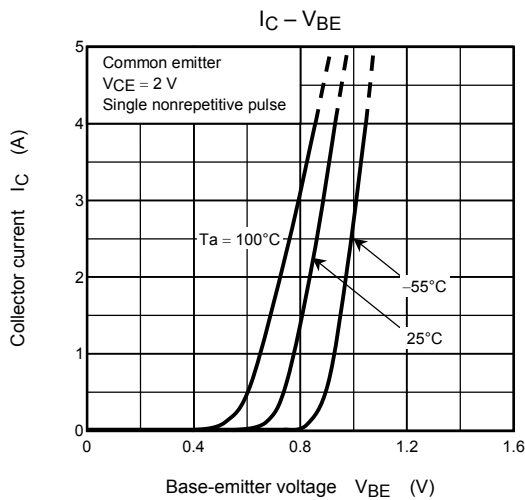
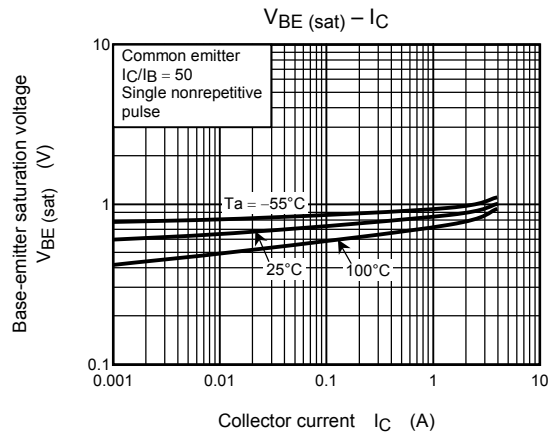
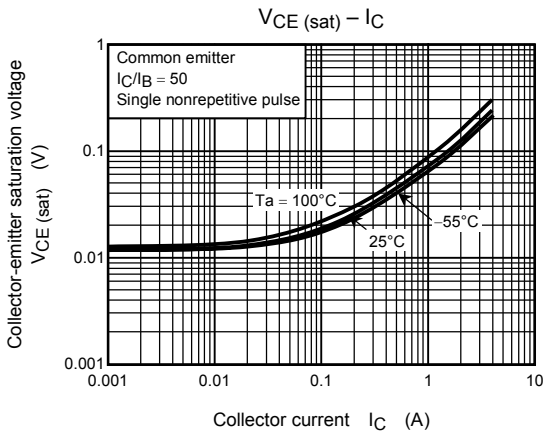
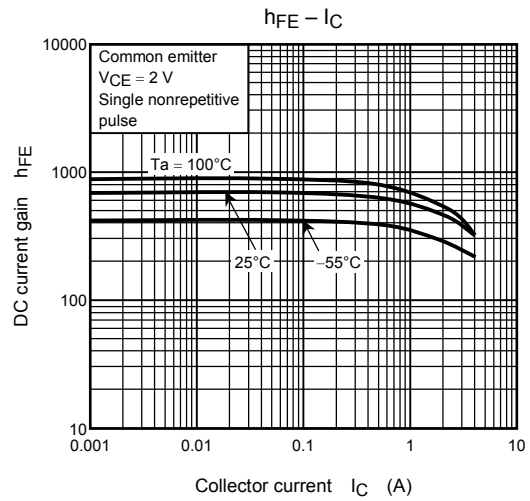
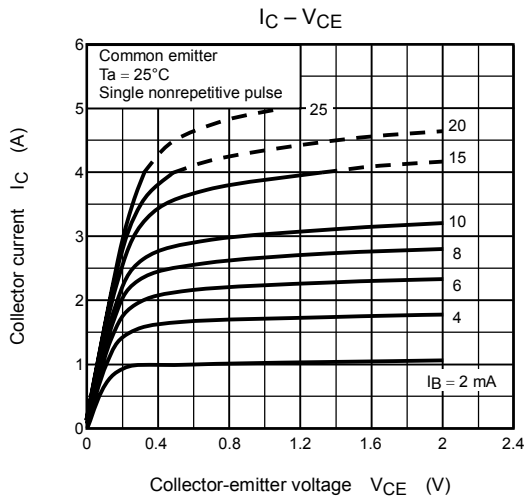
Unit: mm

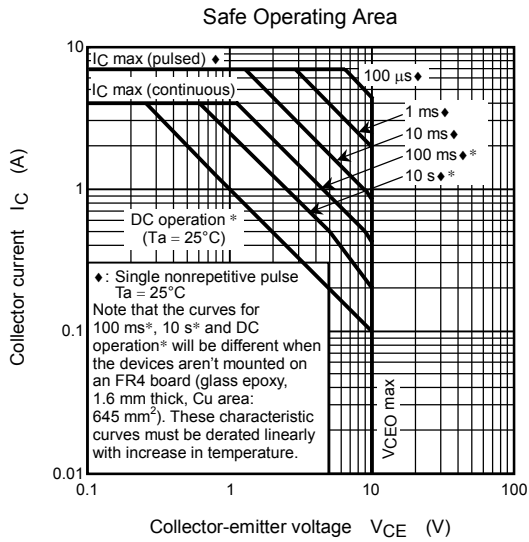
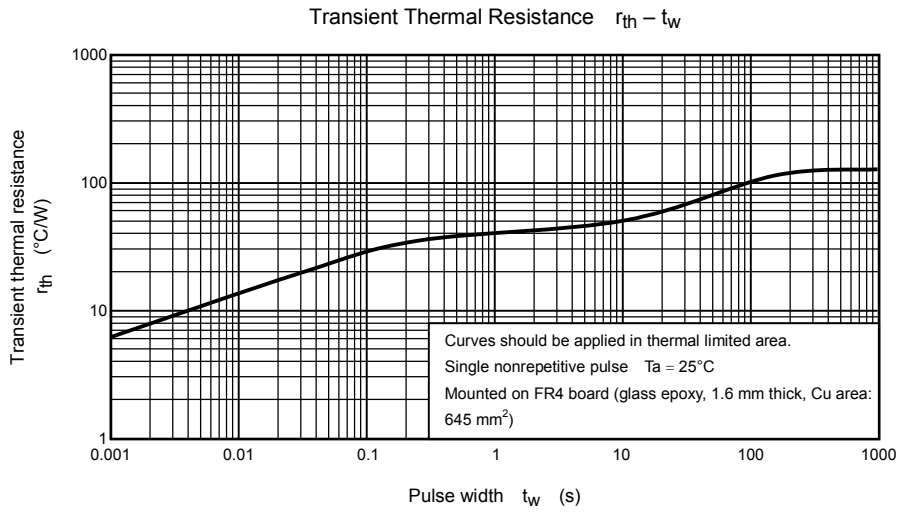


Weight: 0.05 g (typ.)

**Marking**

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





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