

TOSHIBA Transistor Silicon NPN Epitaxial Type

# TPC6502

High-Speed Switching Applications

DC/DC Converter Applications

Strobe Applications

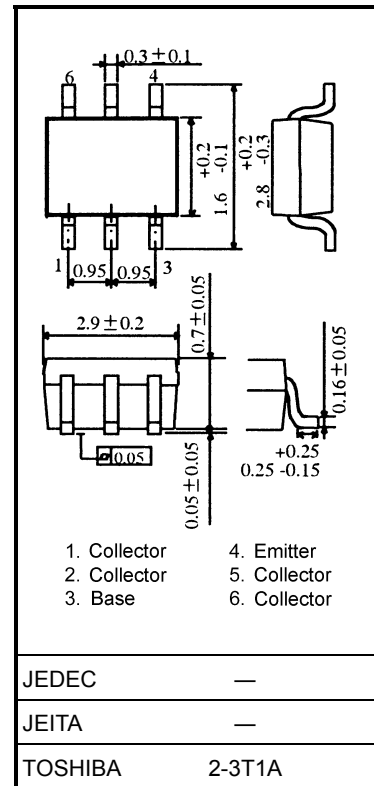
- High DC current gain:  $h_{FE} = 400$  to  $1000$  ( $I_C = 0.3$  A)
- Low collector-emitter saturation voltage:  $V_{CE(sat)} = 0.14$  V (max)
- High-speed switching:  $t_f = 120$  ns (typ.)

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

Characteristic		Symbol	Rating	Unit
Collector-base voltage		$V_{CBO}$	100	V
Collector-emitter voltage		$V_{CEX}$	80	V
Collector-emitter voltage		$V_{CEO}$	50	V
Emitter-base voltage		$V_{EBO}$	7	V
Collector current	DC	$I_C$	3.0	A
	Pulse	$I_{CP}$	5.0	
Base current		$I_B$	300	mA
Collector power dissipation	DC	$P_C$	0.8	W
	$t = 10$ s	(Note)	1.6	
Junction temperature		$T_j$	150	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-55 to 150	$^\circ\text{C}$

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

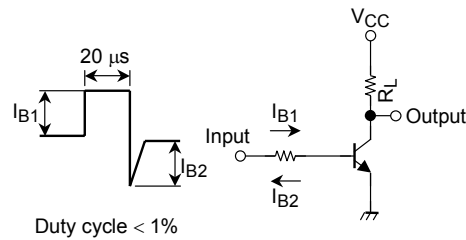
Unit: mm



Weight: 0.01 g (typ.)

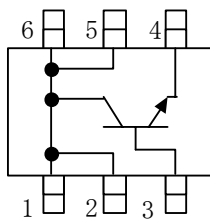
## Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current	$I_{CBO}$	$V_{CB} = 100 \text{ V}, I_E = 0$	—	—	100	nA
Emitter cutoff 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	$h_{FE} (1)$	$V_{CE} = 2 \text{ V}, I_C = 0.3 \text{ A}$	400	—	1000	
	$h_{FE} (2)$	$V_{CE} = 2 \text{ V}, I_C = 1 \text{ A}$	200	—	—	
Collector-emitter saturation voltage	$V_{CE (sat)}$	$I_C = 1 \text{ A}, I_B = 20 \text{ mA}$	—	—	0.14	V
Base-emitter saturation voltage	$V_{BE (sat)}$	$I_C = 1 \text{ A}, I_B = 20 \text{ mA}$	—	—	1.10	V
Collector output capacitance	$C_{ob}$	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$	—	13	—	pF
Switching time	Rise time	$t_r$	See Figure 1 circuit diagram. $V_{CC} \approx 30 \text{ V}, R_L = 30 \Omega$ $I_{B1} = -I_{B2} = 33.3 \text{ mA}$		—	ns
	Storage time	$t_{stg}$			—	
	Fall time	$t_f$			—	

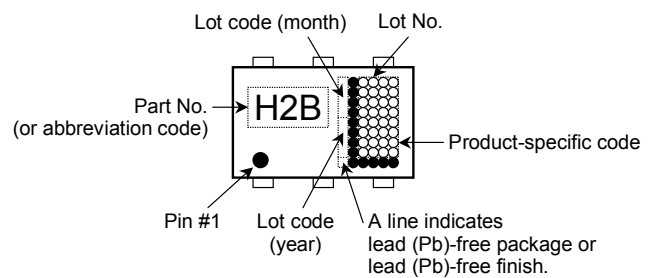


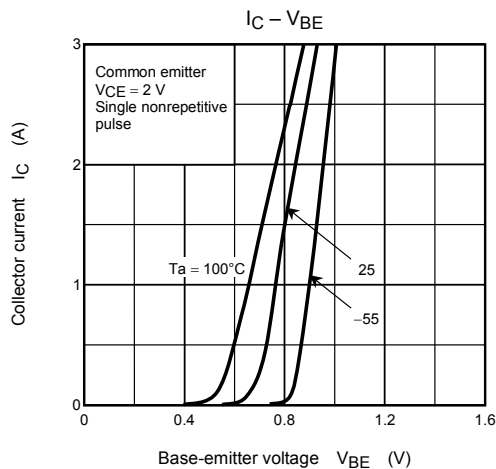
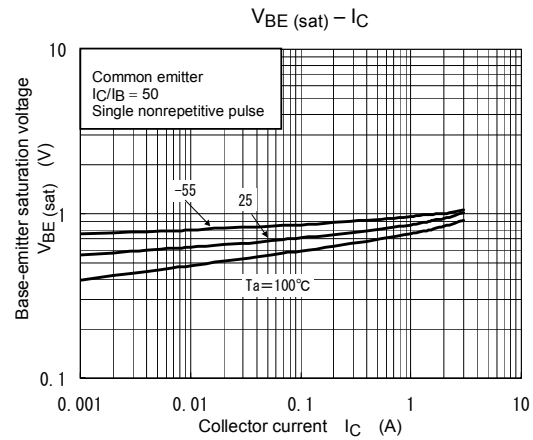
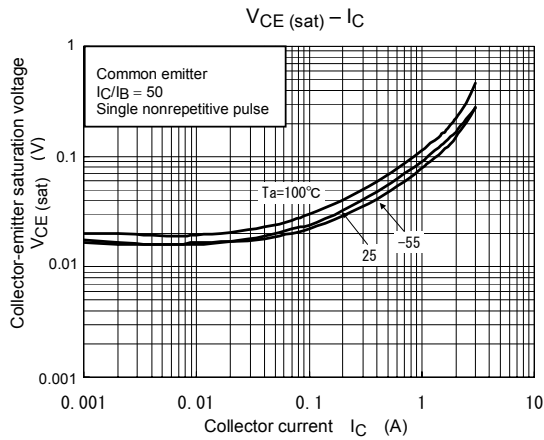
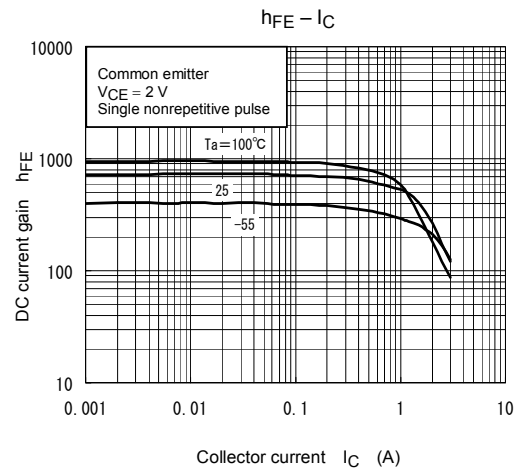
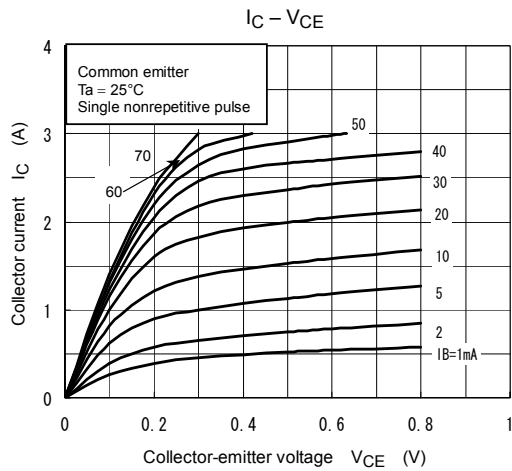
**Figure 1. Switching Time Test Circuit & Timing Chart**

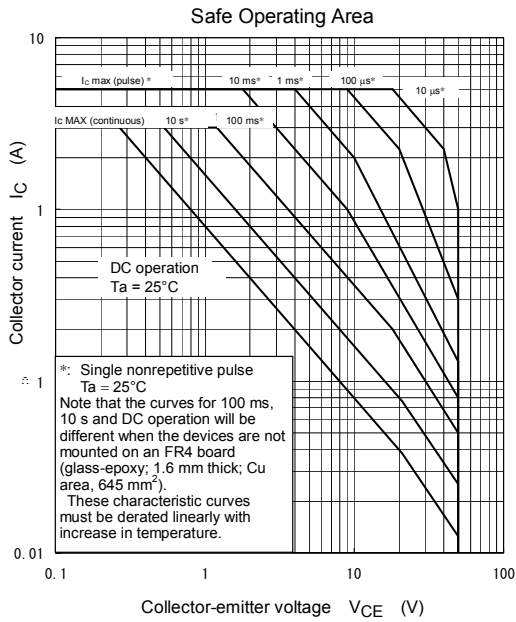
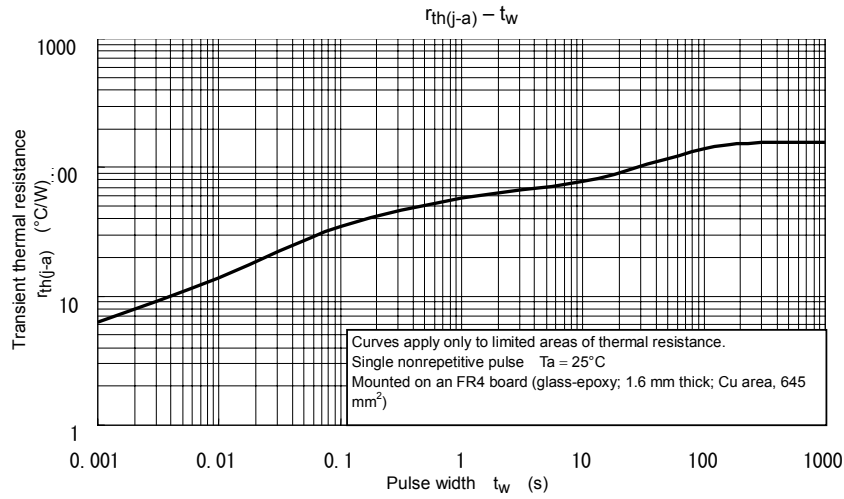
## Circuit Configuration



## Marking







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