

## TOSHIBA Transistor Silicon PNP Epitaxial Type

# TPC6601

## High-Speed Switching Applications

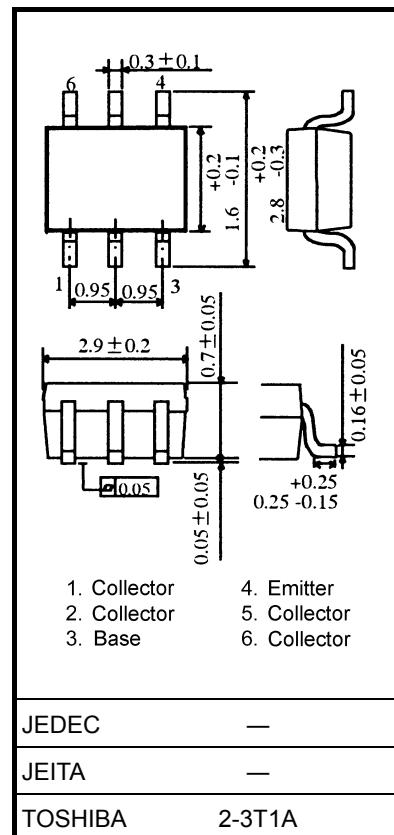
## DC-DC Converter Applications

Unit: mm

- High DC current gain:  $hFE = 200$  to  $500$  ( $I_C = -0.3$  A)
- Low collector-emitter saturation voltage:  $V_{CE(\text{sat})} = -0.2$  V (max)
- High-speed switching:  $t_f = 90$  ns (typ.)

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

Characteristics		Symbol	Rating	Unit
Collector-base voltage		V <sub>CBO</sub>	-50	V
Collector-emitter voltage		V <sub>CEO</sub>	-50	V
Emitter-base voltage		V <sub>EBO</sub>	-7	V
Collector current	DC	I <sub>C</sub>	-2.0	A
	Pulse	I <sub>CP</sub>	-3.5	
Base current		I <sub>B</sub>	-0.2	A
Collector power dissipation	DC	P <sub>C</sub> (Note 1)	0.8	W
	t = 10 s		1.6	
Junction temperature		T <sub>j</sub>	150	°C
Storage temperature range		T <sub>stg</sub>	-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).

## Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = -50\text{ V}$ , $I_E = 0$	—	—	-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)	$V_{CE} = -2\text{ V}$ , $I_C = -0.3\text{ A}$	200	—	500	
	$h_{FE}$ (2)	$V_{CE} = -2\text{ V}$ , $I_C = -1.0\text{ A}$	100	—	—	
Collector-emitter saturation voltage	$V_{CE(\text{sat})}$	$I_C = -1.0\text{ A}$ , $I_B = -33\text{ mA}$	—	—	-0.2	V
Base-emitter saturation voltage	$V_{BE(\text{sat})}$	$I_C = -1.0\text{ A}$ , $I_B = -33\text{ mA}$	—	—	-1.1	V
Switching time	Rise time	$t_r$	See Figure 1 circuit diagram. $V_{CC} \approx -30\text{ V}$ , $R_L = 30\Omega$ $I_{B1} = -I_{B2} = -33\text{ mA}$		60	ns
	Storage time	$t_{stg}$			250	
	Fall time	$t_f$			90	

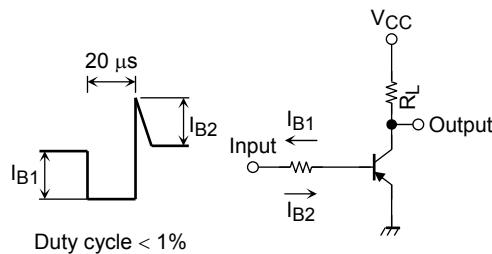
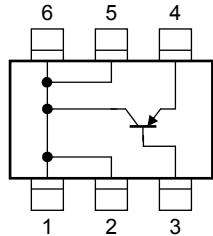
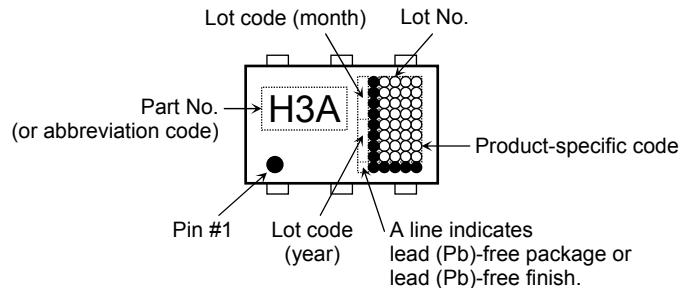


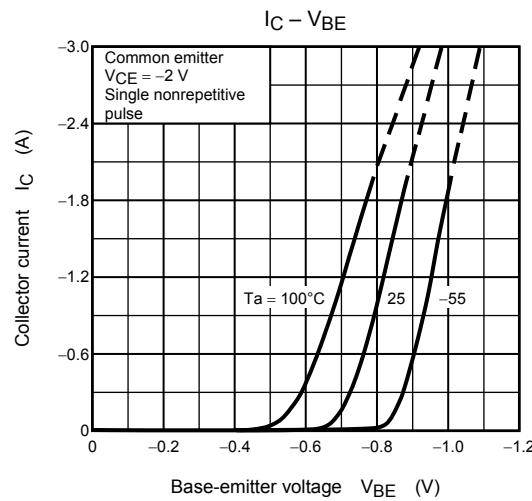
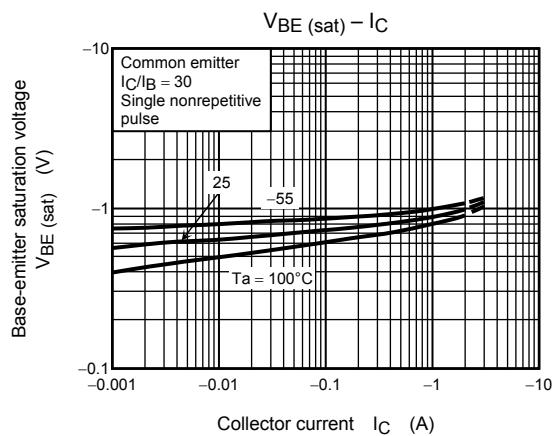
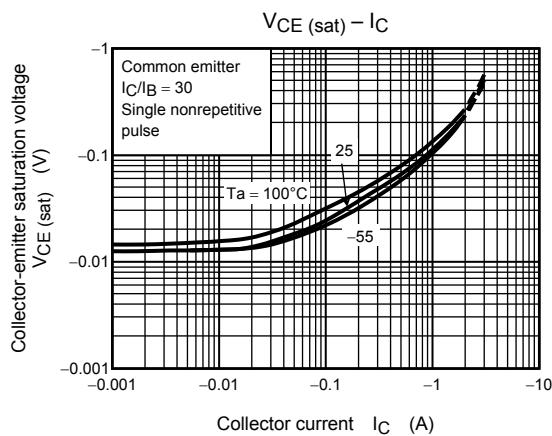
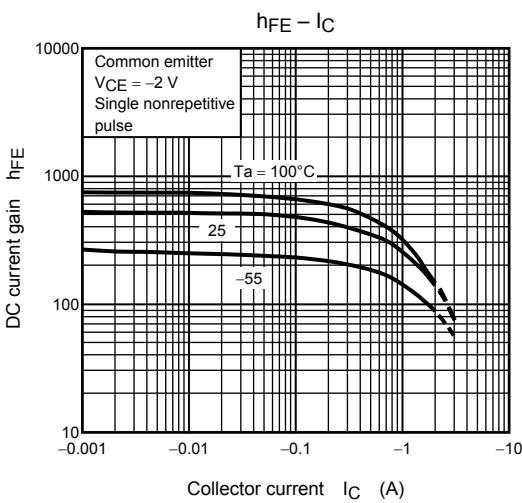
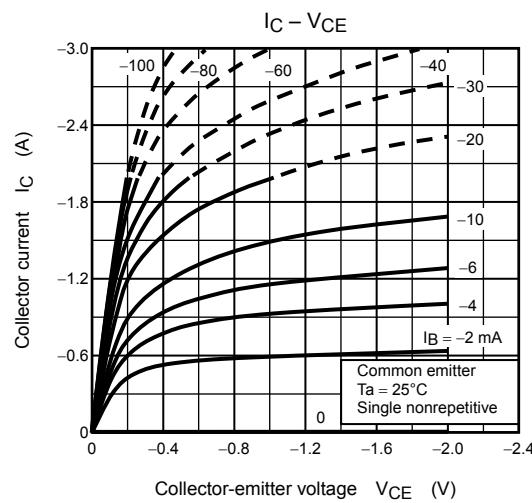
Figure 1 Switching Time Test Circuit &amp; Timing Chart

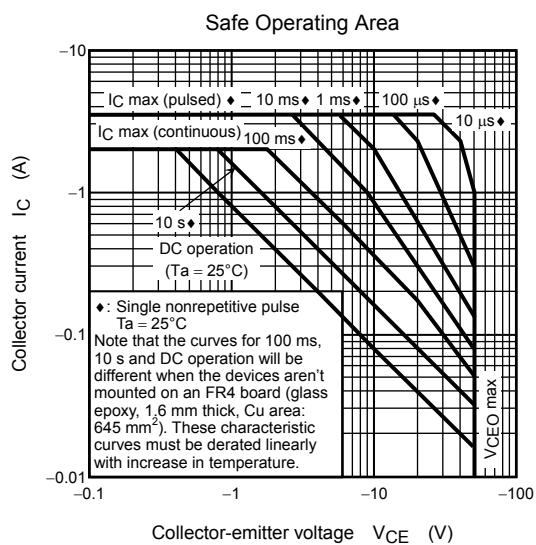
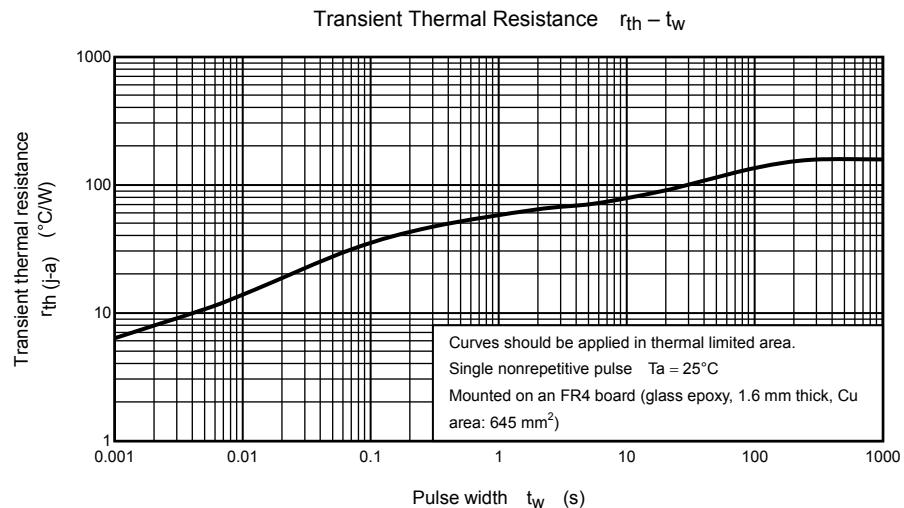
## Circuit Configuration



## Marking







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