

TOSHIBA Transistor Silicon PNP Epitaxial Type

TPC6604

High-Speed Switching Applications

DC-DC Converter Applications

- High DC current gain : $h_{FE} = 200$ to 500 ($I_C = -0.1$ A)
- Low collector-emitter saturation voltage : $V_{CE(sat)} = -0.23$ V (max)
- High-speed switching : $t_f = 70$ ns (typ.)

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

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	-50	V
Collector-emitter voltage	V_{CEO}	-50	V
Emitter-base voltage	V_{EBO}	-7	V
Collector current (Note 1)	DC	I_C	A
	Pulse	I_{CP}	
Base current	I_B	-0.1	A
Collector power dissipation (Note 2)	DC	P_C	W
	$t = 10$ s		
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55 to 150	$^\circ\text{C}$

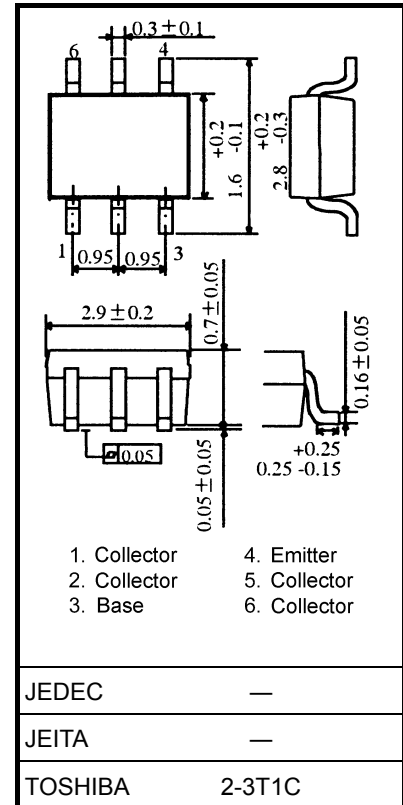
Note 1: Ensure that the junction temperature does not exceed 150°C during use of the device.

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

Note 3: 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

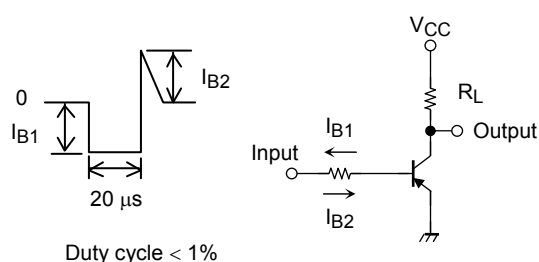


Weight: 0.011 g (typ.)

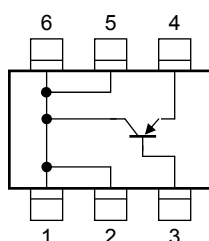
Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Conditions	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	$h_{FE} (1)$	$V_{CE} = -2\text{ V}, I_C = -0.1\text{ A}$	200	—	500	
	$h_{FE} (2)$	$V_{CE} = -2\text{ V}, I_C = -0.3\text{ A}$	125	—	—	
Collector-emitter saturation voltage	$V_{CE (sat)}$	$I_C = -300\text{ mA}, I_B = -10\text{ mA}$	—	—	-0.23	V
Base-emitter saturation voltage	$V_{BE (sat)}$	$I_C = -300\text{ mA}, I_B = -10\text{ mA}$	—	—	-1.1	V
Collector output capacitance	C_{ob}	$V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	8	—	pF
Switching time	Rise time	See Figure 1 circuit diagram. $V_{CC} \approx -30\text{ V}, R_L = 100\ \Omega$ $I_{B1} = I_{B2} = 10\text{ mA}$	—	60	—	ns
	Storage time		—	280	—	
	Fall time		—	70	—	

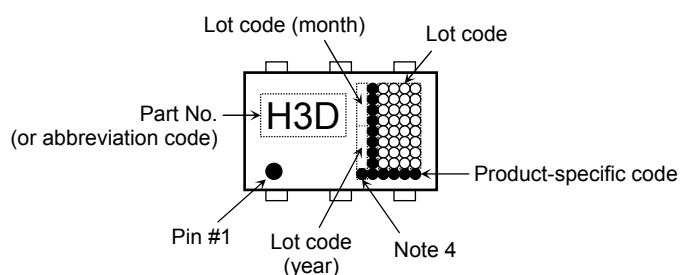
Figure 1. Switching Time Test Circuit & Timing Chart



Circuit Configuration



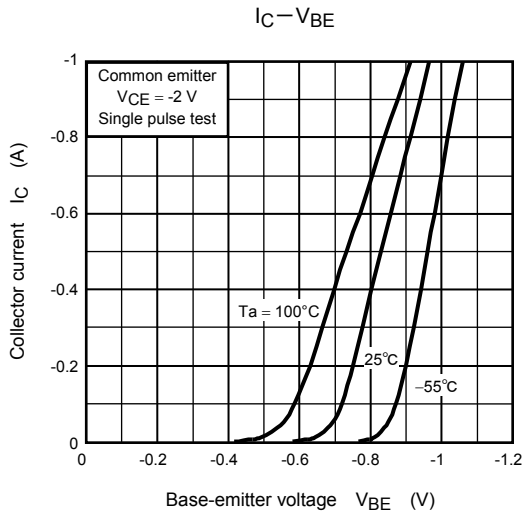
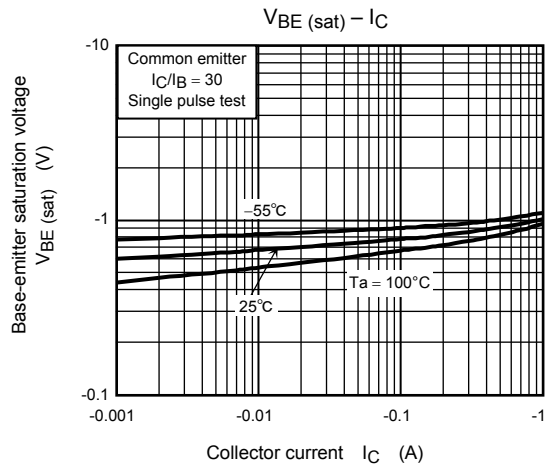
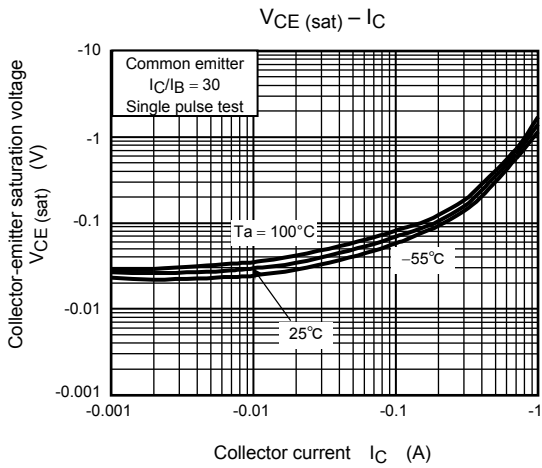
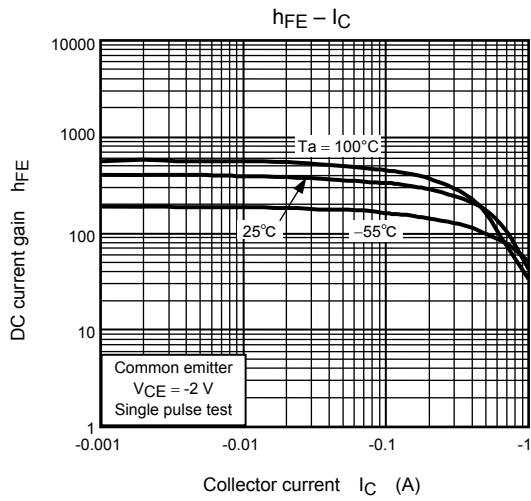
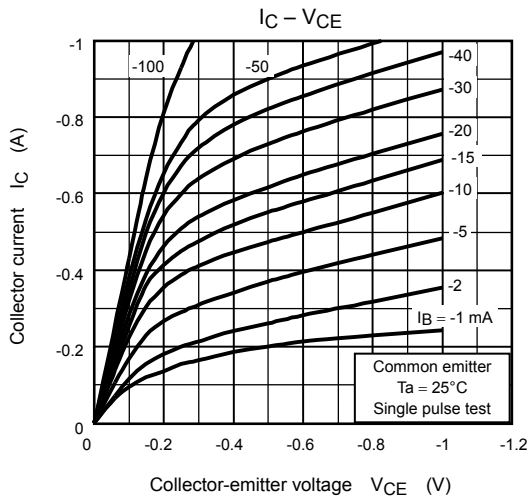
Marking

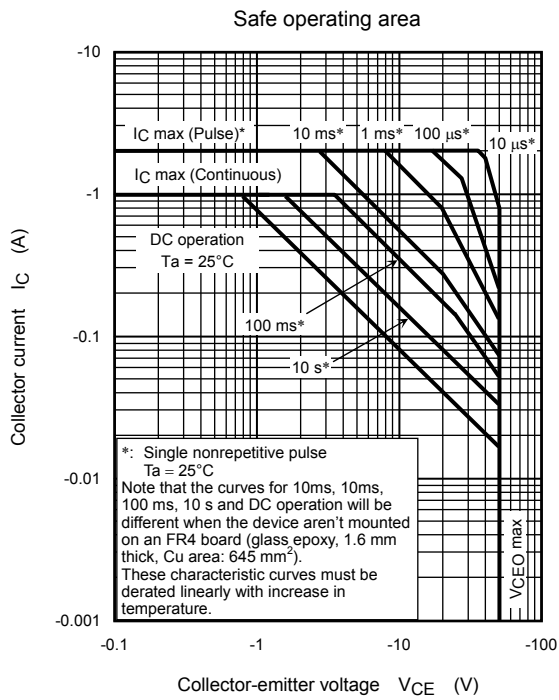
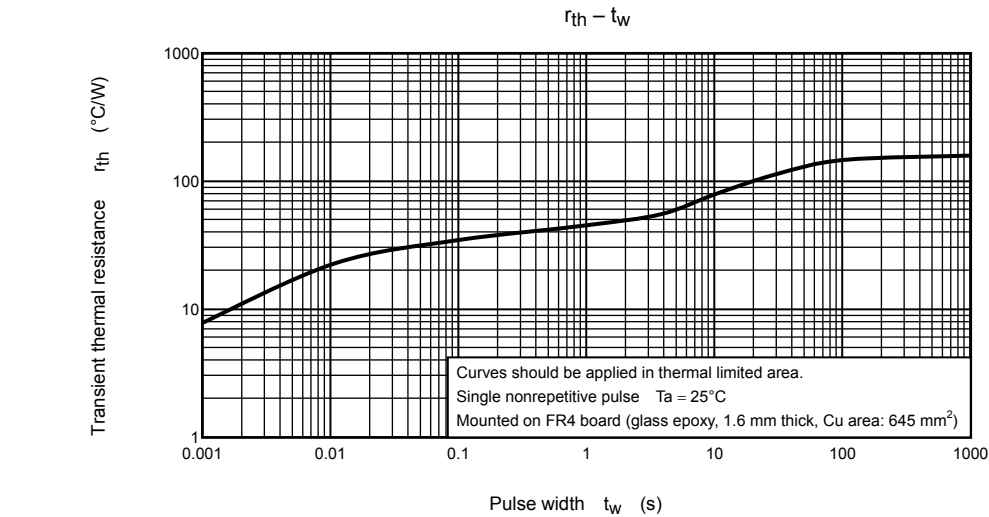


Note 4 : A dot marking identifies the indication of product Labels.
[[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product.

The RoHS is the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.





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