

TOSHIBA Transistor Silicon NPN Triple Diffused Mesa Type

# TPCP8604

## High-Voltage Switching Applications

High breakdown voltage:  $V_{CEO} = -400\text{ V}$

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

Characteristics		Symbol	Rating	Unit
Collector-base voltage		$V_{CBO}$	-400	V
Collector-emitter voltage		$V_{CEO}$	-400	V
Emitter-base voltage		$V_{EBO}$	-7	V
Collector current	DC (Note 1)	$I_C$	-0.3	A
	Pulse (Note 1)	$I_{CP}$	-1	
Base current		$I_B$	-0.25	A
Collector power dissipation	$t=10\text{s}$	$P_C$ (Note 2)	-2.2	W
	DC		-1.1	
Junction temperature		$T_j$	-150	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-55 to 150	$^\circ\text{C}$

Unit: mm

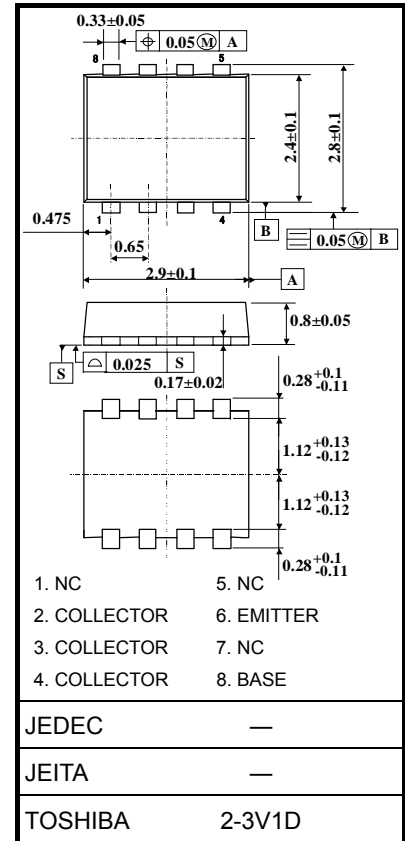
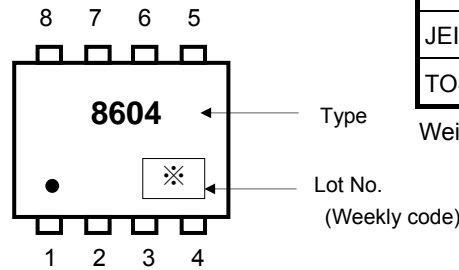
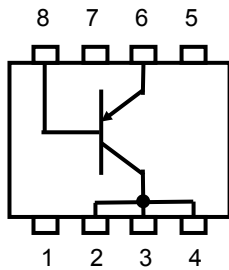


Figure1. Circuit Configuration

Figure2. Marking (Note 3)

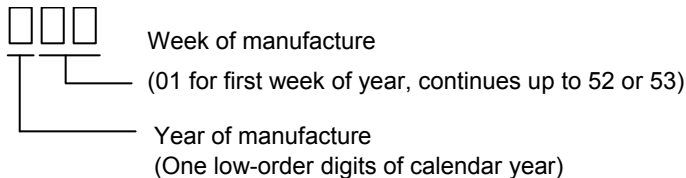


Note 1 : Please use devices on condition that the junction temperature is below  $150^\circ\text{C}$ .

Note 2 : Mounted on FR4 board( glass epoxy, 1.6mm thick, Cu area:  $645\text{mm}^2$ )

Note 3 : ● on lower left of the marking indicates Pin 1.

※ Weekly code: (three digits)

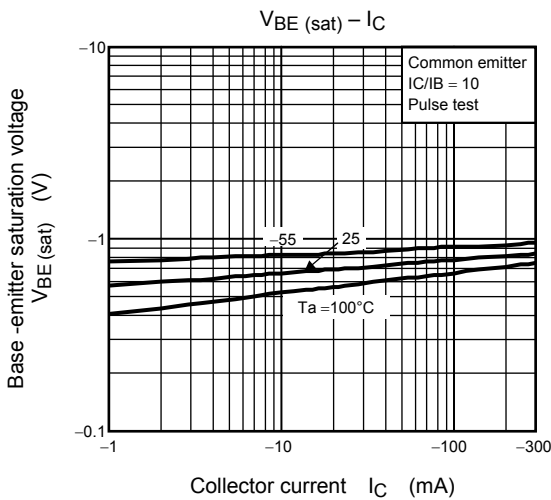
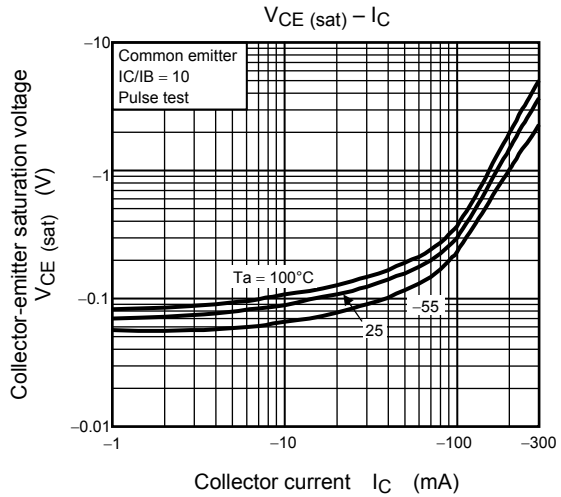
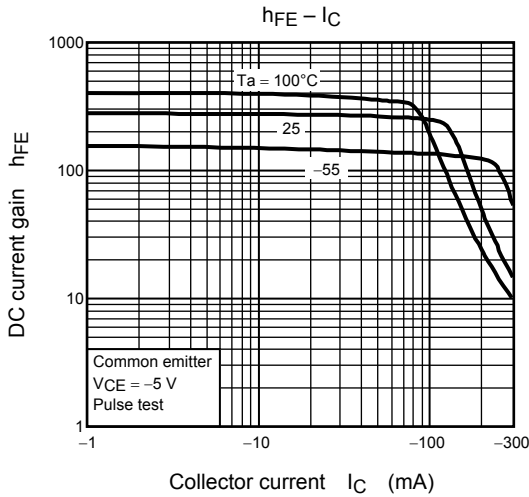
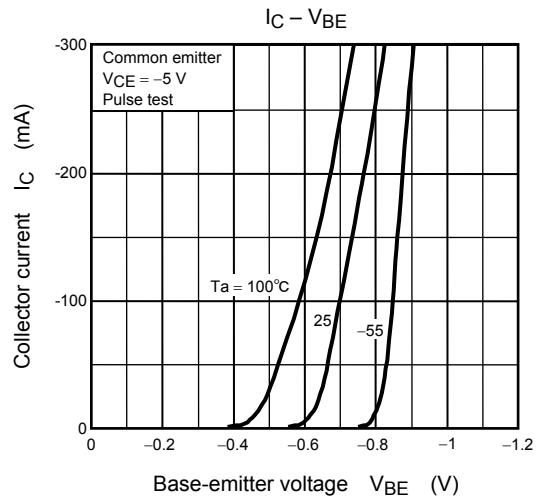
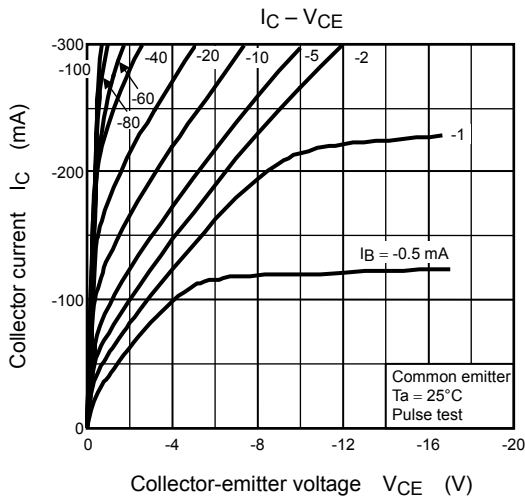


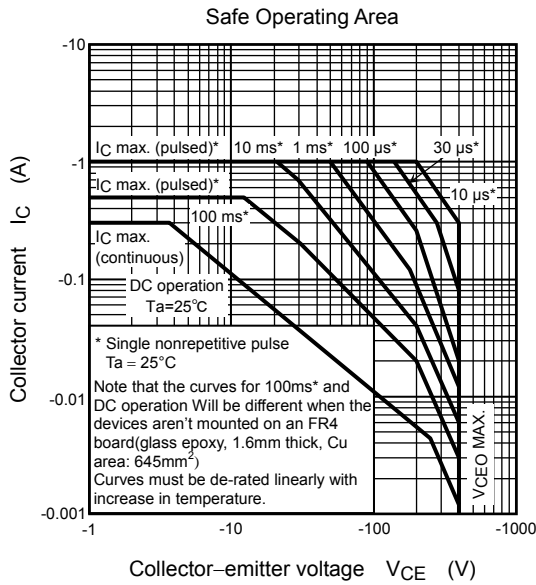
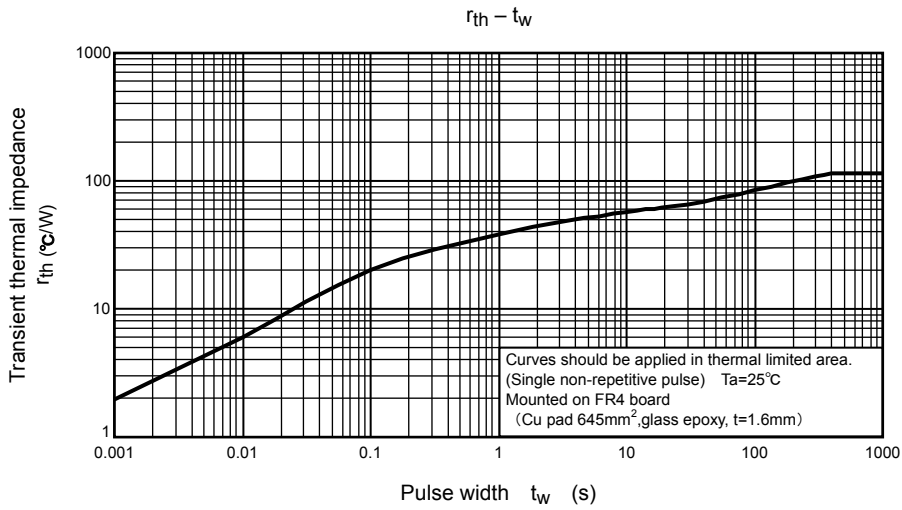
Note 4 : Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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		$I_{CBO}$	$V_{CB} = -400\text{ V}, I_E = 0$	—	—	-10	$\mu\text{A}$
Emitter cut-off current		$I_{EBO}$	$V_{EB} = -7\text{ V}, I_C = 0$	—	—	-1	$\mu\text{A}$
Collector-emitter breakdown voltage		$V_{(BR)CEO}$	$I_C = -10\text{ mA}, I_B = 0$	-400	—	—	V
DC current gain		$h_{FE(1)}$	$V_{CE} = -5\text{ V}, I_C = -20\text{ mA}$	140	—	450	
		$h_{FE(2)}$	$V_{CE} = -5\text{ V}, I_C = -100\text{ mA}$	140	—	400	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = -100\text{ mA}, I_B = -10\text{ mA}$	—	-0.4	-1.0	V
Base-emitter voltage		$V_{BE(sat)}$	$I_C = -100\text{ mA}, I_B = -10\text{ mA}$	—	-0.76	-0.9	V
Transition frequency		$f_T$	$V_{CE} = -5\text{ V}, I_C = -50\text{ mA}$	—	35	—	MHz
Collector output capacitance		$C_{ob}$	$V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	18	—	pF
Switching time	Turn-on time	$t_{on}$	<p> <math>I_{B1} = -10\text{ mA}, I_{B2} = 20\text{ mA}</math>,                      Duty cycle <math>\leq 1\%</math> </p>	—	0.2	—	$\mu\text{s}$
	Storage time	$t_{stg}$		—	2.3	—	
	Fall time	$t_f$		—	0.2	—	





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