

TPC6701

High-Speed Switching Applications

Motor Drive Applications

Inverter Lighting Applications

- Two NPN transistors are mounted on a compact and slim package.
- High DC current gain: $h_{FE} = 400$ to 1000 ($I_C = 0.1$ A)
- Low collector-emitter saturation voltage: $V_{CE(sat)} = 0.17$ V (max)
- High-speed switching: $t_f = 85$ ns (typ.)

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

Characteristics	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	1.0
	Pulse	I_{CP}	2.0
Base current	I_B	0.1	mA
Collector power dissipation (single-device operation)	P_C (Note 1)	400	mW
Total collector power dissipation (simultaneous operation)	P_{CT} (Note 2)	660	mW
Thermal resistance, junction to ambient (single-device operation)	$R_{th(j-a)}$ (Note 1)	312	$^\circ\text{C/W}$
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55 to 150	$^\circ\text{C}$

Note 1: Mounted on an FR4 board (glass epoxy, 1.6 mm thick, Cu area: 645 mm²)

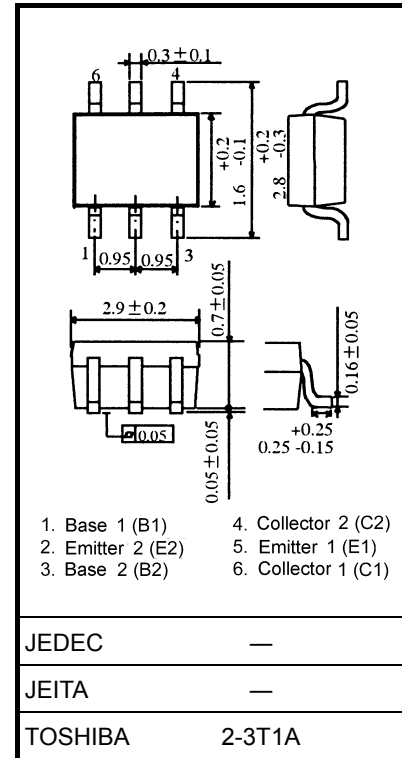
Note 2: Mounted on an FR4 board (glass epoxy, 1.6 mm thick, Cu area: 645 mm²)

Total collector power dissipation value when two devices are operated at the same time

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)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	$V_{CB} = 100\text{ V}, I_E = 0$	—	—	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		$h_{FE(1)}$	$V_{CE} = 2\text{ V}, I_C = 0.1\text{ A}$	400	—	1000	
		$h_{FE(2)}$	$V_{CE} = 2\text{ V}, I_C = 0.3\text{ A}$	200	—	—	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 300\text{ mA}, I_B = 6\text{ mA}$	—	—	0.17	V
Base-emitter saturation voltage		$V_{BE(sat)}$	$I_C = 300\text{ mA}, I_B = 6\text{ mA}$	—	—	1.10	V
Collector output capacitance		C_{ob}	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	5	—	pF
Switching time	Rise time	t_r	See Figure 1 circuit diagram.	—	35	—	ns
	Storage time	t_{stg}	$V_{CC} \approx 30\text{ V}, R_L = 100\ \Omega$	—	680	—	
	Fall time	t_f	$I_{B1} = -I_{B2} = 10\text{ mA}$	—	85	—	

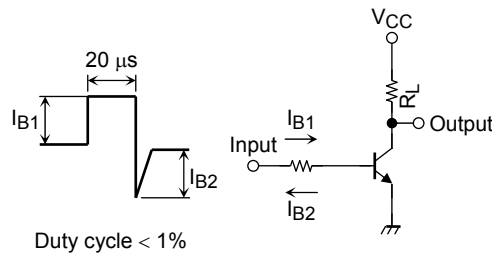
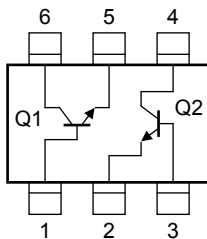
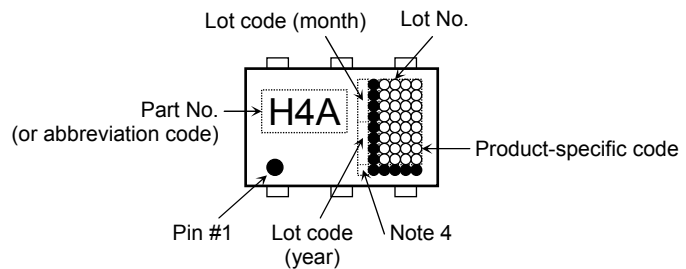


Figure 1 Switching Time Test Circuit & Timing Chart

Circuit Configuration



Marking

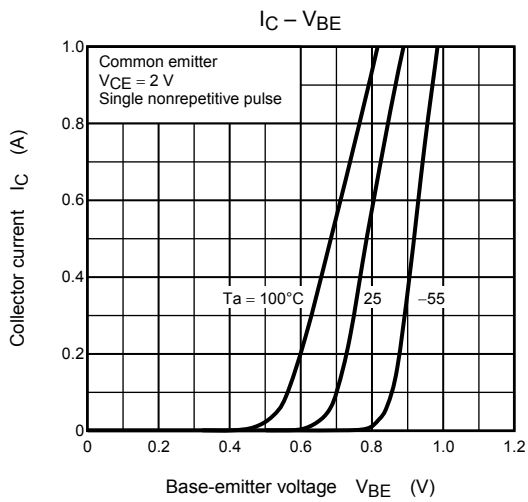
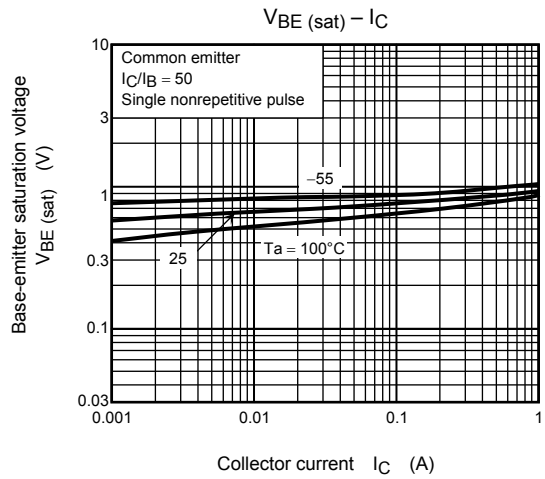
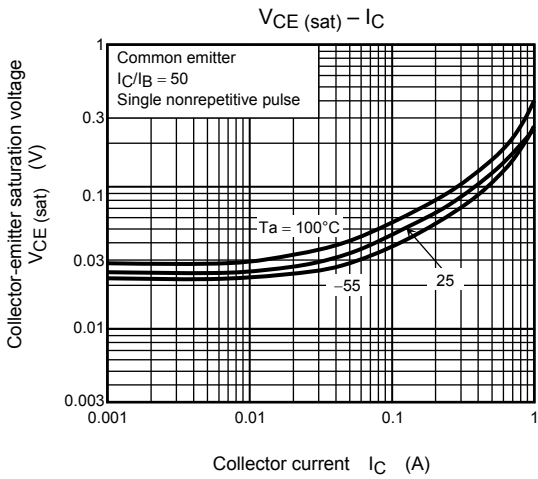
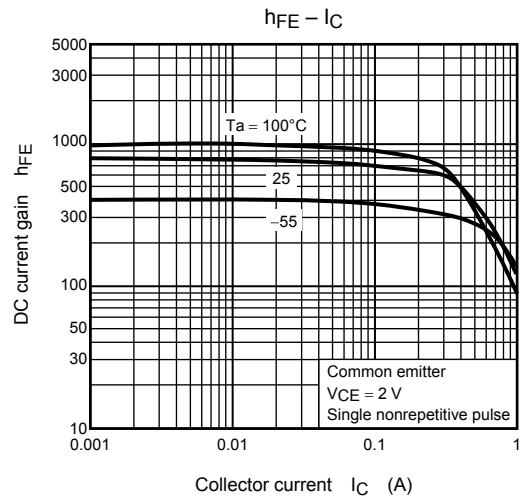
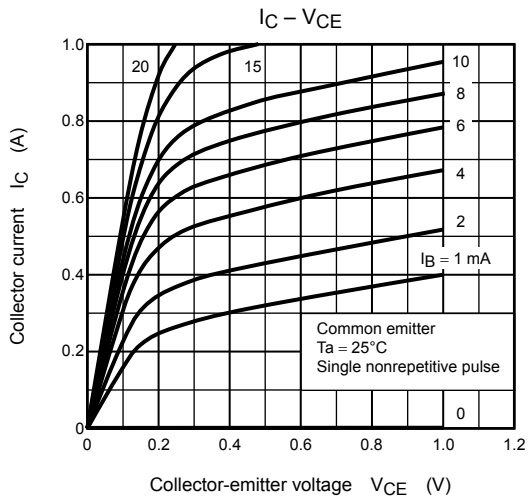


Note 4: A dot marking identifies the indication of product Labels.

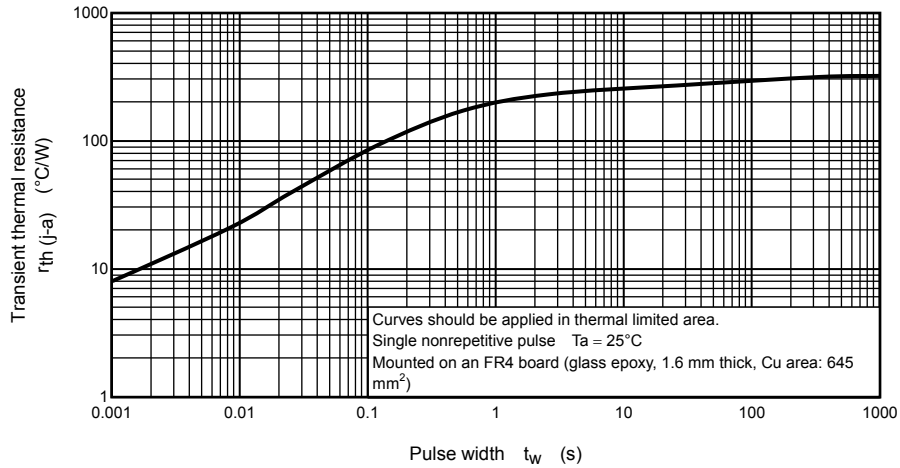
Without a dot: [[Pb]]/INCLUDES > MCV

With a dot: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

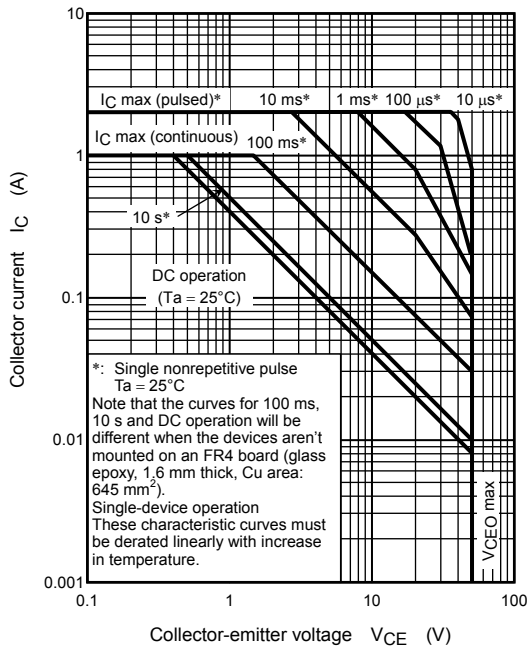
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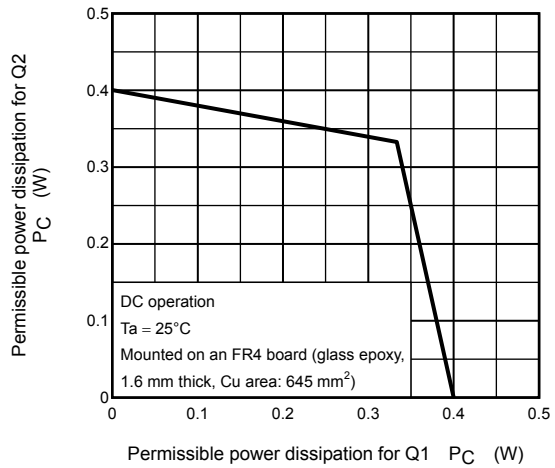
Transient Thermal Resistance $r_{th} - t_w$



Safe Operating Area



Permissible Power Dissipation for Simultaneous Operation



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