

# 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.)

## Maximum Ratings (Ta = 25°C)

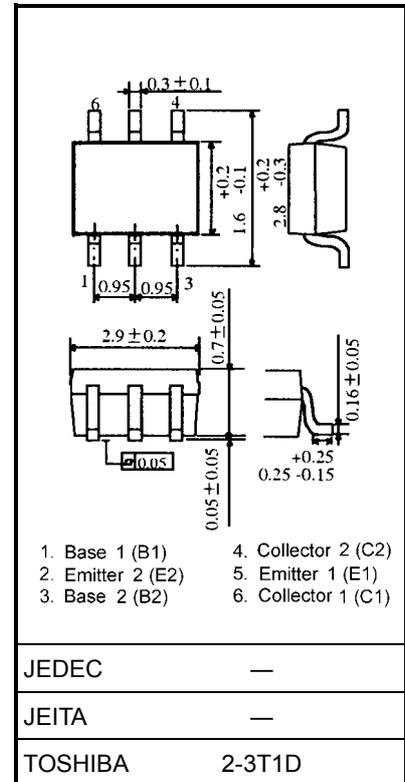
Characteristics		Symbol	Rating	Unit
Collector-base voltage		$V_{CBO}$	100	V
Collector-emitter voltage		$V_{CEX}$	80	V
Collector-emitter voltage		$V_{CEO}$	50	V
Emitter-base voltage		$V_{EBO}$	7	V
Collector current	DC	$I_C$	1.0	A
	Pulse	$I_{CP}$	2.0	
Base current		$I_B$	0.1	mA
Collector power dissipation (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	°C/W
Junction temperature		$T_j$	150	°C
Storage temperature range		$T_{stg}$	-55 to 150	°C

Note 1: Mounted on FR4 board (glass epoxy, 1.6 mm thick, Cu area: 645 mm<sup>2</sup>)

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

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

Unit: mm

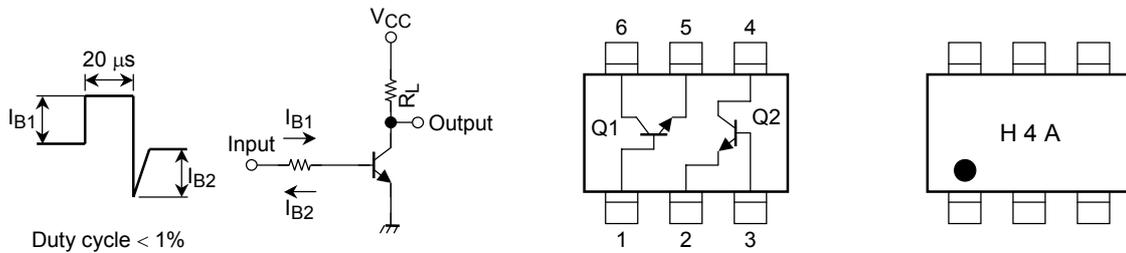


Weight: 0.011 g (typ.)

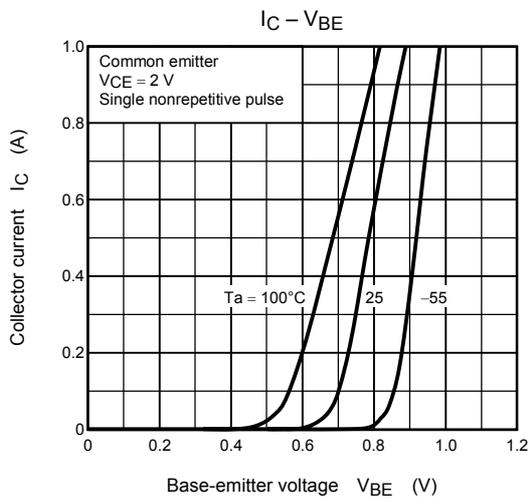
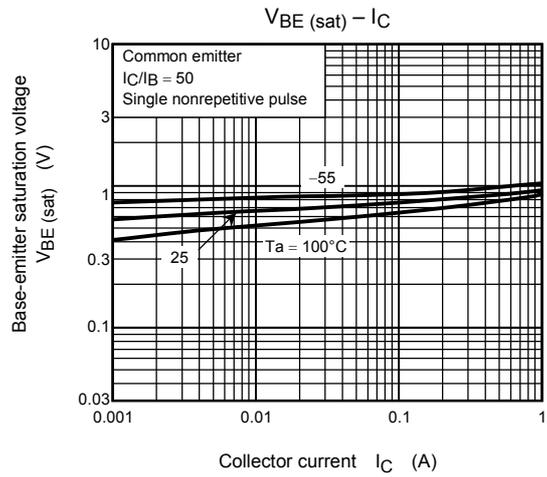
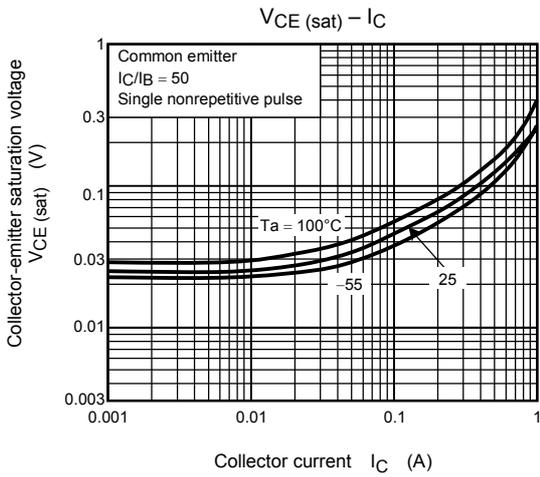
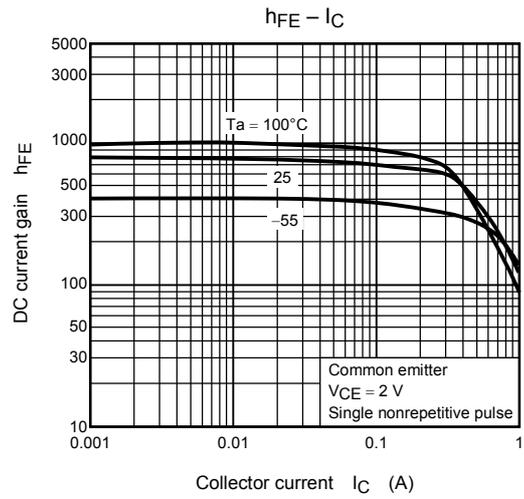
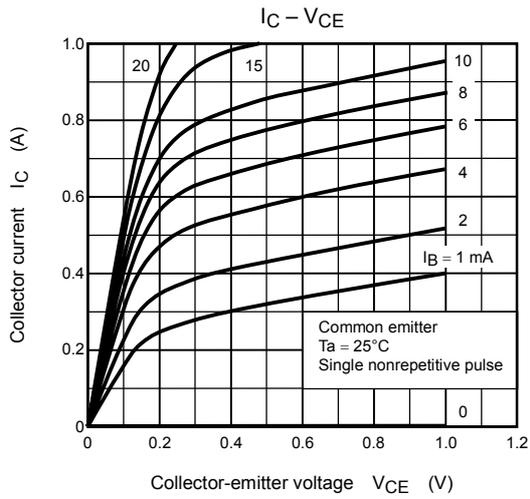
**Electrical Characteristics (Ta = 25°C)**

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	—	

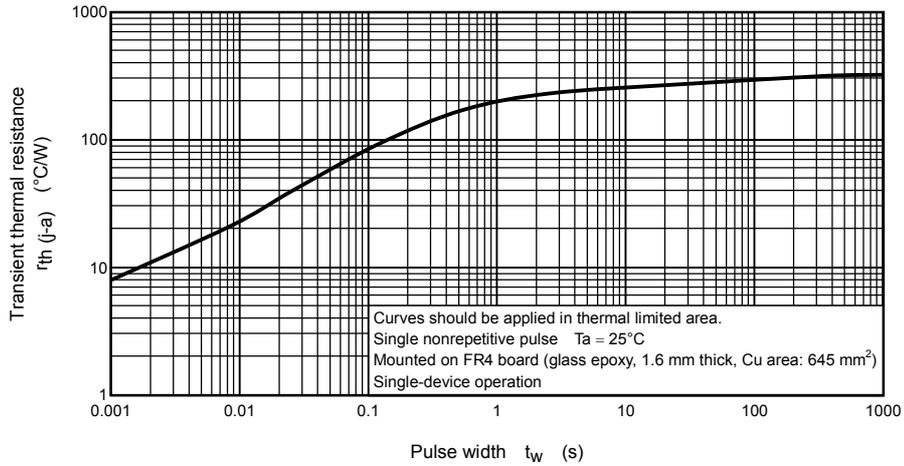
**Circuit Configuration    Marking**



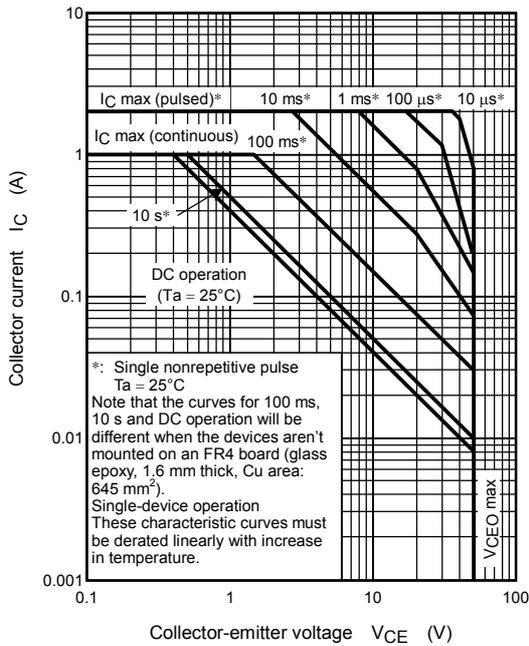
**Figure 1 Switching Time Test Circuit & Timing Chart**



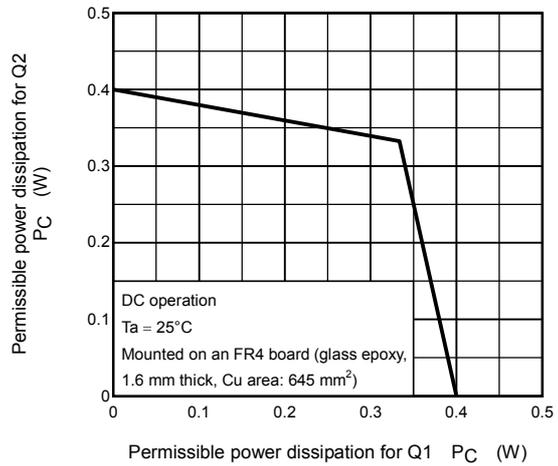
Transient Thermal Resistance  $r_{th-t_w}$



Safe Operating Area



Permissible Power Dissipation for Simultaneous Operation



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