

# TPCP8701

Portable Equipment Applications

Switching Applications

Inverter Lighting Applications

- Small footprint due to small and thin package
- High DC current gain :  $h_{FE} = 400$  to  $1000$  ( $I_C = 0.3$  A)
- Low collector-emitter saturation :  $V_{CE(sat)} = 0.14$  V (max)
- High-speed switching :  $t_f = 120$  ns (typ.)

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

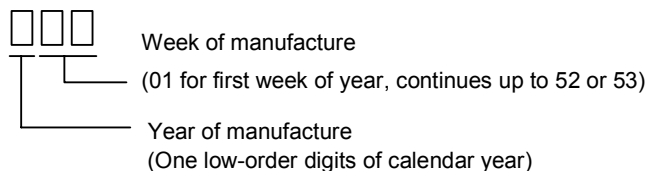
Characteristics		Symbol	Rating	Unit
Collector-base voltage		$V_{CBO}$	100	V
Collector-emitter voltage		$V_{CEX}$	80	V
		$V_{CEO}$	50	V
Emitter-base voltage		$V_{EBO}$	7	V
Collector current	DC (Note 1)	$I_C$	3.0	A
	Pulse (Note 1)	$I_{CP}$	5.0	
Base current		$I_B$	300	mA
Collector power dissipation ( $t = 10$ s)	Single-device operation	$P_c$ (Note 2)	1.77	W
	Single-device value at dual operation		0.95	
Collector power dissipation (DC)	Single-device operation	$P_c$ (Note 2)	0.94	W
	Single-device value at dual operation		0.54	
Junction temperature		$T_j$	150	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-55 to 150	$^\circ\text{C}$

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

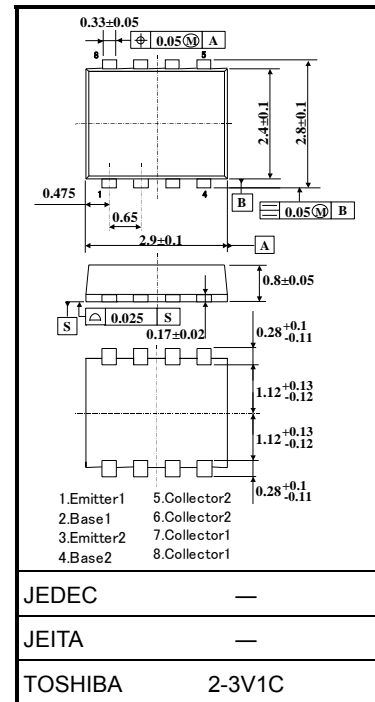
Note 2: Mounted on FR4 board (glass epoxy, 1.6 mm thick, Cu area:  $645\text{ mm}^2$ )

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

※ Weekly code: (Three digits)

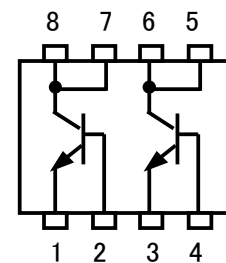


Unit: mm

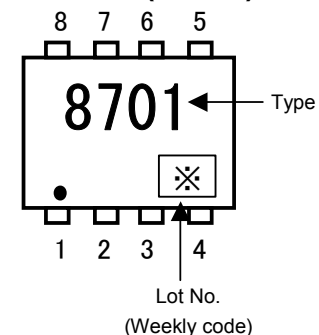


Weight: 0.017 g (typ.)

**Figure 1.**  
Circuit configuration  
(Top View)



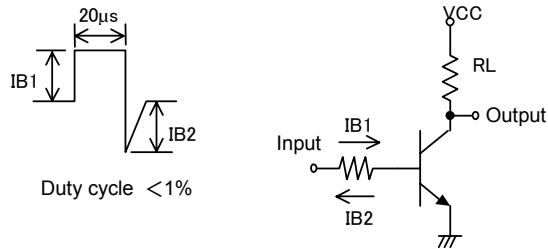
**Figure 2. Marking**  
(Note 3)

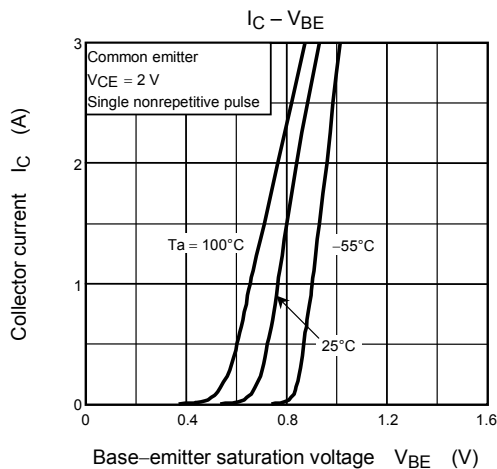
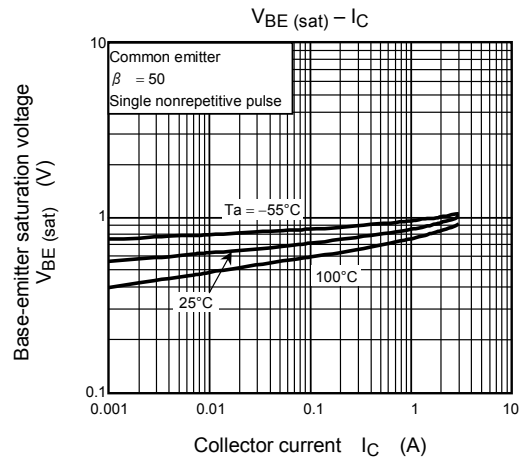
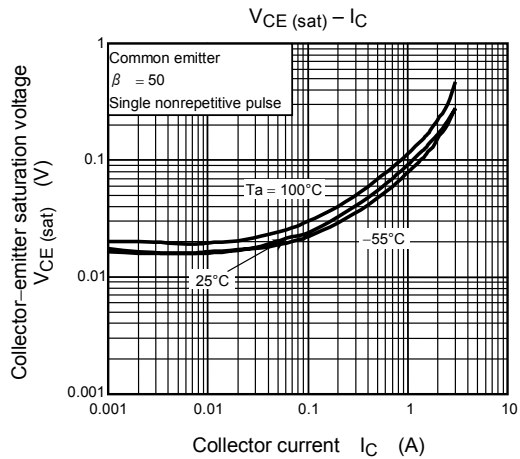
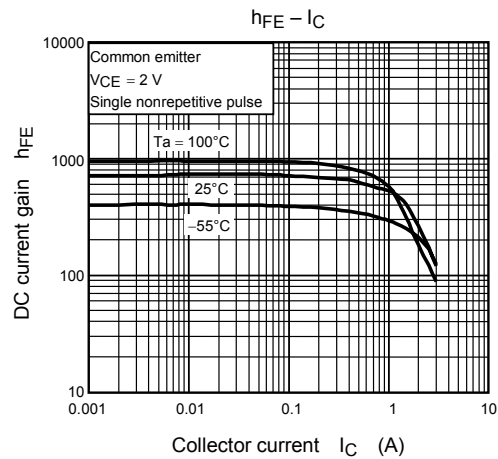
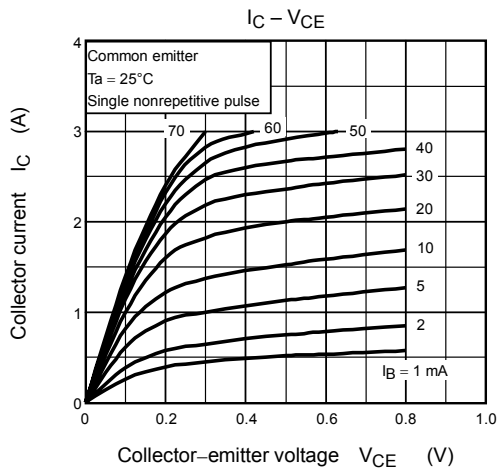


**Electrical Characteristics (Ta = 25°C)**

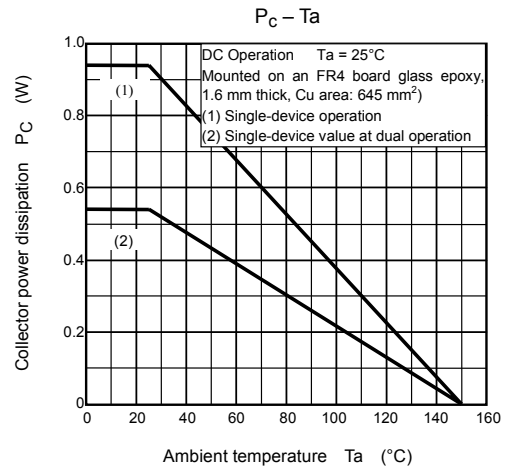
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		$I_{CBO}$	$V_{CB} = 100 \text{ V}, I_E = 0$	—	—	100	nA
Emitter cut-off current		$I_{EBO}$	$V_{EB} = 7 \text{ V}, I_C = 0$	—	—	100	nA
Collector-emitter brakedown voltage		$V_{(BR) CEO}$	$I_C = 10 \text{ mA}, I_B = 0$	50	—	—	V
DC current gain	Rise time	$h_{FE} (1)$	$V_{CE} = 2 \text{ V}, I_C = 0.3 \text{ A}$	400	—	1000	
	Storage time	$h_{FE} (2)$	$V_{CE} = 2 \text{ V}, I_C = 1 \text{ A}$	200	—	—	
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 1 \text{ A}, I_B = 20 \text{ mA}$	—	—	0.14	V
Base-emitter saturation voltage		$V_{BE (sat)}$	$I_C = 1 \text{ A}, I_B = 20 \text{ mA}$	—	—	1.10	V
Collector output capacitance		$C_{ob}$	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$	—	13	—	pF
Switching time	Rise time	$t_r$	See Figure 3 circuit diagram $V_{CC} \approx 30 \text{ V}, R_L = 30 \Omega$ $I_{B1} = -I_{B2} = 33.3 \text{ mA}$	—	40	—	ns
	Storage time	$t_{stg}$		—	500	—	
	Fall time	$t_f$		—	120	—	

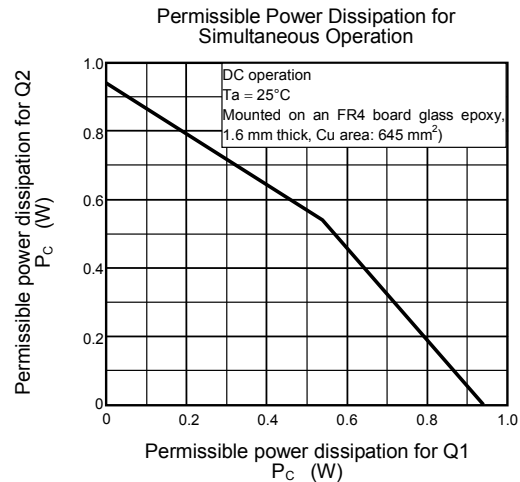
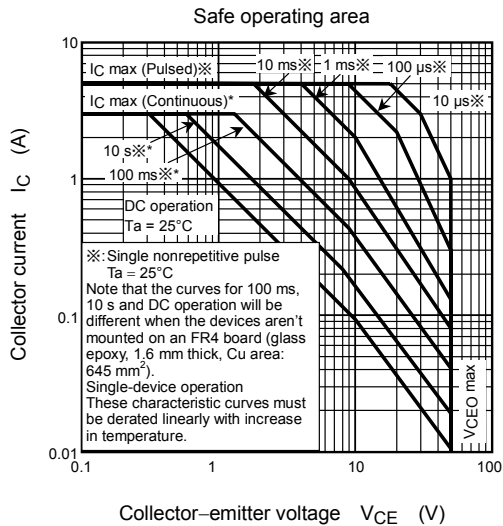
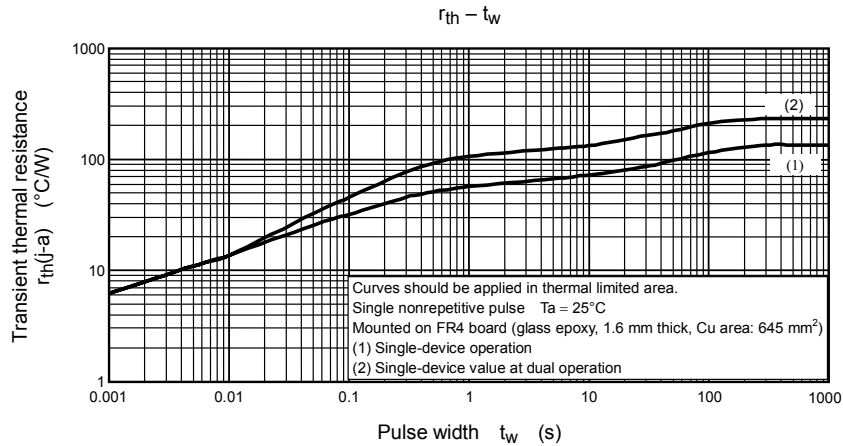
**Figure 3. Switching Time Test Circuit & Timing Chart**





(2)





Collector power dissipation at the single-device operation is 0.94W.  
 Collector power dissipation at the single-device value at dual operation is 0.54W.  
 Collector power dissipation at the dual operation is set to 1.08W.

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