

TOSHIBA Transistor Silicon NPN Epitaxial Type

TPCP8701

Portable Equipment Applications

Switching Applications

Inverter Lighting Applications

- Small footprint due to small and thin package
- High DC current gain : $hFE = 400$ to 1000 ($I_C = 0.3$ A)
- Low collector-emitter saturation : $V_{CE}(\text{sat}) = 0.14$ 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 ($t = 10\text{s}$)	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°C .

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

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

※ Weekly code: (Three digits)

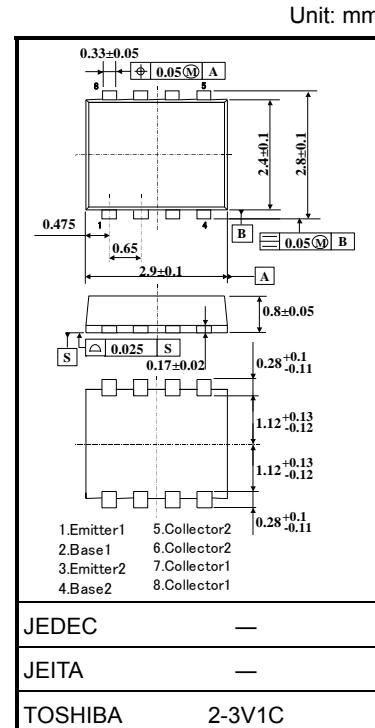


Week of manufacture

(01 for first week of year, continues up to 52 or 53)

Year of manufacture

(One low-order digits of calendar year)



Weight: 0.017 g (typ.)

Figure 1.
Circuit configuration
(Top View)

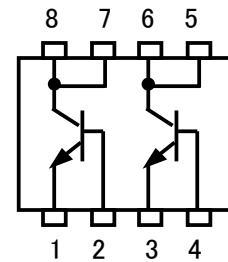
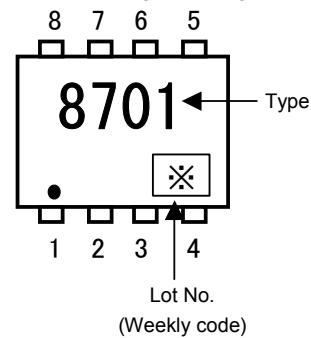


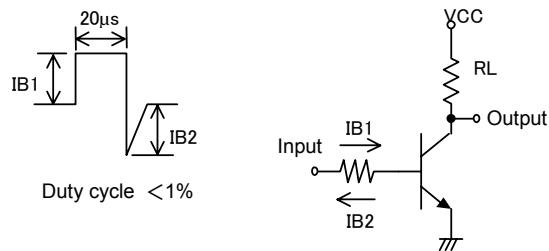
Figure 2. Marking
(Note 3)

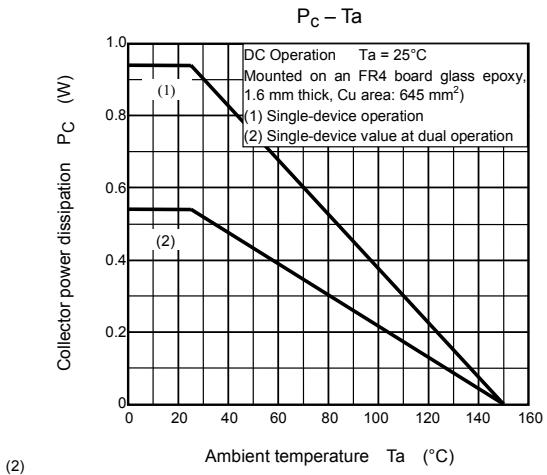
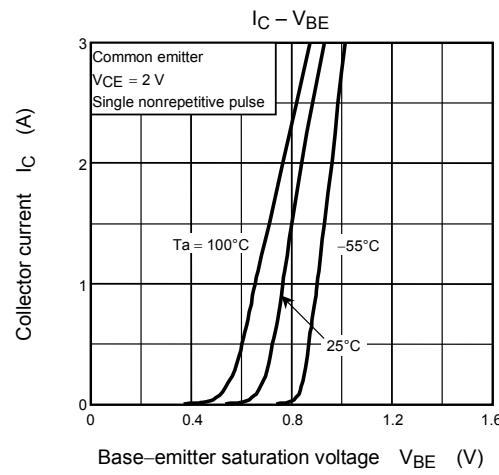
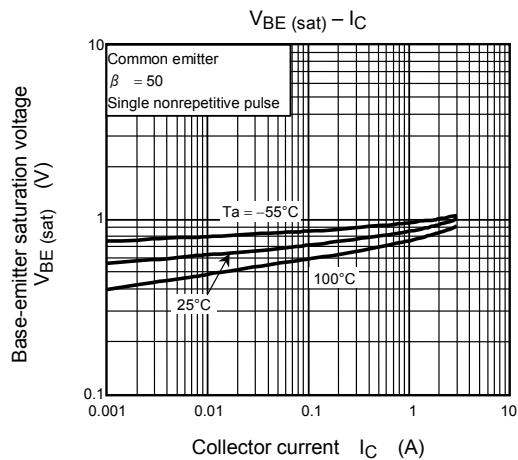
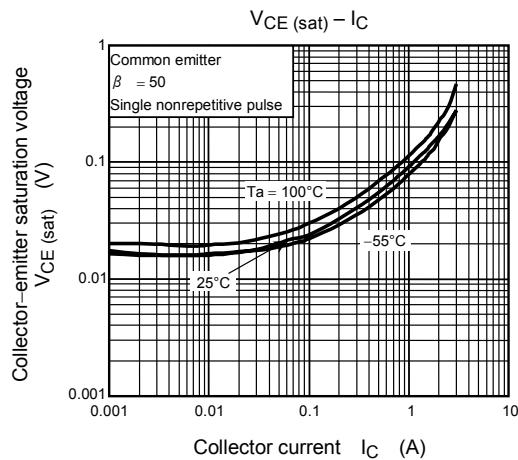
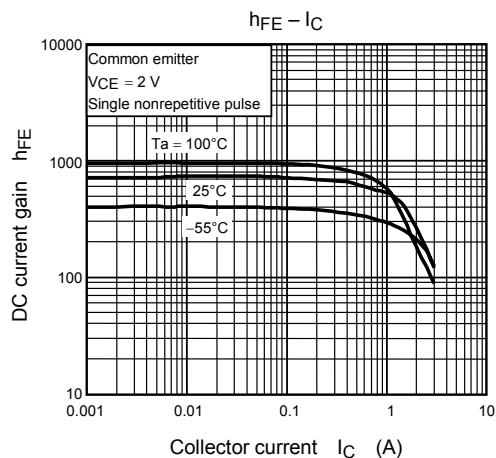
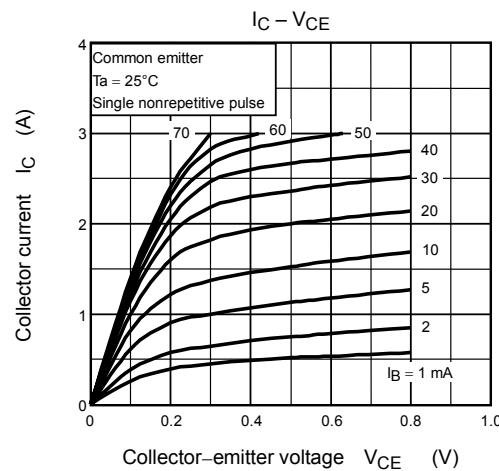


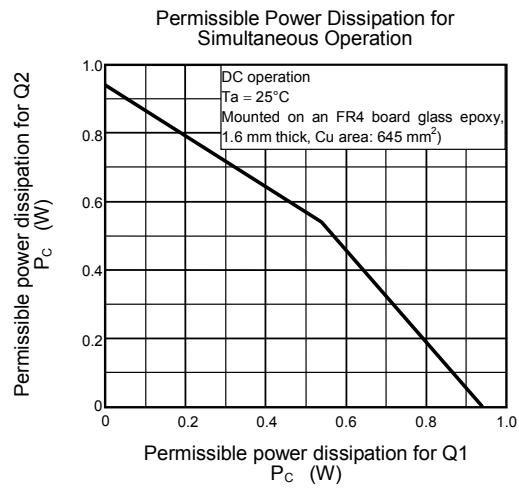
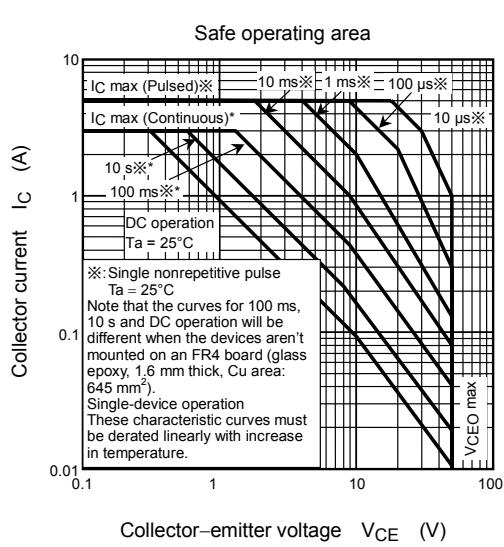
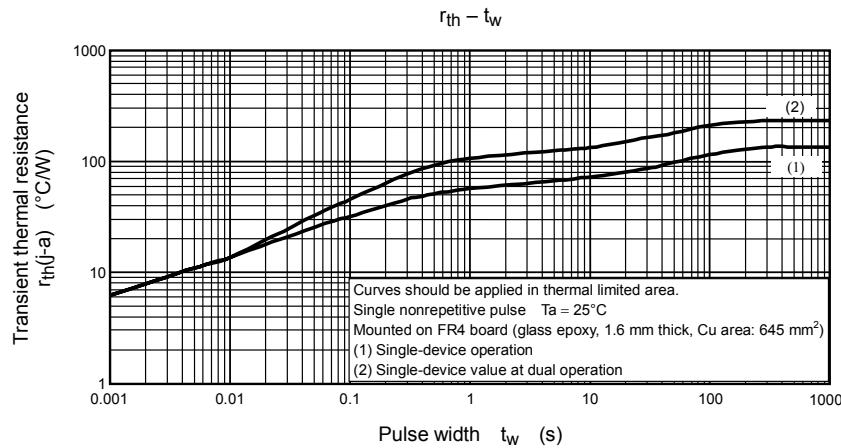
Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I _{CBO}	V _{CB} = 100 V, I _E = 0	—	—	100	nA
Emitter cut-off current	I _{EBO}	V _{EB} = 7 V, I _C = 0	—	—	100	nA
Collector-emitter breakdown voltage	V _{(BR) CEO}	I _C = 10 mA, I _B = 0	50	—	—	V
DC current gain	h _{FE} (1)	V _{CE} = 2 V, I _C = 0.3 A	400	—	1000	
	h _{FE} (2)	V _{CE} = 2 V, I _C = 1 A	200	—	—	
Collector-emitter saturation voltage	V _{CE} (sat)	I _C = 1 A, I _B = 20 mA	—	—	0.14	V
Base-emitter saturation voltage	V _{BE} (sat)	I _C = 1 A, I _B = 20 mA	—	—	1.10	V
Collector output capacitance	C _{ob}	V _{CB} = 10 V, I _E = 0, f = 1MHz	—	13	—	pF
Switching time	Rise time	t _r	See Figure 3 circuit diagram V _{CC} ≈ 30 V, R _L = 30 Ω I _{B1} = -I _{B2} = 33.3 mA	—	40	—
	Storage time	t _{stg}		—	500	—
	Fall time	t _f		—	120	—

Figure 3. Switching Time Test Circuit & Timing Chart







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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