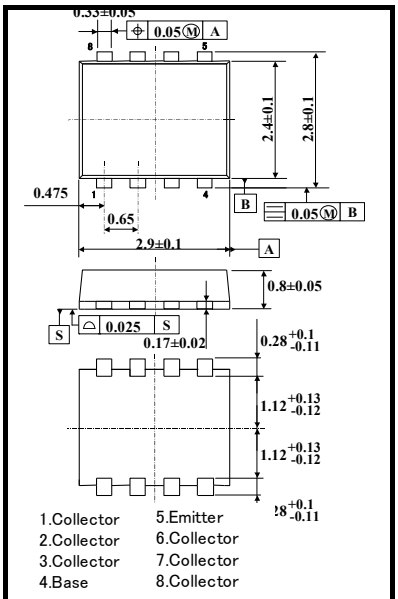
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

TPCP8601

High-Speed Switching Applications
DC-DC Converter Applications
Strobo Flash Applications

- High DC current gain: h_{FE} = 200 to 500 (I_C = –0.6 A)
- Low collector-emitter saturation: $V_{CE\ (sat)}$ = –0.19 V (max)
- High-speed switching: t_f = 35 ns (typ.)

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-3V1A

Weight: 0.017 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

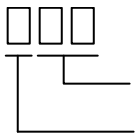
Characteristic		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	–20	V
Collector-emitter voltage		V_{CEO}	–20	V
Emitter-base voltage		V_{EBO}	–7	V
Collector current	DC (Note 1)	I_C	–4.0	A
	Pulse (Note 1)	I_{CP}	–7.0	
Base current		I_B	–0.5	A
Collector power dissipation (t = 10s)	t = 10s	Pc (Note 2)	3.3	W
	DC		1.3	
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	–55 to 150	°C

Note 1: Ensure that the junction temperature does not exceed 150°C during use of this device.

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

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

* Weekly code (three digits):



Week of manufacture
(01 for the first week of the year, continuing up to 52 or 53)

Year of manufacture
(lowest-order digit of the calendar year)

Figure 1. Circuit Configuration (Top View)

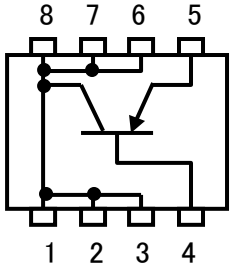
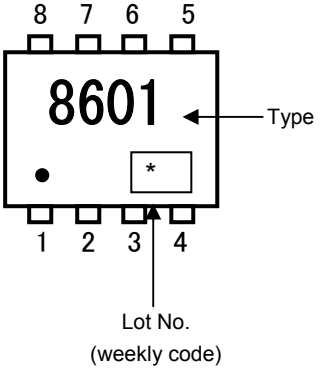


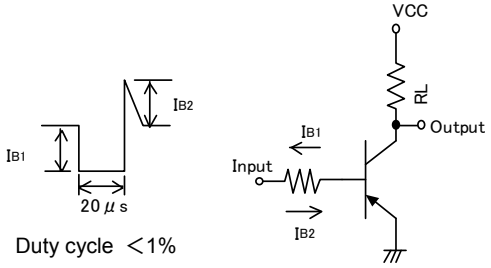
Figure 2. Marking (Note 3)



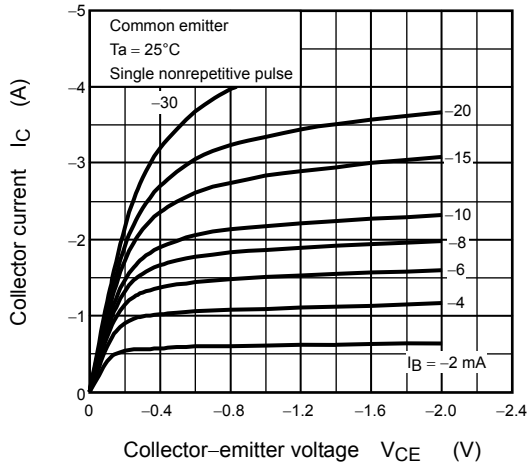
Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	V_{CB} = −20 V, I_E = 0	—	—	−100	nA
Emitter cut-off current		I_{EBO}	V_{EB} = −7 V, I_C = 0	—	—	−100	nA
Collector-base breakdown voltage		$V_{(BR)\ CBO}$	I_C = −1 mA, I_B = 0	−20	—	—	V
Collector-emitter breakdown voltage		$V_{(BR)\ CEO}$	I_C = −10 mA, I_B = 0	−20	—	—	V
DC current gain		h_{FE} (1)	V_{CE} = −2 V, I_C = −0.6 A	200	—	500	
		h_{FE} (2)	V_{CE} = −2 V, I_C = −2.0 A	100	—	—	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = −2 A, I_B = −67 mA	—	—	−0.19	V
Base-emitter saturation voltage		$V_{BE\ (sat)}$	I_C = −2 A, I_B = −67 mA	—	—	−1.1	V
Switching time	Rise time	t_r	See Figure 3 circuit diagram V_{CC} ≃ 12 V, R_L = 6 Ω I_{B1} = −I_{B2} = −67 mA	—	72	—	ns
	Storage time	t_{stg}		—	170	—	
	Fall time	t_f		—	35	—	

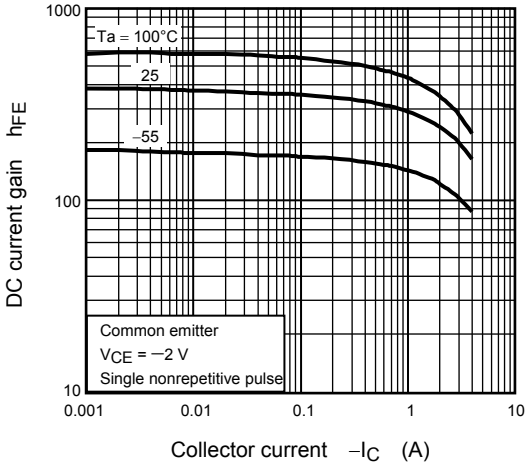
Figure 3. Switching Time Test Circuit & Timing Chart



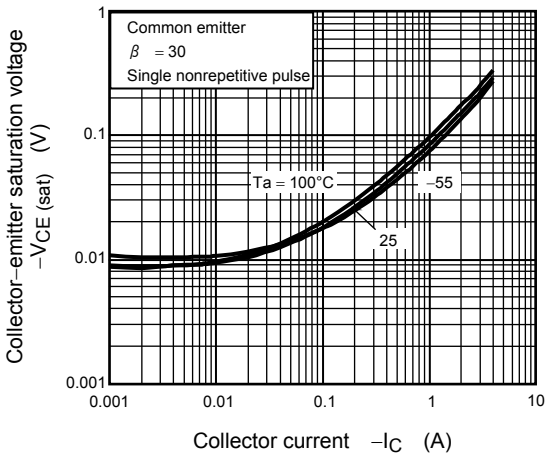
$I_C - V_{CE}$



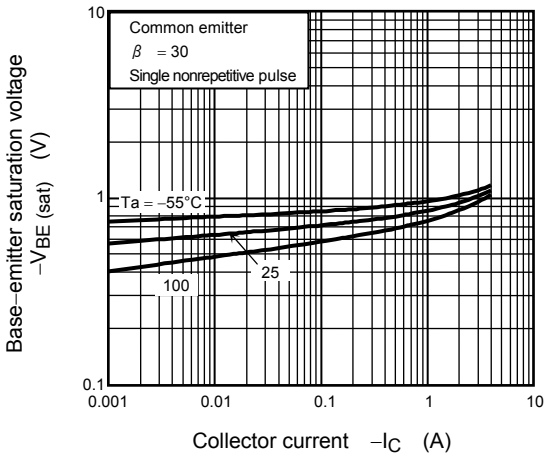
$h_{FE} - I_C$



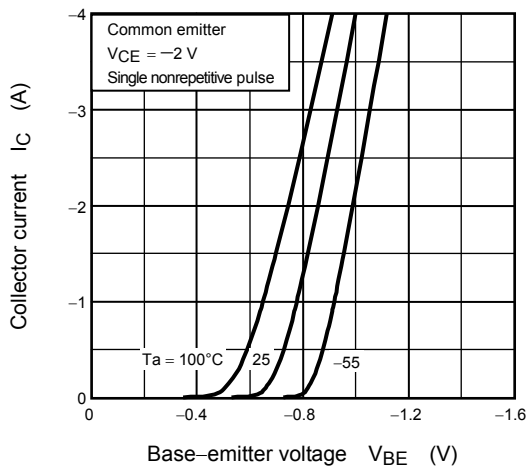
$V_{CE\ (sat)} - I_C$



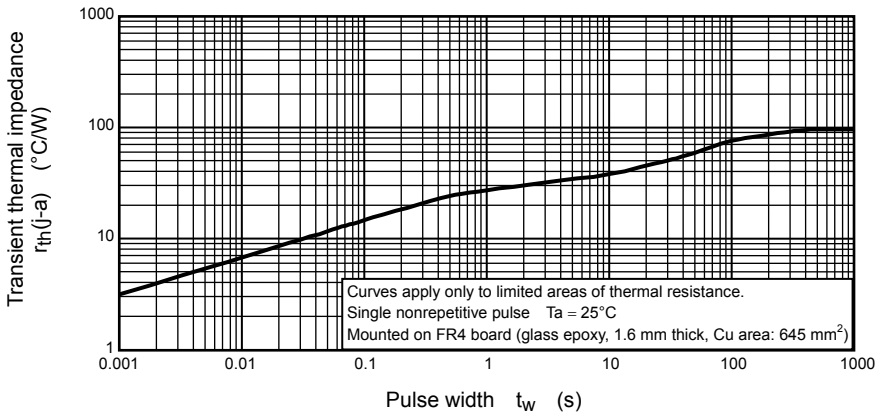
$V_{BE\ (sat)} - I_C$



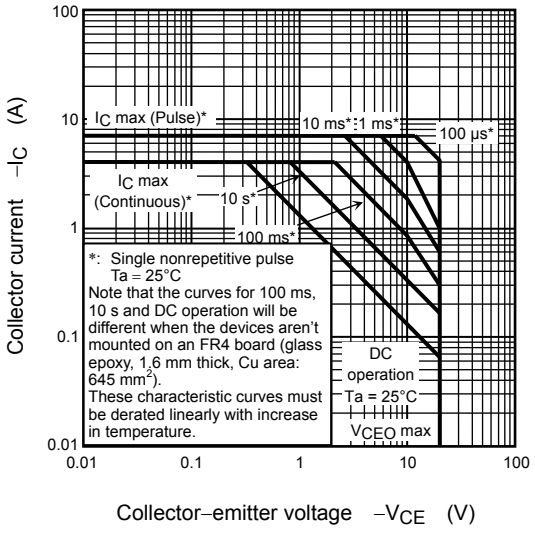
$I_C - V_{BE}$



$r_{th} - t_w$



Safe operating area



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