TOSHIBA Transistor Silicon PNP Epitaxial Type

TPCP8603

High-Speed Switching Applications

DC/DC Converters

Strobe Applications

- High DC current gain: h_{FE} = 120～300 (IC = −0.1 A)
- Low collector-emitter saturation voltage: $V_{CE\ (sat)}$ = −0.2 V (max)
- High-speed switching: t_f = 120 ns (typ.)

Absolute Maximum Ratings (Ta = 25°C)

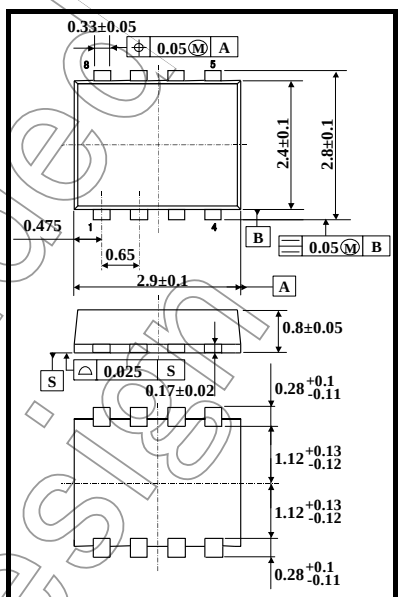
Characteristic		Symbol	Rating	Unit
Collector-vase voltage		V_{CBO}	−120	V
Collector-emitter voltage		V_{CEO}	−120	V
Collector-emitter voltage		V_{EBO}	−7	V
Collector current	DC (Note 1)	I_C	−1.0	A
	Pulsed (Note 1)	I_{CP}	−2.0	A
Base current		I_B	0.1	A
Collector power dissipation	t = 10 s	P_C (Note 2)	3.00	W
	DC		1.25	W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55~150	°C

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

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

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



1. Collector 5. Emitter
2. Collector 6. Collector
3. Collector 7. Collector
4. Base 8. Collector

JEDEC	―
JEITA	―
TOSHIBA	2-3V1A

Weight: 0.017 g (typ.)

Figure 1. Circuit Configuration

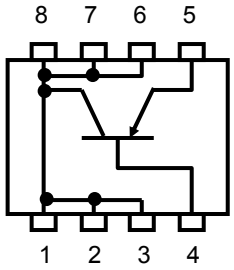
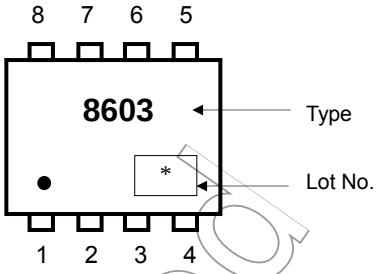
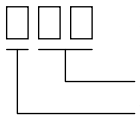


Figure 2. Marking (Note4)



Note 4: ● on the lower left of the marking indicates Pin 1.

* Weekly code (three digits):



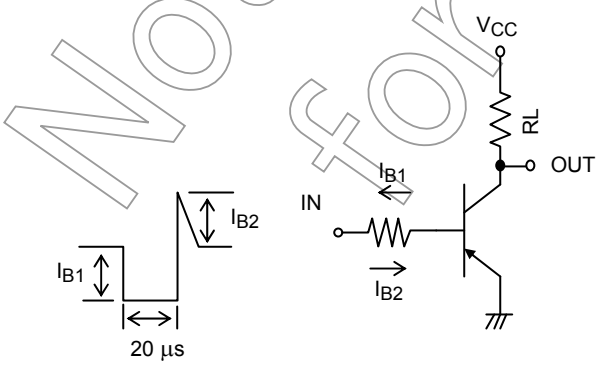
Week of manufacture
(01 for first week of year, continuing up to 52 or 53)

Year of manufacture
(the last digit of the calendar year)

Electrical Characteristics (Ta = 25°C)

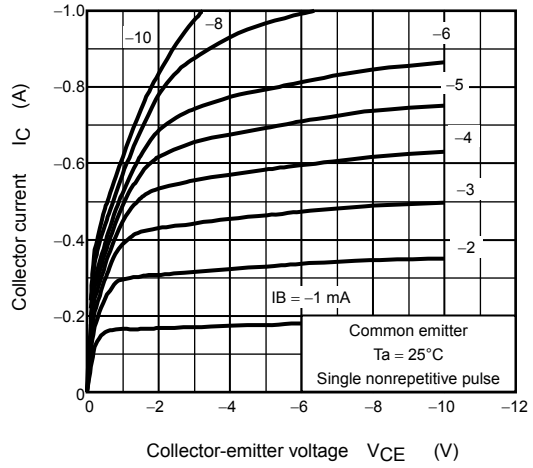
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current		I_{CBO}	V_{CB} = −120 V, IE = 0	—	—	−100	nA
Emitter cutoff current		I_{EBO}	V_{EB} = −7 V, I_C = 0	—	—	−100	nA
Collector-emitter breakdown voltage		$V_{(BR)\ CEO}$	I_C = −10 mA, IB = 0	−120	—	—	V
DC current gain		hFE(1)	V_{CE} = −2 V, I_C = −0.1 A	120	—	300	
		hFE(2)	V_{CE} = −2 V, I_C = −0.3 A	60	—	—	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = −0.3 A, IB = −0.01 A	—	—	−0.2	V
Base-emitter saturation voltage		$V_{BE\ (sat)}$	I_C = −0.3 A, IB = −0.01 A	—	—	−1.1	V
Switching time	Storage time	t_r	See Figure 3 circuit diagram.	—	130	—	ns
	Storage time	t_{stg}	V_{CC} ≅ 72 V, RL = 240 Ω	—	650	—	
	Fall time	t_f	−IB1 = IB2 = −10 mA	—	120	—	

Figure 3. Switching Time Test Circuit & Timing Chart

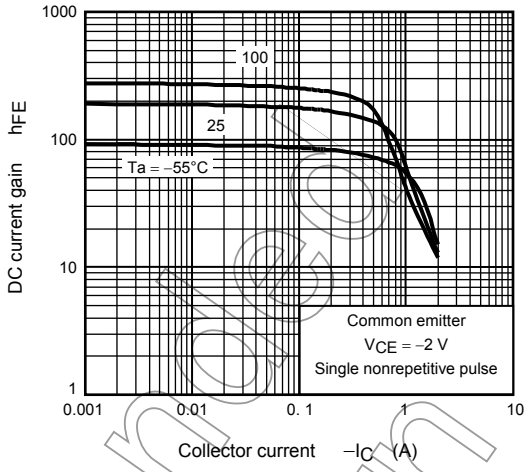


Duty cycle < 1 %

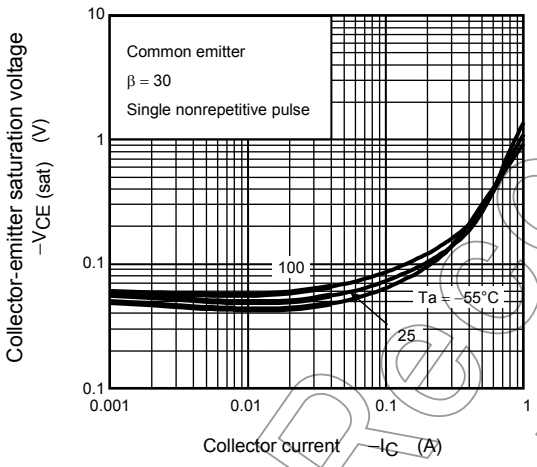
$I_C - V_{CE}$



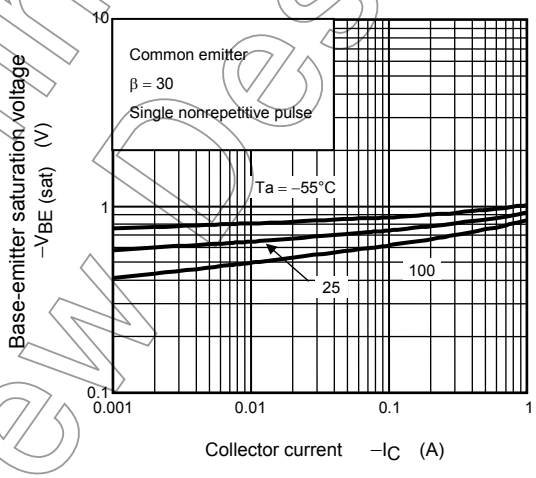
hFE – I_C



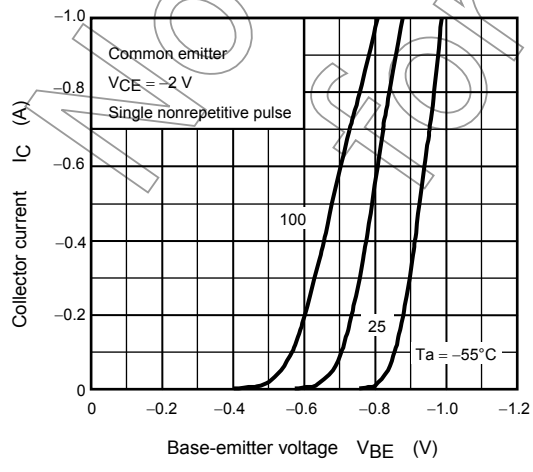
$V_{CE\ (sat)} - I_C$



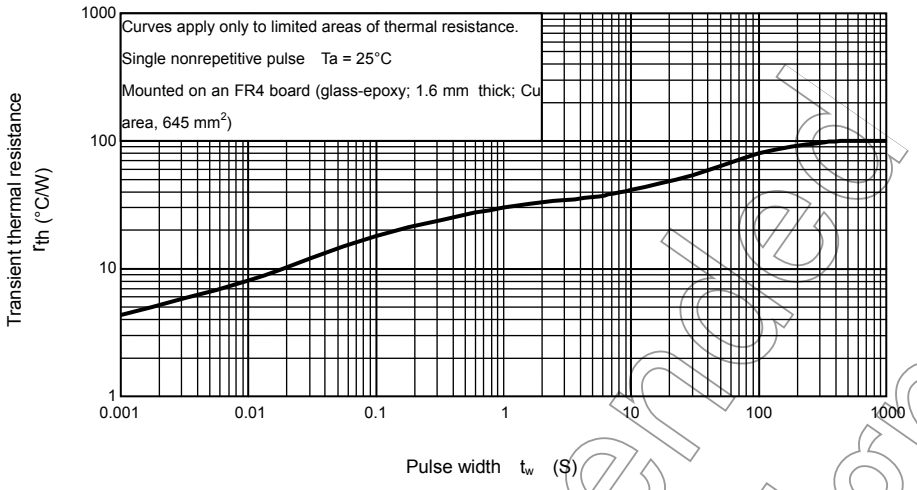
$V_{BE\ (sat)} - I_C$



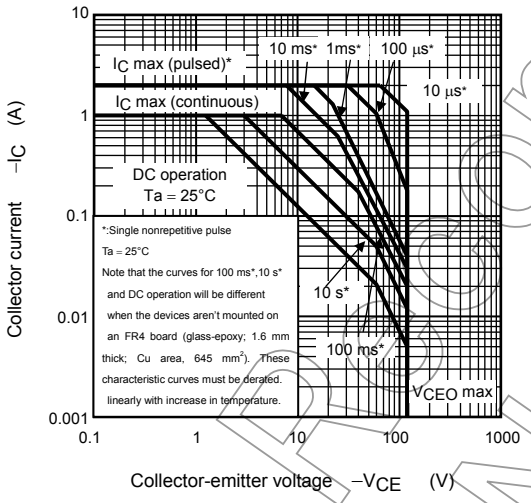
$I_C - V_{BE}$



$r_{th} - t_w$



Safe Operating Area



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