

TTC008

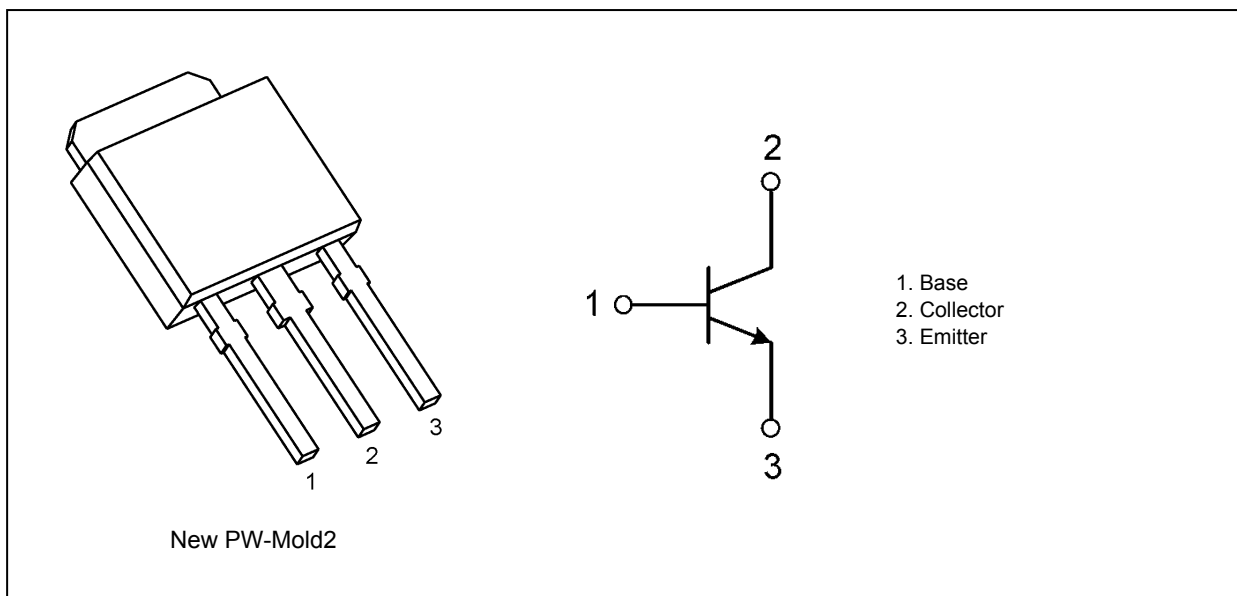
1. Applications

- High-Speed High-Voltage Switching
- Switching Voltage Regulators
- High-Speed DC-DC Converters

2. Features

- (1) High collector-emitter voltage: $V_{CEO} = 285 \text{ V}$, $V_{CES} = 600 \text{ V}$
- (2) High DC current gain: $h_{FE} = 100$ to 200 ($I_C = 0.3 \text{ A}$)
- (3) Excellent switching times: $t_f = 0.1 \mu\text{s}$ (typ.)

3. Packaging and Internal Circuit



4. Absolute Maximum Ratings (Note) ($T_a = 25\text{ }^\circ\text{C}$ unless otherwise specified)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	600	V
Collector-emitter voltage	V_{CES}	600	
Collector-emitter voltage	V_{CEO}	285	
Emitter-base voltage	V_{EBO}	7	
Collector current (DC) (Note 1)	I_C	1.5	A
Collector current (pulsed) (Note 1)	I_{CP}	3	
Base current	I_B	0.75	
Collector power dissipation	P_C	1.1	W
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to 150	

Note: 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).

Note 1: Ensure that the junction temperature does not exceed $150\text{ }^\circ\text{C}$.

5. Electrical Characteristics

5.1. Static Characteristics ($T_a = 25\text{ }^\circ\text{C}$ unless otherwise specified)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 600\text{ V}, I_E = 0\text{ A}$	—	—	10	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 7\text{ V}, I_C = 0\text{ A}$	—	—	100	nA
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 1\text{ mA}, I_E = 0\text{ A}$	600	—	—	V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 10\text{ mA}, I_B = 0\text{ A}$	285	—	—	
DC current gain	$h_{FE(1)}$	$V_{CE} = 5\text{ V}, I_C = 1\text{ mA}$	80	—	250	—
	$h_{FE(2)}$	$V_{CE} = 5\text{ V}, I_C = 0.3\text{ A}$	100	—	200	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 0.5\text{ A}, I_B = 62.5\text{ mA}$	—	—	1.0	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 0.5\text{ A}, I_B = 62.5\text{ mA}$	—	—	1.3	

5.2. Dynamic Characteristics ($T_a = 25\text{ }^\circ\text{C}$ unless otherwise specified)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Switching time (rise time)	t_r	See Figure 5.2.1.	—	0.05	—	μs
Switching time (storage time)	t_{stg}		—	3.3	—	
Switching time (fall time)	t_f		—	0.1	—	

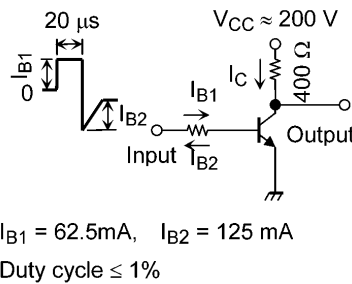


Fig. 5.2.1 Switching Time Test Circuit

6. Marking (Note)

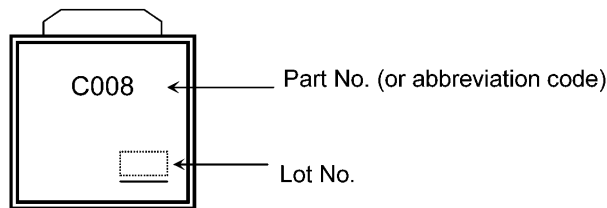


Fig. 6.1 Marking

Note: A line under a Lot No. identifies the indication of product Labels.

Not underlined: $[[Pb]]/INCLUDES > MCV$

Underlined: $[[G]]/RoHS\ COMPATIBLE$ or $[[G]]/RoHS\ [[Pb]]$

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product.

The RoHS is the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

7. Characteristics Curves (Note)

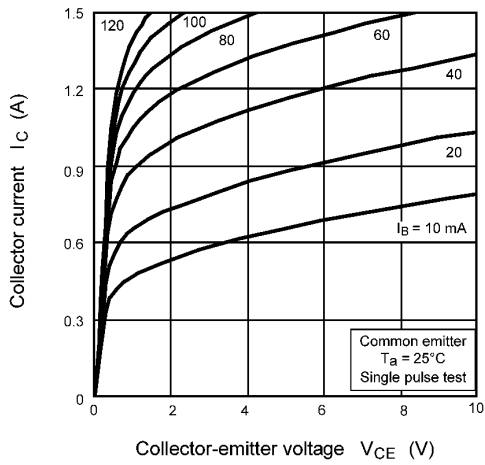


Fig. 7.1 $I_C - V_{CE}$

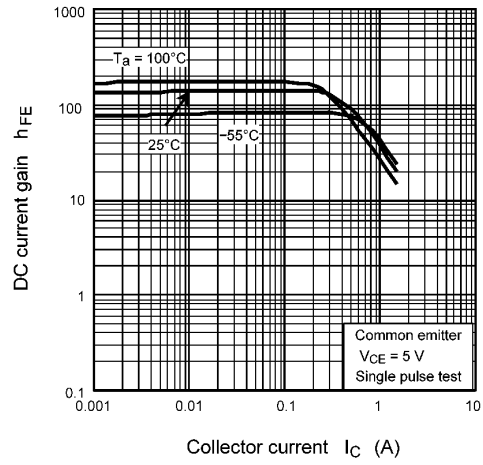


Fig. 7.2 $h_{FE} - I_C$

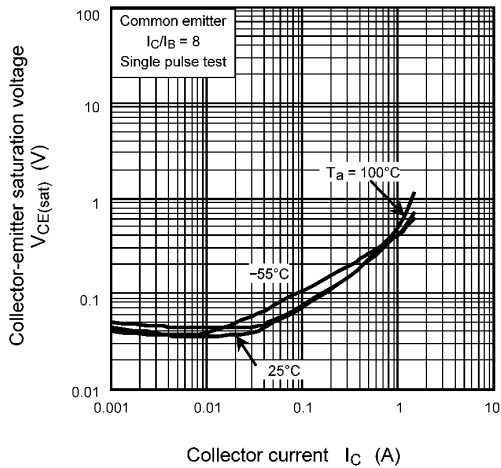


Fig. 7.3 $V_{CE(sat)} - I_C$

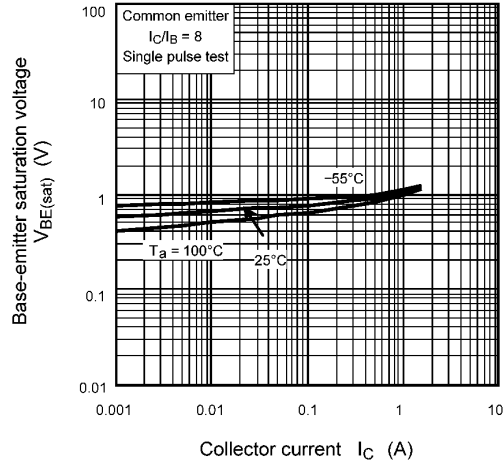


Fig. 7.4 $V_{BE(sat)} - I_C$

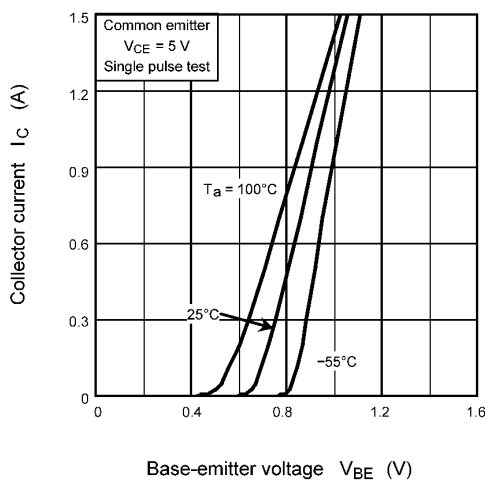


Fig. 7.5 $I_C - V_{BE}$

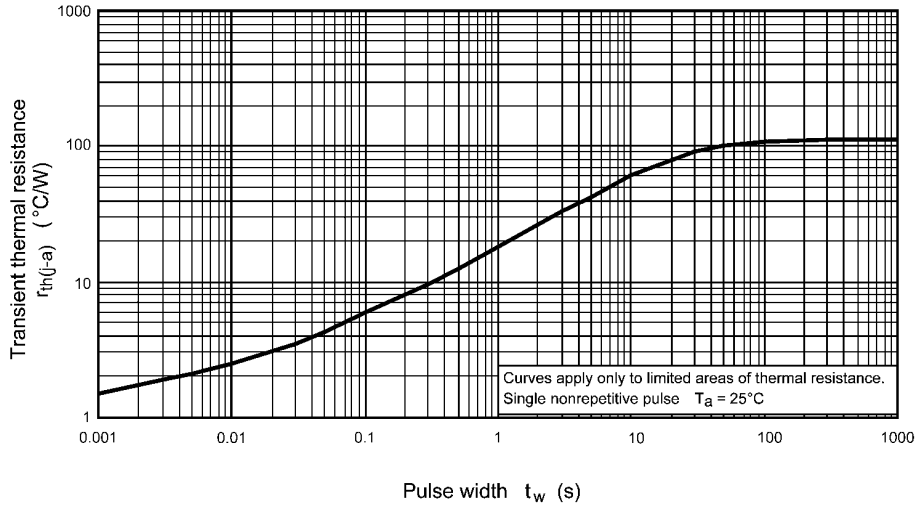


Fig. 7.6 $r_{th(j-a)} - t_w$
(Guaranteed Maximum)

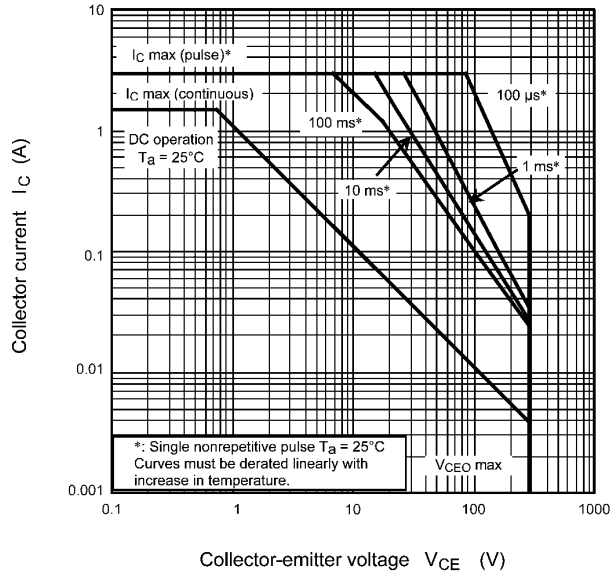
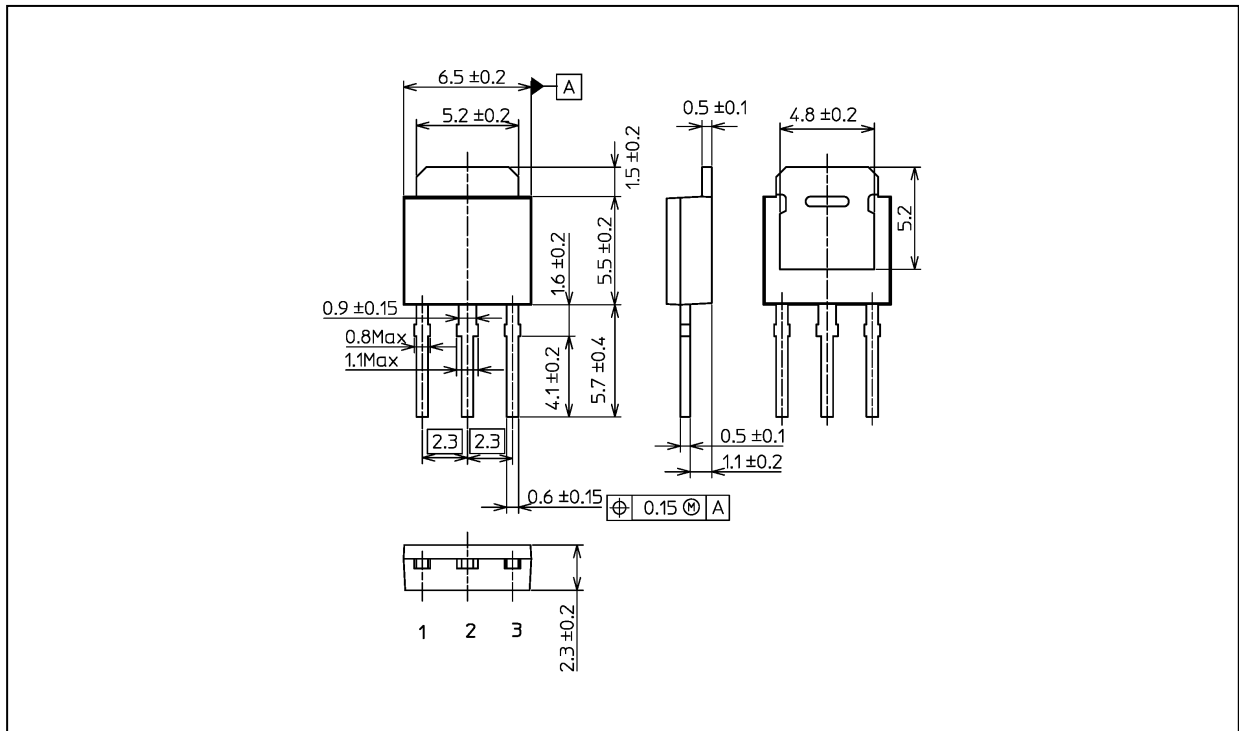


Fig. 7.7 Safe Operating Area
(Guaranteed Maximum)

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Package Dimensions

Unit: mm



Weight: 0.36 g (typ.)

Package Name(s)
TOSHIBA: 2-7J2S
Nickname: New PW-Mold2

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