

# TTC008

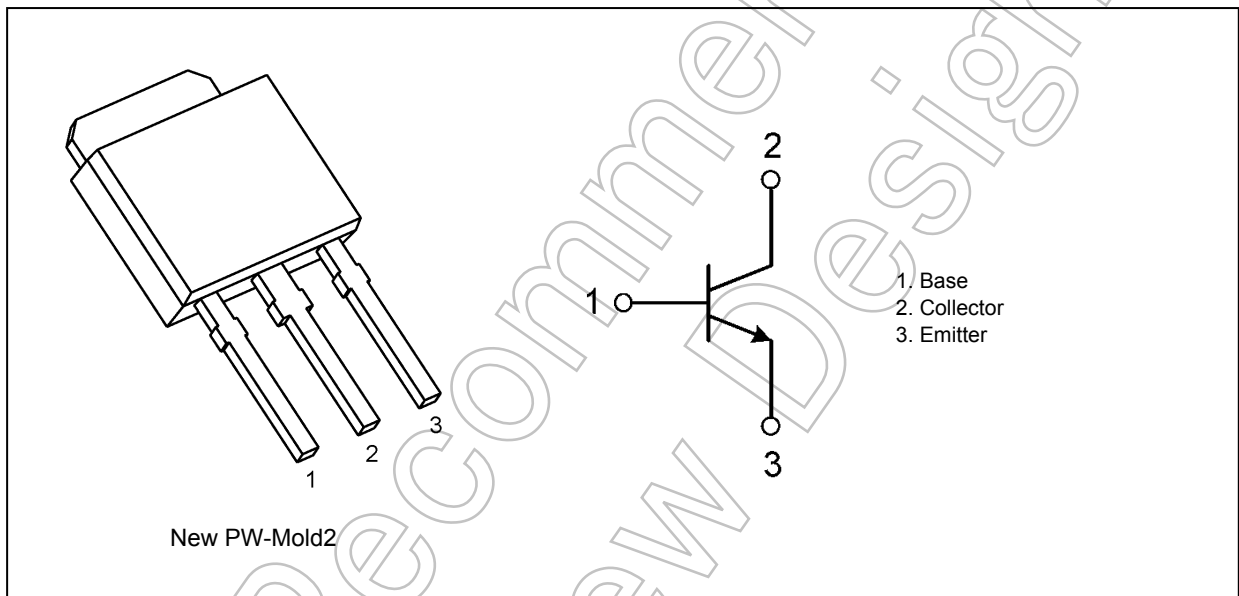
## 1. Applications

- 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:  $h_{FE} = 100 \text{ to } 200$  ( $I_C = 0.3 \text{ A}$ )
- (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  $150\text{ }^\circ\text{C}$ .

Not Recommended for New Design

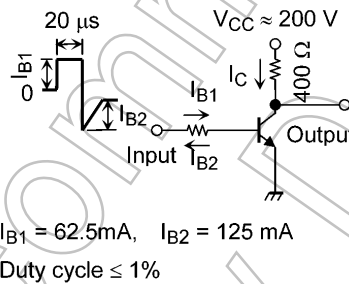
**5. Electrical Characteristics**

**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	$\mu\text{A}$
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	

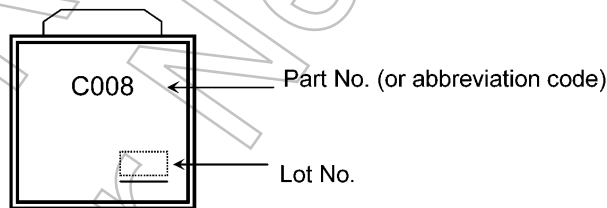
**5.2. Dynamic Characteristics ( $T_a = 25\text{ }^\circ\text{C}$  unless otherwise specified)**

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Switching time (rise time)	$t_r$	See Figure 5.2.1.	—	0.05	—	$\mu\text{s}$
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.

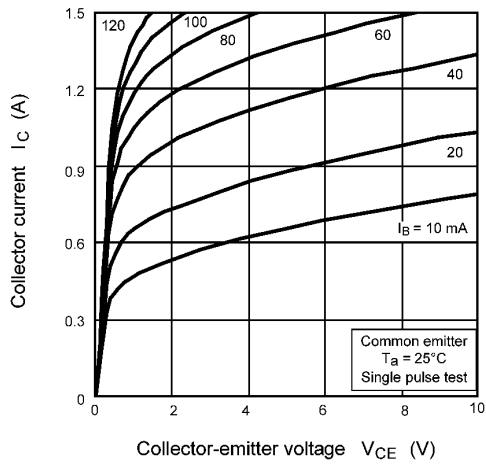
Not underlined:  $[[Pb]]/INCLUDES > MCV$

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

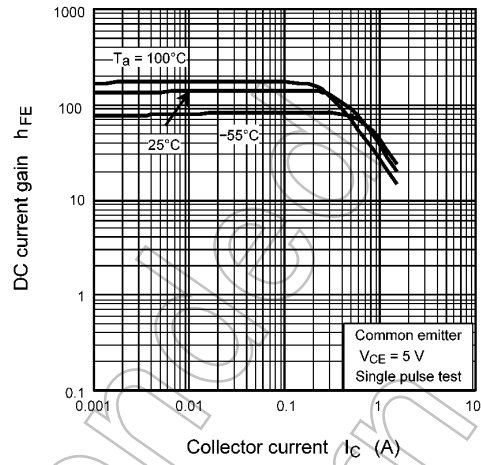
Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product.

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.

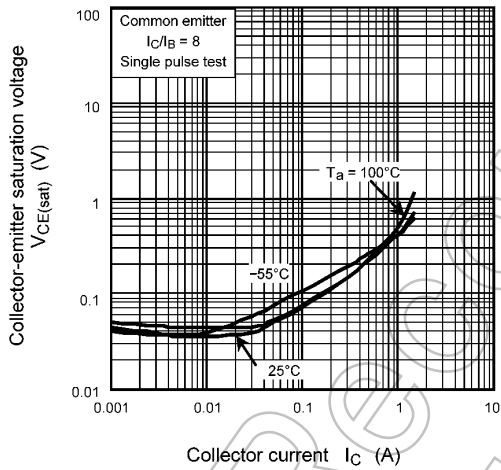
**7. Characteristics Curves (Note)**



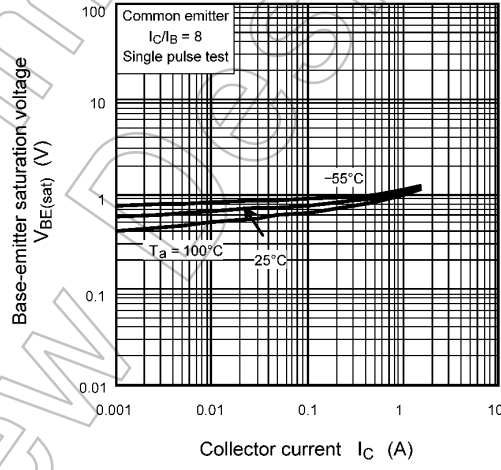
**Fig. 7.1  $I_C - V_{CE}$**



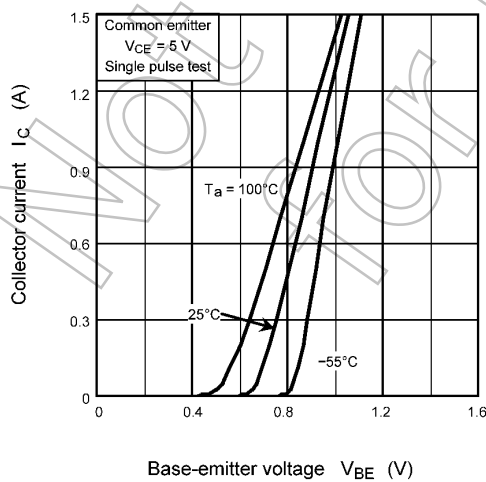
**Fig. 7.2  $h_{FE} - I_C$**



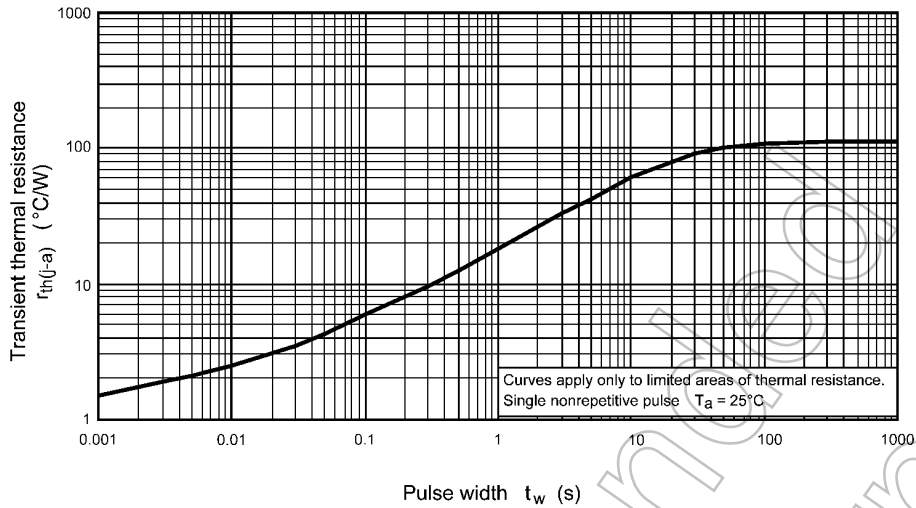
**Fig. 7.3  $V_{CE(sat)} - I_C$**



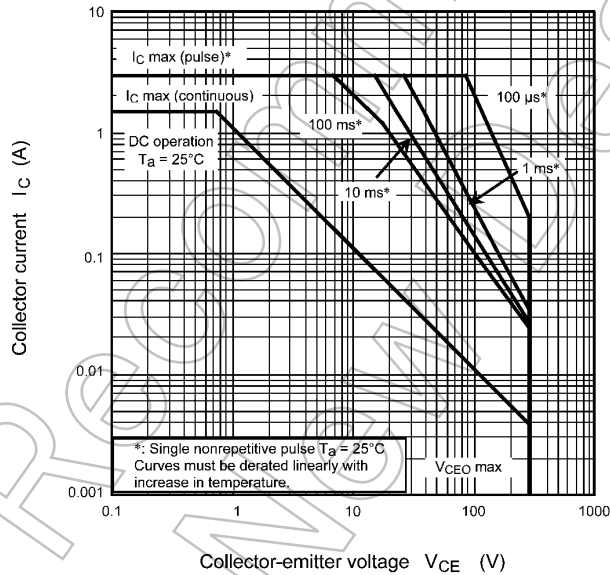
**Fig. 7.4  $V_{BE(sat)} - I_C$**



**Fig. 7.5  $I_C - V_{BE}$**



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

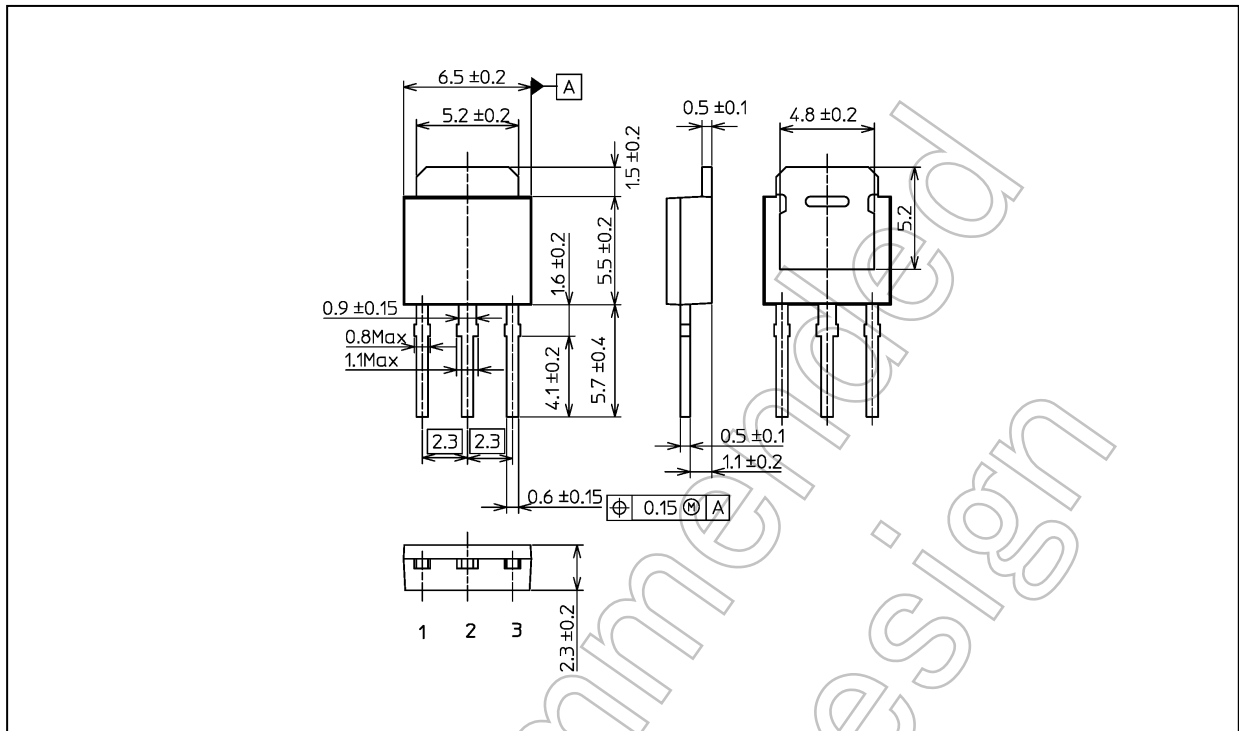


**Fig. 7.7 Safe Operating Area**  
(Guaranteed Maximum)

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

Not Recommended for New Design

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