

SiC Schottky Barrier Diode

# TRS12V65H

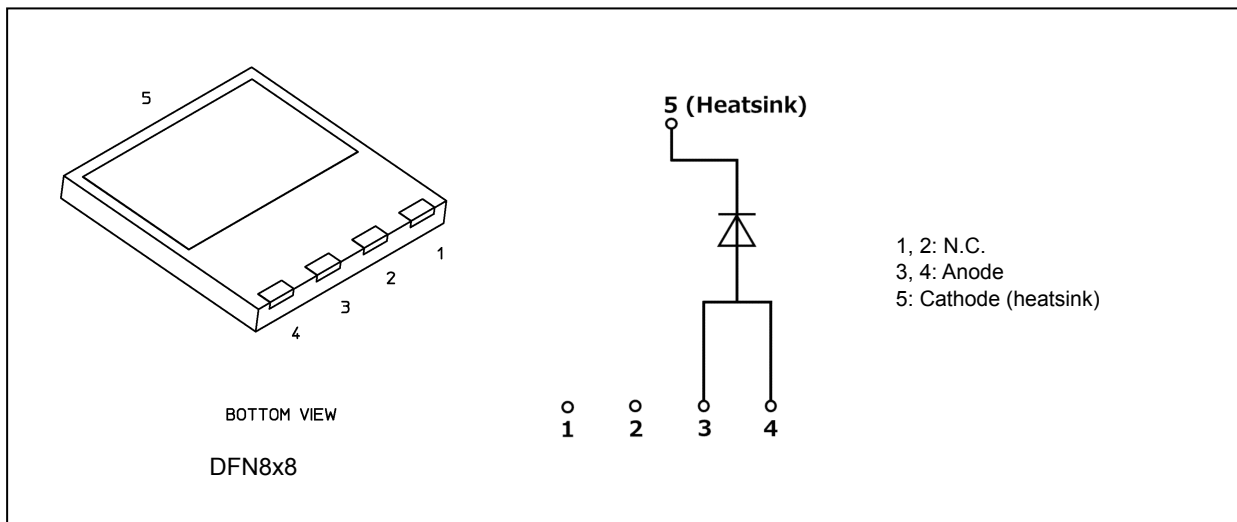
## 1. Applications

- Power Factor Correction
- Solar Inverters
- Uninterruptible Power Supplies
- DC-DC Converters

## 2. Features

- (1) Chip design of 3rd generation
- (2) Low forward voltage :  $V_F = 1.2 \text{ V (typ.)}$
- (3) Low total capacitive charge:  $Q_c = 33 \text{ nC (typ.)}$
- (4) Low reverse current:  $I_R = 2.4 \text{ }\mu\text{A (typ.)}$

## 3. Packaging and Internal Circuit



Start of commercial production

2023-05

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

Characteristics	Symbol	Note	Rating	Unit
Repetitive peak reverse voltage	$V_{RRM}$		650	V
Forward DC current	$I_{F(DC)}$	(Note 1)	12	A
		(Note 2)	30	
Non-repetitive peak forward surge current	$I_{FSM}$	(Note 3)	60	A
		(Note 4)	55	
		(Note 5)	640	
Power dissipation	$P_D$	(Note 2)	88	W
Junction temperature	$T_j$		175	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to 175	

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:  $T_c = 142\text{ }^\circ\text{C}$

Note 2:  $T_c = 25\text{ }^\circ\text{C}$

Note 3:  $f = 50\text{ Hz}$  (half-sine wave,  $t = 10\text{ ms}$ ),  $T_c = 25\text{ }^\circ\text{C}$

Note 4:  $f = 50\text{ Hz}$  (half-sine wave,  $t = 10\text{ ms}$ ),  $T_c = 150\text{ }^\circ\text{C}$

Note 5: Square wave,  $t = 10\text{ }\mu\text{s}$ ,  $T_c = 25\text{ }^\circ\text{C}$

### 5. Thermal Characteristics

Characteristics	Symbol	Note	Max	Unit
Thermal resistance (junction-to-case)	$R_{th(j-c)}$	(Note 1)	1.70	$^\circ\text{C/W}$

Note 1:  $T_c = 25\text{ }^\circ\text{C}$

### 6. Electrical Characteristics (Unless otherwise specified, $T_a = 25\text{ }^\circ\text{C}$ )

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward voltage (pulse measurement)	$V_F$	$I_F = 6\text{ A}$	—	1.0	—	V
		$I_F = 12\text{ A}$	—	1.2	1.35	
		$I_F = 12\text{ A}$ , $T_a = 150\text{ }^\circ\text{C}$	—	1.36	—	
Reverse current (pulse measurement)	$I_R$	$V_R = 650\text{ V}$	—	2.4	120	$\mu\text{A}$
		$V_R = 650\text{ V}$ , $T_a = 150\text{ }^\circ\text{C}$	—	21	—	
Total capacitance	$C_t$	$V_R = 1\text{ V}$ , $f = 1\text{ MHz}$	—	778	—	pF
		$V_R = 400\text{ V}$ , $f = 1\text{ MHz}$	—	46	—	
		$V_R = 650\text{ V}$ , $f = 1\text{ MHz}$	—	43	—	
Total capacitive charge	$Q_c$	$V_R = 400\text{ V}$ , $f = 1\text{ MHz}$	—	33	—	nC

## 7. Marking

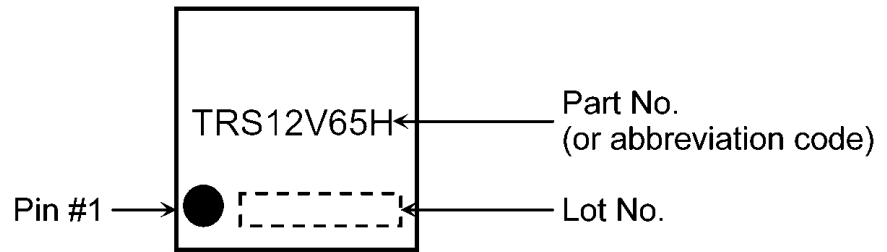
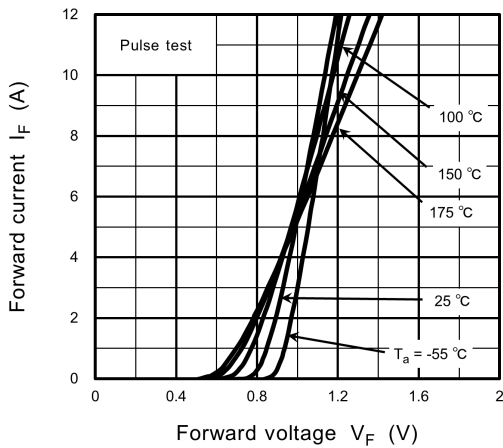


Fig. 7.1 Marking

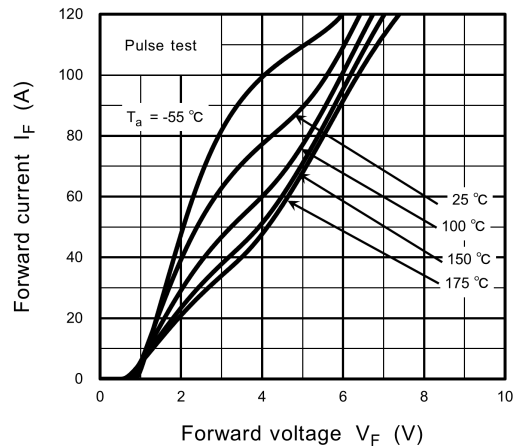
## 8. Usage Considerations

For other design considerations, see the Toshiba website.

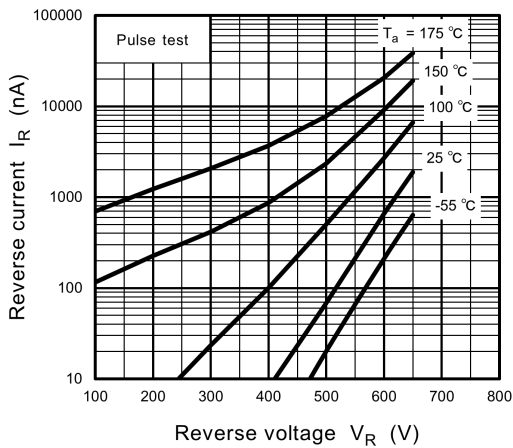
## 9. Characteristics Curves (Note)



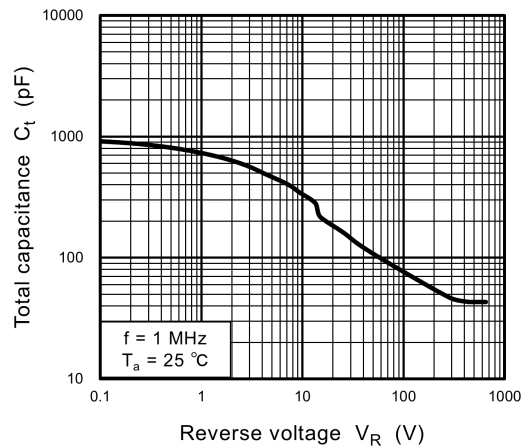
**Fig. 9.1  $I_F - V_F$**



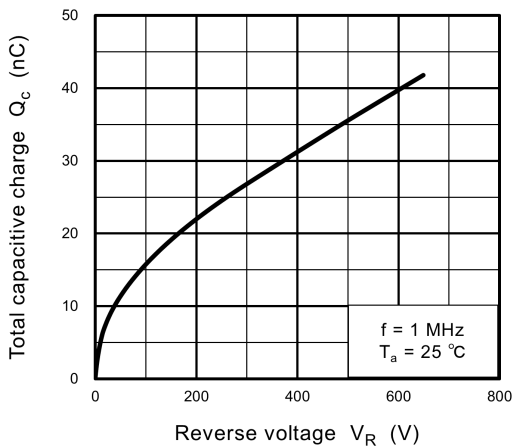
**Fig. 9.2  $I_F - V_F$**



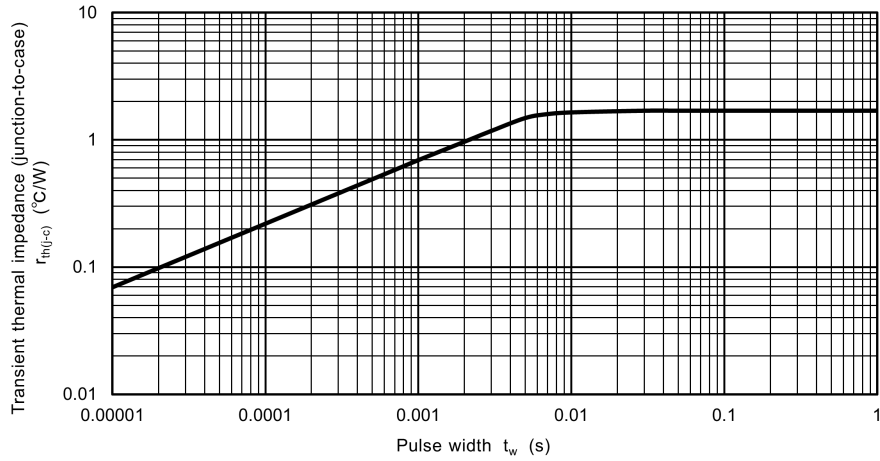
**Fig. 9.3  $I_R - V_R$**



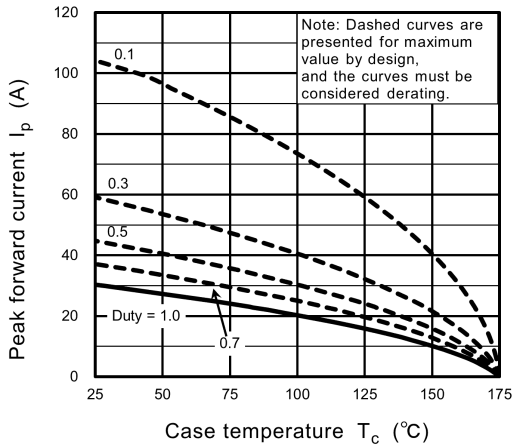
**Fig. 9.4  $C_t - V_R$**



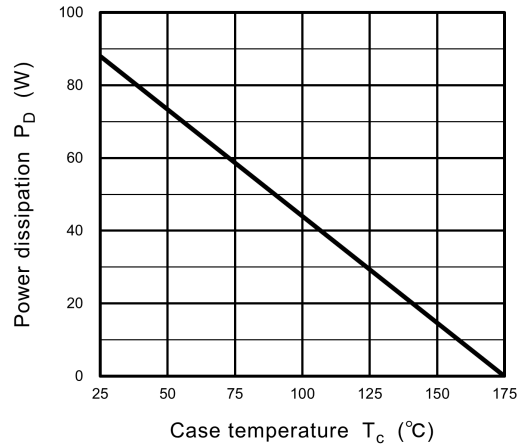
**Fig. 9.5  $Q_c - V_R$**



**Fig. 9.6  $r_{th(j-c)} - t_w$**   
(Guaranteed Maximum)



**Fig. 9.7  $I_p - T_c$**

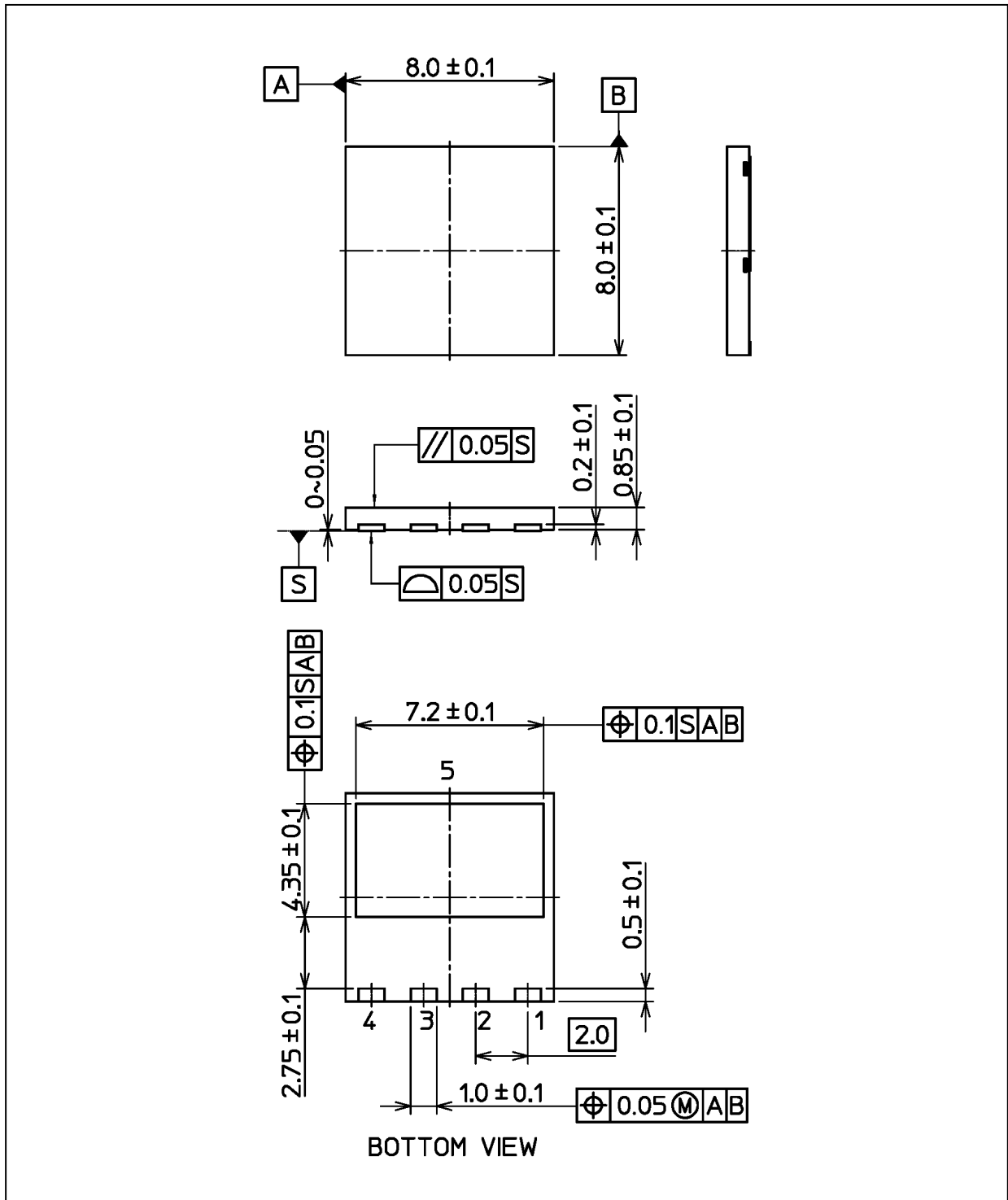


**Fig. 9.8  $P_D - T_c$**   
(Guaranteed Maximum)

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

## Package Dimensions

Unit: mm



Weight: 0.175 g (typ.)

Package Name(s)
TOSHIBA: 2-8T1A
Nickname: DFN8x8

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