SiC Schottky Barrier Diode

TRS4V65H

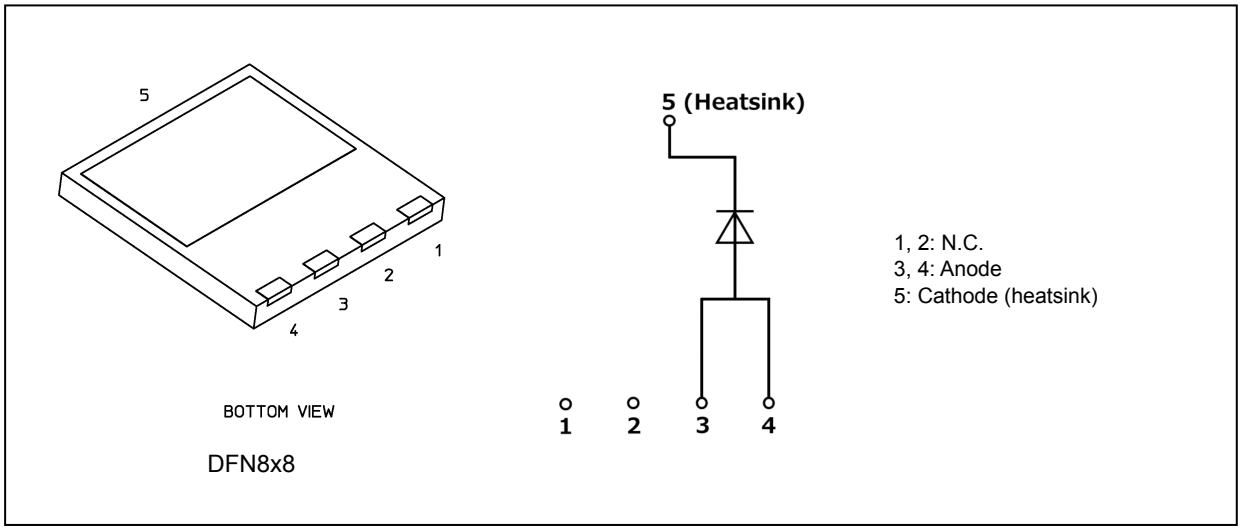
1. Applications

- 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 V (typ.)
(3) Low total capacitive charge: Q_c = 12nC (typ.)
(4) Low reverse current: I_R = 0.6 μA (typ.)

3. Packaging and Internal Circuit



Start of commercial production
2023-05

4. Absolute Maximum Ratings (Note) (Unless otherwise specified, T_a = 25 °C)

Characteristics	Symbol	Note	Rating	Unit
Repetitive peak reverse voltage	V_{RRM}		650	V
Forward DC current	$I_{F(DC)}$	(Note 1)	4	A
		(Note 2)	13	
Non-repetitive peak forward surge current	I_{FSM}	(Note 3)	28	A
		(Note 4)	23	
		(Note 5)	230	
Power dissipation	P_D	(Note 2)	50	W
Junction temperature	T_j		175	°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 = 155 °C
Note 2: T_c = 25 °C
Note 3 :f = 50 Hz (half-sine wave, t = 10 ms), T_c = 25 °C
Note 4: f = 50 Hz (half-sine wave, t = 10 ms), T_c = 150 °C
Note 5: Square wave, t = 10 μs, T_c = 25 °C

5. Thermal Characteristics

Characteristics	Symbol	Note	Max	Unit
Thermal resistance (junction-to-case)	$R_{th(j-c)}$	(Note 1)	3.00	°C/W

Note 1: T_c = 25°C

6. Electrical Characteristics (Unless otherwise specified, T_a = 25 °C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward voltage(pulse measurement)	V_F	I_F = 2 A	—	1.0	—	V
Forward voltage (pulse measurement)		I_F = 4 A	—	1.2	1.35	
		I_F = 4 A, T_a = 150°C	—	1.36	—	
Reverse current(pulse measurement)	I_R	V_R = 650 V	—	0.6	55	μA
		V_R = 650 V, T_a = 150°C	—	7	—	
Total capacitance	C_t	V_R = 1 V, f = 1 MHz	—	263	—	pF
		V_R = 400 V, f = 1 MHz	—	17	—	
		V_R = 650 V, f = 1 MHz	—	15	—	
Total capacitive charge	Q_c	V_R = 400 V, f = 1 MHz	—	12	—	nC

7. Marking

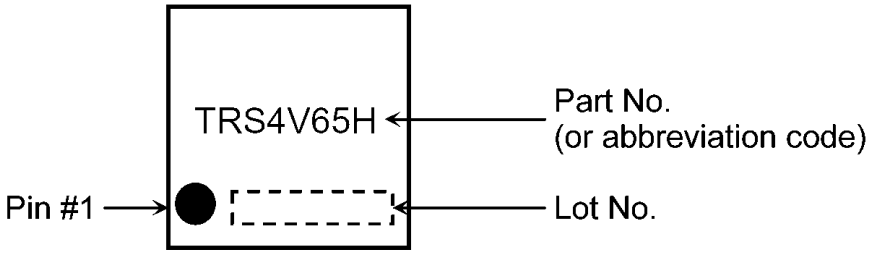


Fig. 7.1 Marking

8. Usage Considerations

For other design considerations, see the Toshiba website.

9. Characteristics Curves (Note)

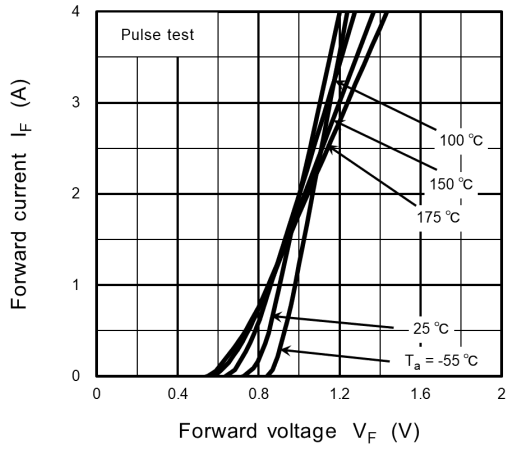


Fig. 9.1 I_F - V_F

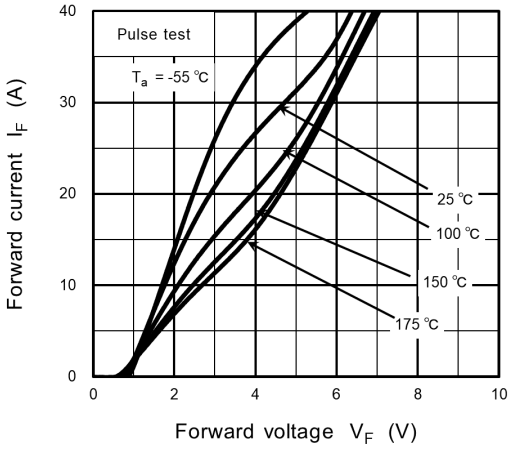


Fig. 9.2 I_F - V_F

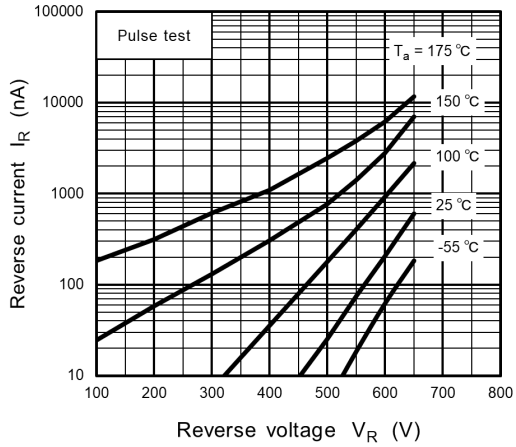


Fig. 9.3 I_R - V_R

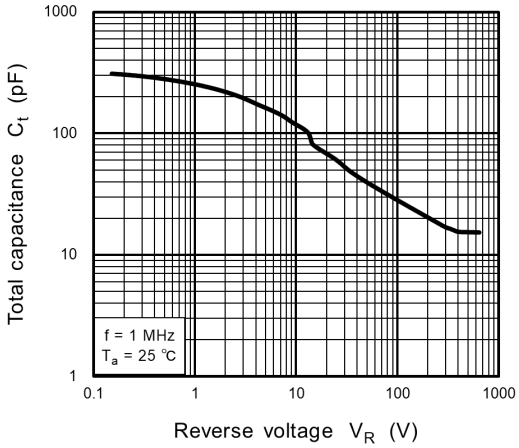


Fig. 9.4 C_t - V_R

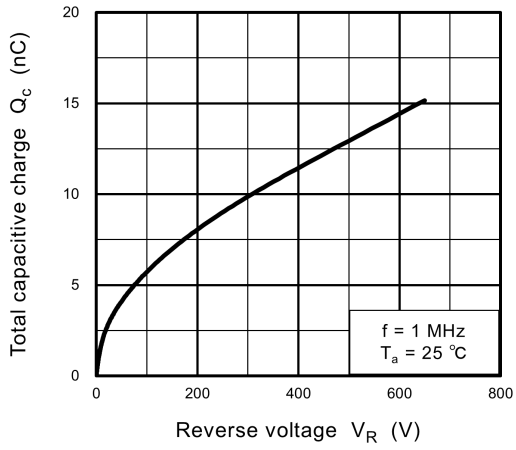


Fig. 9.5 Q_c - V_R

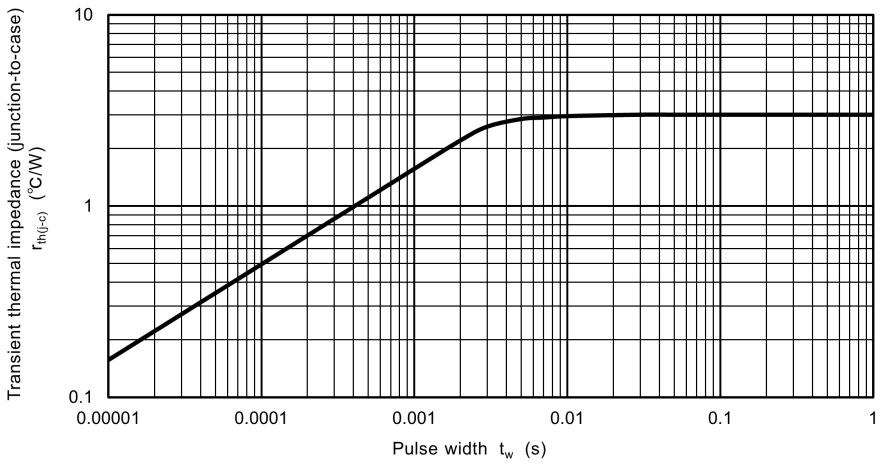


Fig. 9.6 $r_{th(j-c)}$ - t
(Guaranteed Maximum)

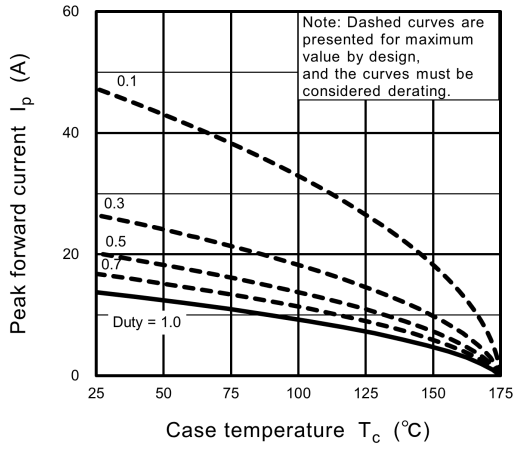


Fig. 9.7 I_p - T_c

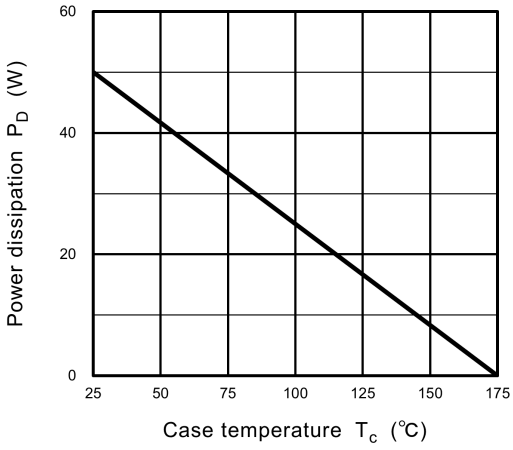
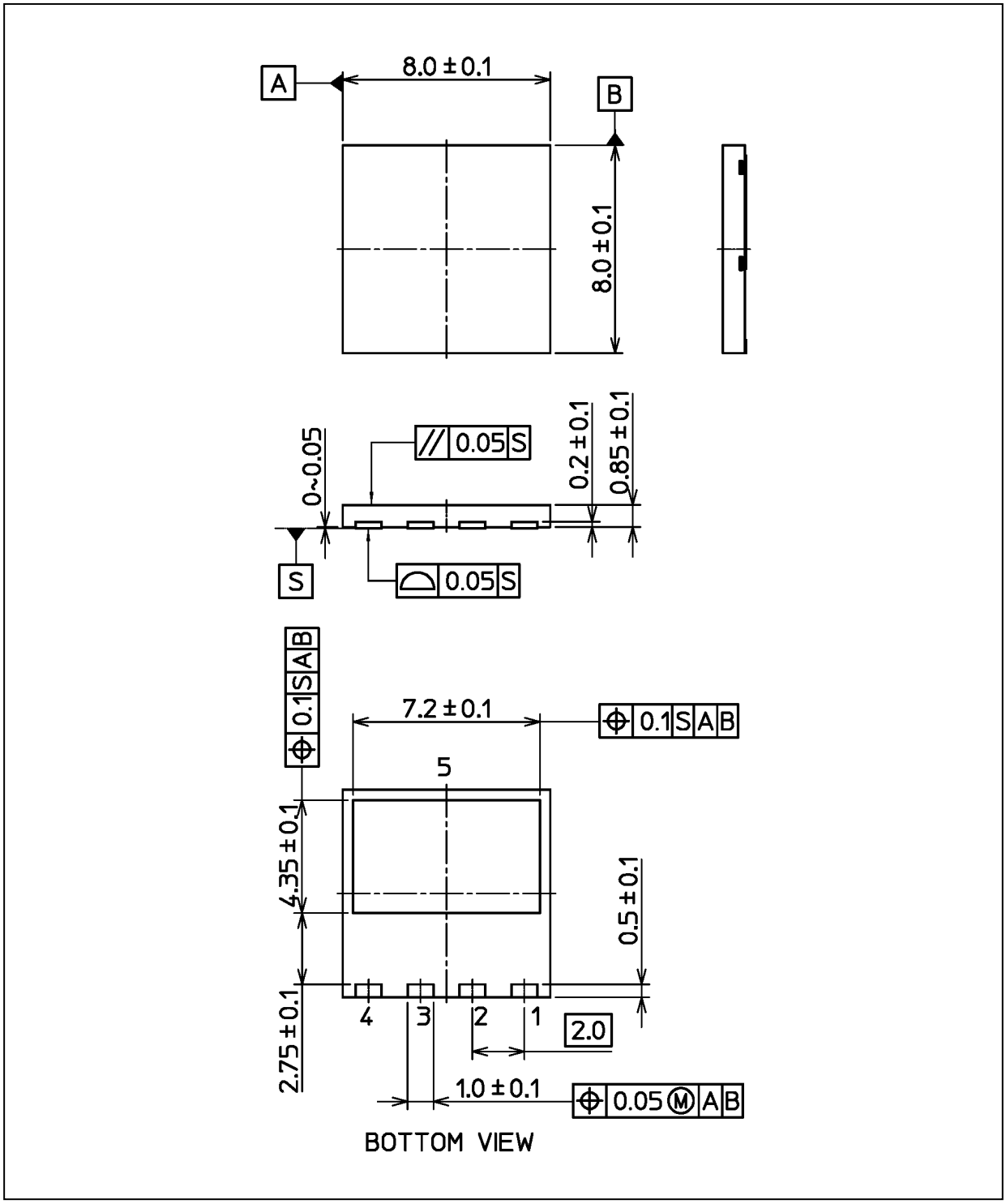


Fig. 9.8 P_D - T_c
(Guaranteed Maximum)

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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