

SiC Schottky Barrier Diode

TRS4V65H

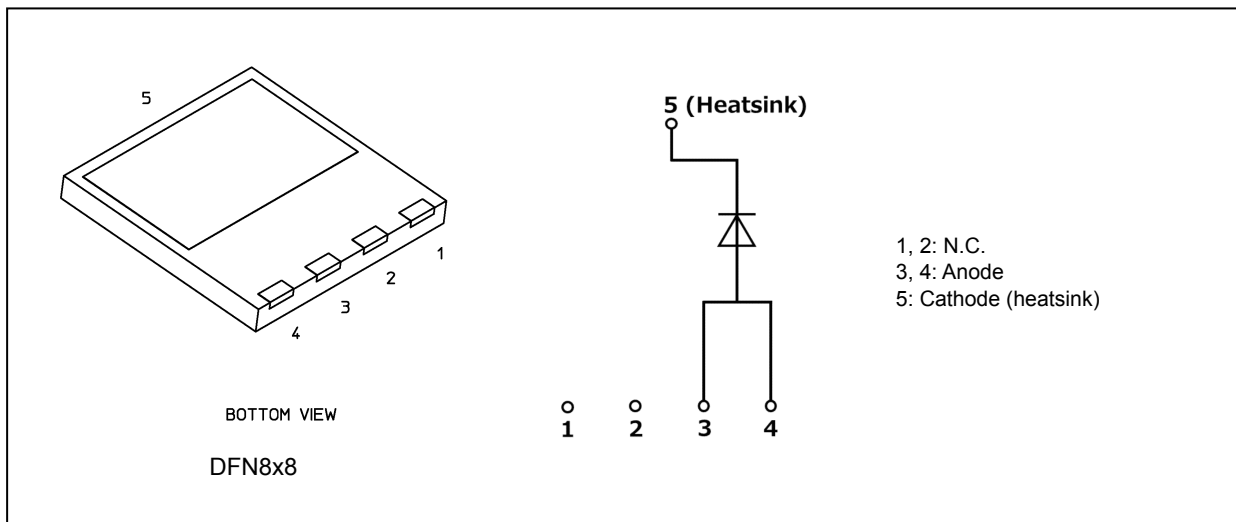
1. Applications

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

2. Features

- (1) Chip design of 3rd generation
- (2) Low forward voltage : $V_F = 1.2 \text{ V (typ.)}$
- (3) Low total capacitive charge: $Q_c = 12\text{nC (typ.)}$
- (4) Low reverse current: $I_R = 0.6 \mu\text{A (typ.)}$

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)	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	$^\circ\text{C}$
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: $T_c = 155\text{ }^\circ\text{C}$

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)	3.00	$^\circ\text{C/W}$

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	$I_F = 2\text{ A}$	—	1.0	—	V
		$I_F = 4\text{ A}$	—	1.2	1.35	
		$I_F = 4\text{ A}$, $T_a = 150\text{ }^\circ\text{C}$	—	1.36	—	
Reverse current(pulse measurement)	I_R	$V_R = 650\text{ V}$	—	0.6	55	μA
		$V_R = 650\text{ V}$, $T_a = 150\text{ }^\circ\text{C}$	—	7	—	
Total capacitance	C_t	$V_R = 1\text{ V}$, $f = 1\text{ MHz}$	—	263	—	pF
		$V_R = 400\text{ V}$, $f = 1\text{ MHz}$	—	17	—	
		$V_R = 650\text{ V}$, $f = 1\text{ MHz}$	—	15	—	
Total capacitive charge	Q_c	$V_R = 400\text{ V}$, $f = 1\text{ MHz}$	—	12	—	nC

7. Marking

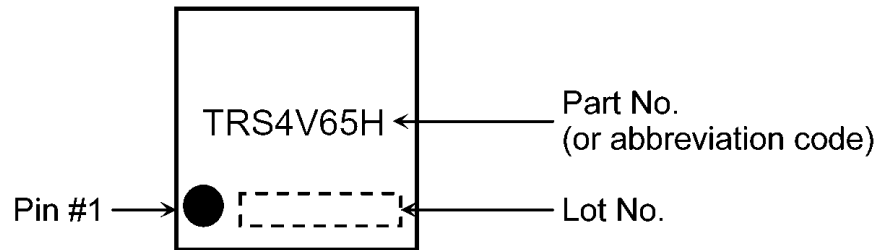


Fig. 7.1 Marking

8. Usage Considerations

For other design considerations, see the Toshiba website.

9. Characteristics Curves (Note)

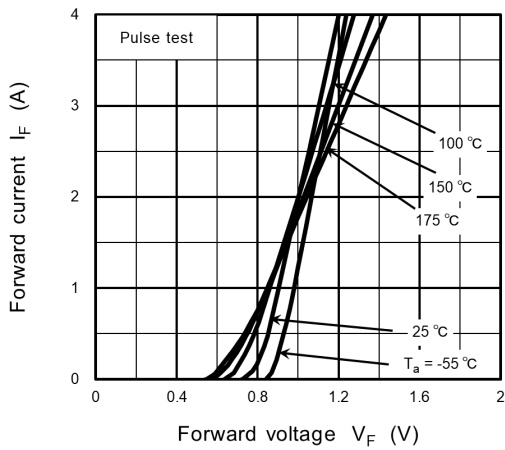


Fig. 9.1 $I_F - V_F$

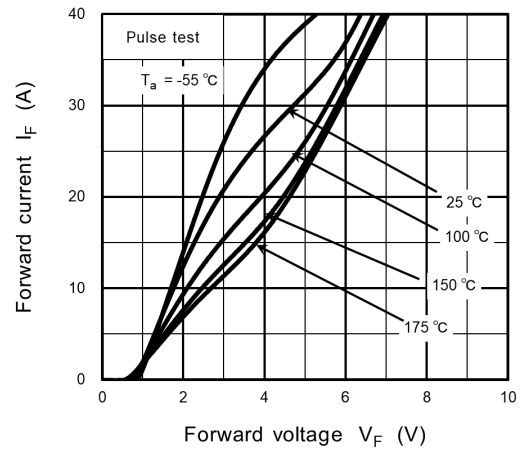


Fig. 9.2 $I_F - V_F$

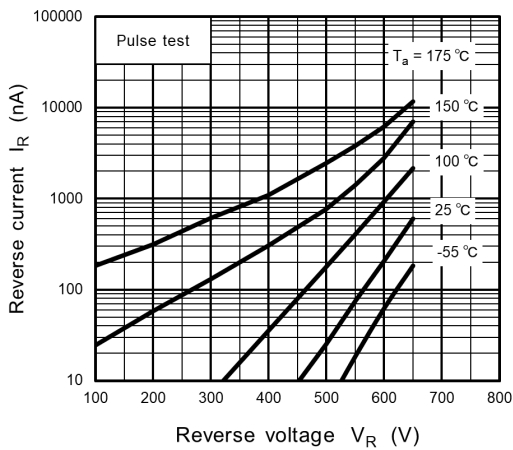


Fig. 9.3 $I_R - V_R$

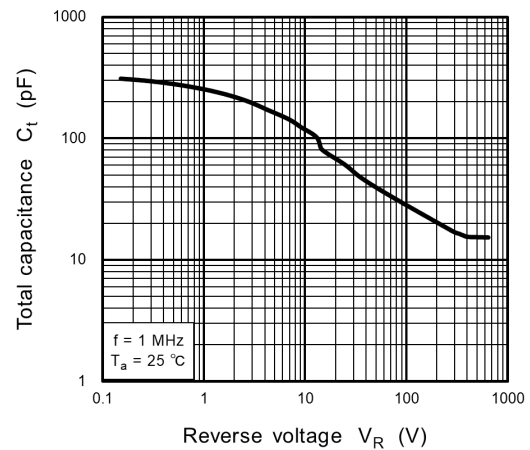


Fig. 9.4 $C_t - V_R$

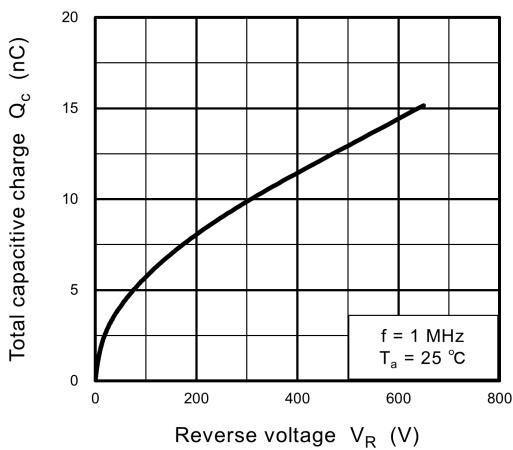
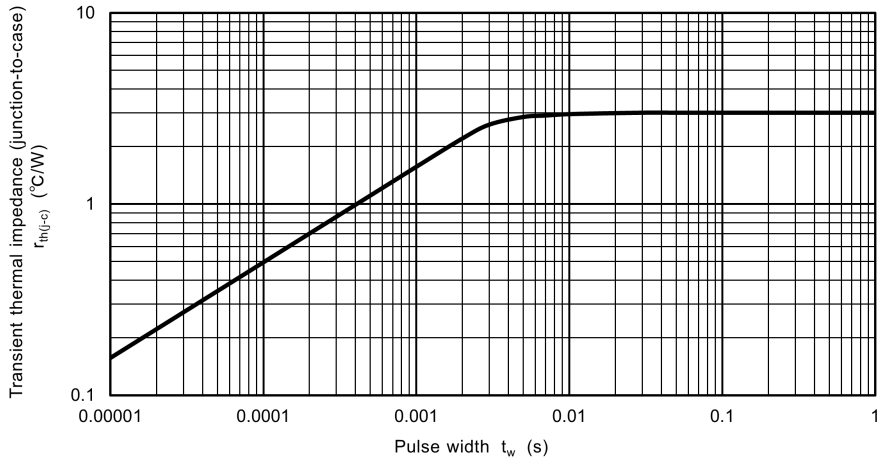


Fig. 9.5 $Q_C - V_R$



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

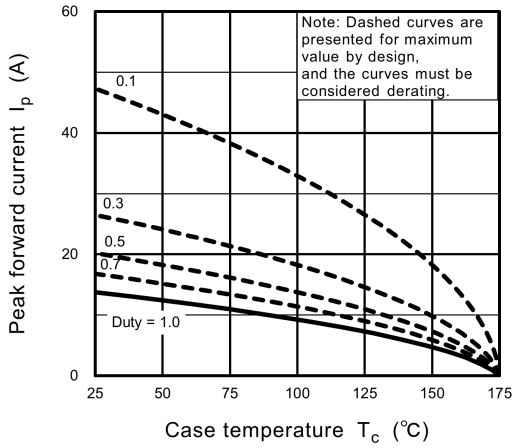
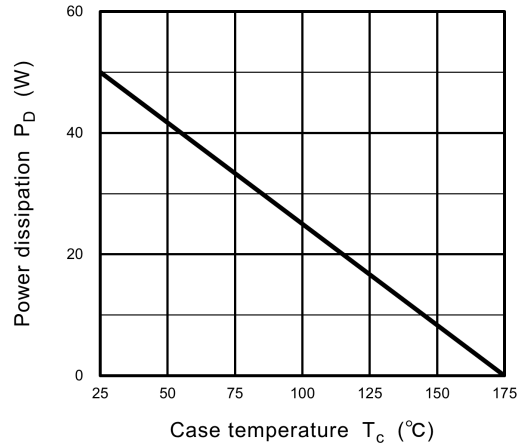


Fig. 9.7 $I_p - T_c$



**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.

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