SiC Schottky Barrier Diode

TRS20H120H

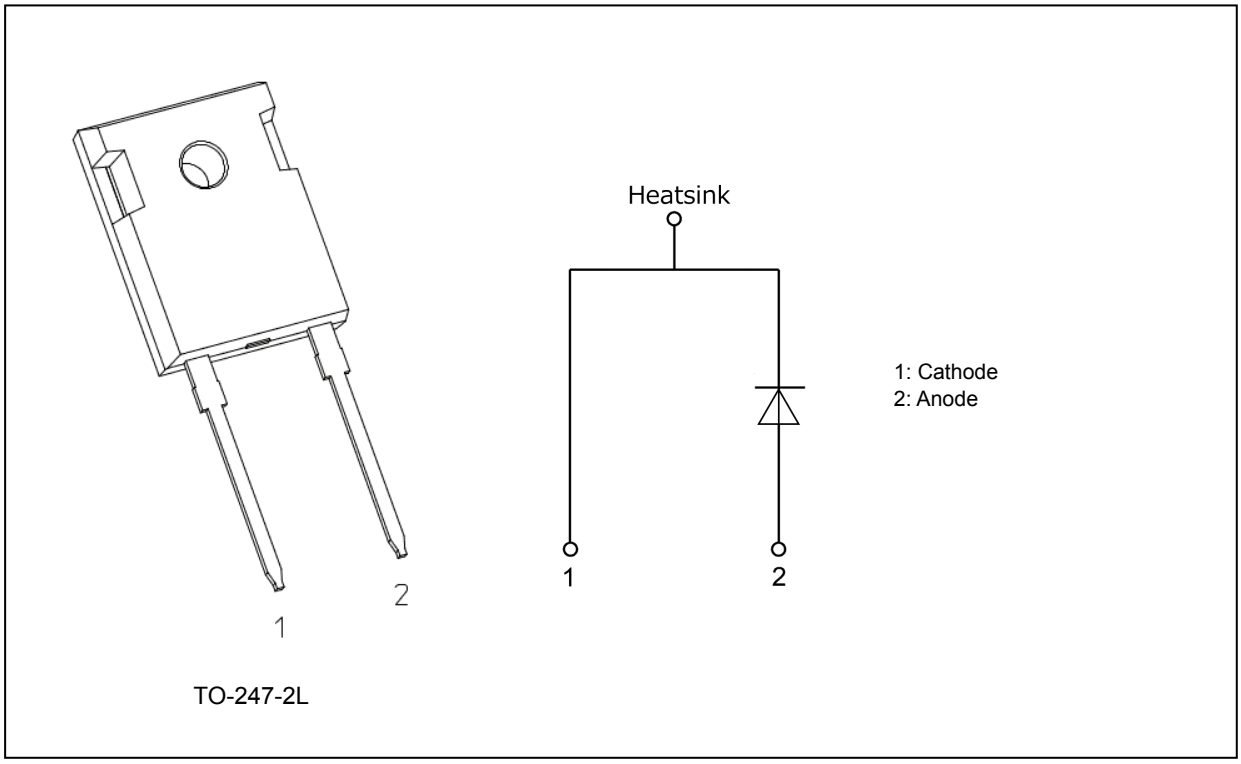
1. Applications

- 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 = 1.27 V (typ.)
(3) Low total capacitive charge: Q_c = 109 nC (typ.)
(4) Low reverse current: I_R = 2.0 μA (typ.)

3. Packaging and Internal Circuit



Start of commercial production
2024-07

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

Characteristics	Symbol	Note	Rating	Unit
Repetitive peak reverse voltage	V_{RRM}		1200	V
Forward DC current	$I_{F(DC)}$	(Note1)	20	A
		(Note2)	61	
Non-repetitive peak forward surge current	I_{FSM}	(Note3)	140	A
		(Note4)	120	
		(Note5)	1080	
Power dissipation	P_D	(Note2)	312	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).

Note1: T_c = 155 °C
Note2: T_c = 25 °C
Note3: f = 50 Hz (half-sine wave, t = 10 ms), T_c = 25 °C
Note4: f = 50 Hz (half-sine wave, t = 10 ms), T_c = 150 °C
Note5: Square wave, t = 10 μs, T_c = 25 °C

5. Thermal Characteristics

Characteristics	Symbol	Note	Max	Unit
Thermal resistance (junction-to-case)	$R_{th(j-c)}$	(Note1)	0.48	°C/W
Thermal resistance (junction-to-ambient)	$R_{th(j-a)}$	(Note1)	50	°C/W

Note1: 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 = 10 A	—	1.0	—	V
		I_F = 20 A	—	1.27	1.45	
		I_F = 20 A, T_a = 150°C	—	1.64	—	
Reverse current (pulse measurement)	I_R	V_R = 1200 V	—	2.0	130	μA
		V_R = 1200 V, T_a = 150°C	—	20	—	
Total capacitance	C_t	V_R = 1 V, f = 1 MHz	—	2070	—	pF
		V_R = 800 V, f = 1 MHz	—	74	—	
		V_R = 1200 V, f = 1 MHz	—	71	—	
Total capacitive charge	Q_c	V_R = 800 V, f = 1 MHz	—	109	—	nC

7. Marking

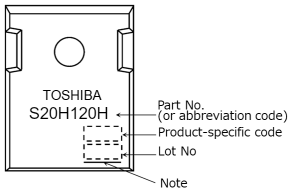


Fig. 7.1 Marking

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

Abbreviation Code	Part Number
S20H120H	TRS20H120H

8. Usage Considerations

For other design considerations, see the Toshiba website.

9. Characteristics Curves (Note)

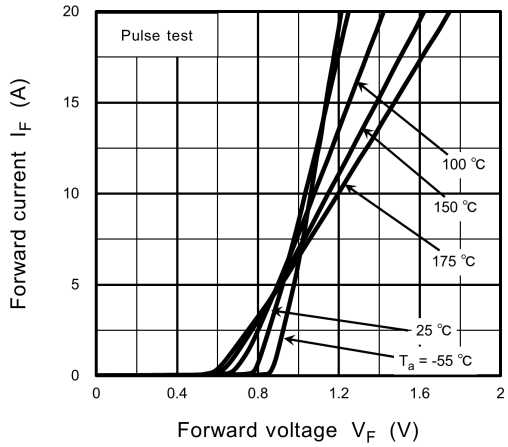


Fig. 9.1 I_F - V_F

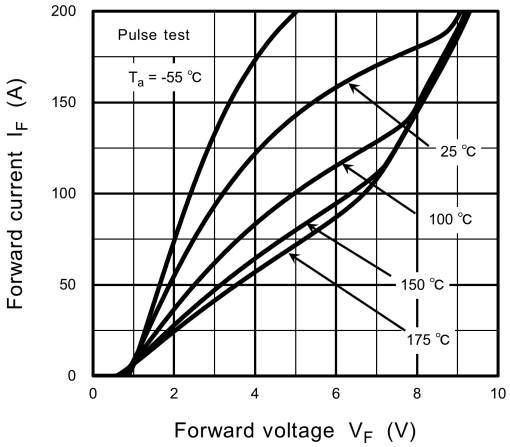


Fig. 9.2 I_F - V_F

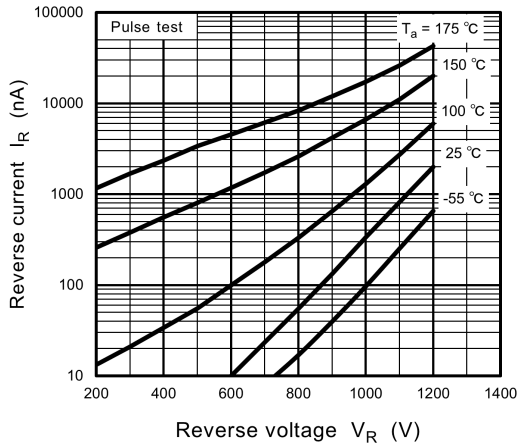


Fig. 9.3 I_R - V_R

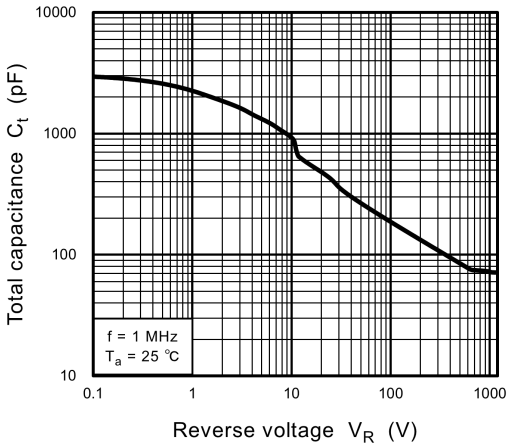


Fig. 9.4 C_t - V_R

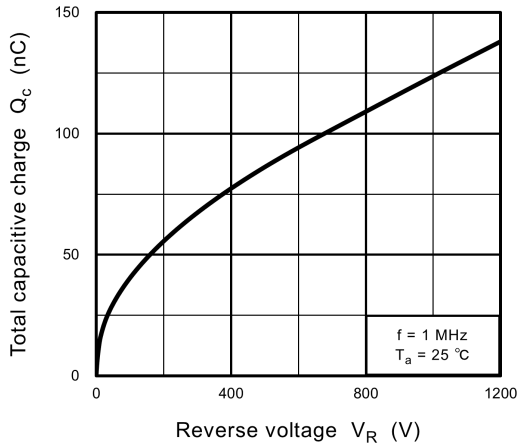


Fig. 9.5 Q_c - V_R

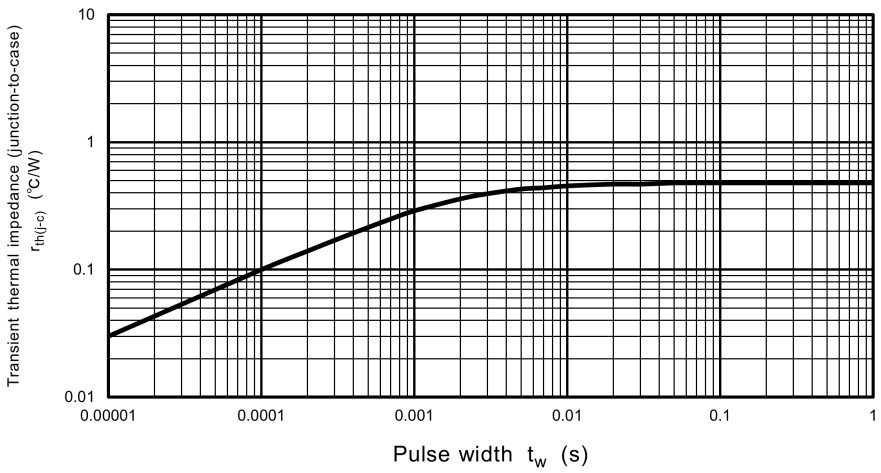


Fig. 9.6 $r_{th(j-c)}$ - t_w
(Guaranteed Maximum)

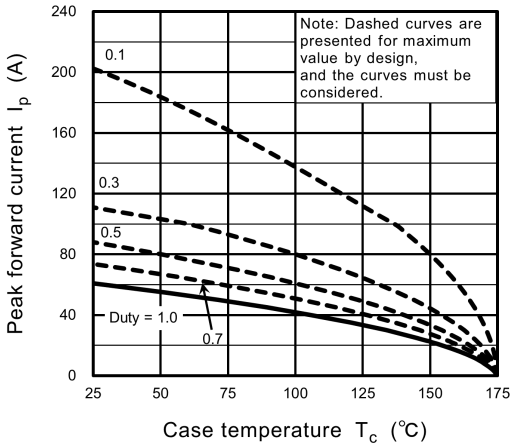


Fig. 9.7 I_p - T_c

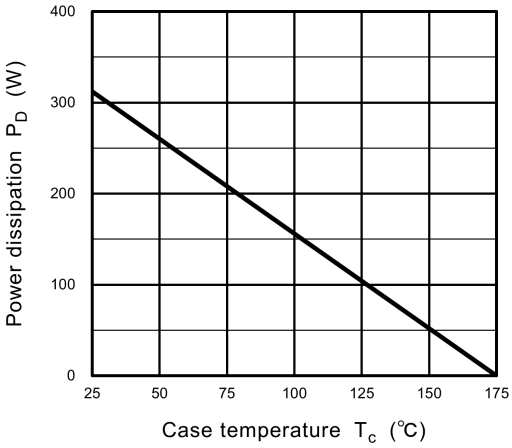
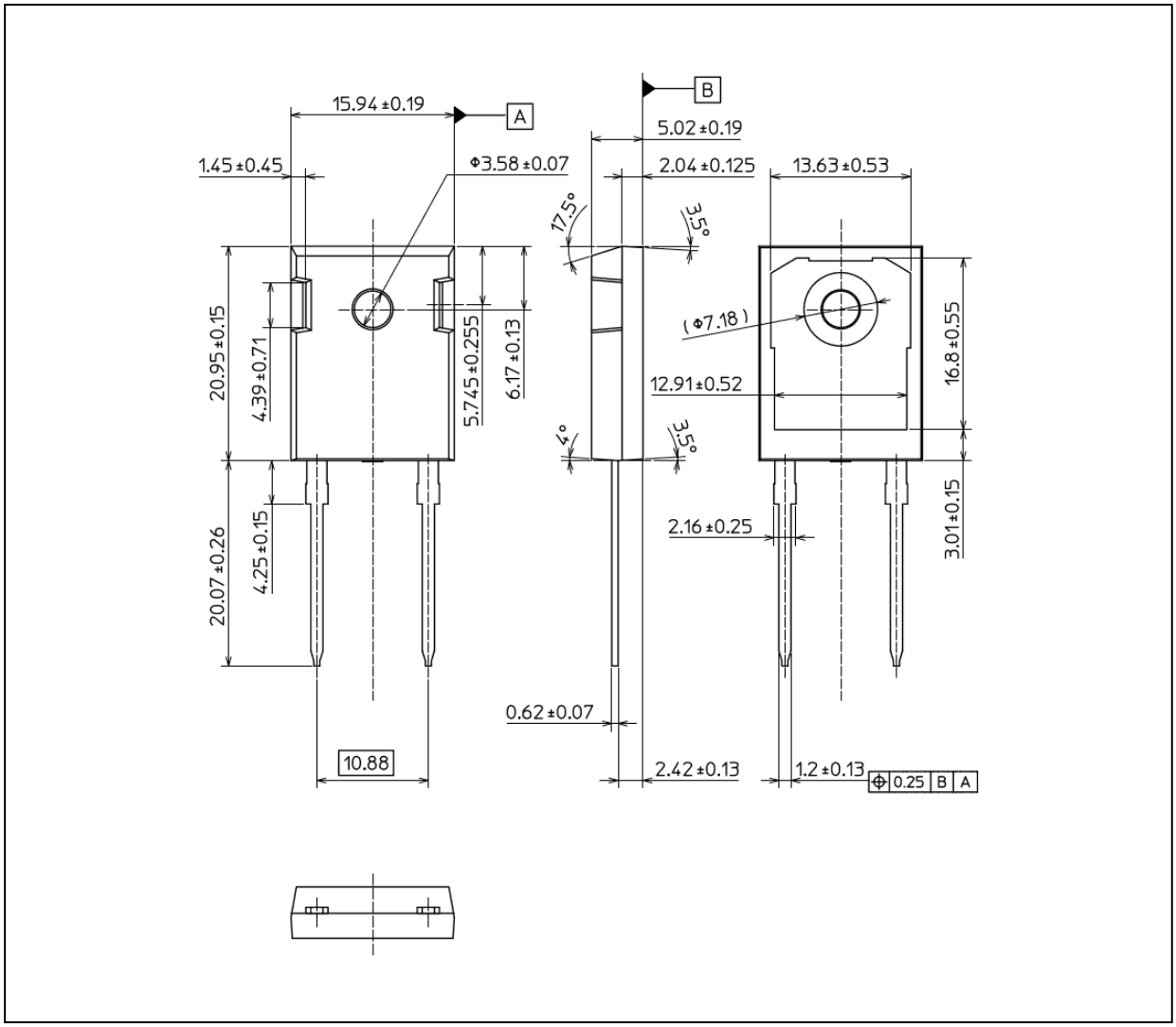


Fig. 9.8 P_D - T_c
(Guaranteed Maximum)

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

Package Dimensions

Unit: mm



Weight: 5.98 g (typ.)

Package Name(s)
TOSHIBA: 1-16A1A
Nickname: TO-247-2L

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