SiC Schottky Barrier Diode

TRS10N120HB

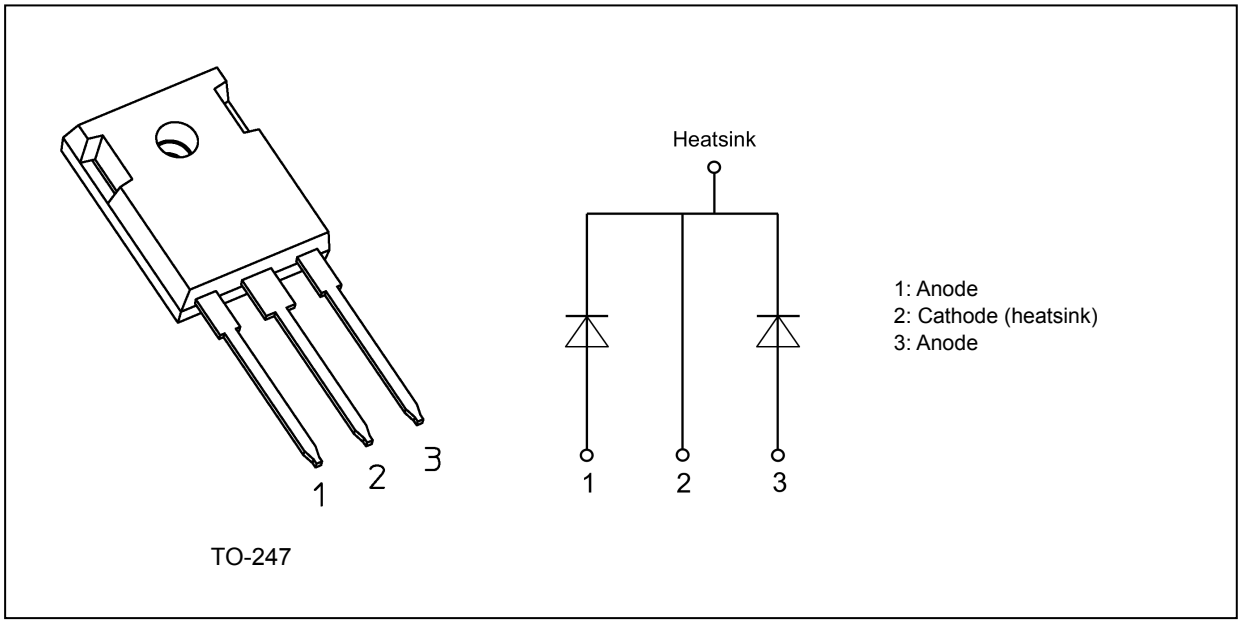
1. Applications

- 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 (Per Leg) = 1.27 V (typ.)
(3) Low total capacitive charge: Q_c (Per Leg) = 30 nC (typ.)
(4) Low reverse current: I_R (Per Leg) = 0.5 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	Test Condition	Rating	Unit
Repetitive peak reverse voltage	V_{RRM}			1200	V
Forward DC current	$I_{F(DC)}$	(Note1)	Per Leg	5	A
			Both Legs	10	
		(Note2)	Per Leg	18	
			Both Legs	36	
Non-repetitive peak forward surge current	I_{FSM}	(Note3)	Per Leg	40	A
			Both Legs	80	
		(Note4)	Per Leg	35	
			Both Legs	70	
		(Note5)	Per Leg	410	
			Both Legs	820	
Power dissipation	P_D	(Note2)	Per Leg	105	W
			Both Legs	211	
Junction temperature	T_j			175	°C
Storage temperature	T_{stg}			-55 to 175	°C
Mounting torque	TOR			0.8	N · m

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 = 160 °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	Test Condition	Max	Unit
Thermal resistance (junction-to-case)	$R_{th(j-c)}$	(Note1)	Per Leg	1.42	°C/W
			Both Legs	0.71	
Thermal resistance (junction-to-ambient)	$R_{th(j-a)}$	(Note2)	—	50	

Note1: T_c = 25 °C
Note2: T_a = 25 °C

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

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward voltage (pulse measurement)	V_F	I_F = 2.5 A	—	1.0	—	V
		I_F = 5 A	—	1.27	1.45	
		I_F = 5 A, T_a = 150°C	—	1.64	—	
Reverse current (pulse measurement)	I_R	V_R = 1200 V	—	0.5	50	μA
		V_R = 1200 V, T_a = 150°C	—	4.9	—	
Total capacitance	C_t	V_R = 1 V, f = 1 MHz	—	564	—	pF
		V_R = 800 V, f = 1 MHz	—	21	—	
		V_R = 1200 V, f = 1 MHz	—	19	—	
Total capacitive charge	Q_c	V_R = 800 V, f = 1 MHz	—	30	—	nC

7. Marking (Note)

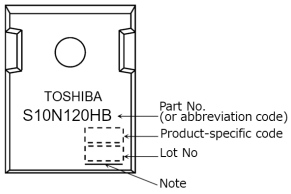


Fig. 7.1 Marking

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
S10N120HB	TRS10N120HB

8. Usage Considerations

For other design considerations, see the Toshiba website.

9. Characteristics Curves (Note)

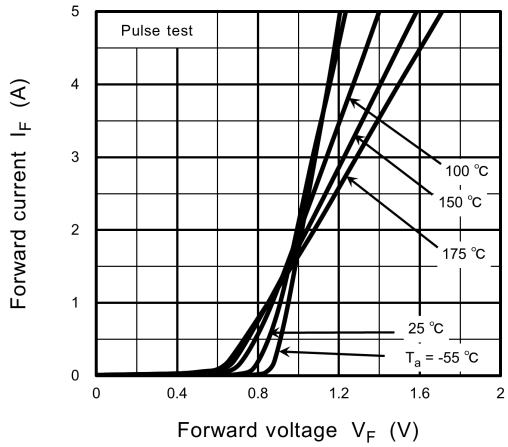


Fig. 9.1 I_F - V_F (Per Leg)

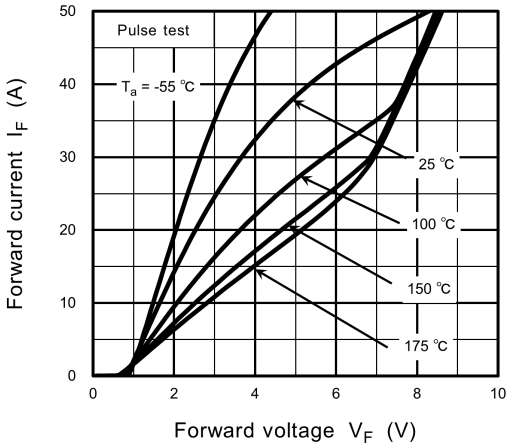


Fig. 9.2 I_F - V_F (Per Leg)

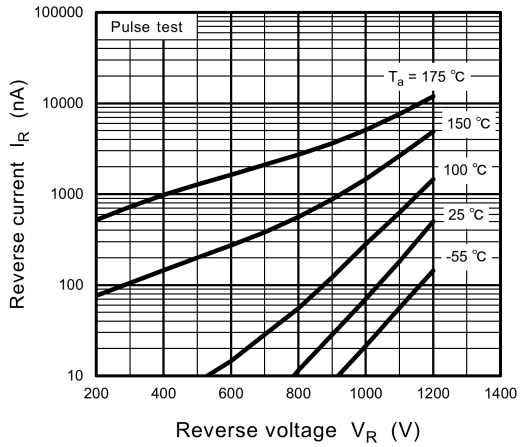


Fig. 9.3 I_R - V_R (Per Leg)

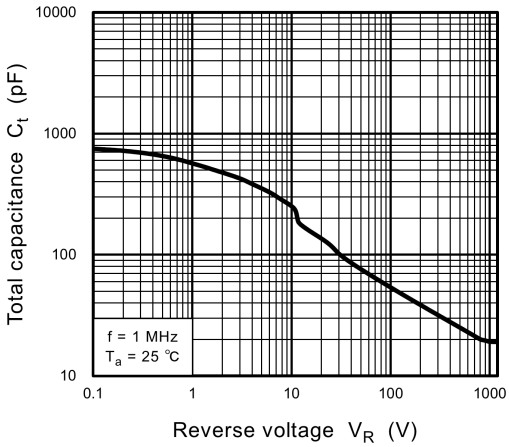


Fig. 9.4 C_t - V_R (Per Leg)

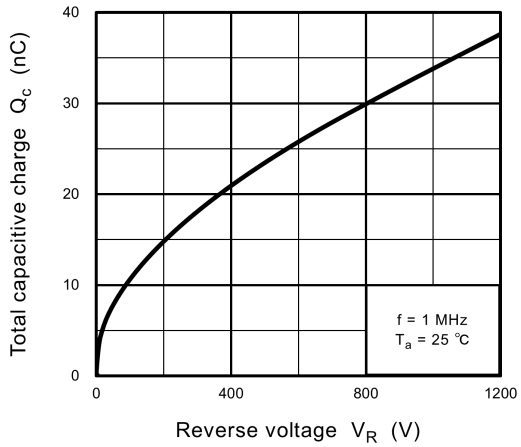


Fig. 9.5 Q_c - V_R (Per Leg)

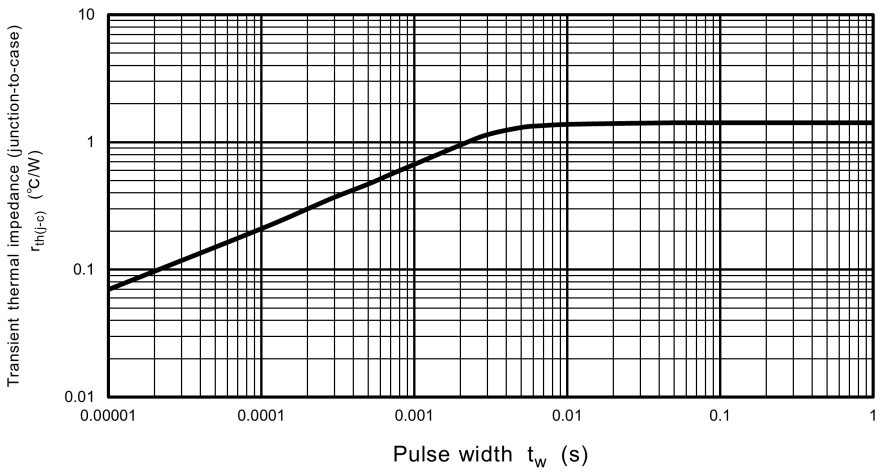


Fig. 9.6 $r_{th(j-c)}$ - t_w (Per Leg) (Guaranteed Maximum)

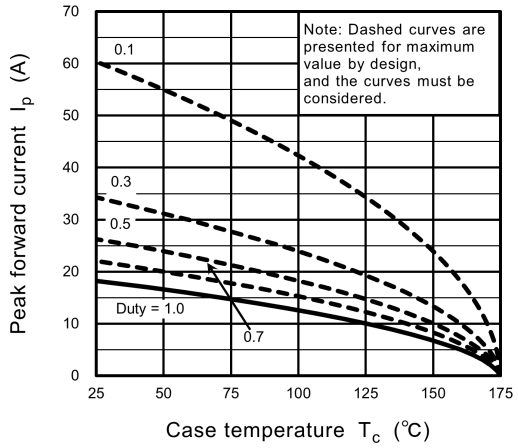


Fig. 9.7 I_p - T_c (Per Leg)

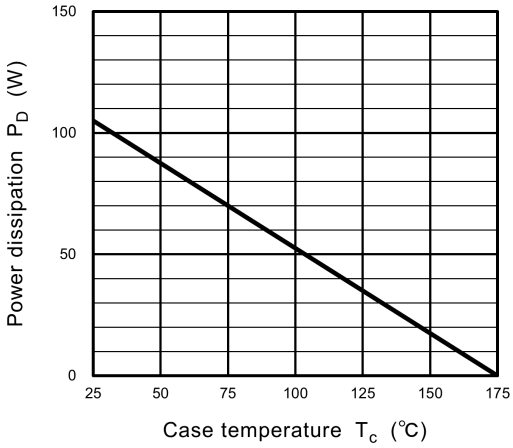
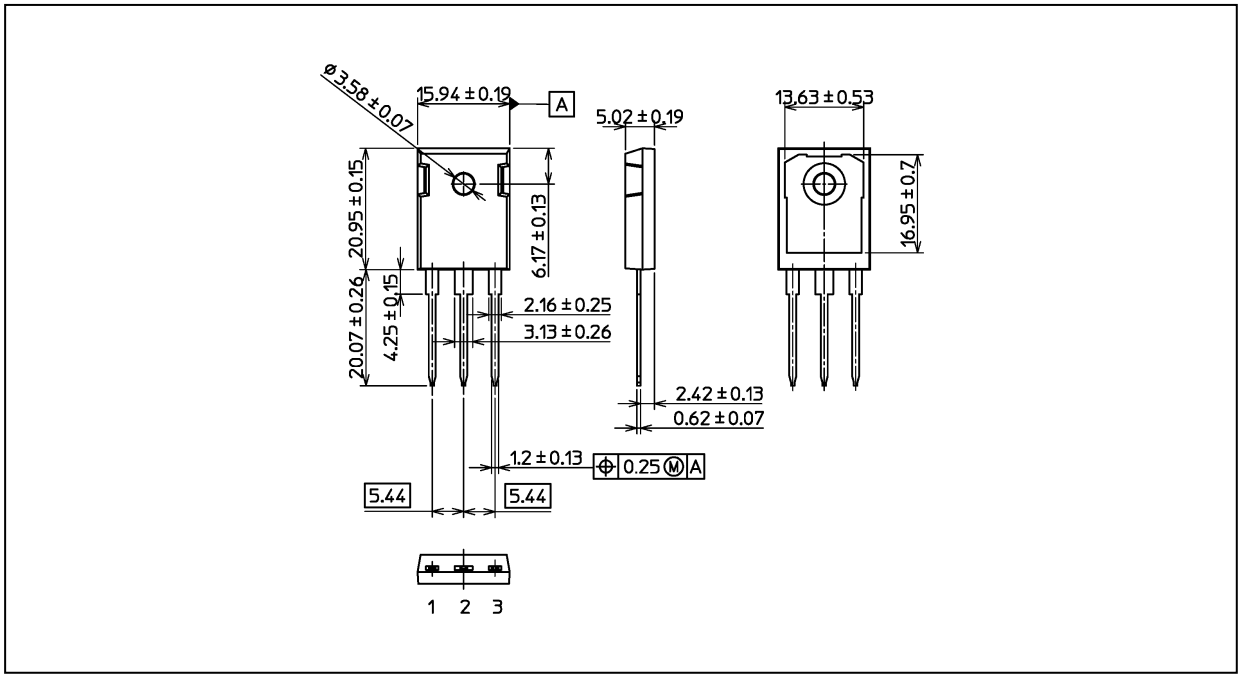


Fig. 9.8 P_D - T_c (Per Leg) (Guaranteed Maximum)

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

Package Dimensions

Unit: mm



Weight: 6.15 g (typ.)

Package Name(s)
TOSHIBA: 2-16L1A
Nickname: TO-247

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