SiC Schottky Barrier Diode

TRS12N65FB

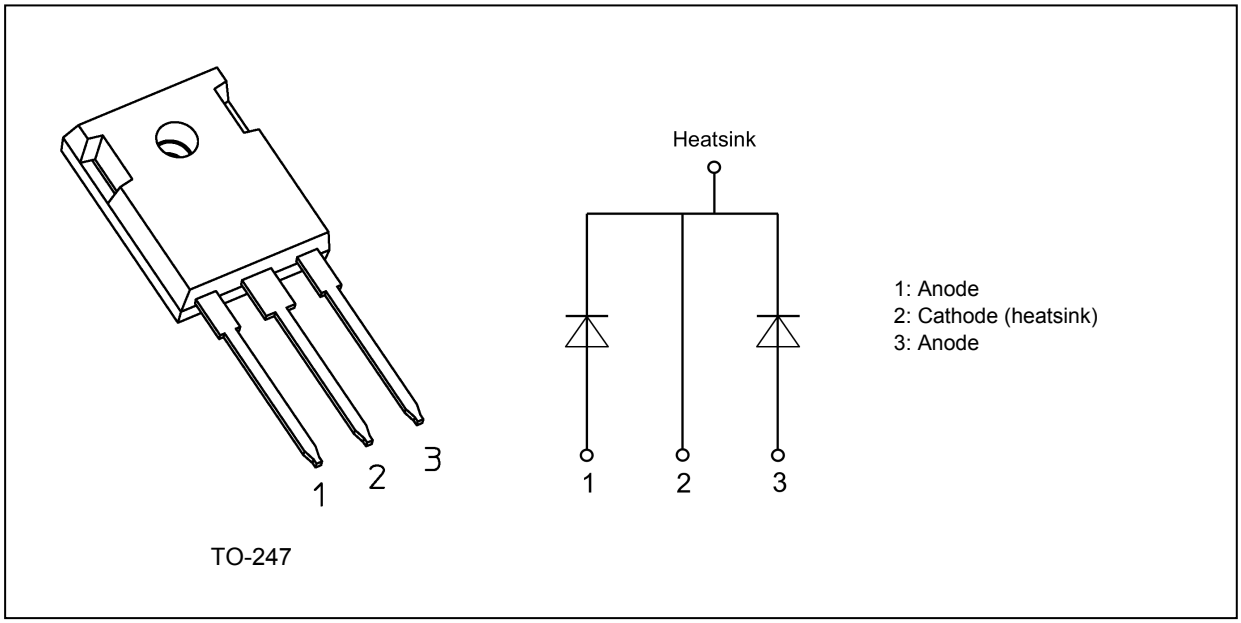
1. Applications

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

2. Features

(1) Chip design of 2nd generation
(2) High non-repetitive peak forward surge current: I_{FSM} (Per Leg) / (Both Legs) = 52 A / 104 A
(3) Low junction capacitance: C_j (Per Leg) = 23 pF (typ.)
(4) Low reverse current: I_R (Per Leg) = 0.3 μA (typ.)

3. Packaging and Internal Circuit



TO-247

Start of commercial production
2020-07

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

Characteristics	Symbol	Note	Test Condition	Rating	Unit
Repetitive peak reverse voltage	V_{RRM}			650	V
Forward DC current	$I_{F(DC)}$		Per Leg	6	A
			Both Legs	12	
Forward pulse current	I_{FP}	(Note 1)	Per Leg	60	
			Both Legs	120	
Power dissipation	P_D	(Note 2)	Per Leg	68	W
			Both Legs	136	
Non-repetitive peak forward surge current	I_{FSM}	(Note 3)	Per Leg	52	A
			Both Legs	104	
Junction temperature	T_j			175	°C
Storage temperature	T_{stg}			-55 to 175	
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).

Note 1: t = 50 μs
Note 2: T_c = 25 °C
Note 3: f = 50 Hz (half-sine wave, t = 10 ms)

5. Thermal Characteristics

Characteristics	Symbol	Note	Test Condition	Max	Unit
Thermal resistance (junction-to-case)	$R_{th(j-c)}$	(Note 1)	Per Leg	2.2	°C/W
			Both Legs	1.1	
Thermal resistance (junction-to-ambient)	$R_{th(j-a)}$	(Note 2)	—	50	

Note 1: T_c = 25 °C
Note 2: T_a = 25 °C

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

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Forward voltage	(pulse measurement)	V_F	I_F = 3 A	—	1.2	—	V
			I_F = 6 A	—	1.45	1.6	
Reverse current	(pulse measurement)	I_R	V_R = 650 V	—	0.3	30	μA
Junction capacitance		C_j	V_R = 400 V, f = 1 MHz	—	23	—	pF
Total junction capacitive charge		Q_{cj}	V_R = 0.1 to 400 V	—	15	—	nC

7. Marking (Note)

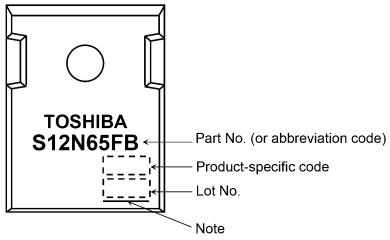


Fig. 7.1 Marking

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
S12N65FB	TRS12N65FB

8. Characteristics Curves (Note)

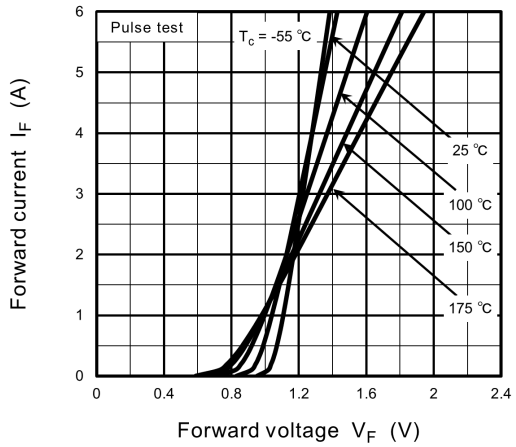


Fig. 8.1 I_F - V_F (Per Leg)

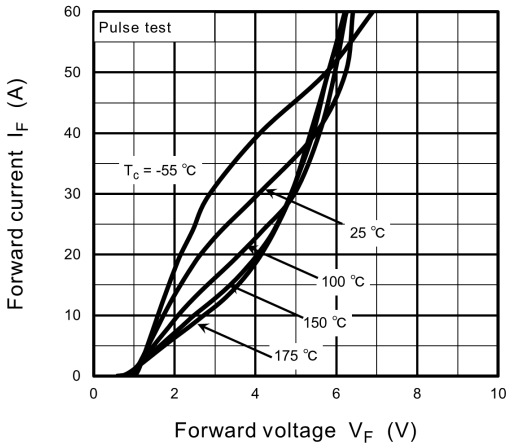


Fig. 8.2 I_F - V_F (Per Leg)

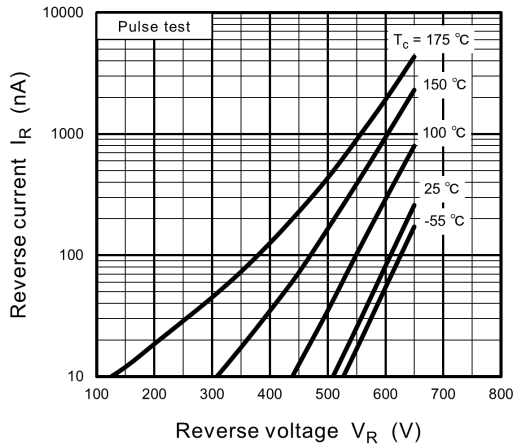


Fig. 8.3 I_R - V_R (Per Leg)

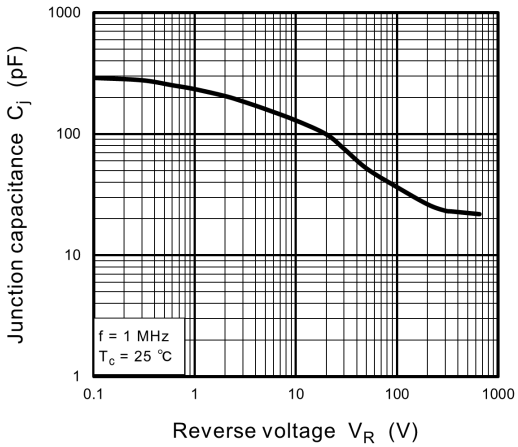


Fig. 8.4 C_j - V_R (Per Leg)

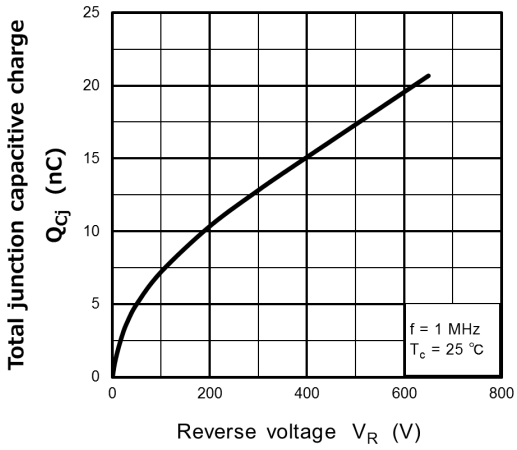


Fig. 8.5 Q_{cj} - V_R

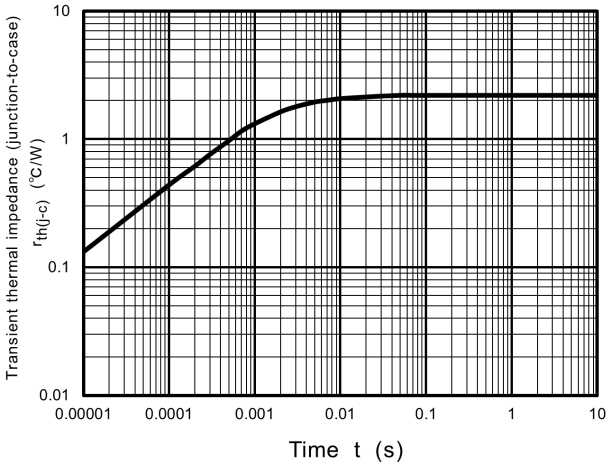
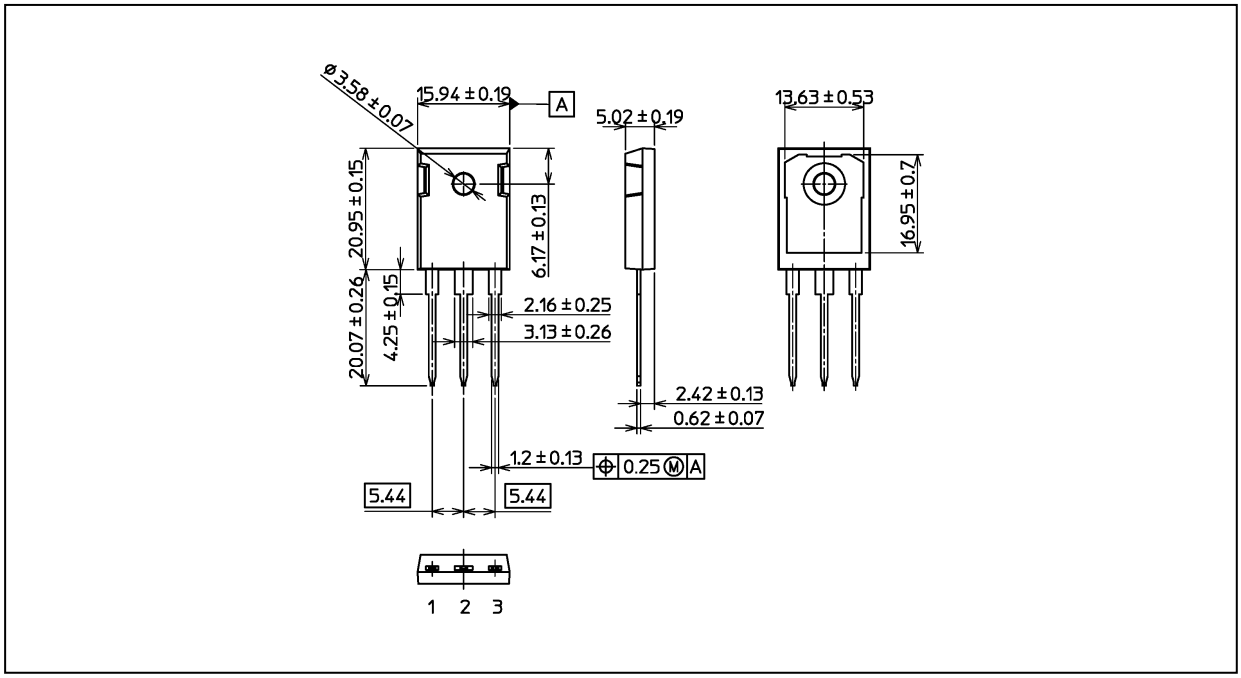


Fig. 8.6 $r_{th(j-c)}$ - t
(Guaranteed Maximum) (Per Leg)

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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