

SiC Schottky Barrier Diode

# TRS20N65FB

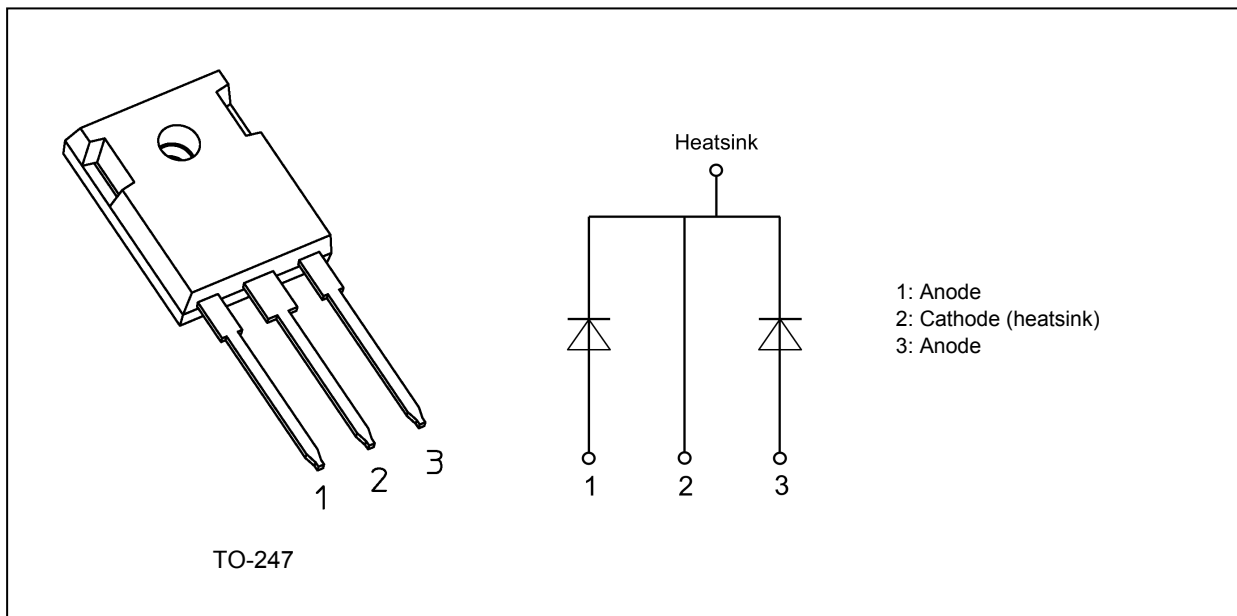
## 1. Applications

- 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) = 79 A / 158 A
- (3) Low junction capacitance:  $C_j$  (Per Leg) = 38 pF (typ.)
- (4) Low reverse current:  $I_R$  (Per Leg) = 0.5  $\mu$ A (typ.)

## 3. Packaging and Internal Circuit



Start of commercial production

2020-08

## 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	10	A
			Both Legs	20	
Forward pulse current	$I_{FP}$	(Note 1)	Per Leg	100	
			Both Legs	200	
Power dissipation	$P_D$	(Note 2)	Per Leg	107	W
			Both Legs	214	
Non-repetitive peak forward surge current	$I_{FSM}$	(Note 3)	Per Leg	79	A
			Both Legs	158	
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:  $t = 50 \mu s$

Note 2:  $T_c = 25 \text{ }^\circ\text{C}$

Note 3:  $f = 50 \text{ Hz}$  (half-sine wave,  $t = 10 \text{ ms}$ )

## 5. Thermal Characteristics

Characteristics	Symbol	Note	Test Condition	Max	Unit
Thermal resistance (junction-to-case)	$R_{th(j-c)}$	(Note 1)	Per Leg	1.4	°C/W
			Both Legs	0.7	
Thermal resistance (junction-to-ambient)	$R_{th(j-a)}$	(Note 2)	—	50	

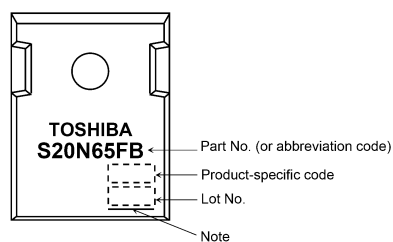
Note 1:  $T_c = 25 \text{ }^\circ\text{C}$

Note 2:  $T_a = 25 \text{ }^\circ\text{C}$

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

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward voltage (pulse measurement)	$V_F$	$I_F = 5 \text{ A}$	—	1.2	—	V
		$I_F = 10 \text{ A}$	—	1.45	1.6	
Reverse current (pulse measurement)	$I_R$	$V_R = 650 \text{ V}$	—	0.5	50	$\mu\text{A}$
Junction capacitance	$C_j$	$V_R = 400 \text{ V}$ , $f = 1 \text{ MHz}$	—	38	—	pF
Total junction capacitive charge	$Q_{cj}$	$V_R = 0.1 \text{ to } 400 \text{ V}$	—	24	—	nC

## 7. Marking (Note)



**Fig. 7.1 Marking**

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

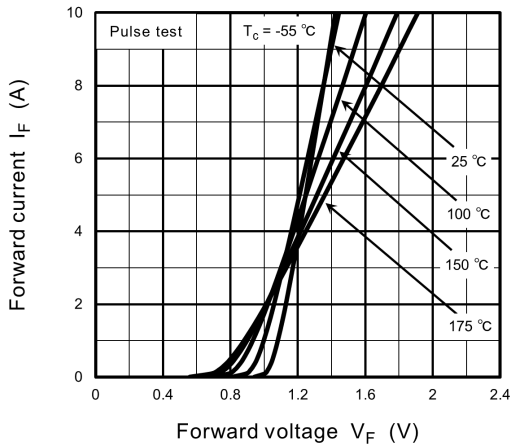
[[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product.

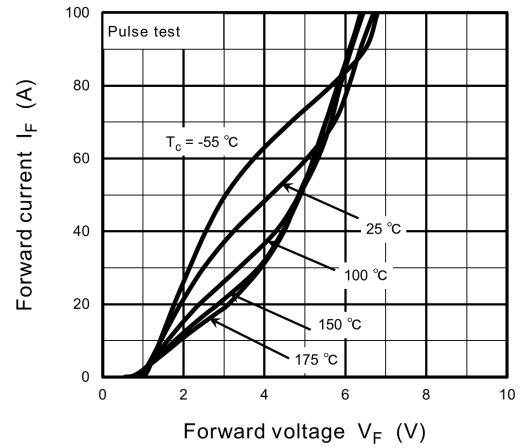
The RoHS is the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Abbreviation Code	Part Number
S20N65FB	TRS20N65FB

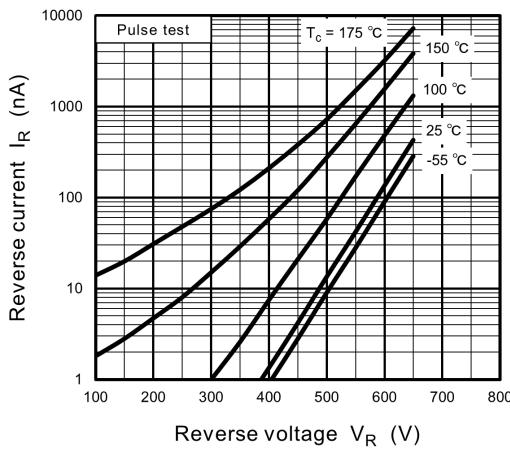
## 8. Characteristics Curves (Note)



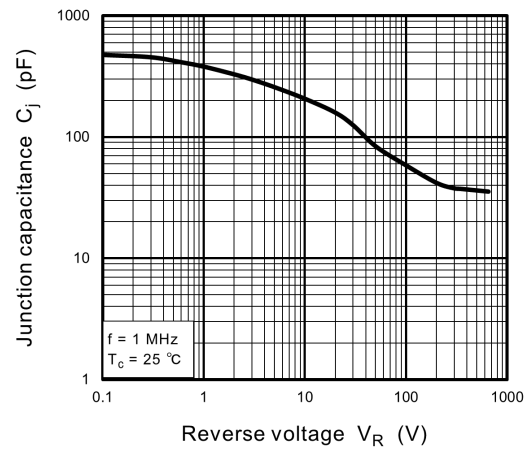
**Fig. 8.1  $I_F - V_F$  (Per Leg)**



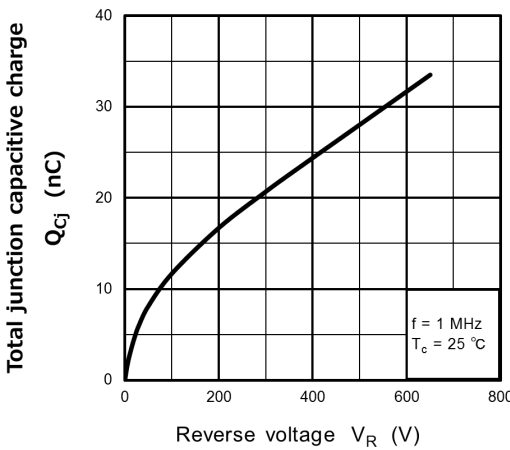
**Fig. 8.2  $I_F - V_F$  (Per Leg)**



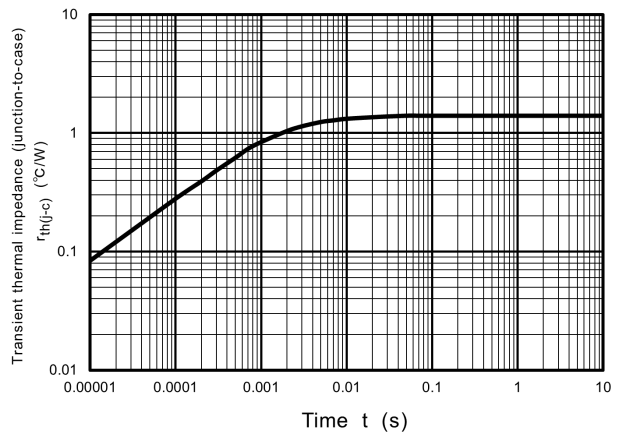
**Fig. 8.3  $I_R - V_R$  (Per Leg)**



**Fig. 8.4  $C_j - V_R$  (Per Leg)**



**Fig. 8.5  $Q_{cj} - V_R$**

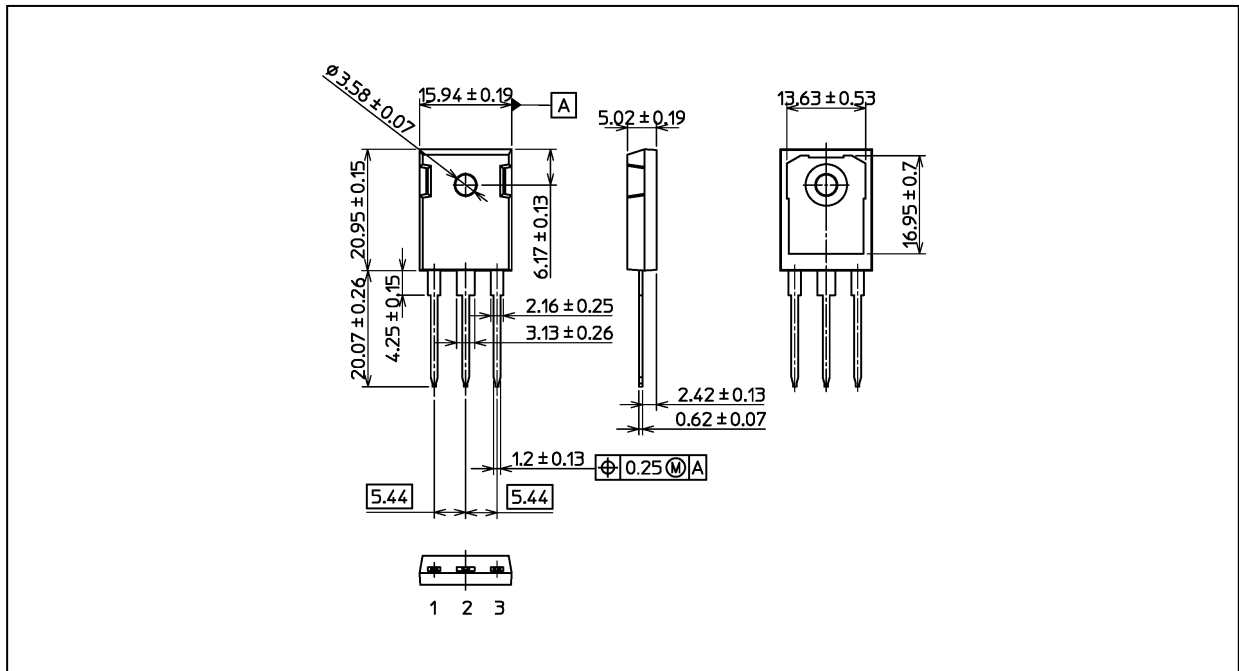


**Fig. 8.6  $r_{th(j-c)} - t$   
(Guaranteed Maximum) (Per Leg)**

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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