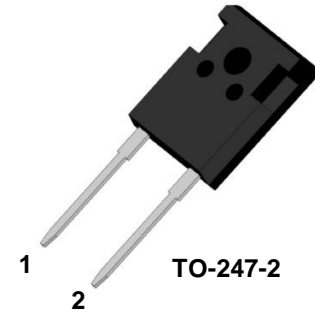


PRODUCT FEATURES

- Zero Forward/Reverse Recovery Current
- High Blocking Voltage
- High Frequency Operation
- Positive Temperature Coefficient on VF
- High Surge Current Capability

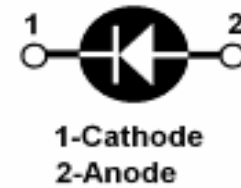
APPLICATIONS

- Motor Drives
- Solar / Wind Inverters
- AC/DC converters
- DC/DC converters
- UPS



DESCRIPTION

SiC SBD from MacMic use a completely new technology that provides superior switching performance and higher reliability compared to silicon. No reverse recovery current, temperature independent switching characteristics, and excellent thermal performance are helpful to gain system benefits including highest efficiency, increased power density, reduced EMI, and reduced system size and cost.



ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
V_R	Maximum D.C. Reverse Voltage		1200	V
V_{RRM}	Maximum Repetitive Reverse Voltage			
$I_{F(AV)}$	Average Forward Current	$T_C=25^\circ\text{C}$	58	A
		$T_C=150^\circ\text{C}$	20	
I_{FSM}	Non Repetitive Surge Forward Current	$T_J=25^\circ\text{C}, t=10\text{ms}, 50\text{Hz}, \text{Sine}$	180	
P_D	Power Dissipation	$T_C=25^\circ\text{C}$	250	W
E_{AS}	Single Pulse Avalanche Energy	$L=10\text{mH}, I_{AS}=10\text{A}$	500	mJ
T_J	Junction Temperature		-55 to +175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-55 to +150	$^\circ\text{C}$
Torque	To Heat Sink	Recommended (M3)	1.1	Nm
R_{thJC}	Junction to Case Thermal Resistance		0.56	$^\circ\text{C}/\text{W}$
Weight			6	g

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MM20S120B

ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions	Min.	Typ.	Max.	Unit
I_{RM}	Maximum Reverse Leakage Current	$V_R = 1200\text{V}$	2	50	μA
		$V_R = 1200\text{V}, T_J = 125^\circ\text{C}$	10	100	μA
		$V_R = 1200\text{V}, T_J = 175^\circ\text{C}$	30	300	μA
V_F	Forward Voltage	$I_F = 20\text{A}$	1.4	1.6	V
		$I_F = 20\text{A}, T_J = 125^\circ\text{C}$	1.6		
		$I_F = 20\text{A}, T_J = 175^\circ\text{C}$	1.8		
Q_C	Total Capacitive Charge	$V_R = 800\text{V}, T_J = 25^\circ\text{C}$	98		nC
C	Total Capacitive Charge	$V_R = 1\text{V}, T_J = 25^\circ\text{C},$ Freq = 1MHz	1252		pF
		$V_R = 400\text{V}, T_J = 25^\circ\text{C},$ Freq = 1MHz	102		
		$V_R = 800\text{V}, T_J = 25^\circ\text{C},$ Freq = 1MHz	69		

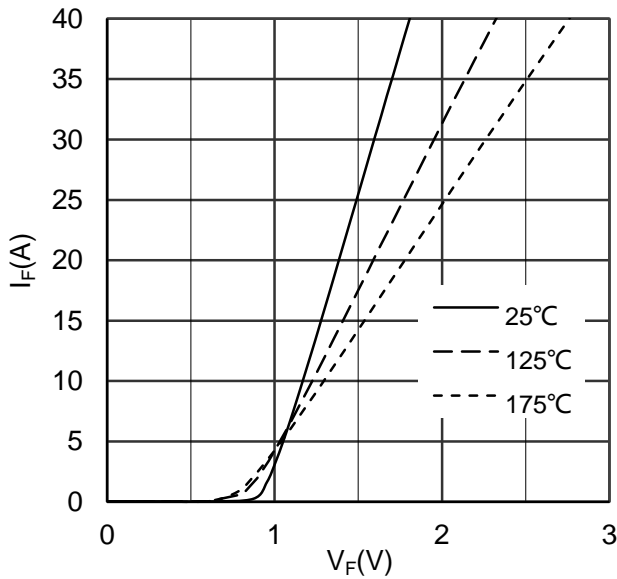


Figure 1. Forward Voltage Drop vs Forward Current

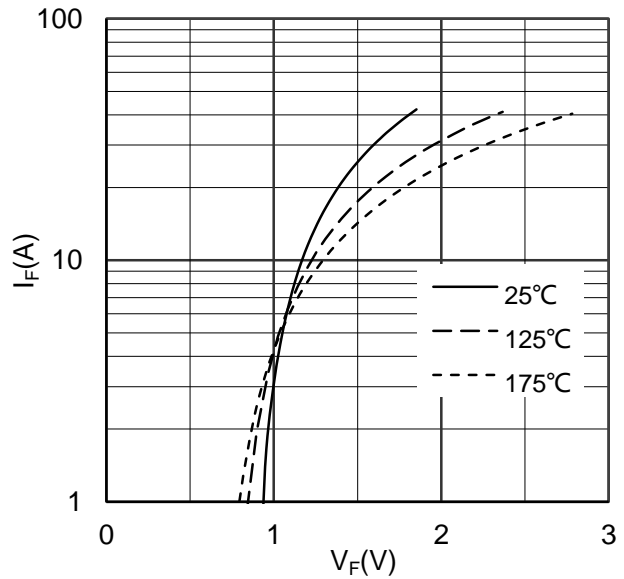


Figure 2. Forward Voltage Drop vs Forward Current

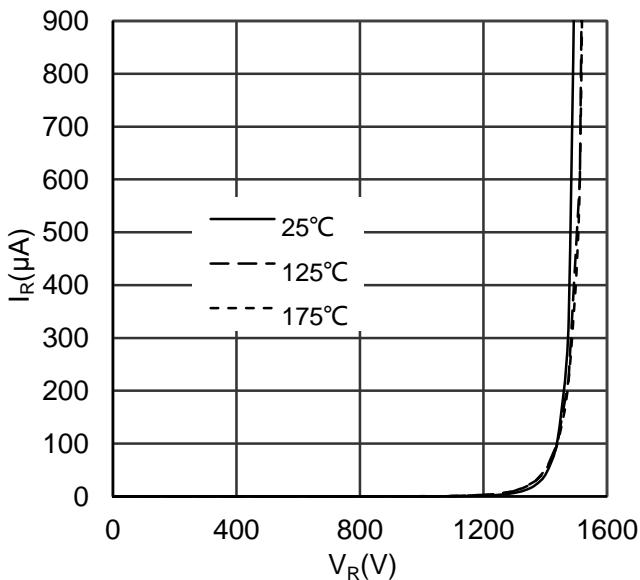


Figure 3. Reverse Characteristics

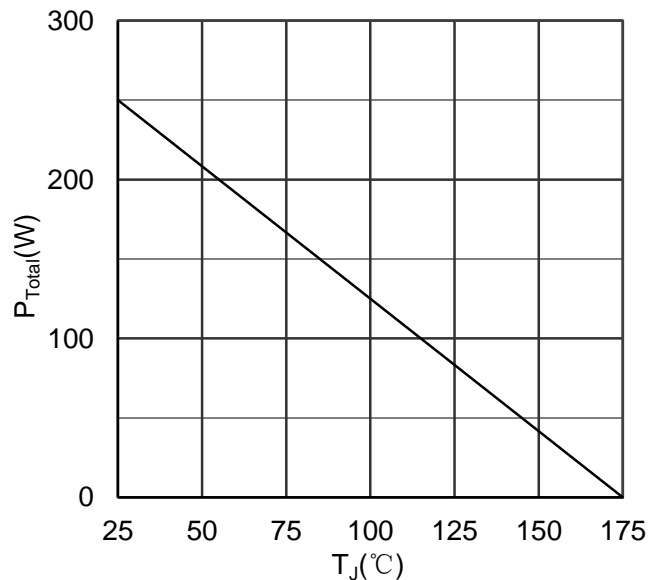


Figure 4. Power Derating

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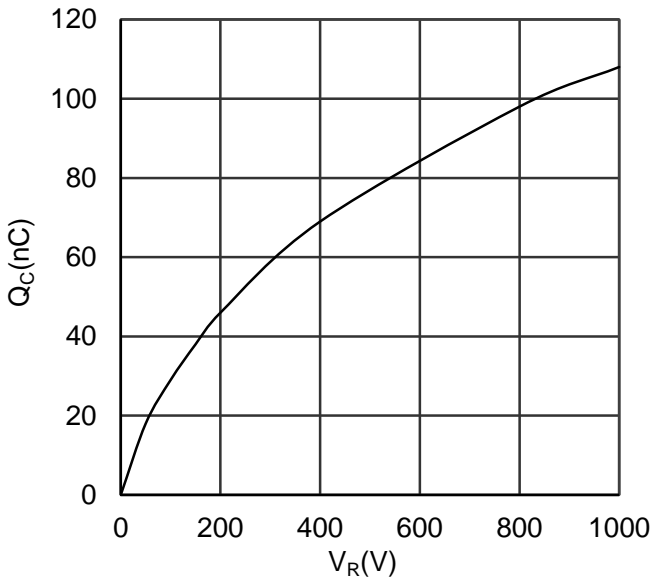


Figure 5. Reverse Charge vs. Reverse Voltage

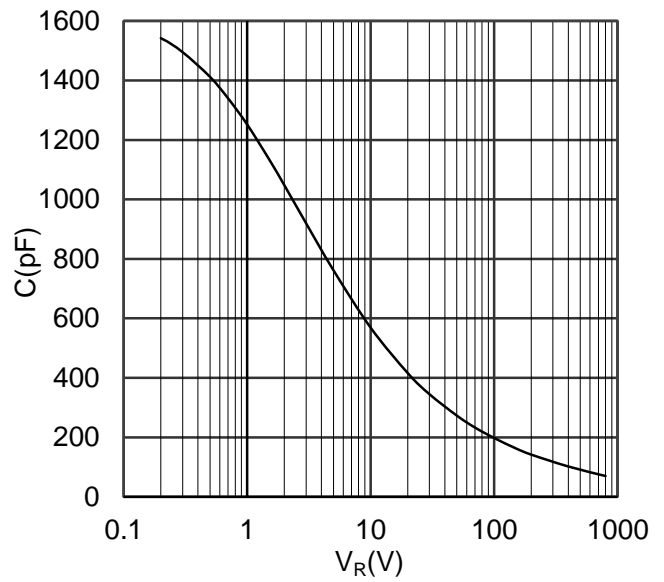
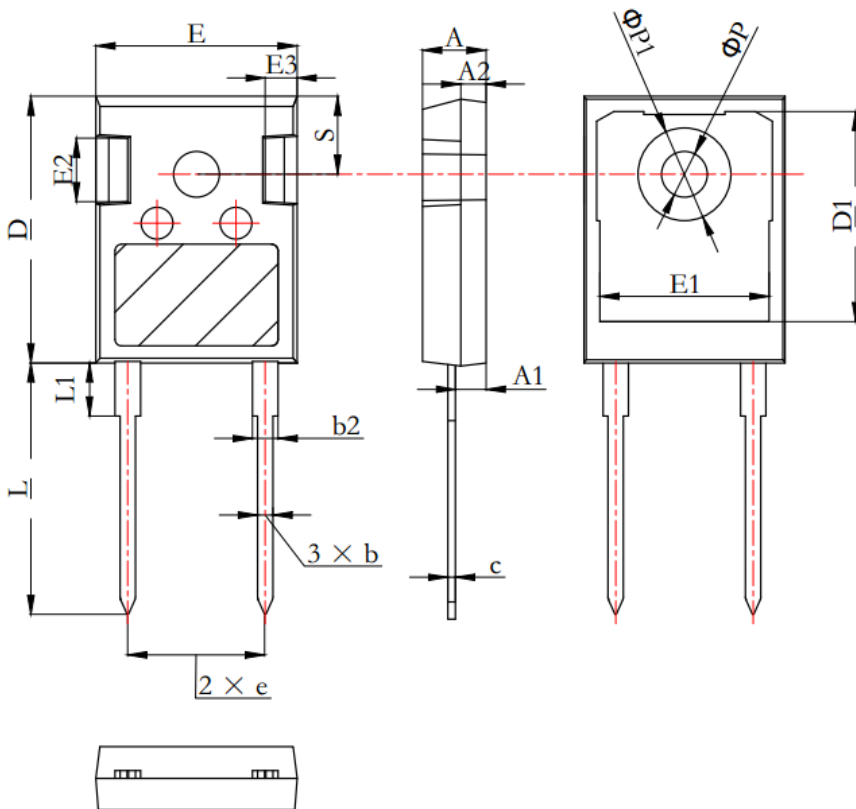


Figure 6. Capacitance vs. Reverse Voltage



Symbol	Min	Nom	Max
A	4.80	5.00	5.21
A1	2.21	2.41	2.61
A2	1.85	2.00	2.16
b	1.07	1.23	1.36
b2	1.90	2.05	2.41
c	0.50	0.60	0.75
e	5.44BSC		
E	15.50	15.80	16.13
E1	12.38	13.30	13.60
E2	3.68	-	5.20
E3	1.00	-	2.70
D	20.70	21.00	21.30
D1	16.25	-	17.65
L	19.60	19.91	20.32
L1	-	-	4.40
ΦP	3.40	3.60	3.80
ΦP1	-	-	7.30
S	6.15BSC		

Dimensions in (mm)
Figure 7. Package Outline