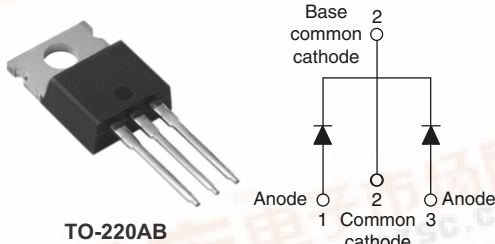


High Performance Schottky Generation 5.0, 2 x 10 A



FEATURES

- 175 °C high performance Schottky diode
- Very low forward voltage drop
- Extremely low reverse leakage
- Optimized V_F vs. I_R trade off for high efficiency
- Increased ruggedness for reverse avalanche capability
- RBSOA available
- Negligible switching losses
- Submicron trench technology
- Full lead (Pb)-free and RoHS compliant devices
- Designed and qualified for industrial level



RoHS
COMPLIANT

PRODUCT SUMMARY

$I_{F(AV)}$	2 x 10 A
V_R	100 V
V_F at 10 A at 125 °C	0.68 V

APPLICATIONS

- High efficiency SMPS
- Automotive
- High frequency switching
- Output rectification
- Reverse battery protection
- Freewheeling
- Dc-to-dc systems
- Increased power density systems

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
V_{RRM}		100	V
V_F	10 Apk, $T_J = 125$ °C (typical, per leg)	0.62	
T_J	Range	- 55 to 175	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	MBR20T100CT	UNITS
Maximum DC reverse voltage	V_R	$T_J = 25$ °C	100	V

ABSOLUTE MAXIMUM RATINGS

ABSOLUTE MAXIMUM RATINGS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum average forward current	per leg per device	$I_{F(AV)}$	50 % duty cycle at $T_C = 159\text{ }^{\circ}\text{C}$, rectangular waveform		10	A
					20	
Maximum peak one cycle non-repetitive surge current per leg		I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	850	A
			10 ms sine or 6 ms rect. pulse		200	
Non-repetitive avalanche energy per leg		E_{AS}	$T_J = 25\text{ }^{\circ}\text{C}$, $I_{AS} = 3\text{ A}$, $L = 12\text{ mH}$		54	mJ
Repetitive avalanche current per leg		I_{AR}	Limited by frequency of operation and time pulse duration so that $T_J < T_J\text{ max.}$ I_{AS} at $T_J\text{ max.}$ as a function of time pulse See fig. 8		I_{AS} at $T_J\text{ max.}$	A

MBR20T100CT

Vishay High Power Products

High Performance
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2 x 10 A



ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		TYP.	MAX.	UNITS
Forward voltage drop per leg	$V_{FM}^{(1)}$	10 A	$T_J = 25\text{ }^{\circ}\text{C}$	-	0.79	V
		20 A		-	0.88	
		10 A	$T_J = 125\text{ }^{\circ}\text{C}$	-	0.68	
		20 A		-	0.80	
Reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = \text{Rated } V_R$	-	100	μA
		$T_J = 125\text{ }^{\circ}\text{C}$		-	4	mA
Junction capacitance per leg	C_T	$V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$		400	-	pF
Series inductance per leg	L_S	Measured lead to lead 5 mm from package body		8.0	-	nH
Maximum voltage rate of change	dV/dt	Rated V_R		-	10 000	V/ μs

Note

(1) Pulse width < 300 μs , duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range		T _J , T _{Stg}		- 55 to 175	°C
Maximum thermal resistance, junction to case per leg		R _{thJC}	DC operation	2	°C/W
Maximum thermal resistance, junction to case per device				1	
Typical thermal resistance, case to heatsink		R _{thCS}	Mounting surface, smooth and greased	0.5	
Approximate weight				2	g
				0.07	oz.
Mounting torque	minimum			6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device			Case style TO-220AB	MBR20T100CT	

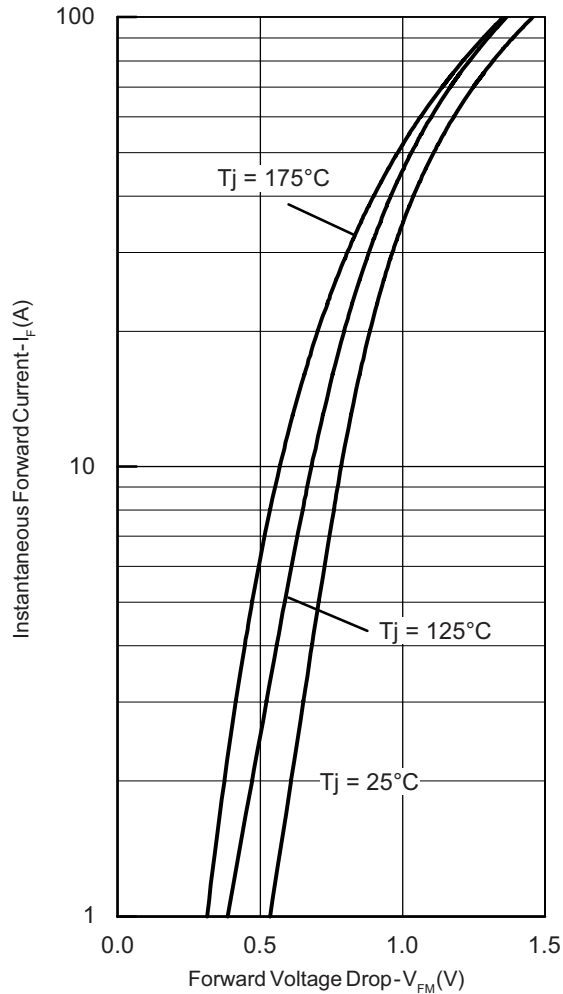


Fig. 1 - Maximum Forward Voltage Drop Characteristics

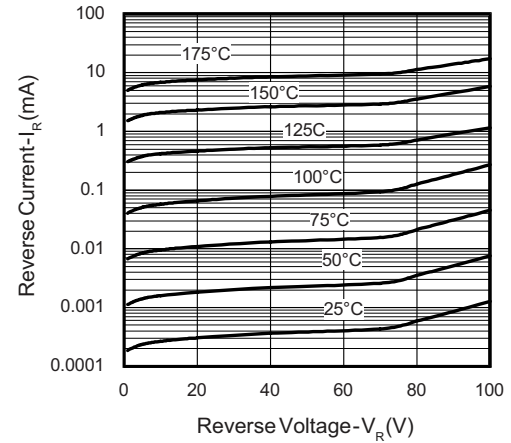


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

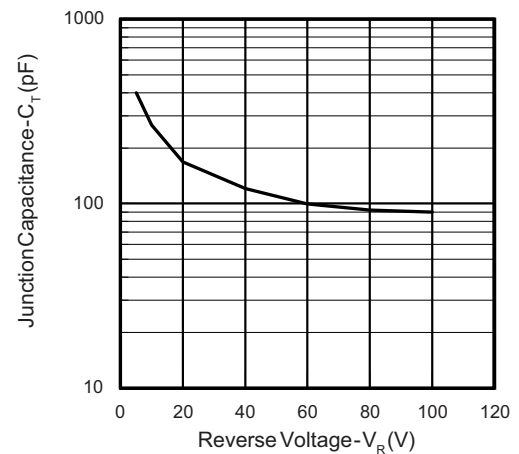


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

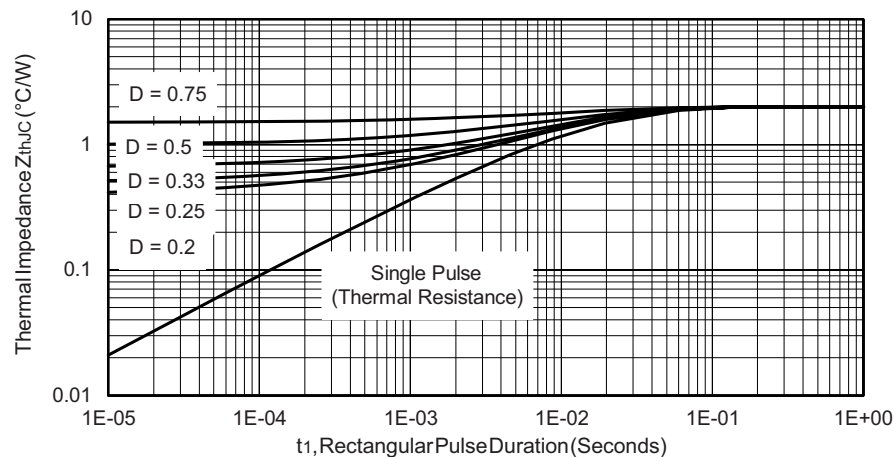


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

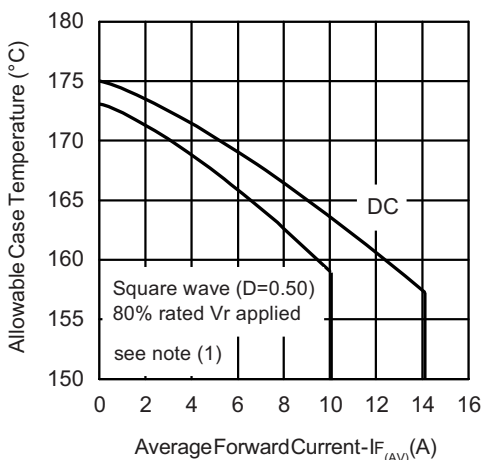


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

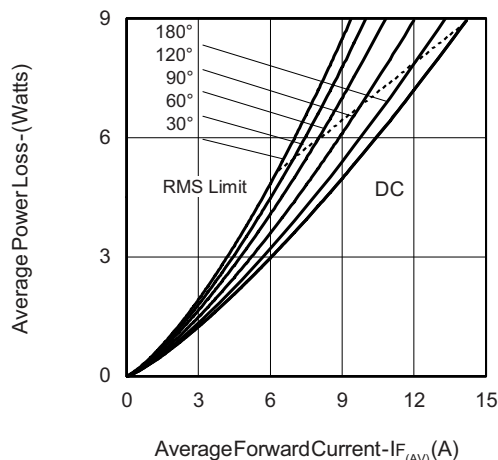


Fig. 6 - Forward Power Loss Characteristics

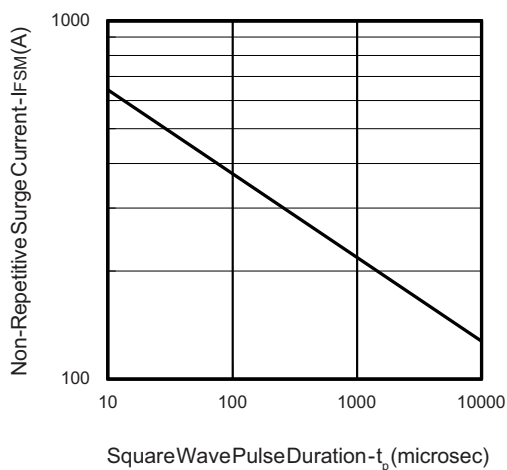


Fig. 7 - Maximum Non-Repetitive Surge Current

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
 P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 $P_{d_{REV}}$ = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80\%$ rated V_R

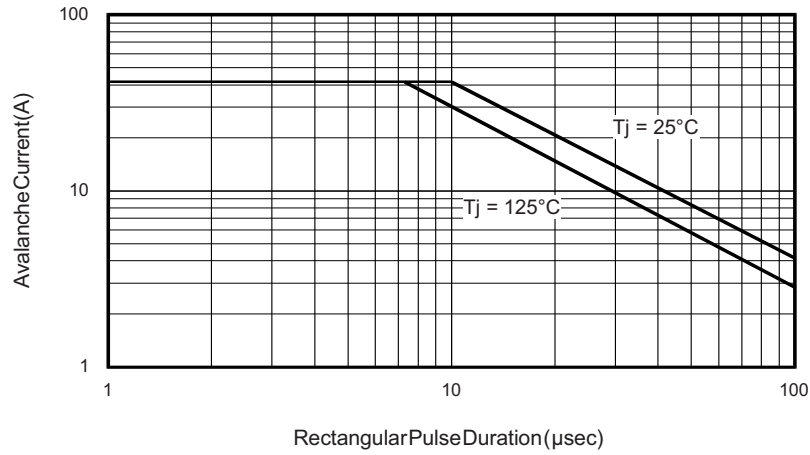


Fig. 8 - Reverse Bias Safe Operating Area (Avalanche Current vs. Rectangular Pulse Duration)

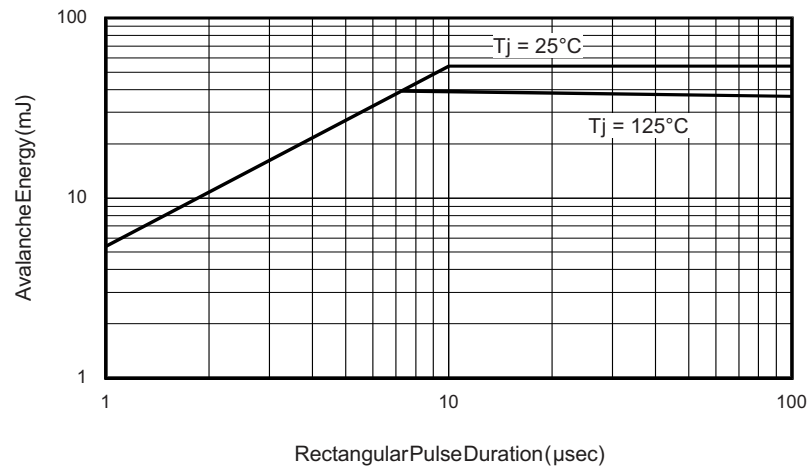


Fig. 9 - Reverse Bias Safe Operating Area (Avalanche Energy vs. Rectangular Pulse Duration)

MBR20T100CT

Vishay High Power Products

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ORDERING INFORMATION TABLE

Device code	MBR	20	T	100	CT
	1	2	3	4	5
	1	-			
	2	-			
	3	-			
	4	-			
	5	-			

Tube standard pack quantity: 50 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95222
Part marking information	http://www.vishay.com/doc?95225



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