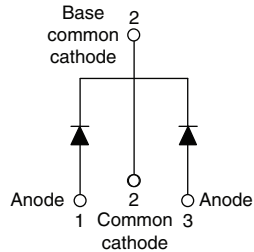


## Schottky Rectifier, 2 x 10 A



TO-220AB



### FEATURES

- 150 °C  $T_J$  operation
- Center tap package
- Low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level


**RoHS\***  
COMPLIANT

### PRODUCT SUMMARY

$I_{F(AV)}$	2 x 10 A
$V_R$	100 V

### DESCRIPTION

This center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform (per device)	20	A
$V_{RRM}$		100	V
$I_{FRM}$	$T_C = 133\text{ °C}$ (per leg)	20	A
$I_{FSM}$	$t_p = 5\ \mu\text{s}$ sine	850	A
$V_F$	10 Apk, $T_J = 125\text{ °C}$	0.65	V
$T_J$	Range	- 65 to 150	°C

### VOLTAGE RATINGS

PARAMETER	SYMBOL	MBR20100CTKPbF	UNITS
Maximum DC reverse voltage	$V_R$	100	V
Maximum working peak reverse voltage	$V_{RWM}$		

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 133\text{ °C}$ , rated $V_R$	10	A
			20	
Peak repetitive forward current per leg	$I_{FRM}$	Rated $V_R$ , square wave, 20 kHz, $T_C = 133\text{ °C}$	20	
Non-repetitive peak surge current	$I_{FSM}$	5 $\mu\text{s}$ sine or 3 $\mu\text{s}$ rect. pulse	850	
		Surge applied at rated load conditions half wave, single phase, 60 Hz	150	
Peak repetitive reverse surge current	$I_{RRM}$	2.0 $\mu\text{s}$ , 1.0 kHz	0.5	
Non-repetitive avalanche energy per leg	$E_{AS}$	$T_J = 25\text{ °C}$ , $I_{AS} = 2\text{ A}$ , $L = 12\text{ mH}$	24	mJ

\* Pb containing terminations are not RoHS compliant, exemptions may apply

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}^{(1)}$	10 A	$T_J = 25\text{ }^\circ\text{C}$	0.80	V
		20 A		0.95	
		10 A	$T_J = 125\text{ }^\circ\text{C}$	0.65	
		20 A		0.80	
Maximum instantaneous reverse current	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	Rated DC voltage	0.10	mA
		$T_J = 125\text{ }^\circ\text{C}$		6	
Threshold voltage	$V_{F(TO)}$	$T_J = T_J$ maximum		0.433	V
Forward slope resistance	$r_t$			15.8	m $\Omega$
Maximum junction capacitance	$C_T$	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) 25 $^\circ\text{C}$		400	pF
Typical series inductance	$L_S$	Measured from top of terminal to mounting plane		8.0	nH
Maximum voltage rate of change	$dV/dt$	Rated $V_R$		10 000	V/ $\mu\text{s}$

**Note**

(1) Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction temperature range	$T_J$			- 65 to 150	$^\circ\text{C}$
Maximum storage temperature range	$T_{Stg}$			- 65 to 175	
Maximum thermal resistance, junction to case per leg	$R_{thJC}$	DC operation		2.0	$^\circ\text{C/W}$
Typical thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth and greased (Only for TO-220)		0.50	
Maximum thermal resistance, junction to ambient	$R_{thJA}$	DC operation (For D <sup>2</sup> PAK and TO-262)		50	
Approximate weight				2	g
				0.07	oz.
Mounting torque	minimum maximum		Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
				12 (10)	
Marking device		Case style TO-220AB		MBR20100CTK	

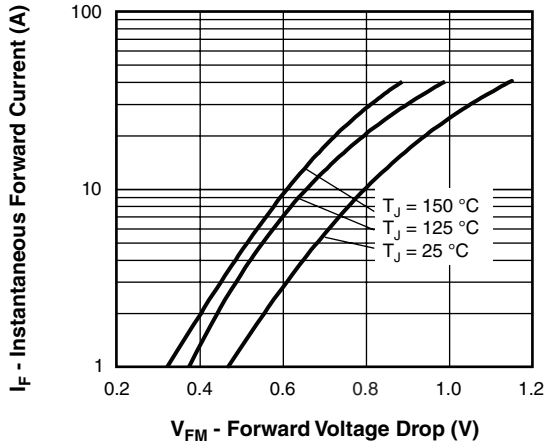


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

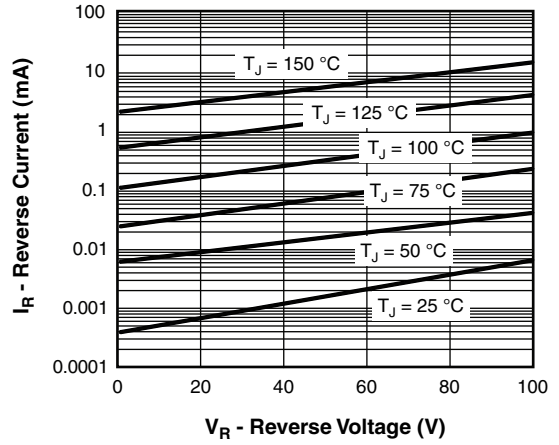


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

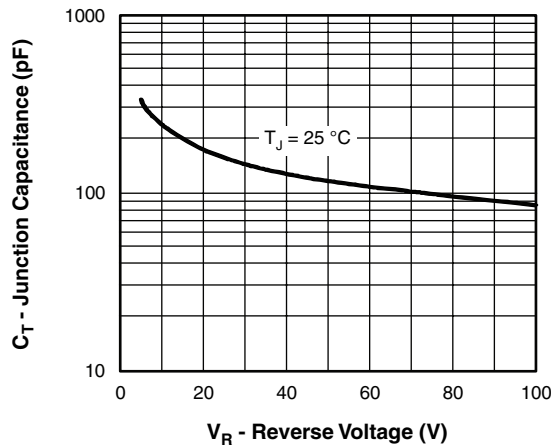


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

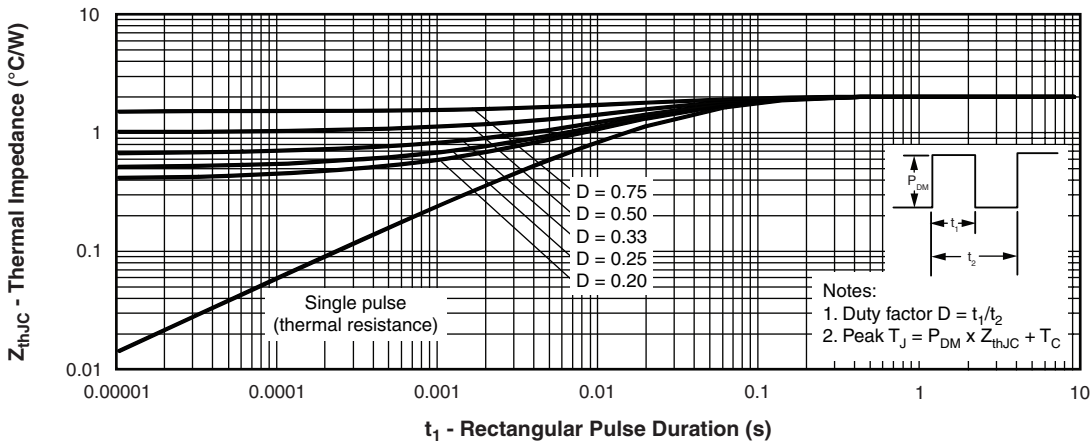


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

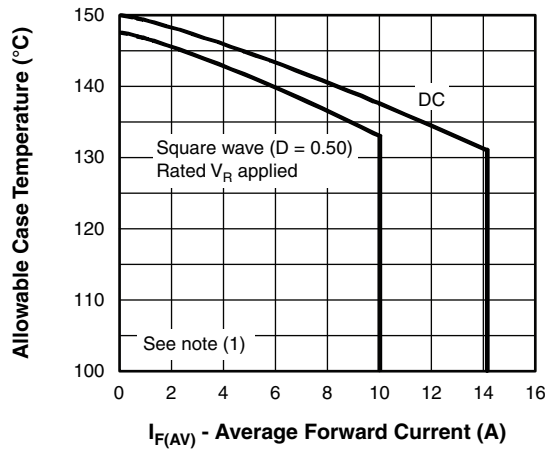


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

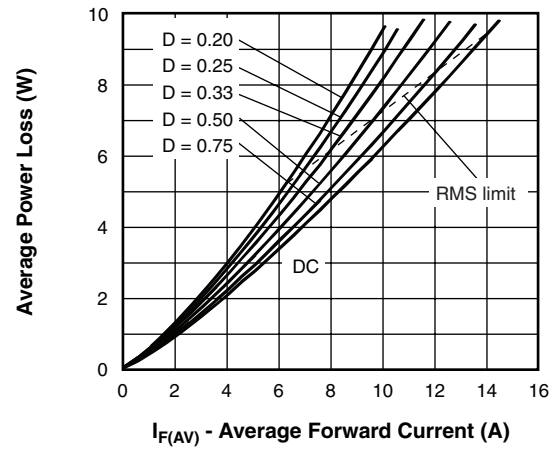


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

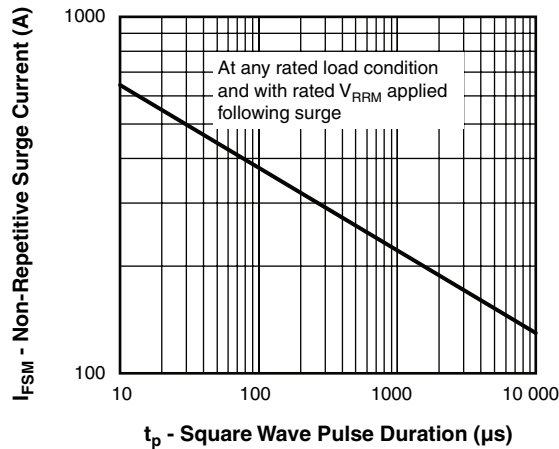


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

**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  $V_{R1}$  = Rated  $V_R$



**ORDERING INFORMATION TABLE**

Device code	<b>MBR</b>	<b>20</b>	<b>100</b>	<b>CT</b>	<b>K</b>	<b>PbF</b>
	①	②	③	④	⑤	⑥

- 1** - MBR series
- 2** - Current rating (20 = 20 A)
- 3** - Voltage rating (100 = 100 V)
- 4** - CT = Center tap (dual)
- 5** - K = Schottky generation
- 6** - PbF = Lead (Pb)-free

Tube standard pack quantity: 50 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95222">http://www.vishay.com/doc?95222</a>
Part marking information	<a href="http://www.vishay.com/doc?95225">http://www.vishay.com/doc?95225</a>



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