



**MBRB20...CTPbF**  
**MBR20...CT-1PbF**

**SCHOTTKY RECTIFIER**

**20 Amp**

$I_{F(AV)} = 20\text{Amp}$   
 $V_R = 80/ 100\text{V}$

**Major Ratings and Characteristics**


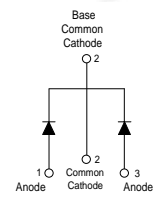

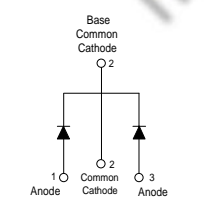
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform (Per Device)	20	A
$I_{FRM}$ @ $T_C = 133^\circ\text{C}$ (PerLeg)	20	A
$V_{RRM}$	80/90/100	V
$I_{FSM}$ @ $t_p = 5\ \mu\text{s}$ sine	850	A
$V_F$ @ 10Apk, $T_J = 125^\circ\text{C}$	0.70	V
$T_J$ range	-65 to 150	$^\circ\text{C}$

**Description/ Features**

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, free-wheeling diodes, and reverse battery protection.

- 150° C  $T_J$  operation
- Center tap TO-220, D<sup>2</sup>Pak and TO-262 packages
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

**Case Styles**

<p><b>MBRB20...CTPbF</b></p>   <p><b>D<sup>2</sup>PAK</b></p>	<p><b>MBR20...CT-1PbF</b></p>   <p><b>TO-262</b></p>
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Voltage Ratings

Parameters	MBRB2080CTPbF MBR2080CT-1PbF	MBRB2090CTPbF MBR2090CT-1PbF	MBRB20100CTPbF MBR20100CT-1PbF
V <sub>R</sub> Max. DC Reverse Voltage (V)	80	90	100
V <sub>RWM</sub> Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters	Values	Units	Conditions
I <sub>F(AV)</sub> Max. Average Forward Current (PerLeg) (PerDevice)	10	A	@ T <sub>C</sub> = 133 °C, (Rated V <sub>R</sub> )
	20		
I <sub>FRM</sub> Peak Repetitive Forward Current (Per Leg)	20	A	Rated V <sub>R</sub> , squarewave, 20kHz T <sub>C</sub> = 133 °C
I <sub>FSM</sub> Non Repetitive Peak Surge Current	850	A	5µs. Sine or 3µs Rect. pulse Following any rated load condition and with rated V <sub>RRM</sub> applied Surge applied at rated load conditions halfwave, single phase, 60Hz
	150		
I <sub>RRM</sub> Peak Repetitive Reverse Surge Current	0.5	A	2.0 µsec 1.0KHz
E <sub>AS</sub> Non-Repetitive Avalanche Energy (PerLeg)	24	mJ	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 2 Amps, L = 12 mH

Electrical Specifications

Parameters	Values	Units	Conditions
V <sub>FM</sub> Max. Forward Voltage Drop (1)	0.80	V	@ 10A T <sub>J</sub> = 25 °C
	0.95	V	@ 20A
	0.70	V	@ 10A T <sub>J</sub> = 125 °C
	0.85	V	@ 20A
I <sub>RM</sub> Max. Instantaneous Reverse Current (1)	0.10	mA	T <sub>J</sub> = 25 °C
	6	mA	T <sub>J</sub> = 125 °C Rated DC voltage
V <sub>F(TO)</sub> Threshold Voltage	0.433	V	T <sub>J</sub> = T <sub>J</sub> max.
r <sub>t</sub> Forward Slope Resistance	15.8	mΩ	
C <sub>T</sub> Max. Junction Capacitance	400	pF	V <sub>R</sub> = 5V <sub>DC</sub> (test signal range 100Khz to 1Mhz) 25°C
L <sub>S</sub> Typical Series Inductance	8.0	nH	Measured from top of terminal to mounting plane
dv/dt Max. Voltage Rate of Change	10000	V/ µs	(Rated V <sub>R</sub> )

(1) Pulse Width < 300µs, Duty Cycle <2%

Thermal-Mechanical Specifications

Parameters	Values	Units	Conditions
T <sub>J</sub> Max. Junction Temperature Range	-65 to 150	°C	
T <sub>stg</sub> Max. Storage Temperature Range	-65 to 175	°C	
R <sub>thJC</sub> Max. Thermal Resistance Junction to Case (Per Leg)	2.0	°C/W	DC operation
R <sub>thCS</sub> Typical Thermal Resistance Case to Heatsink	0.50	°C/W	Mounting surface, smooth and greased Only for TO-220
R <sub>thJA</sub> Max. Thermal Resistance Junction to Ambient	50	°C/W	DC operation For D <sup>2</sup> Pak and TO-262
wt Approximate Weight	2(0.07)	g(oz.)	
T Mounting Torque	Min. 6(5)	Kg-cm (lbf-in)	Non-lubricated threads
	Max. 12(10)		
Marking Device	MBRB20...CT	Case style D <sup>2</sup> Pak	
	MBR20...CT-1	Case style TO-262	

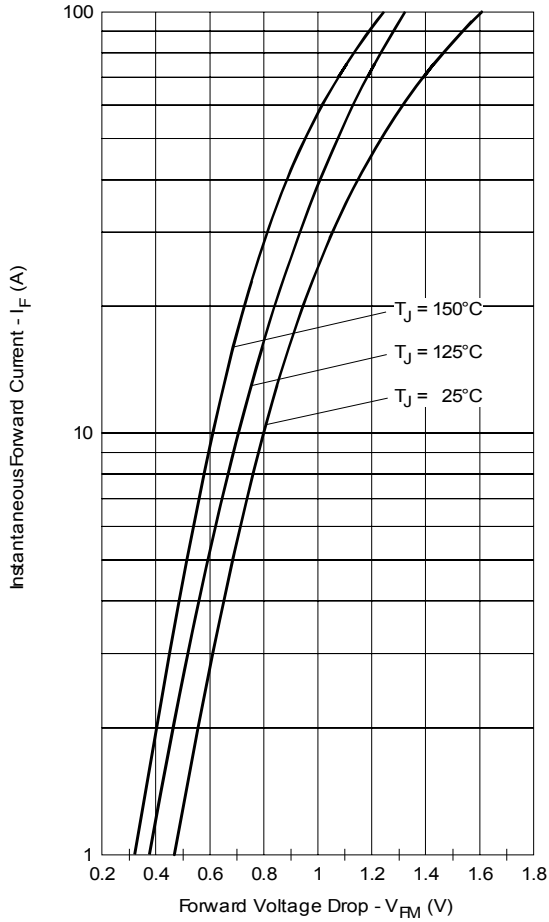


Fig. 1 - Max. Forward Voltage Drop Characteristics (PerLeg)

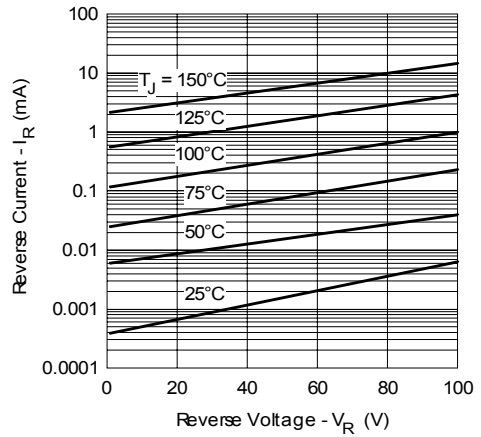


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (PerLeg)

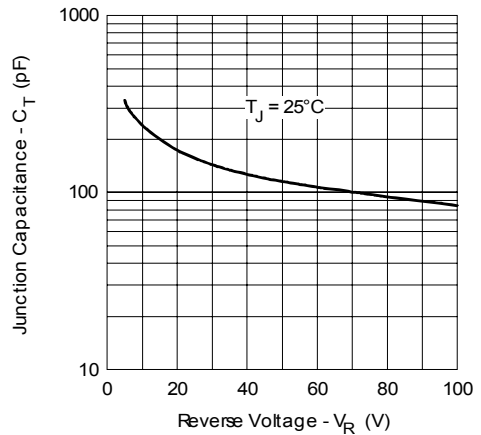


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (PerLeg)

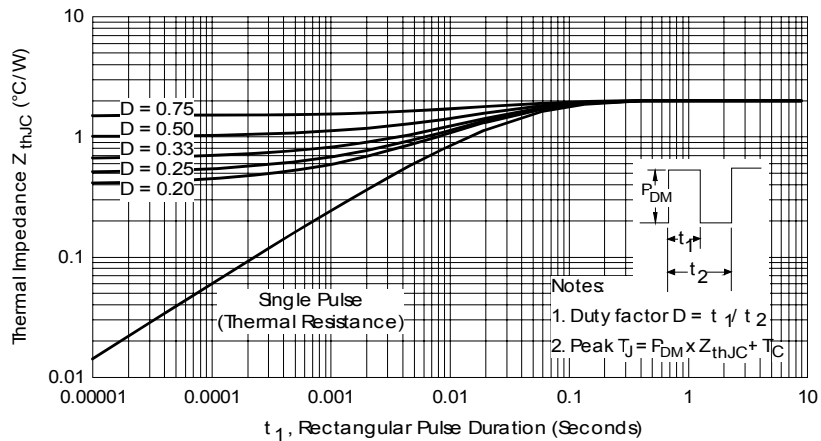


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (PerLeg)

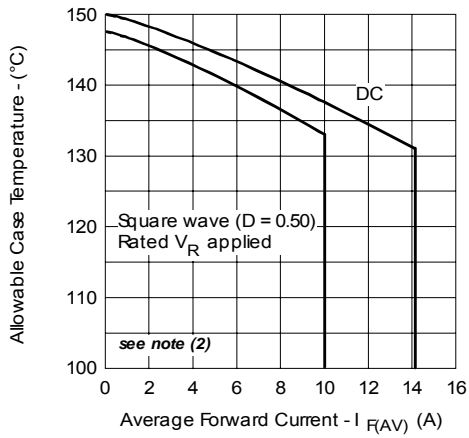


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

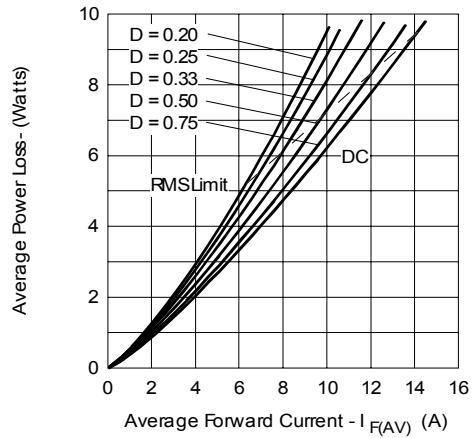


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

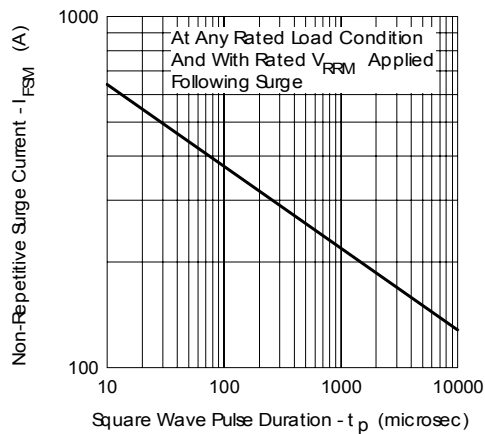


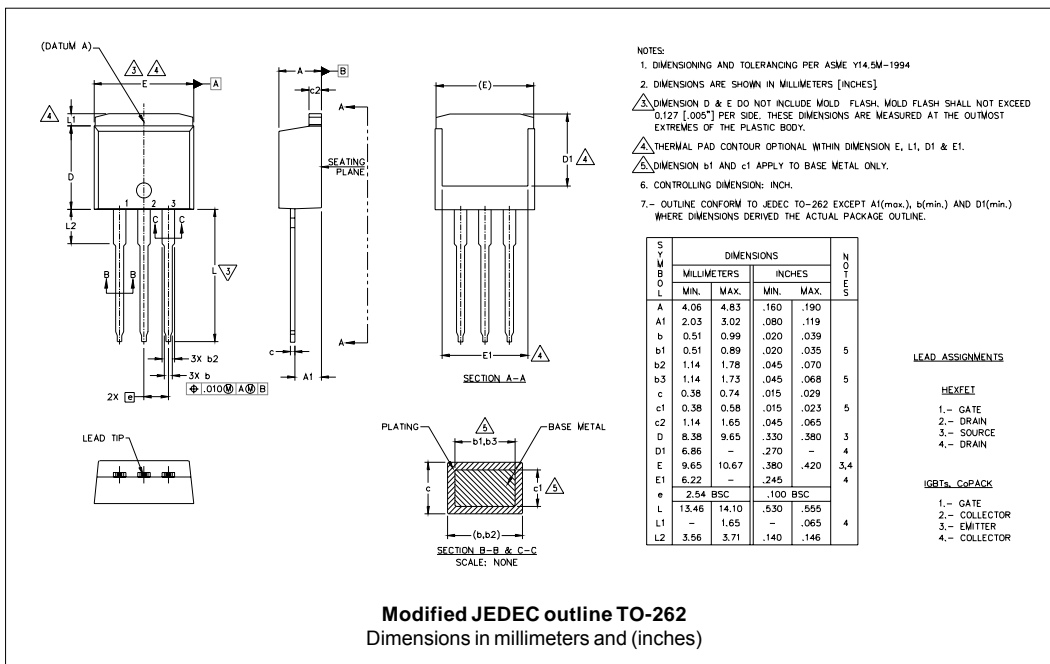
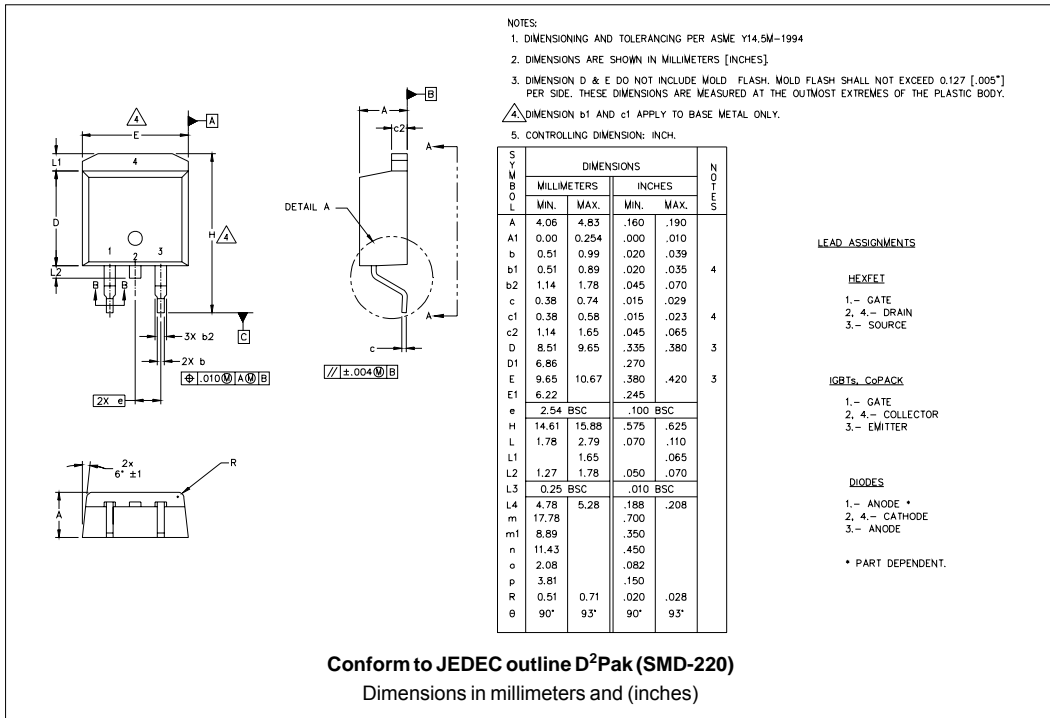
Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

(2) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;

$P_d$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);

$P_{d_{REV}}$  = Inverse Power Loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R @ V_{R1}$  = rated  $V_R$

Outlines Table



Part Marking Information

**D<sup>2</sup>PAK**

EXAMPLE: THIS IS A MBRB20100CTPbF  
 LOT CODE 8024  
 ASSEMBLED ON WW 02, 2000

Note: "P" in assembly line position indicates "Lead-Free"

INTERNATIONAL RECTIFIER LOGO

ASSEMBLY LOT CODE

PART NUMBER

DATE CODE  
 YEAR 0 = 2000  
 WEEK 02  
 P = LEAD-FREE

**TO-262**

EXAMPLE: THIS IS A MBR20100CT-1PbF  
 LOT CODE 1789  
 ASSEMBLED ON WW 19, 1999

Note: "P" in assembly line position indicates "Lead-Free"

INTERNATIONAL RECTIFIER LOGO

ASSEMBLY LOT CODE

PART NUMBER

DATE CODE  
 YEAR 9 = 1999  
 WEEK 19  
 P = LEAD-FREE

Tape & Reel Information

SECTION Y-Y

Ao	10.50	+/-	0.1
Bo	15.80	+/-	0.1
B2	10.25	+/-	0.1
Ko	4.90	+/-	0.1
F	11.50	+/-	0.1
P1	16.00	+/-	0.1
W	24.00	+/-	0.3

NOTES:

- 1.0 10 SPROCKET HOLE PITH CUMULATIVE TOLERANCE ±.02
- 2.0 CAMBER NOT TO EXCEED 1mm In 100mm
- 3.0 MATERIAL: CONDUCTIVE BLACK STYRENIC ALLOY
- 4.0 Ko MEASURED FROM A PLANE ON THE INSIDE BOTTOM OF THE POCKET TO THE TOP SURFACE OF THE CARRIER
- 5.0 MEASURED FROM CENTRELINE OF SPROCKET HOLE TO CENTRELINE OF POCKET
- 6.0 VENDOR: (OPTIONAL)
- 7.0 MUST ALSO MEET REQUIREMENTS OF EIA STANDAR #EIA-481A TAPING OF SURFACE MOUNT COMPONENTS FOR AUTOMATIC PLACEMENT
- 8.0 SURFACE RESISTIVITY OF MOLDED MATL. MUST MEASURE LESS OR EQUAL TO 10<sup>6</sup> OHMS PER SQUARE. MEASURED IN ACCORDANCE TO PROCEDURE GIVEN IN ASTM D-257 & ASTM D-991
- 9.0 TOTAL LENGTH PER REEL MUST BE 45 METERS
- 10.0 © CRITICAL

Dimensions in millimeters and (inches)

Ordering Information Table

Device Code																	
	<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">MBR</td> <td style="padding: 5px;">B</td> <td style="padding: 5px;">20</td> <td style="padding: 5px;">100</td> <td style="padding: 5px;">CT</td> <td style="padding: 5px;">-1</td> <td style="padding: 5px;">TRL</td> <td style="padding: 5px;">P</td> </tr> <tr> <td style="text-align: center;">①</td> <td style="text-align: center;">②</td> <td style="text-align: center;">③</td> <td style="text-align: center;">④</td> <td style="text-align: center;">⑤</td> <td style="text-align: center;">⑥</td> <td style="text-align: center;">⑦</td> <td style="text-align: center;">⑧</td> </tr> </table>	MBR	B	20	100	CT	-1	TRL	P	①	②	③	④	⑤	⑥	⑦	⑧
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①	②	③	④	⑤	⑥	⑦	⑧										
<p><b>1</b> - Essential Part Number</p> <p><b>2</b> -</p> <ul style="list-style-type: none"> <li>• B = D<sup>2</sup>Pak     <b>6</b> none</li> <li>• none = TO-262   <b>6</b> = -1</li> </ul> <p><b>3</b> - Current Rating (20 = 20A)</p> <p><b>4</b> - Voltage Ratings</p> <p><b>5</b> - CT = Essential Part Number</p> <p><b>6</b></p> <ul style="list-style-type: none"> <li>• none = D<sup>2</sup>Pak     <b>2</b> = B</li> <li>• -1 = TO-262     <b>2</b> none</li> </ul> <p><b>7</b> -</p> <ul style="list-style-type: none"> <li>• none = Tube (50 pieces)</li> <li>• TRL = Tape &amp; Reel (Left Oriented - for D<sup>2</sup>Pak only)</li> <li>• TRR = Tape &amp; Reel (Right Oriented - for D<sup>2</sup>Pak only)</li> </ul> <p><b>8</b> -</p> <ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free (for TO-262 and D<sup>2</sup>Pak tube)</li> <li>• P = Lead-Free (for D<sup>2</sup>Pak TRR and TRL)</li> </ul>	<table border="1" style="margin: auto;"> <tr> <td style="padding: 2px 5px;">80 = 80V</td> </tr> <tr> <td style="padding: 2px 5px;">90 = 90V</td> </tr> <tr> <td style="padding: 2px 5px;">100 = 100V</td> </tr> </table>	80 = 80V	90 = 90V	100 = 100V													
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Data and specifications subject to change without notice.  
 This product has been designed and qualified for Industrial Level and Lead-Free.  
 Qualification Standards can be found on IR's Web site.