

International  
**IOR** Rectifier

**MBR20...CTG**  
**MBRB20...CTG**  
**MBR20...CTG-1**

SCHOTTKY RECTIFIER

20 Amp

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

**Major Ratings and Characteristics**


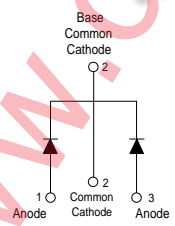

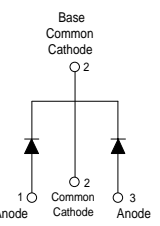

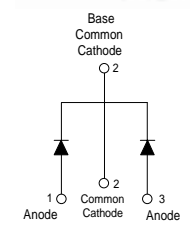
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform (Per Device)	20	A
$I_{FRM}$ @ $T_C = 133^\circ\text{C}$ (Per Leg)	20	A
$V_{RRM}$	80/90/100	V
$I_{FSM}$ @ $t_p = 5 \mu\text{s}$ sine	850	A
$V_F$ @ 10 Apk, $T_J = 125^\circ\text{C}$	0.70	V
$T_J$ range	-65 to 150	$^\circ\text{C}$

**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  $150^\circ\text{C}$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- $150^\circ\text{C}$   $T_J$  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**

MBR20...CTG	MBRB20...CTG	MBR20...CTG-1
  <p>TO-220</p>	  <p>D<sup>2</sup>PAK</p>	  <p>TO-262</p>

MBR20...CTG, MBRB20...CTG, MBR20...CTG-1

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Voltage Ratings

Parameters	MBR2080CTG MBRB2080CTG MBR2080CTG-1	MBR2090CTG MBRB2090CTG MBR2090CTG-1	MBR20100CTG MBRB20100CTG MBR20100CTG-1
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 (Per Leg) (Per Device)	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> , square wave, 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>RWM</sub> applied Surge applied at rated load conditions halfwave, single phase, 60Hz
	150		
I <sub>RSM</sub> Peak Repetitive Reverse Surge Current	0.5	A	2.0 µsec 1.0KHz
E <sub>AS</sub> Non-Repetitive Avalanche Energy (Per Leg)	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)		
Device Marking	MBR20...CTG	Case style TO-220	
	MBRB20...CG	Case style D <sup>2</sup> -Pak	
	MBR20...CG-1	Case style TO-262	

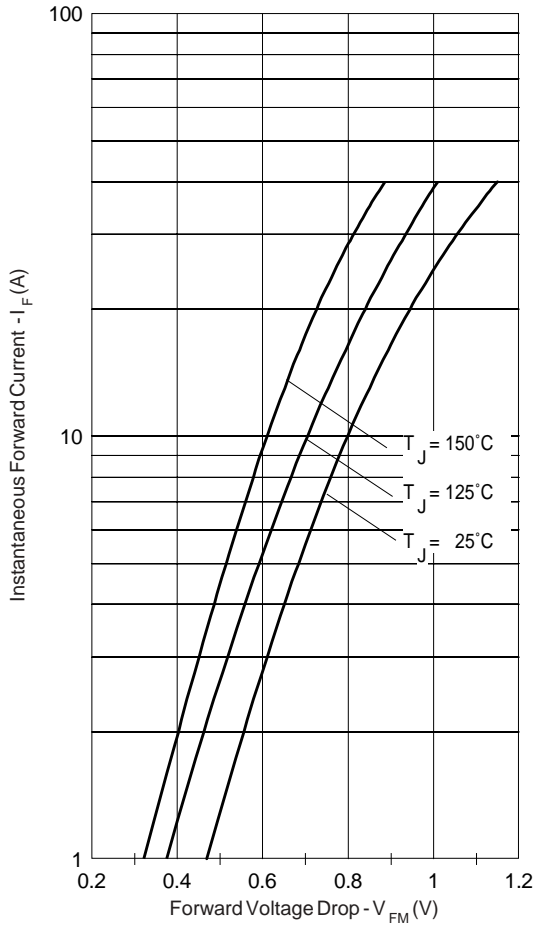


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

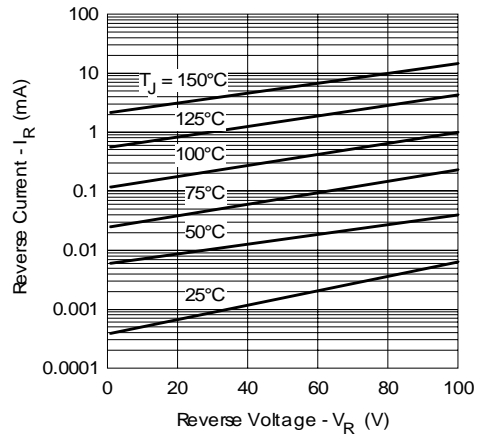


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

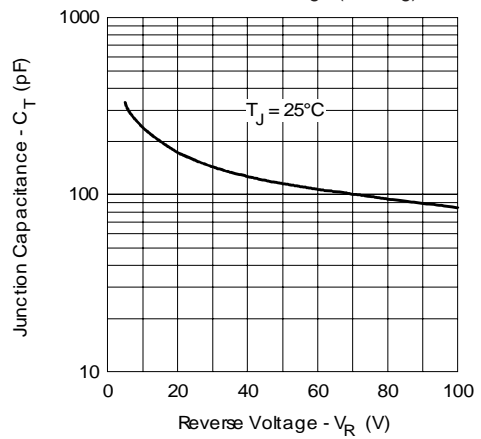


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

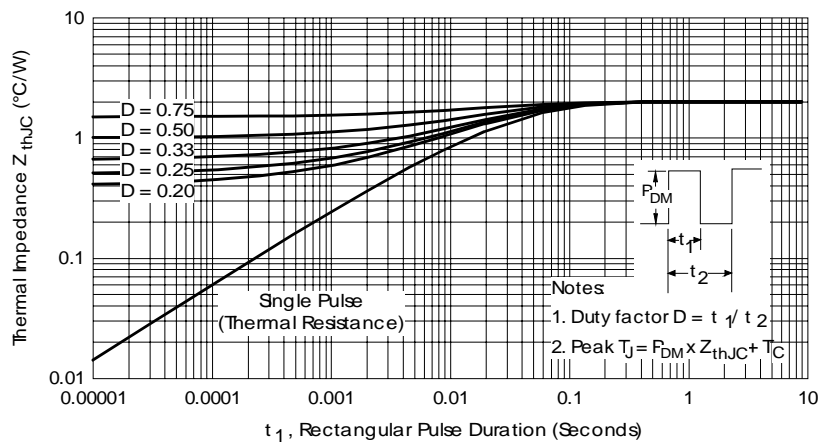


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

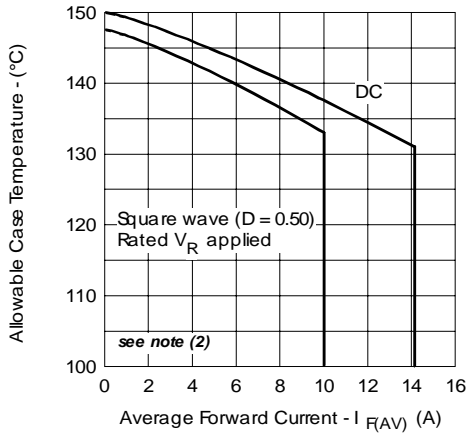


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

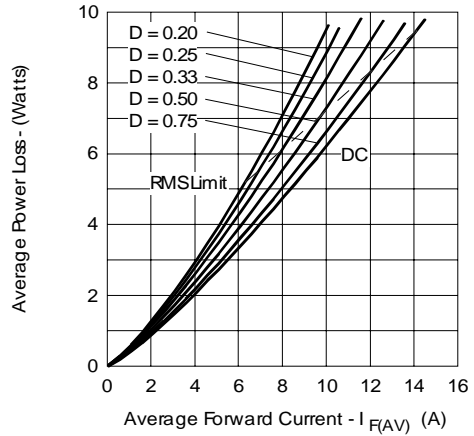


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

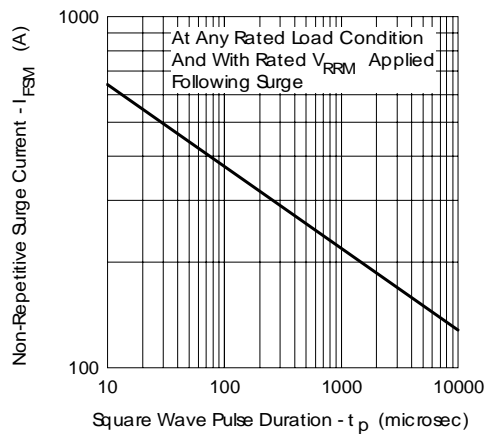
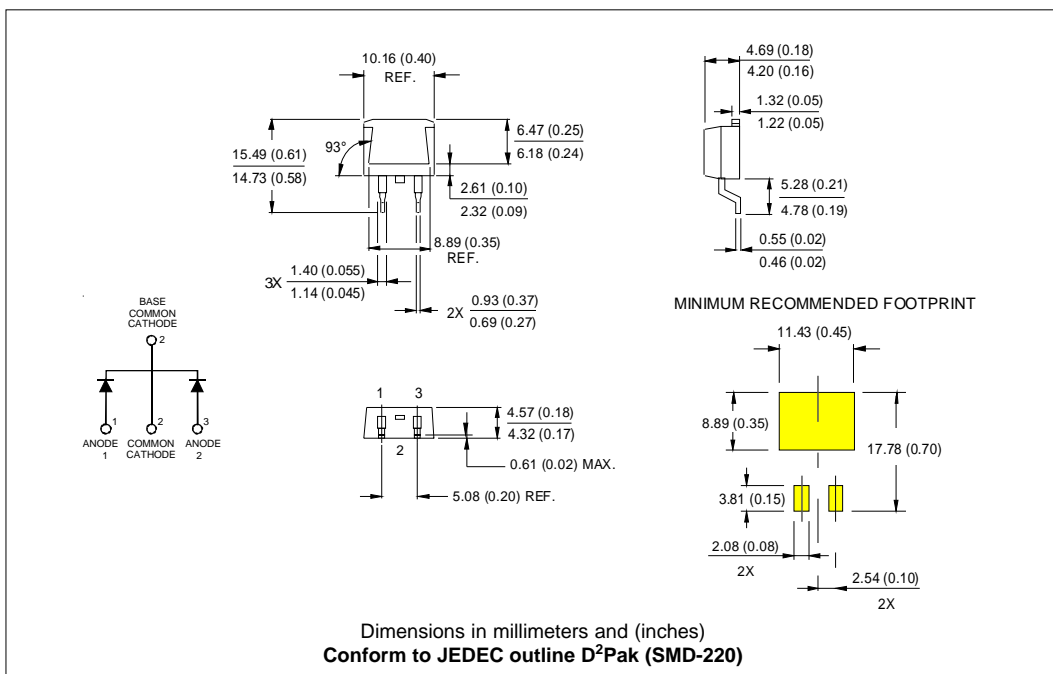
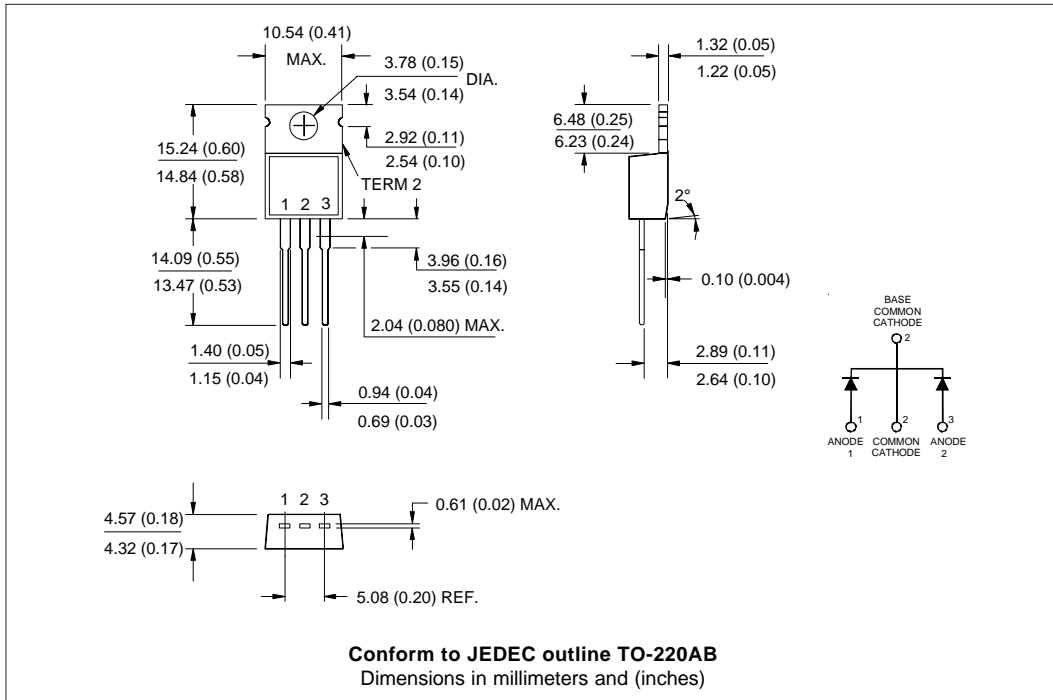


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

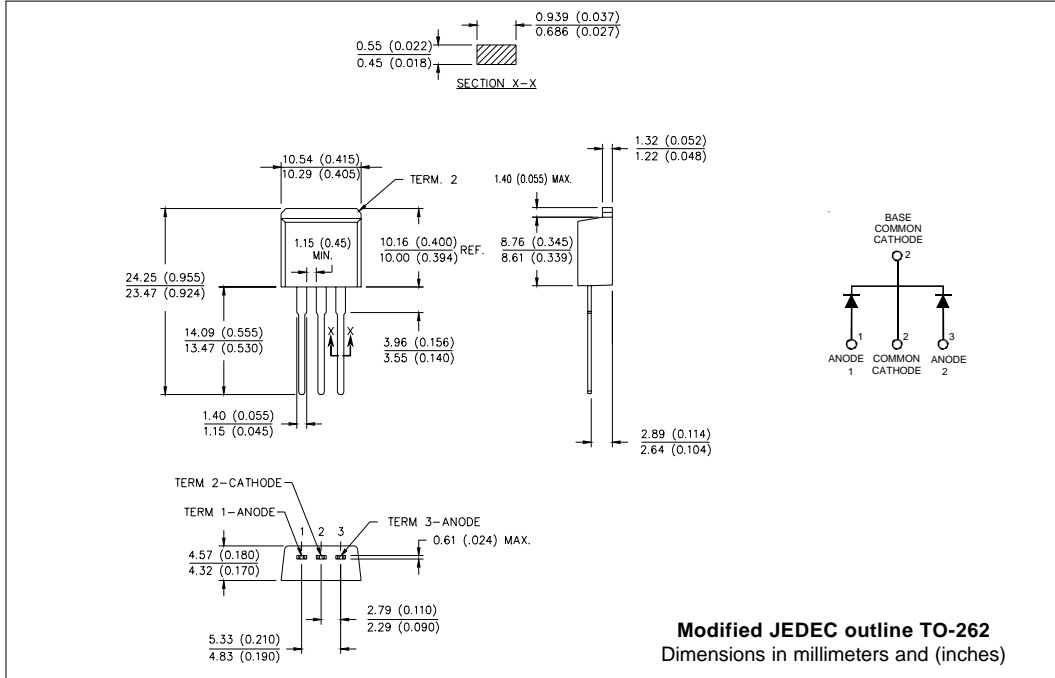
- (2) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;  
 $P_d = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);  
 $P_{d_{REV}} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D); I_R @ V_{R1} = \text{rated } V_R$

Outline Table

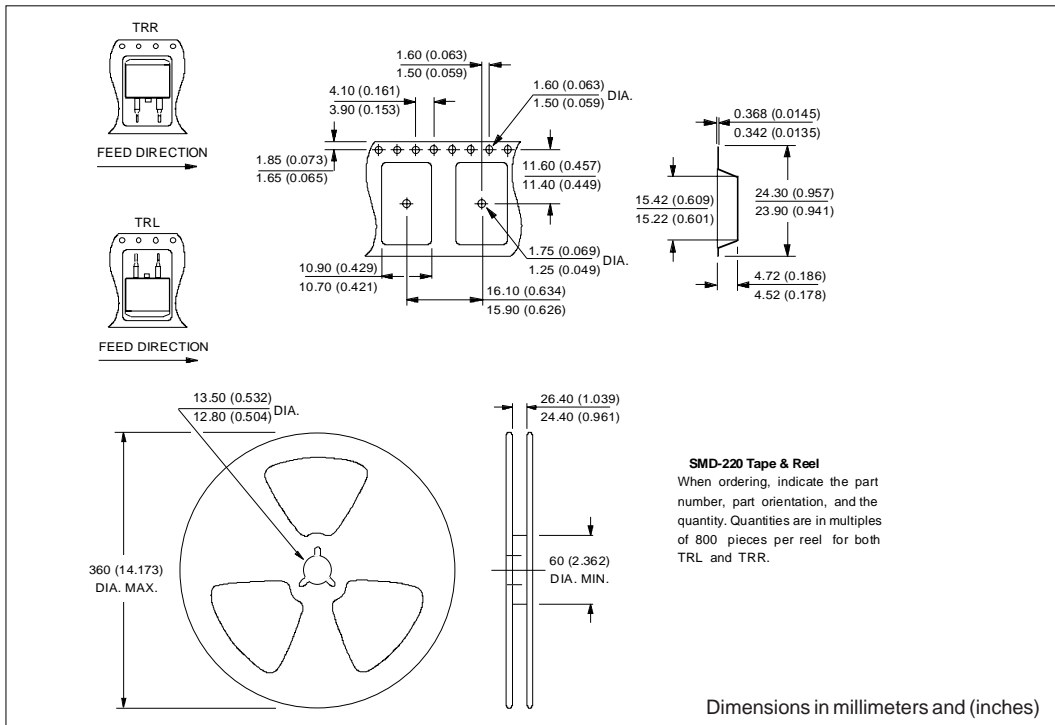


MBR20...CTG, MBRB20...CTG, MBR20...CTG-1

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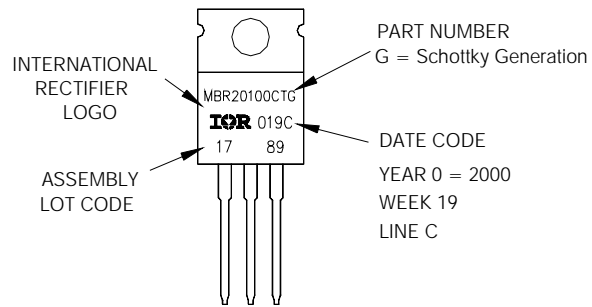
Tape & Reel Information



Part Marking Information

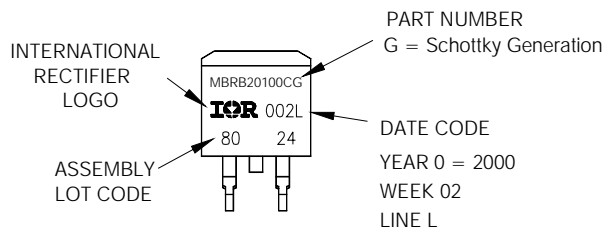
EXAMPLE: THIS IS A MBR20100CTG  
 LOT CODE 1789  
 ASSEMBLED ON WW 19, 2000  
 IN THE ASSEMBLY LINE "C"

TO-220



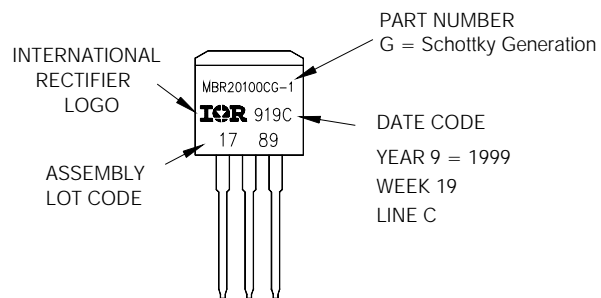
EXAMPLE: THIS IS A MBRB20100CTG  
 LOT CODE 8024  
 ASSEMBLED ON WW 02, 2000  
 IN THE ASSEMBLY LINE "L"

D<sup>2</sup>PAK



EXAMPLE: THIS IS A MBR20100CTG-1  
 LOT CODE 1789  
 ASSEMBLED ON WW 19, 1999  
 IN THE ASSEMBLY LINE "C"

TO-262



Ordering Information Table

Device Code								
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	
	<b>MBR</b>	<b>B</b>	<b>20</b>	<b>100</b>	<b>CT</b>	<b>G</b>	<b>-1</b>	<b>TRL</b>

<b>1</b>	-	Essential Part Number
<b>2</b>	-	B = Surface Mount None = TO-220
<b>3</b>	-	Current Rating (20 = 20A)
<b>4</b>	-	Voltage code: Code = $V_{RRM}$
<b>5</b>	-	CT = Essential Part Number
<b>6</b>	-	G = Schottky Generation
<b>7</b>	-	"-1" = TO-262
<b>8</b>	-	<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>

080 = 80V  
 090 = 90V  
 100 = 100V

Data and specifications subject to change without notice.  
 This product has been designed and qualified for Industrial Level.  
 Qualification Standards can be found on IR's Web site.