Bulletin PD-2.321 rev. I 08/02

International
IOR Rectifier

MBR20...CT
MBRB20...CT
MBR20...CT-1

SCHOTTKY RECTIFIER 20 Amp

Major Ratings and Characteristics

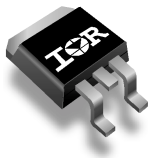
Characteristics		Values	Units
$I_{F(AV)}$	Rectangular waveform (Per Device)	20	A
I_{FRM}	@ T_C = 133°C (Per Leg)	20	A
V_{RRM}		80/90/100	V
I_{FSM}	@ tp = 5 µs sine	850	A
V_F	@ 10 Apk, T_J = 125°C	0.70	V
T_J	range	-65 to 150	°C

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^2Pak 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...CT	MBRB20...CT	MBR20...CT-1
		
TO-220	D^2PAK	TO-262

Voltage Ratings

	Parameters	MBR2080CT MBRB2080CT MBR2080CT-1	MBR2090CT MBRB2090CT MBR2090CT-1	MBR20100CT MBRB20100CT MBR20100CT-1
V_R	Max. DC Reverse Voltage (V)	80	90	100
V_{RWM}	Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

	Parameters	Values	Units	Conditions
$I_{F(AV)}$	Max. Average Forward Current (Per Leg)	10	A	@ T_C = 133° C, (Rated V_R)
	(Per Device)	20		
I_{FRM}	Peak Repetitive Forward Current (Per Leg)	20	A	Rated V_R, square wave, 20kHz T_C = 133° C
I_{FSM}	Non Repetitive Peak Surge Current	850	A	5µs Sine or 3µs Rect. pulse — Following any rated load condition and with rated V_{RRM} applied
		150		Surge applied at rated load conditions halfwave, single phase, 60Hz
I_{RRM}	Peak Repetitive Reverse Surge Current	0.5	A	2.0 µsec 1.0 KHz
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	24	mJ	T_J = 25 °C, I_{AS} = 2 Amps, L = 12 mH

Electrical Specifications

	Parameters	Values	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1)	0.80	V	@ 10A	T_J = 25 °C
		0.95	V	@ 20A	
		0.70	V	@ 10A	T_J = 125 °C
		0.85	V	@ 20A	
I_{RM}	Max. Instantaneus Reverse Current (1)	0.10	mA	T_J = 25 °C	Rated DC voltage
		6	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.433	V	T_J = T_J max.	
r_t	Forward Slope Resistance	15.8	mΩ		
C_T	Max. Junction Capacitance	400	pF	V_R = 5V_{DC}, (test signal range 100Khz to 1Mhz) 25°C	
L_S	Typical Series Inductance	8.0	nH	Measured from top of terminal to mounting plane	
dv/dt	Max. Voltage Rate of Change (Rated V_R)	10,000	V/ µs		

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

Thermal-Mechanical Specifications

	Parameters		Values	Units	Conditions
T_J	Max. Junction Temperature Range		-65 to 150	°C	
T_{stg}	Max. Storage Temperature Range		-65 to 175	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)		2.0	°C/W	DC operation
R_{thCS}	Typical Thermal Resistance Case to Heatsink		0.50	°C/W	Mounting surface, smooth and greased Only for TO-220
R_{thJA}	Max. Thermal Resistance Junction to Ambient		50	°C/W	DC operation For D²Pak 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)		

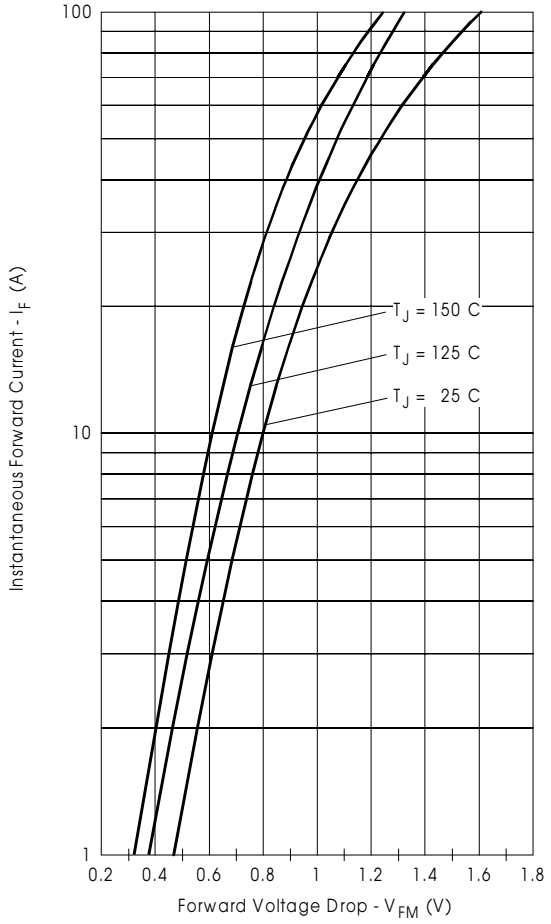


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

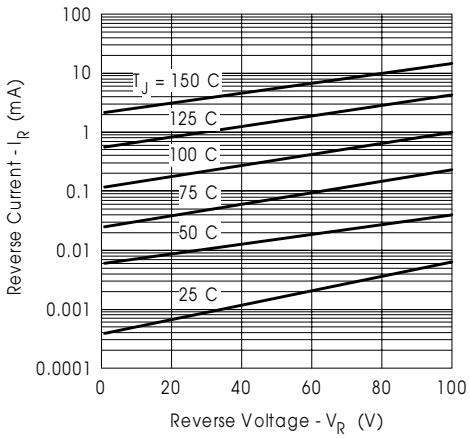


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

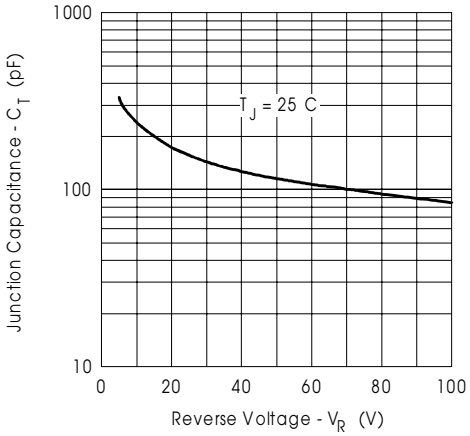


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

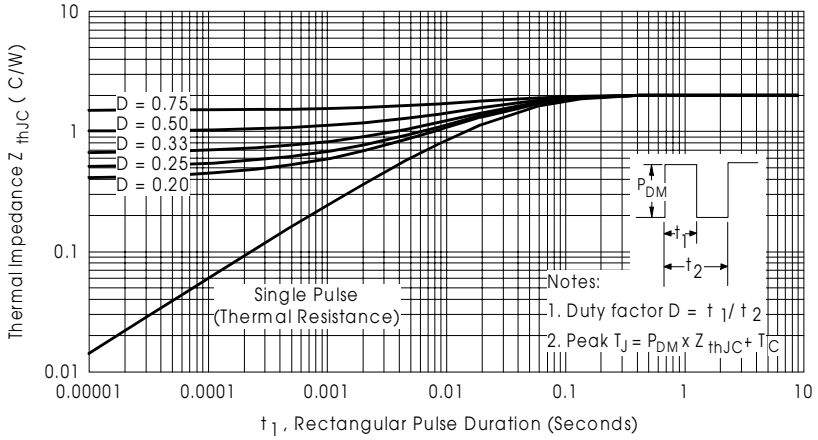


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

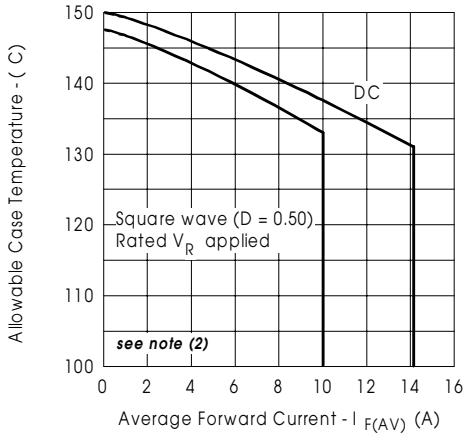


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

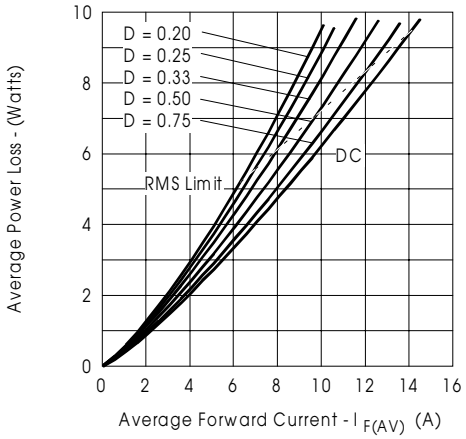


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

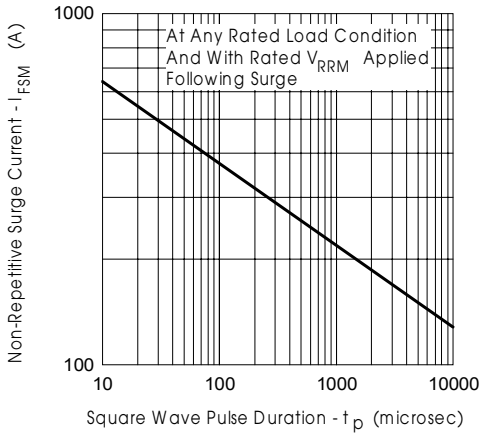
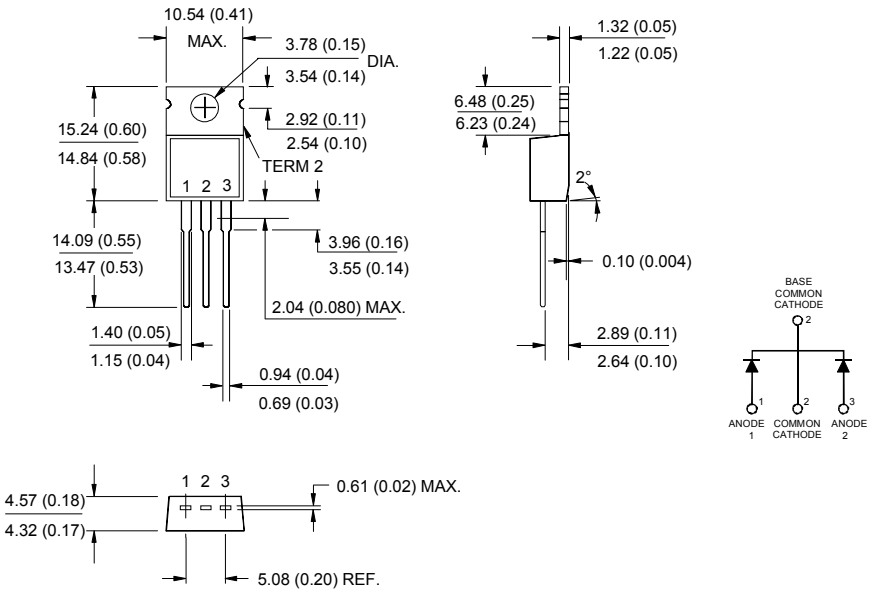


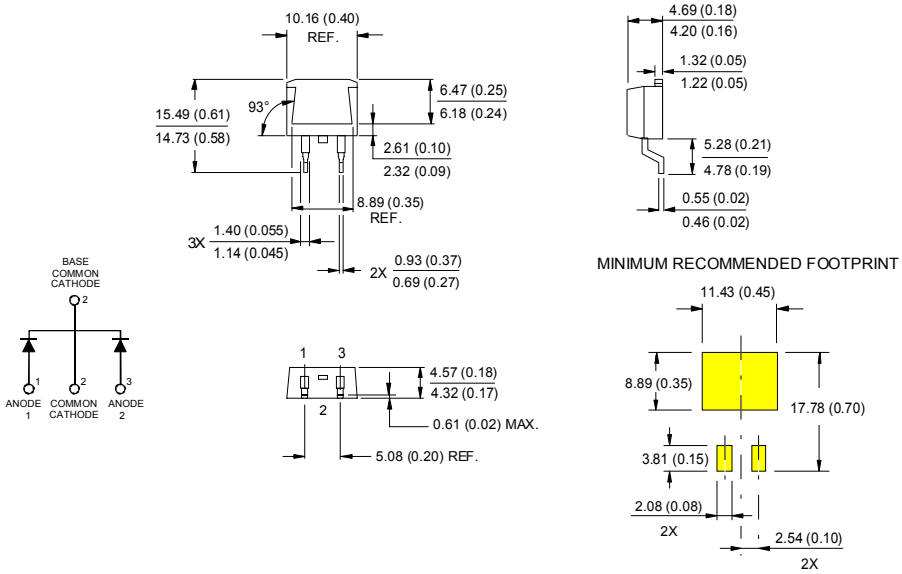
Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

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

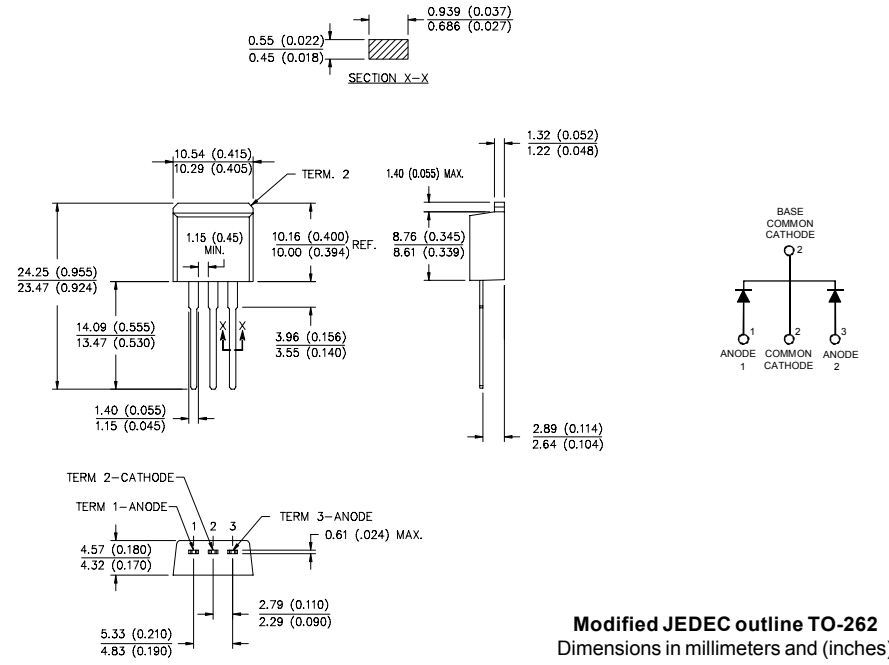
Outline Table



Conform to JEDEC outline TO-220AB
Dimensions in millimeters and (inches)

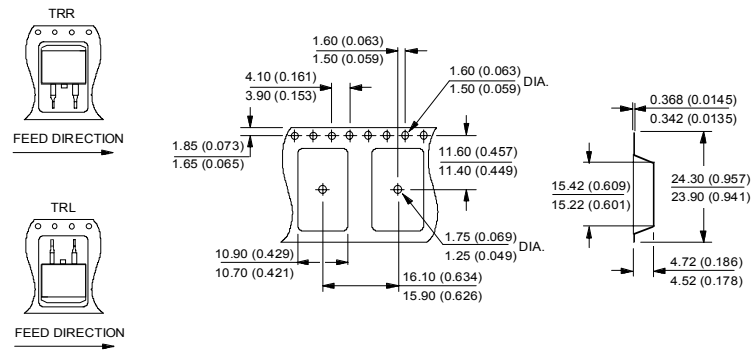


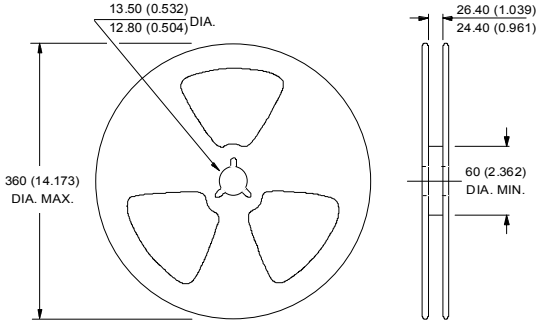
Dimensions in millimeters and (inches)
Conform to JEDEC outline D^2Pak (SMD-220)



Modified JEDEC outline TO-262
Dimensions in millimeters and (inches)

Tape & Reel Information



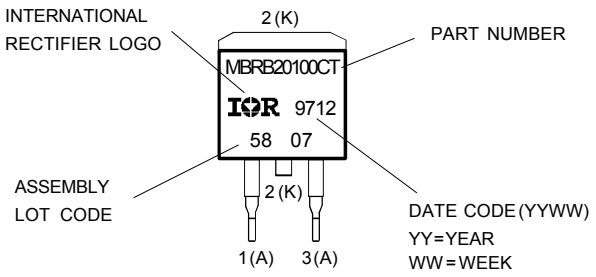


SMD-220 Tape & Reel
When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 800 pieces per reel for both TRL and TRR.

Dimensions in millimeters and (inches)

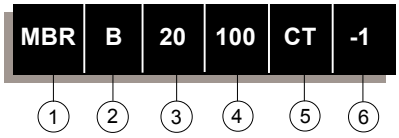
Marking Information

EXAMPLE: THIS IS AN MBRB20100CT



Ordering Information Table

Device Code



1 - Essential Part Number

2 - B = Surface Mount
None = TO-220

3 - Current Rating

4 - Voltage code: Code = V_{RRM}

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

5 - CT = Essential Part Number

6 - -1 = TO-262
None = TO-220

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.

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