

# MBRF2020CT

Preferred Device

## SWITCHMODE™ Schottky Power Rectifier

The SWITCHMODE Power Rectifier employs the Schottky Barrier principle in a large area metal-to-silicon power diode. State-of-the-art geometry features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for use as rectifiers in very low-voltage, high-frequency switching power supplies, free wheeling diodes and polarity protection diodes.

- Highly Stable Oxide Passivated Junction
- Very Low Forward Voltage Drop
- Matched Dual Die Construction
- High Junction Temperature Capability
- High dv/dt Capability
- Excellent Ability to Withstand Reverse Avalanche Energy Transients
- Guardring for Stress Protection
- Epoxy Meets UL94, V<sub>O</sub> at 1/8"
- Electrically Isolated. No Isolation Hardware Required.
- UL Recognized File #E69369

### Mechanical Characteristics

- Case: Epoxy, Molded
- Weight: 1.9 grams (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped 50 units per plastic tube
- Marking: B20200

### MAXIMUM RATINGS

Please See the Table on the Following Page

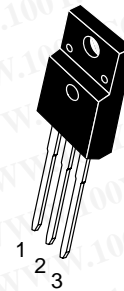
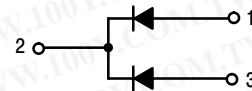
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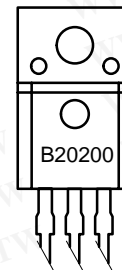
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### SCHOTTKY BARRIER RECTIFIER 20 AMPERES 200 VOLTS



ISOLATED TO-220  
CASE 221D  
STYLE 3

### MARKING DIAGRAM



B20200 = Device Code

### ORDERING INFORMATION

Device	Package	Shipping
MBRF2020CT	TO-220	50 Units/Rail

Preferred devices are recommended choices for future use and best overall value.

# MBRF20200CT

## MAXIMUM RATINGS (Per Leg)

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	200	Volts
Average Rectified Forward Current (Rated $V_R$ , $T_C = 125^\circ\text{C}$ )	$I_{F(AV)}$	10 20	Amps Per Leg Per Package
Peak Repetitive Forward Current, Per Leg (Rated $V_R$ , Square Wave, 20 kHz) $T_C = 90^\circ\text{C}$	$I_{FRM}$	20	Amps
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	150	Amps
Peak Repetitive Reverse Surge Current (2.0 $\mu\text{s}$ , 1.0 kHz)	$I_{RRM}$	1.0	Amp
Operating Junction Temperature and Storage Temperature	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$
Voltage Rate of Change (Rated $V_R$ )	$dv/dt$	10,000	$\text{V}/\mu\text{s}$

## THERMAL CHARACTERISTICS (Per Leg)

Thermal Resistance — Junction to Case	$R_{\theta JC}$	3.5	$^\circ\text{C}/\text{W}$
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## ELECTRICAL CHARACTERISTICS (Per Leg)

Rating	Symbol	Max	Unit
Maximum Instantaneous Forward Voltage (Note 1.) ( $i_F = 10$ Amp, $T_C = 25^\circ\text{C}$ ) ( $i_F = 10$ Amp, $T_C = 125^\circ\text{C}$ ) ( $i_F = 20$ Amp, $T_C = 25^\circ\text{C}$ ) ( $i_F = 20$ Amp, $T_C = 125^\circ\text{C}$ )	$V_F$	0.9 0.8 1.0 0.9	Volts
Maximum Instantaneous Reverse Current (Note 1.) (Rated dc Voltage, $T_C = 25^\circ\text{C}$ ) (Rated dc Voltage, $T_C = 125^\circ\text{C}$ )	$i_R$	1.0 50	mA

## DYNAMIC CHARACTERISTICS (Per Leg)

Capacitance ( $V_R = -5.0$ V, $T_C = 25^\circ\text{C}$ , Freq. = 1.0 MHz)	$C_T$	500	pF
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1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

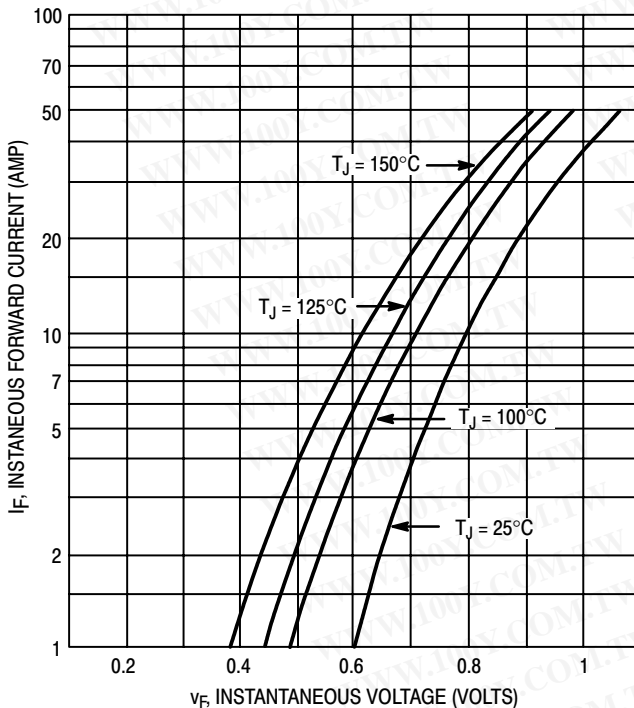


Figure 1. Typical Forward Voltage (Per Leg)

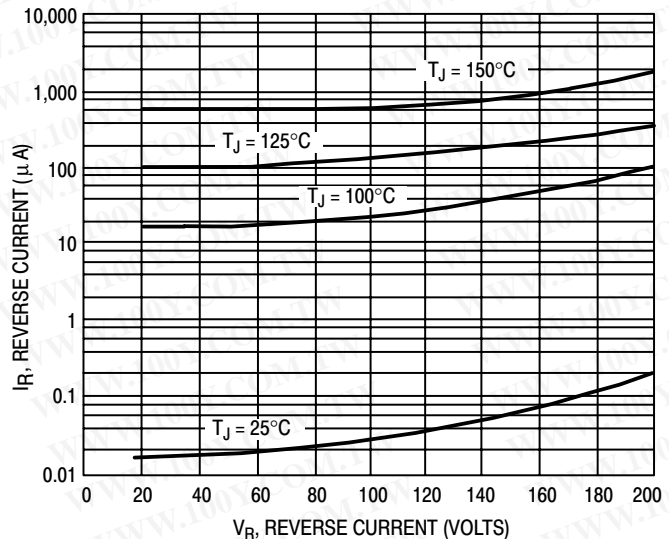


Figure 2. Typical Reverse Current (Per Leg)

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## TEST CONDITIONS FOR ISOLATION TESTS\*

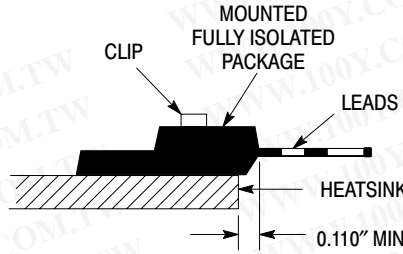


Figure 3. Clip Mounting Position for Isolation Test Number 1

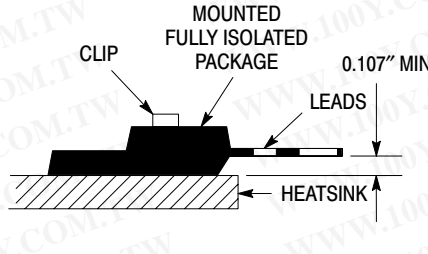


Figure 4. Clip Mounting Position for Isolation Test Number 2

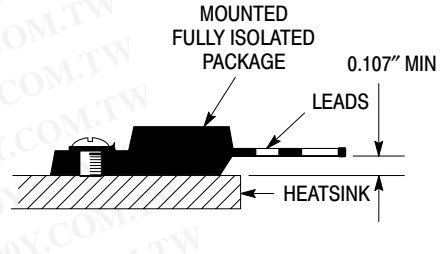
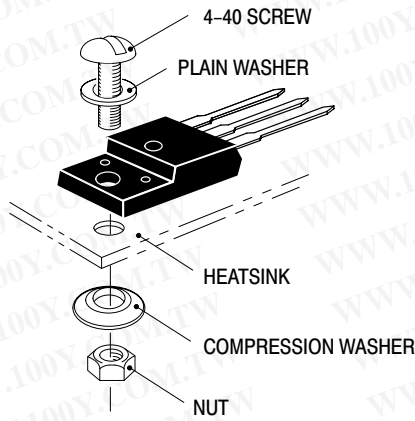


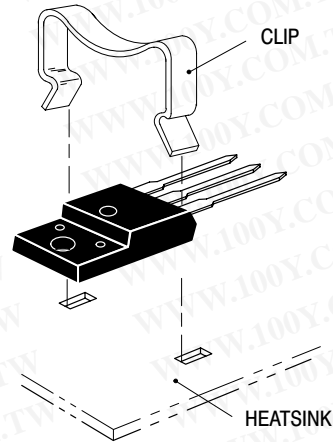
Figure 5. Screw Mounting Position for Isolation Test Number 3

\* Measurement made between leads and heatsink with all leads shorted together.

## MOUNTING INFORMATION\*\*



6a. Screw-Mounted



6b. Clip-Mounted

Figure 6. Typical Mounting Techniques

Laboratory tests on a limited number of samples indicate, when using the screw and compression washer mounting technique, a screw torque of 6 to 8 in · lbs is sufficient to provide maximum power dissipation capability. The compression washer helps to maintain a constant pressure on the package over time and during large temperature excursions.

Destructive laboratory tests show that using a hex head 4-40 screw, without washers, and applying a torque in excess of 20 in · lbs will cause the plastic to crack around the mounting hole, resulting in a loss of isolation capability.

Additional tests on slotted 4-40 screws indicate that the screw slot fails between 15 to 20 in · lbs without adversely affecting the package. However, in order to positively ensure the package integrity of the fully isolated device, ON Semiconductor does not recommend exceeding 10 in · lbs of mounting torque under any mounting conditions.

\*\*For more information about mounting power semiconductors see Application Note AN1040.

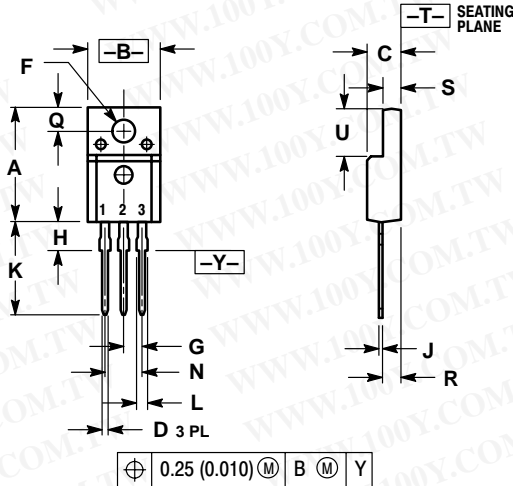
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## PACKAGE DIMENSIONS

TO-220  
FULLPAK  
CASE 221D-02  
ISSUE D



- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.621	0.629	15.78	15.97
B	0.394	0.402	10.01	10.21
C	0.181	0.189	4.60	4.80
D	0.026	0.034	0.67	0.86
F	0.121	0.129	3.08	3.27
G	0.100 BSC		2.54 BSC	
H	0.123	0.129	3.13	3.27
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.14	1.52
N	0.200 BSC		5.08 BSC	
Q	0.126	0.134	3.21	3.40
R	0.107	0.111	2.72	2.81
S	0.096	0.104	2.44	2.64
U	0.259	0.267	6.58	6.78

- STYLE 3:  
PIN 1. ANODE  
2. CATHODE  
3. ANODE

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JAPAN: ON Semiconductor, Japan Customer Focus Center

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