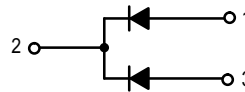


# SWITCHMODE™ Schottky Power Rectifier

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.

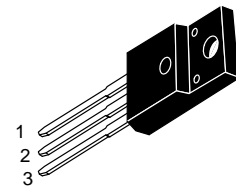
- Highly Stable Oxide Passivated Junction
- Very Low Forward Voltage Drop
- Matched Dual Die Construction
- High Junction Temperature Capability
- High dv/dt Capability
- Excellent Ability to Withstand Reverse Avalanche Energy Transients
- Guardring for Stress Protection
- Epoxy Meets UL94, V<sub>O</sub>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



**MBRF20100CT**

Motorola Preferred Device

**SCHOTTKY BARRIER  
RECTIFIER  
20 AMPERES  
100 VOLTS**



**CASE 221D-02  
ISOLATED TO-220**

## 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: B20100

## MAXIMUM RATINGS, PER LEG

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	100	Volts
Average Rectified Forward Current (Rated $V_R$ ), $T_C = 133^\circ\text{C}$ Total Device	$I_{F(AV)}$	10 20	Amps
Peak Repetitive Forward Current (Rated $V_R$ , Square Wave, 20 kHz), $T_C = 133^\circ\text{C}$	$I_{FRM}$	20	Amps
Non-repetitive 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)	$I_{RRM}$	0.5	Amp
Operating Junction and Storage Temperature	$T_J, T_{stg}$	- 65 to +150	$^\circ\text{C}$
Voltage Rate of Change (Rated $V_R$ )	dv/dt	10000	V/ $\mu\text{s}$
RMS Isolation Voltage (t = 1.0 second, R.H. $\leq$ 30%, $T_A = 25^\circ\text{C}$ ) <sup>(2)</sup>	Per Figure 3 Per Figure 4 <sup>(1)</sup> Per Figure 5	$V_{iso1}$ $V_{iso2}$ $V_{iso3}$	4500 3500 1500 Volts

## THERMAL CHARACTERISTICS, PER LEG

Maximum Thermal Resistance — Junction to Case	$R_{\theta JC}$	3.5	$^\circ\text{C}/\text{W}$
Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	$T_L$	260	$^\circ\text{C}$

(1) UL Recognized mounting method is per Figure 4.

(2) Proper strike and creepage distance must be provided.

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

# MBRF20100CT

## ELECTRICAL CHARACTERISTICS, PER LEG

Characteristic	Symbol	Max	Unit
Maximum Instantaneous Forward Voltage (3) ( $i_F = 10$ 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, $T_C = 125^\circ\text{C}$ )	$v_F$	0.85 0.75 0.95 0.85	Volts
Maximum Instantaneous Reverse Current (3) (Rated DC Voltage, $T_C = 25^\circ\text{C}$ ) (Rated DC Voltage, $T_C = 125^\circ\text{C}$ )	$i_R$	0.15 150	mA

(3) Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

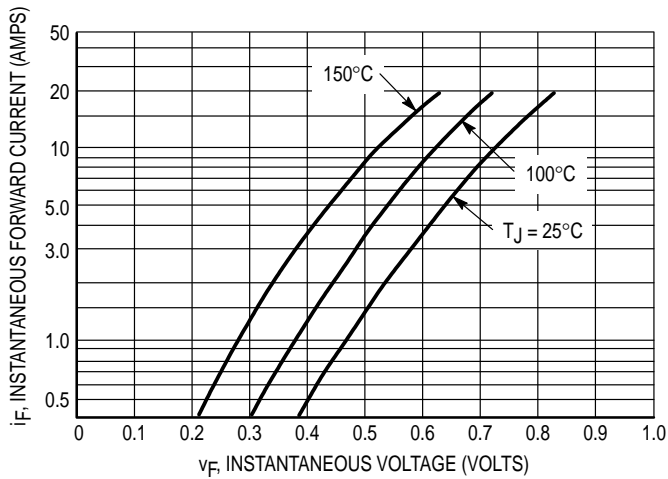


Figure 1. Typical Forward Voltage Per Diode

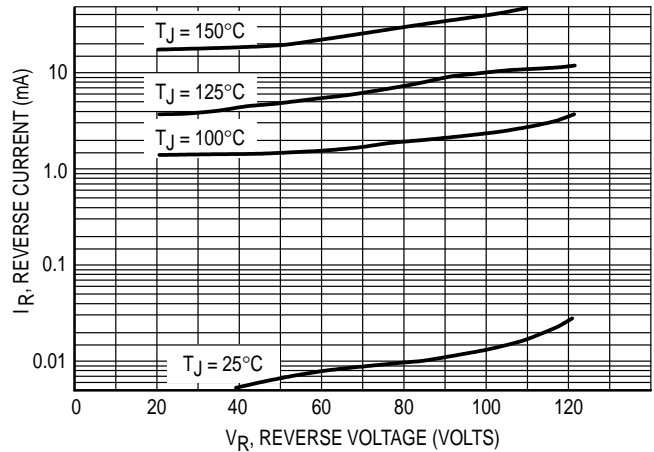


Figure 2. Typical Reverse Current Per Diode

TEST CONDITIONS FOR ISOLATION TESTS\*

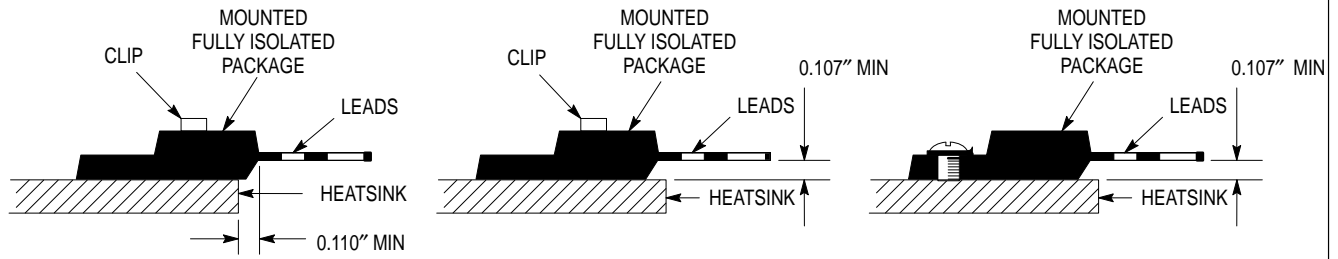


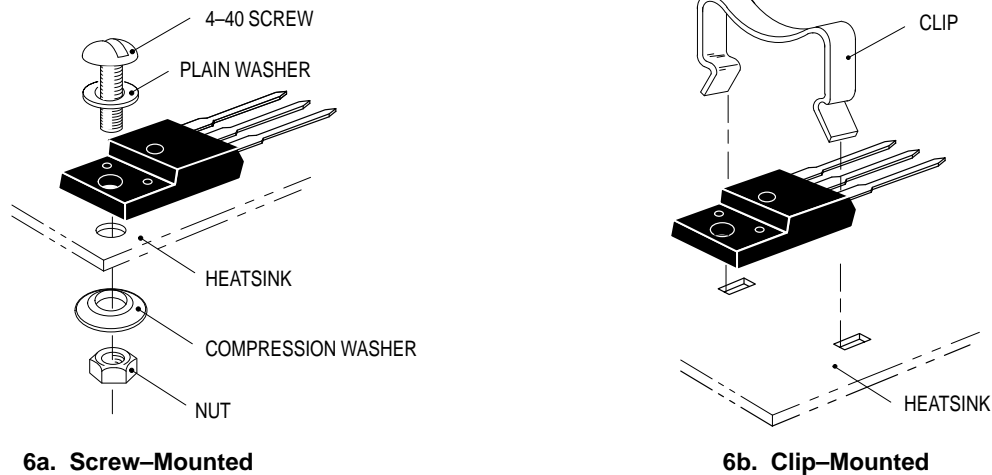
Figure 3. Clip Mounting Position for Isolation Test Number 1

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

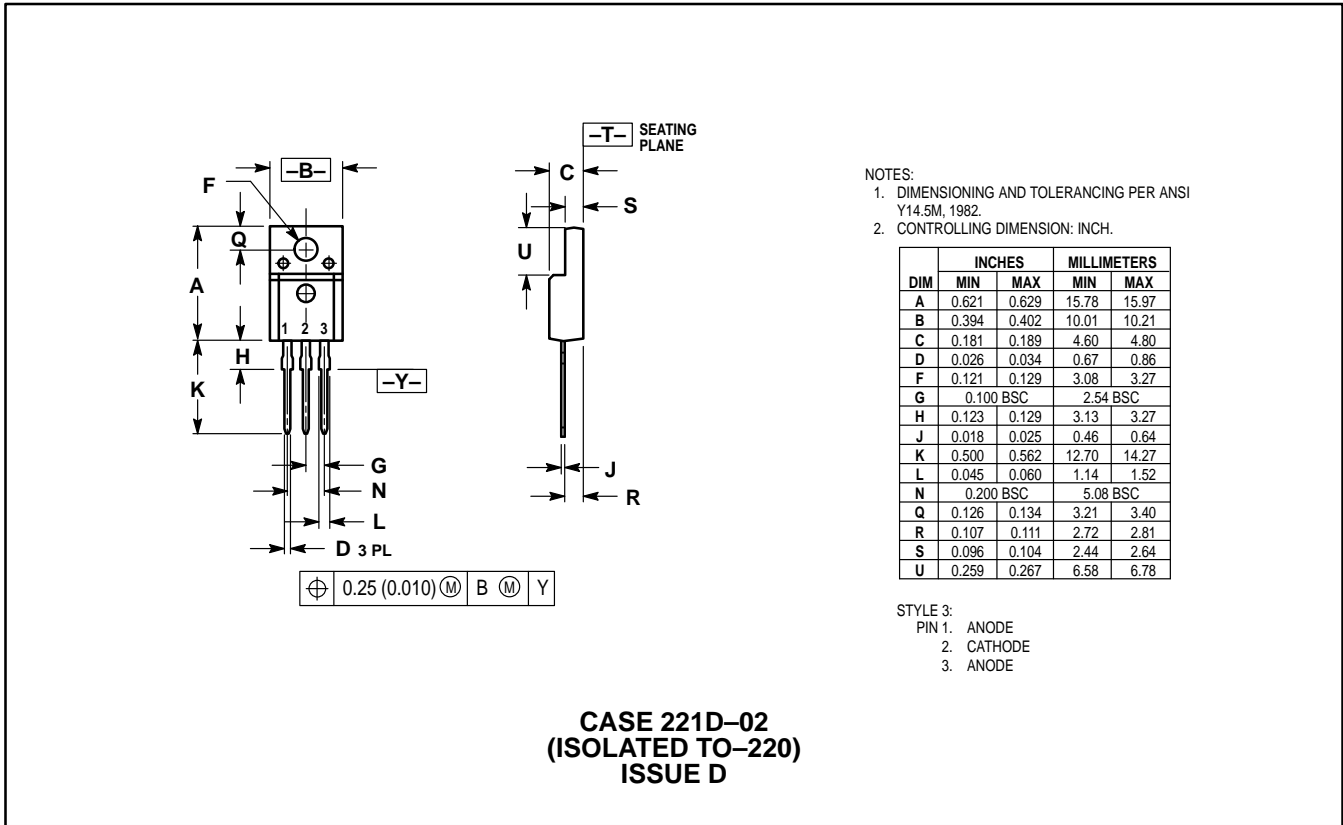
6b. Clip-Mounted

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, Motorola 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.

PACKAGE DIMENSIONS



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