

# MBRF20200CT

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.

### Features

- Highly Stable Oxide Passivated Junction
- Very Low Forward Voltage Drop
- Matched Dual Die Construction
- High Junction Temperature Capability
- High dv/dt Capability
- Guardring for Stress Protection
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Electrically Isolated. No Isolation Hardware Required.
- Pb-Free Package is Available\*

### Mechanical Characteristics:

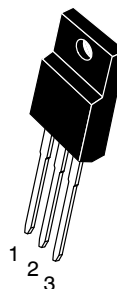
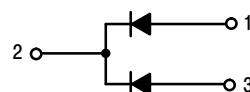
- Case: Epoxy, Molded
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes:  
260°C Max. for 10 Seconds



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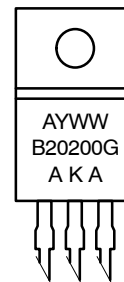
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### SCHOTTKY BARRIER RECTIFIER 20 AMPERES, 200 VOLTS



ISOLATED TO-220  
CASE 221D  
STYLE 3

### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
B20200 = Device Code  
G = Pb-Free Package  
AKA = Polarity Designator

### ORDERING INFORMATION

Device	Package	Shipping
MBRF20200CT	TO-220	50 Units/Rail
MBRF20200CTG	TO-220 (Pb-Free)	50 Units/Rail

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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

**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	V
Average Rectified Forward Current (Rated $V_R$ ) $T_C = 125^\circ\text{C}$	$I_{F(AV)}$	10 20	A
Peak Repetitive Forward Current, Per Leg (Rated $V_R$ , Square Wave, 20 kHz) $T_C = 90^\circ\text{C}$	$I_{FRM}$	20	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	150	A
Peak Repetitive Reverse Surge Current (2.0 $\mu\text{s}$ , 1.0 kHz)	$I_{RRM}$	1.0	A
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	V/ $\mu\text{s}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

**THERMAL CHARACTERISTICS** (Per Leg)

Rating	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.5	$^\circ\text{C/W}$

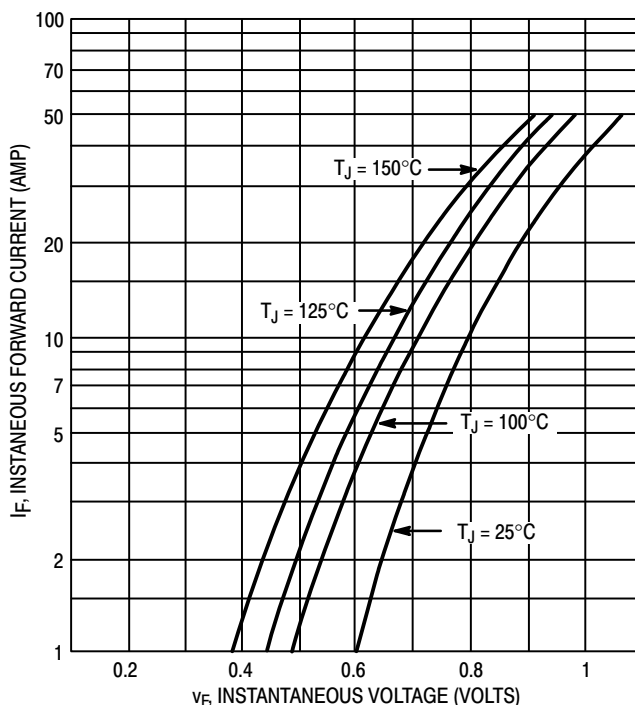
**ELECTRICAL CHARACTERISTICS** (Per Leg)

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	V
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

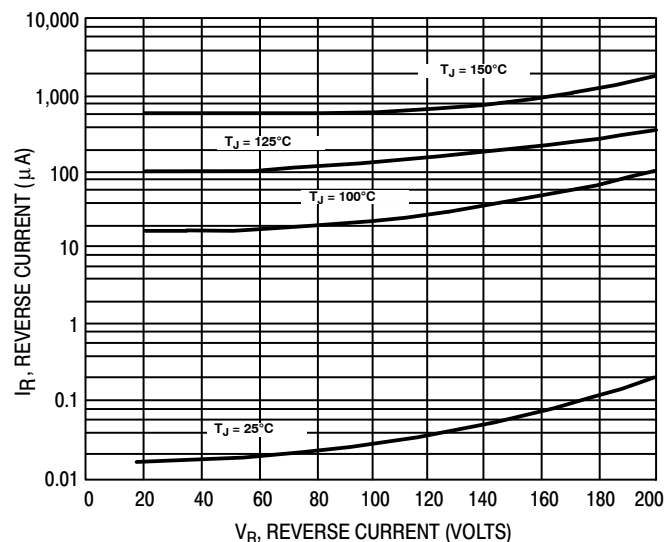
**DYNAMIC CHARACTERISTICS** (Per Leg)

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)**

TEST CONDITION FOR ISOLATION TEST\*

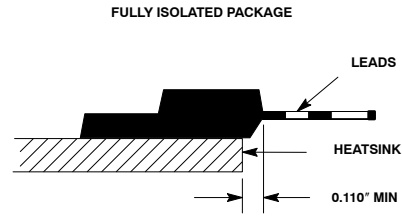
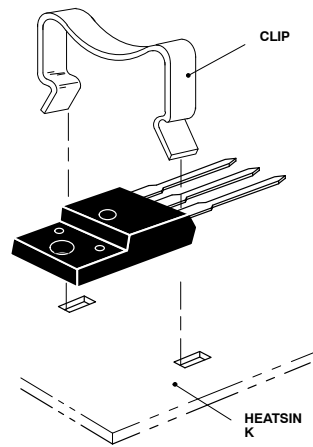


Figure 3. Mounting Position

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

MOUNTING INFORMATION



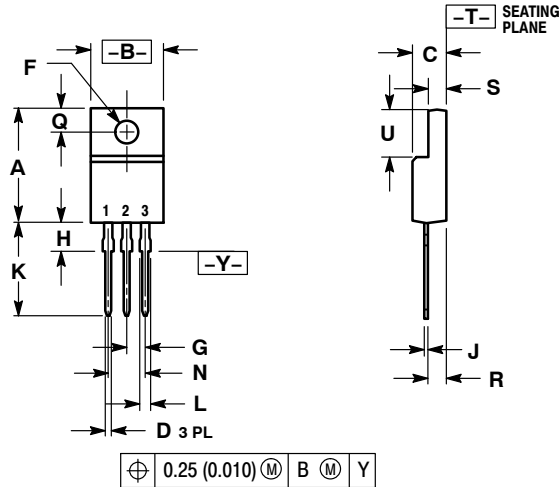
Clip-Mounted

Figure 4. Typical Mounting Technique

# MBRF20200CT

## PACKAGE DIMENSIONS

### TO-220 FULLPAK CASE 221D-03 ISSUE J



#### NOTES:


1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH
3. 221D-01 THRU 221D-02 OBSOLETE, NEW STANDARD 221D-03.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.617	0.635	15.67	16.12
B	0.392	0.419	9.96	10.63
C	0.177	0.193	4.50	4.90
D	0.024	0.039	0.60	1.00
F	0.116	0.129	2.95	3.28
G	0.100 BSC		2.54 BSC	
H	0.118	0.135	3.00	3.43
J	0.018	0.025	0.45	0.63
K	0.503	0.541	12.78	13.73
L	0.048	0.058	1.23	1.47
N	0.200 BSC		5.08 BSC	
Q	0.122	0.138	3.10	3.50
R	0.099	0.117	2.51	2.96
S	0.092	0.113	2.34	2.87
U	0.239	0.271	6.06	6.88

#### STYLE 3:

1. ANODE
2. CATHODE
3. ANODE

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