

# MUR2020R

## SWITCHMODE™ Ultrafast Power Rectifier

### Features and Benefits

- Reverse Polarity Rectifier
- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capacity
- 175°C Operating Junction Temperature
- 20 A Total (10 A Per Diode Leg)
- Pb-Free Packages are Available\*

### Applications

- Power Supply – Output Rectification
- Power Management
- Instrumentation

### Mechanical Characteristics

- Case: Epoxy, Molded
- Epoxy Meets UL 94, V-0 @ 0.125 in
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperatures for Soldering Purposes: 260°C Max. for 10 Seconds
- ESD Rating: Human Body Model 3B  
Machine Model C

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

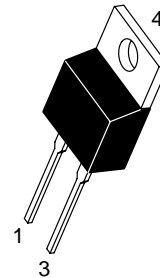
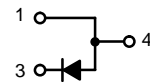


ON Semiconductor®

<http://onsemi.com>

**ULTRAFAST RECTIFIER  
20 AMPERES, 200 VOLTS**

**$t_{rr} = 95 \text{ ns}$**



**TO-220AC  
CASE 221B  
STYLE 2**

### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
G = Pb-Free Package  
AK = Diode Polarity

### ORDERING INFORMATION

Device	Package	Shipping
MUR2020R	TO-220AC	50 Units/Rail
MUR2020RG	TO-220AC (Pb-Free)	50 Units/Rail

# MUR2020R

## 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 Voltage, (Rated $V_R$ ), $T_C = 125^\circ\text{C}$	$I_{F(AV)}$	20	A
Peak Repetitive Forward Current (Rated $V_R$ ), $T_C = 125^\circ\text{C}$	$I_{FRM}$	40	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	250	A
Operating Junction Temperature and Storage Temperature Range	$T_J, T_{stg}$	-65 to +175	$^\circ\text{C}$

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

Characteristic	Conditions	Symbol	Max	Unit
Maximum Thermal Resistance, Junction-to-Case	Min. Pad	$R_{\theta JC}$	2.0	$^\circ\text{C/W}$
Maximum Thermal Resistance, Junction-to-Ambient	Min. Pad	$R_{\theta JA}$	70	

## ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typical	Max	Unit
Instantaneous Forward Voltage (Note 1) ( $i_F = 20$ Amps, $T_J = 25^\circ\text{C}$ ) ( $i_F = 20$ Amps, $T_J = 150^\circ\text{C}$ )	$V_F$	-	0.97 0.79	1.1 1.0	V
Instantaneous Reverse Current (Note 1) (Rated dc Voltage, $T_J = 25^\circ\text{C}$ ) (Rated dc Voltage, $T_J = 150^\circ\text{C}$ )	$i_R$	-	0.1 0.225	50 1.0	$\mu\text{A}$ mA
Maximum Reverse Recovery Time ( $I_F = 1.0$ Amps, $di/dt = 50$ A/ $\mu\text{s}$ ) ( $I_F = 1.0$ Amps, $di/dt = 100$ A/ $\mu\text{s}$ )	$t_{rr}$	-	-	95 75	ns

1. Pulse Test: Pulse Width = 5.0 ms, Duty Cycle  $\leq 10\%$ .

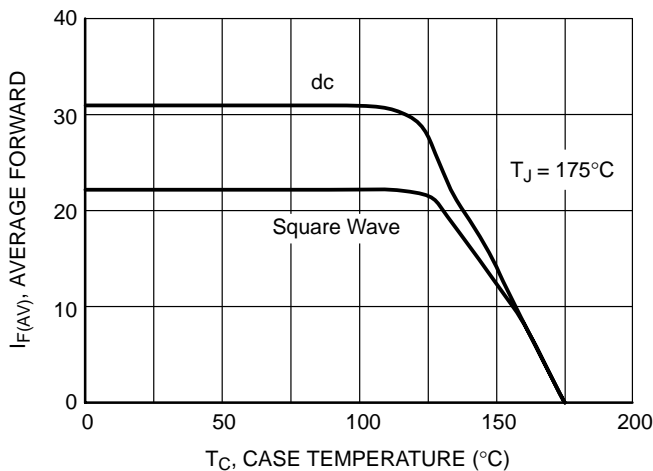


Figure 1. Current Derating

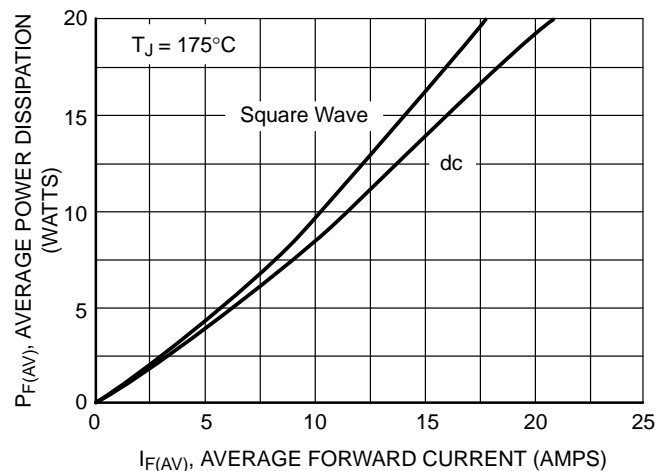
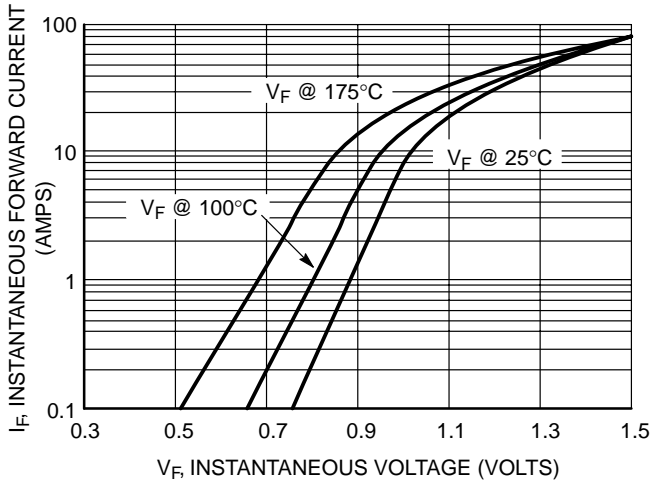
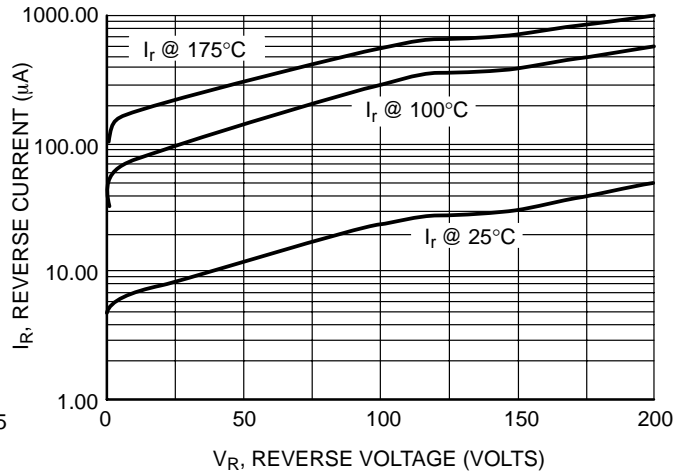


Figure 2. Power Dissipation

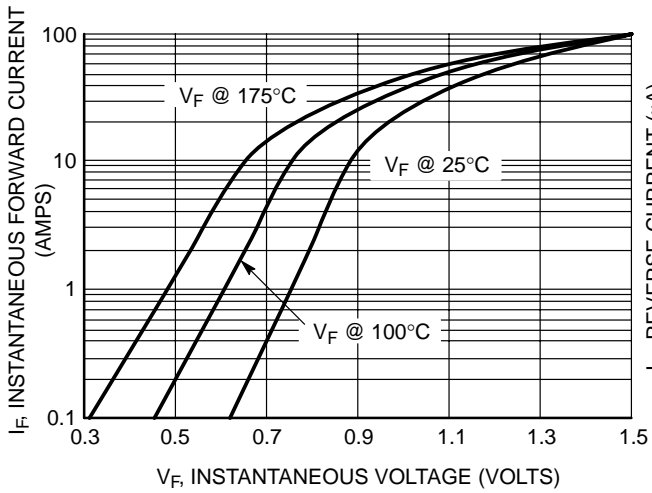
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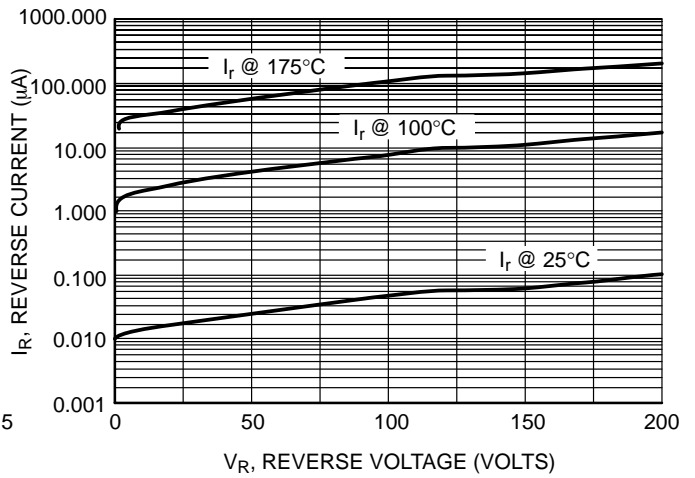
**Figure 3. Maximum Forward Voltage**



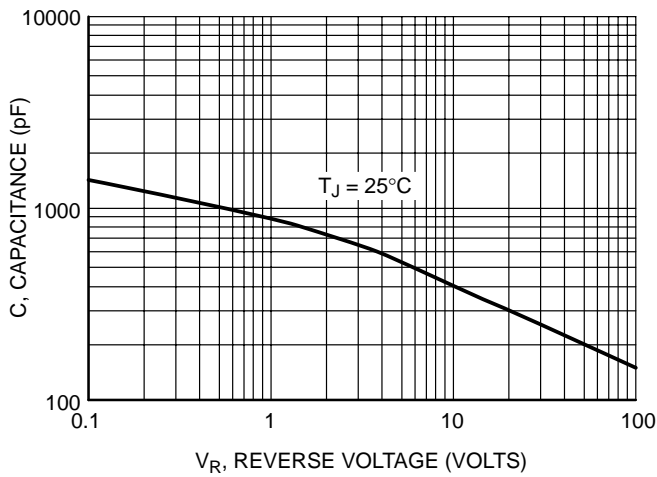
**Figure 4. Maximum Reverse Current**



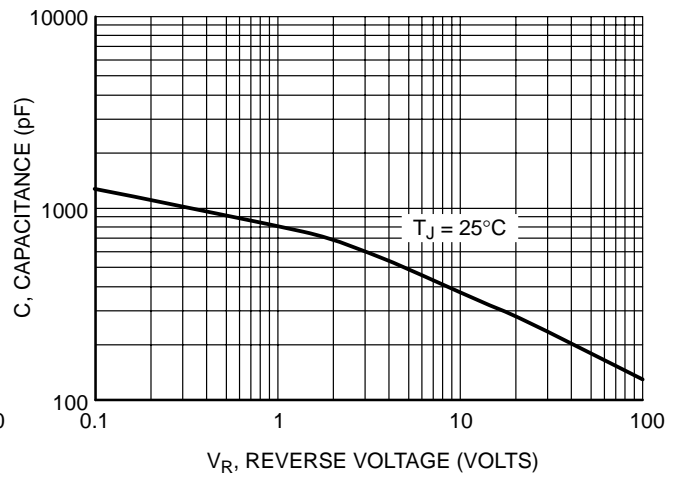
**Figure 5. Typical Forward Voltage**



**Figure 6. Typical Reverse Current**



**Figure 7. Maximum Capacitance**



**Figure 8. Typical Capacitance**

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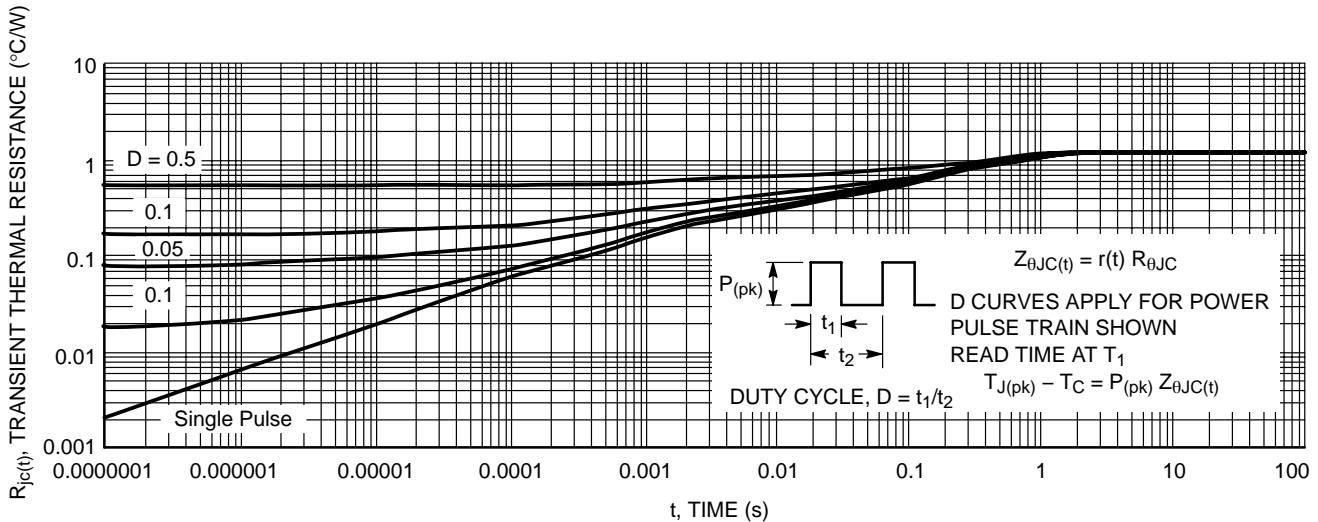
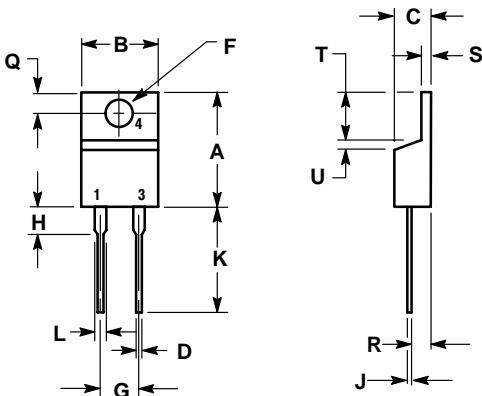


Figure 9. Thermal Response

## PACKAGE DIMENSIONS

### TO-220 TWO-LEAD CASE 221B-04 ISSUE D



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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.595	0.620	15.11	15.75
B	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.82
D	0.025	0.035	0.64	0.89
F	0.142	0.147	3.61	3.73
G	0.190	0.210	4.83	5.33
H	0.110	0.130	2.79	3.30
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
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.14	1.39
T	0.235	0.255	5.97	6.48
U	0.000	0.050	0.000	1.27

- STYLE 2:  
PIN 1. ANODE  
2. N/A  
3. CATHODE  
4. ANODE

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