

# MUR120 Series

## SWITCHMODE Power Rectifiers

MUR105, MUR110, MUR115, MUR120,  
MUR130, MUR140, MUR160

The MUR120 series of SWITCHMODE power rectifiers are designed for use in switching power supplies, inverters and as free wheeling diodes.

### Features

- Ultrafast 25, 50 and 75 Nanosecond Recovery Times
- 175°C Operating Junction Temperature
- Low Forward Voltage
- Low Leakage Current
- High Temperature Glass Passivated Junction
- Reverse Voltage to 600 V
- Shipped in Plastic Bags; 1,000 per Bag
- Available Tape and Reel; 5,000 per Reel, by adding a "RL" Suffix to the Part Number
- These are Pb-Free Devices\*

### Mechanical Characteristics:

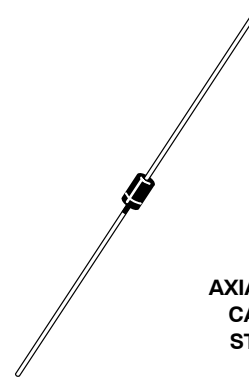
- Case: Epoxy, Molded
- Weight: 0.4 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Polarity: Cathode Indicated by Polarity Band



ON Semiconductor®

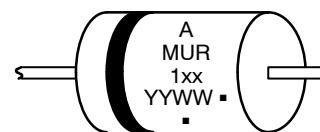
<http://onsemi.com>

ULTRAFAST RECTIFIERS  
1.0 AMPERE, 50 – 600 VOLTS



AXIAL LEAD  
CASE 59  
STYLE 1

### MARKING DIAGRAM



A = Assembly Location  
MUR1xx = Specific Device Code  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 6 of this data sheet.

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

# MUR120 Series

## MAXIMUM RATINGS

Rating	Symbol	MUR							Unit
		105	110	115	120	130	140	160	
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	50	100	150	200	300	400	600	V
Average Rectified Forward Current (Square Wave Mounting Method #3 Per Note 2)	$I_{F(AV)}$	1.0 @ $T_A = 130^\circ\text{C}$				1.0 @ $T_A = 120^\circ\text{C}$			A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions, halfwave, single phase, 60 Hz)	$I_{FSM}$	35							A
Operating Junction Temperature and Storage Temperature	$T_J, T_{stg}$	- 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	Symbol	Max	Unit
Maximum Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	Note 2	$^\circ\text{C}/\text{W}$

## ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Value		Unit
Maximum Instantaneous Forward Voltage (Note 1) ( $I_F = 1.0$ Amp, $T_J = 150^\circ\text{C}$ ) ( $I_F = 1.0$ Amp, $T_J = 25^\circ\text{C}$ )	$v_F$	0.710 0.875	1.05 1.25	V
Maximum Instantaneous Reverse Current (Note 1) (Rated DC Voltage, $T_J = 150^\circ\text{C}$ ) (Rated DC Voltage, $T_J = 25^\circ\text{C}$ )	$i_R$	50 2.0	150 5.0	$\mu\text{A}$
Maximum Reverse Recovery Time ( $I_F = 1.0$ A, $di/dt = 50$ A/ $\mu\text{s}$ ) ( $I_F = 0.5$ A, $i_R = 1.0$ A, $I_{REC} = 0.25$ A)	$t_{rr}$	35 25	75 50	ns
Maximum Forward Recovery Time ( $I_F = 1.0$ A, $di/dt = 100$ A/ $\mu\text{s}$ , $I_{REC}$ to 1.0 V)	$t_{fr}$	25	50	ns
Typical Peak Reverse Recovery Current ( $I_F = 1.0$ A, $di/dt = 50$ A/ $\mu\text{s}$ )	$I_{RM}$	0.85		A

1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

# MUR120 Series

## MUR105, MUR110, MUR115, MUR120

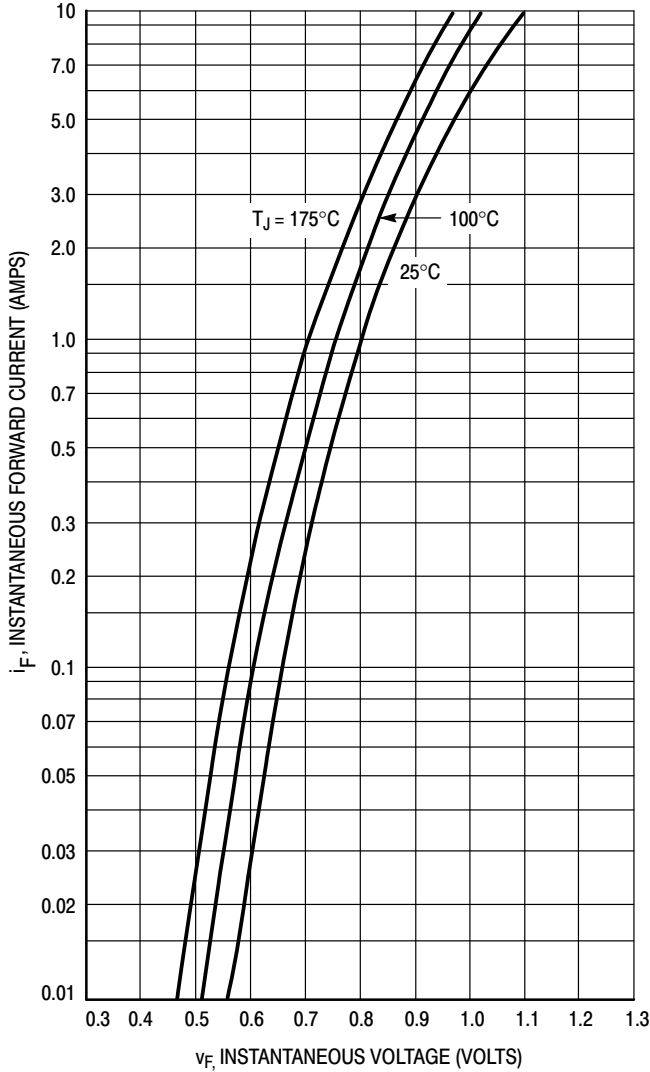


Figure 1. Typical Forward Voltage

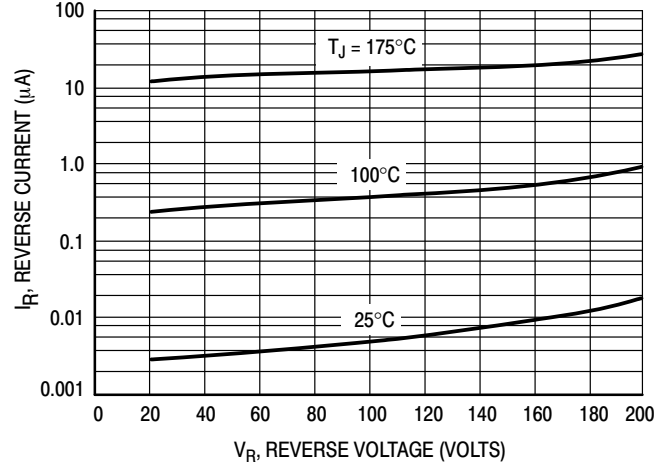


Figure 2. Typical Reverse Current\*

\* The curves shown are typical for the highest voltage device in the voltage grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if  $V_R$  is sufficiently below rated  $V_R$ .

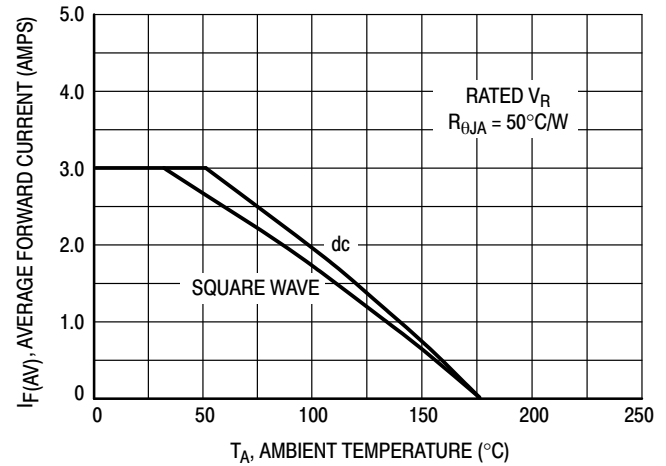


Figure 3. Current Derating  
(Mounting Method #3 Per Note 1)

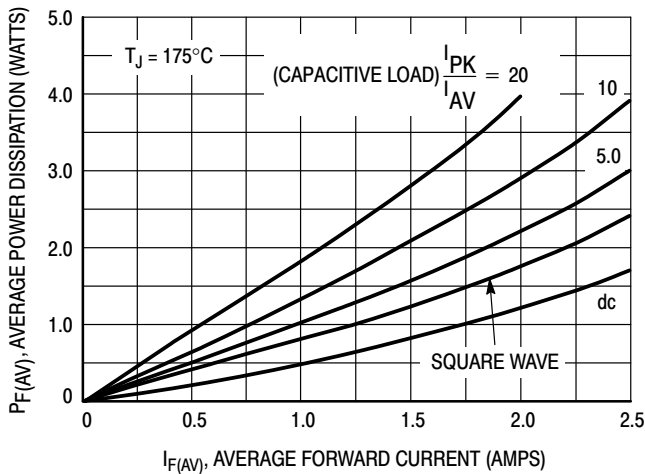


Figure 4. Power Dissipation

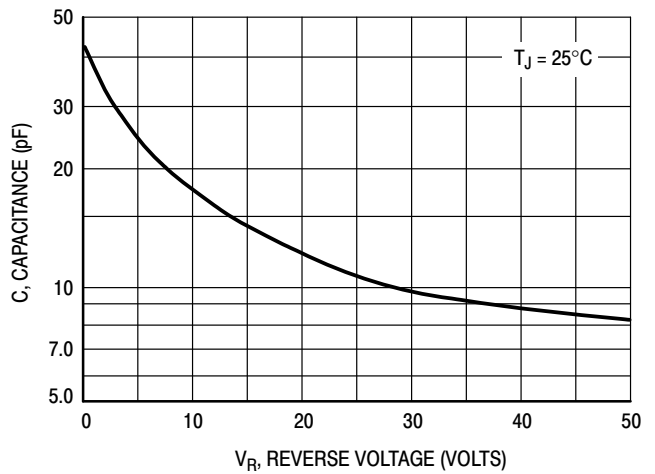
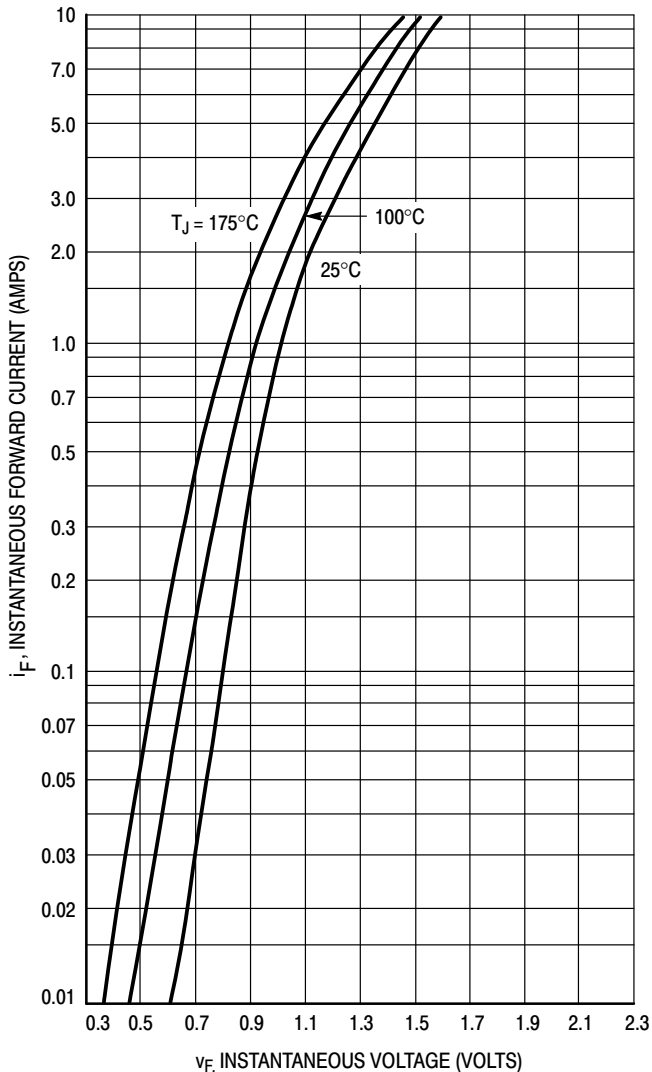


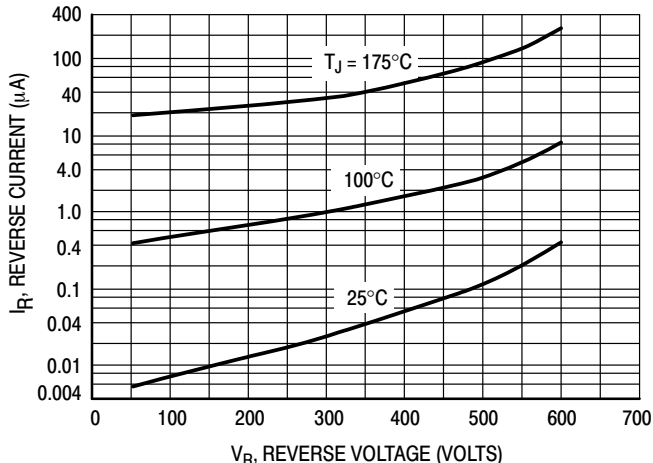
Figure 5. Typical Capacitance

# MUR120 Series

## MUR130, MUR140, MUR160

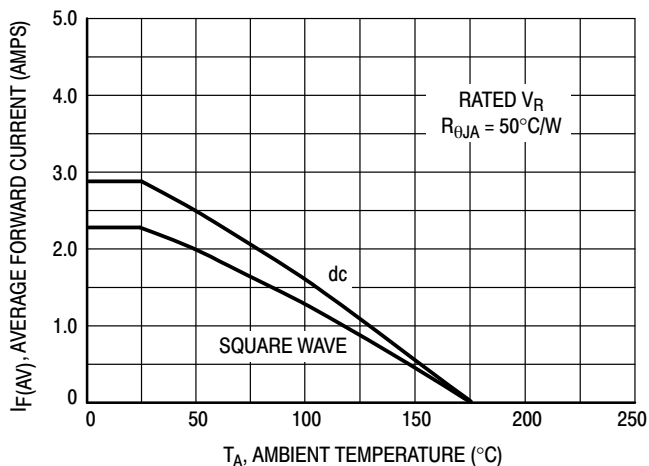


**Figure 6. Typical Forward Voltage**

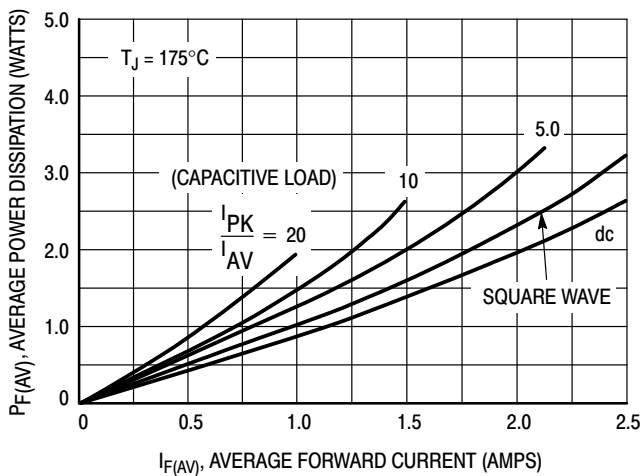


**Figure 7. Typical Reverse Current\***

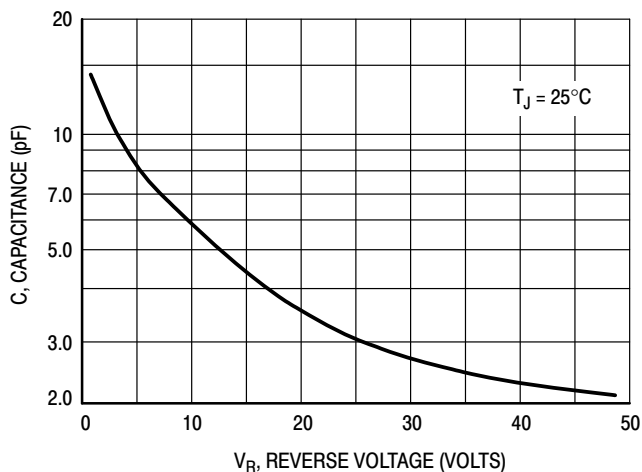
\* The curves shown are typical for the highest voltage device in the voltage grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if  $V_R$  is sufficiently below rated  $V_R$ .



**Figure 8. Current Derating  
(Mounting Method #3 Per Note 2)**



**Figure 9. Power Dissipation**



**Figure 10. Typical Capacitance**

# MUR120 Series

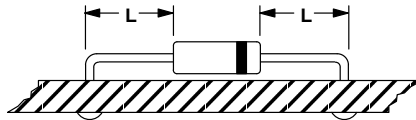
## NOTE 2. — AMBIENT MOUNTING DATA

Data shown for thermal resistance, junction-to-ambient ( $R_{\theta JA}$ ) for the mountings shown is to be used as typical guideline values for preliminary engineering or in case the tie point temperature cannot be measured.

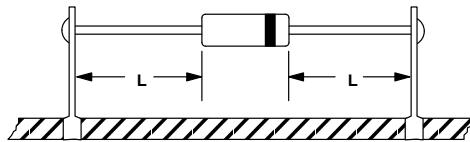
### TYPICAL VALUES FOR $R_{\theta JA}$ IN STILL AIR

Mounting Method	$R_{\theta JA}$	Lead Length, L (in.)			Units
		1/8	1/4	1/2	
1		52	65	72	$^{\circ}\text{C/W}$
2		67	80	87	$^{\circ}\text{C/W}$
3		50			$^{\circ}\text{C/W}$

#### MOUNTING METHOD 1

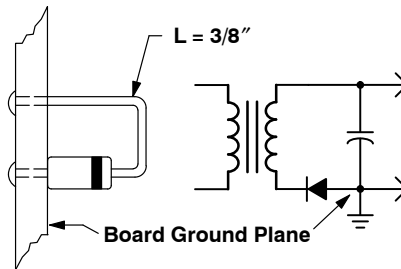


#### MOUNTING METHOD 2



Vector Pin Mounting

#### MOUNTING METHOD 3



P.C. Board with  
1-1/2" X 1-1/2" Copper Surface

## MUR120 Series

### ORDERING INFORMATION

Device	Marking	Package	Shipping†
MUR105	MUR105	Axial Lead*	1000 Units / Bag
MUR105G	MUR105	Axial Lead*	1000 Units / Bag
MUR105RL	MUR105	Axial Lead*	5000 Units / Tape & Reel
MUR105RLG	MUR105	Axial Lead*	5000 Units / Tape & Reel
MUR110	MUR110	Axial Lead*	1000 Units / Bag
MUR110G	MUR110	Axial Lead*	1000 Units / Bag
MUR110RL	MUR110	Axial Lead*	5000 Units / Tape & Reel
MUR110RLG	MUR110	Axial Lead*	5000 Units / Tape & Reel
MUR115	MUR115	Axial Lead*	1000 Units / Bag
MUR115G	MUR115	Axial Lead*	1000 Units / Bag
MUR115RL	MUR115	Axial Lead*	5000 Units / Tape & Reel
MUR115RLG	MUR115	Axial Lead*	5000 Units / Tape & Reel
MUR120	MUR120	Axial Lead*	1000 Units / Bag
MUR120G	MUR120	Axial Lead*	1000 Units / Bag
MUR120RL	MUR120	Axial Lead*	5000 Units / Tape & Reel
MUR120RLG	MUR120	Axial Lead*	5000 Units / Tape & Reel
MUR130	MUR130	Axial Lead*	1000 Units / Bag
MUR130G	MUR130	Axial Lead*	1000 Units / Bag
MUR130RL	MUR130	Axial Lead*	5000 Units / Tape & Reel
MUR130RLG	MUR130	Axial Lead*	5000 Units / Tape & Reel
MUR140	MUR140	Axial Lead*	1000 Units / Bag
MUR140G	MUR140	Axial Lead*	1000 Units / Bag
MUR140RL	MUR140	Axial Lead*	5000 Units / Tape & Reel
MUR140RLG	MUR140	Axial Lead*	5000 Units / Tape & Reel
MUR160	MUR160	Axial Lead*	1000 Units / Bag
MUR160G	MUR160	Axial Lead*	1000 Units / Bag
MUR160RL	MUR160	Axial Lead*	5000 Units / Tape & Reel
MUR160RLG	MUR160	Axial Lead*	5000 Units / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*This package is inherently Pb-Free.

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

ON Semiconductor®



### AXIAL LEAD CASE 59-10 ISSUE U

DATE 15 FEB 2005



SCALE 1:1

POLARITY INDICATOR  
OPTIONAL AS NEEDED  
(SEE STYLES)

STYLE 1:  
PIN 1. CATHODE (POLARITY BAND)  
2. ANODE

STYLE 2:  
NO POLARITY

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. ALL RULES AND NOTES ASSOCIATED WITH JEDEC DO-41 OUTLINE SHALL APPLY
4. POLARITY DENOTED BY CATHODE BAND.
5. LEAD DIAMETER NOT CONTROLLED WITHIN F DIMENSION.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.161	0.205	4.10	5.20
B	0.079	0.106	2.00	2.70
D	0.028	0.034	0.71	0.86
F	---	0.050	---	1.27
K	1.000	---	25.40	---

### GENERIC MARKING DIAGRAM\*



- xxx = Specific Device Code
- A = Assembly Location
- YY = Year
- WW = Work Week

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.

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