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# 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

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

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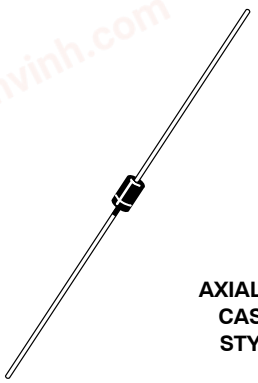
http://onsemi.com

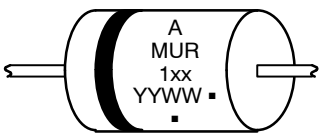
**ULTRAFAST RECTIFIERS**
**1.0 AMPERE, 50 – 600 VOLTS**





**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.

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## MAXIMUM RATINGS

| Rating | Symbol | MUR 105 | 110 | 115 | 120 | 130 | 140 | 160 | Unit |
|---|---|---|---|---|---|---|---|---|---|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 50 | 100 | 150 | 200 | 300 | 400 | 600 | V |
| Average Rectified Forward Current<br>(Square Wave Mounting Method #3 Per Note 2) | $I_{F(AV)}$ | 1.0 @ $T_A$ = 130°C | | | | 1.0 @ $T_A$ = 120°C | | | A |
| Nonrepetitive Peak Surge Current<br>(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 | | | | | | | °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 | °C/W |

## ELECTRICAL CHARACTERISTICS

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

1. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

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## MUR105, MUR110, MUR115, MUR120

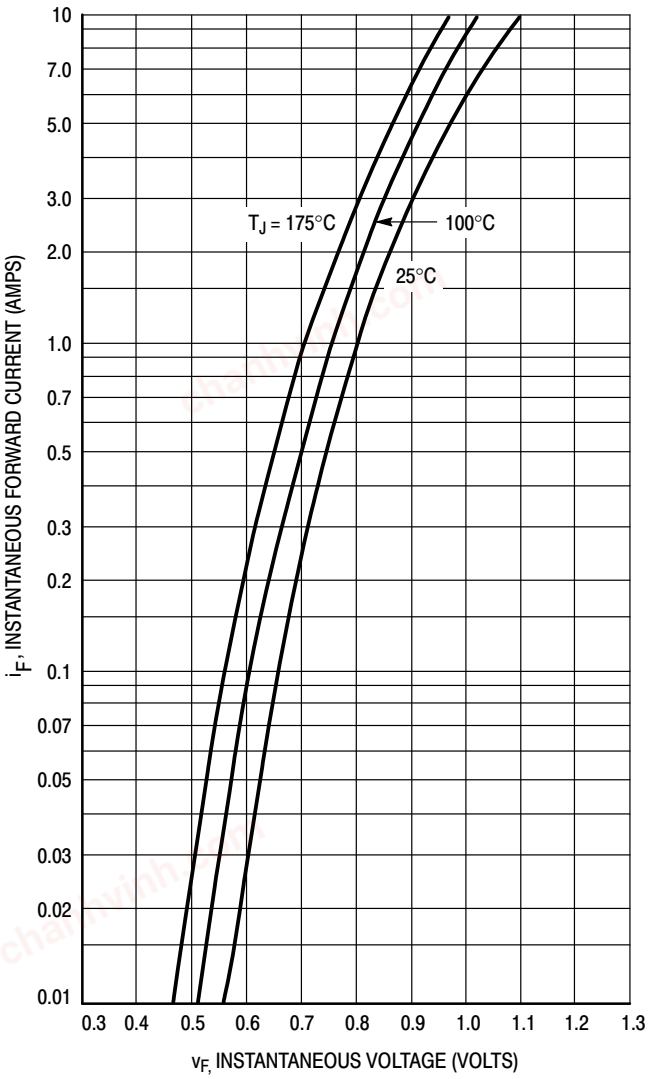


**Figure 1. Typical Forward Voltage**

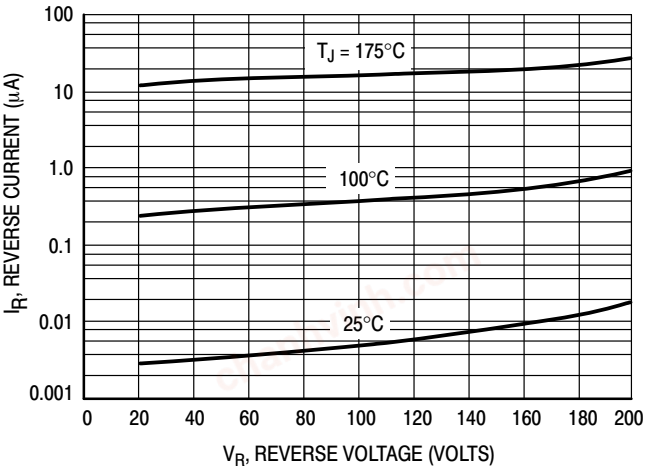


**Figure 2. Typical Reverse Current***

* 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 $V_R$.

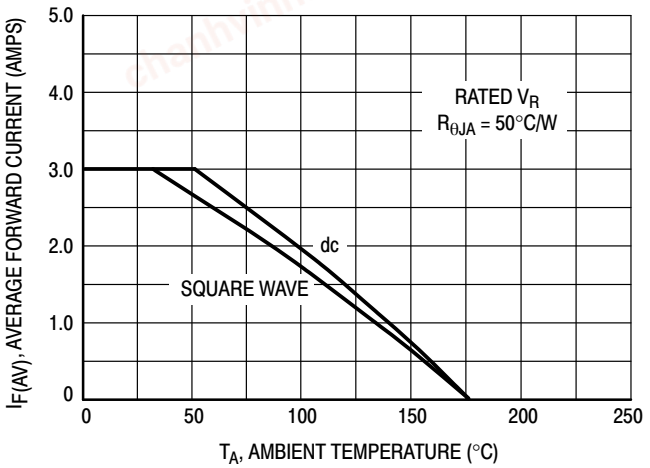


**Figure 3. Current Derating (Mounting Method #3 Per Note 1)**

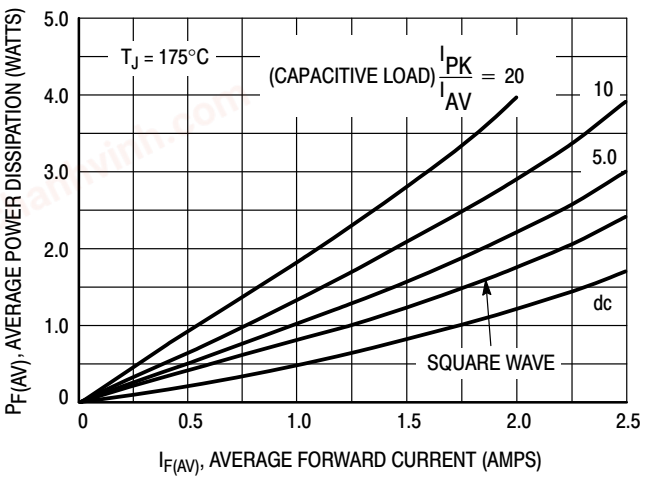


**Figure 4. Power Dissipation**

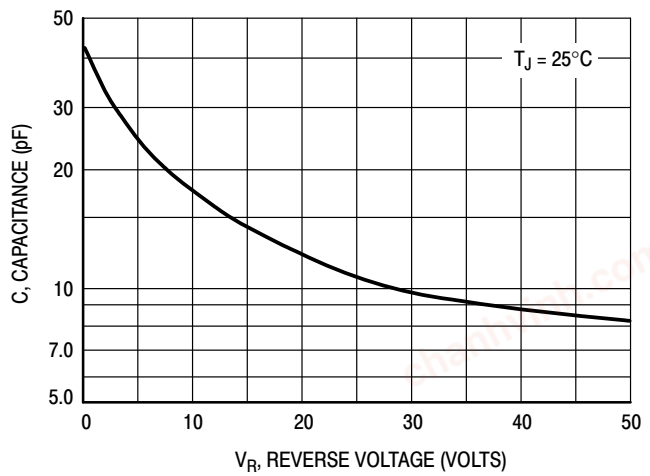


**Figure 5. Typical Capacitance**

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## MUR130, MUR140, MUR160

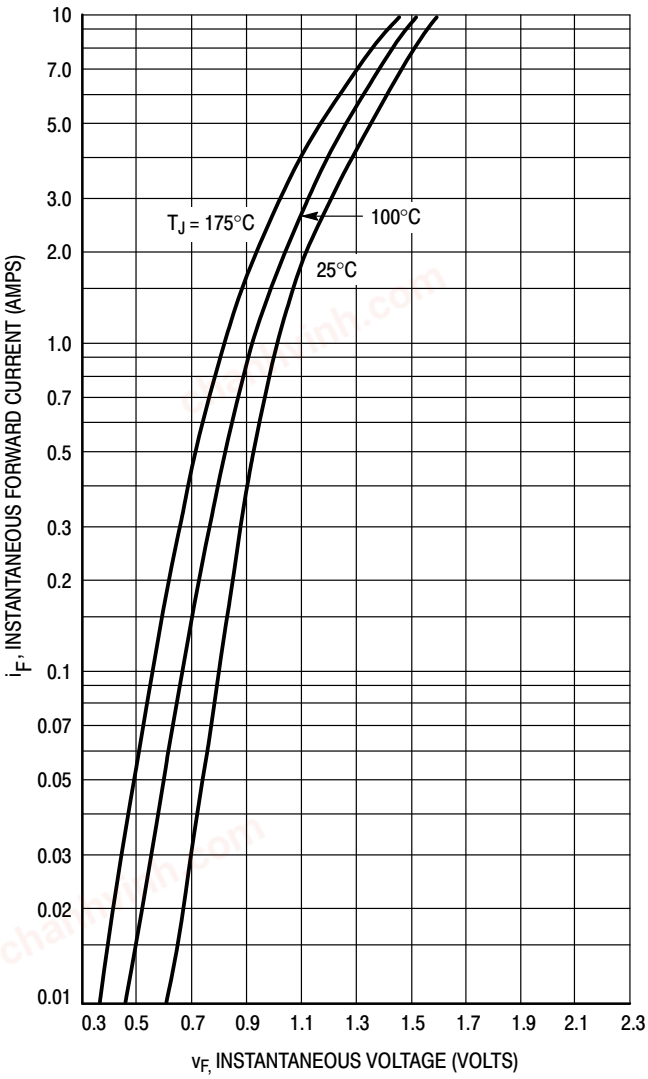


**Figure 6. Typical Forward Voltage**

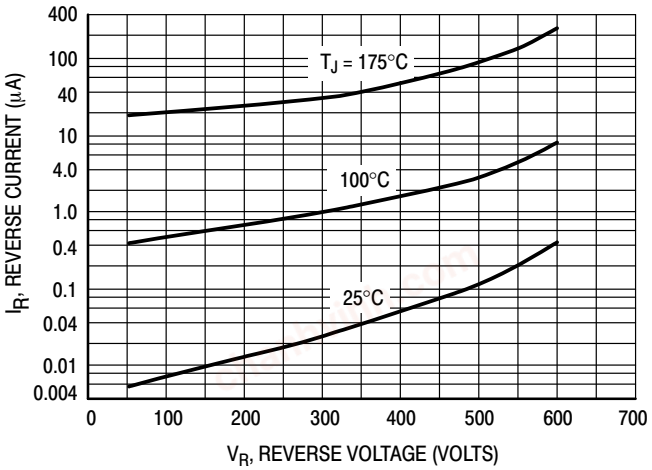


**Figure 7. Typical Reverse Current***

* 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 $V_R$.

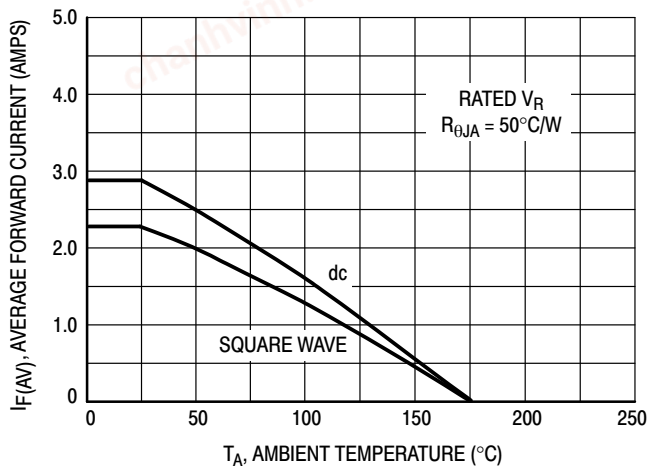


**Figure 8. Current Derating (Mounting Method #3 Per Note 2)**

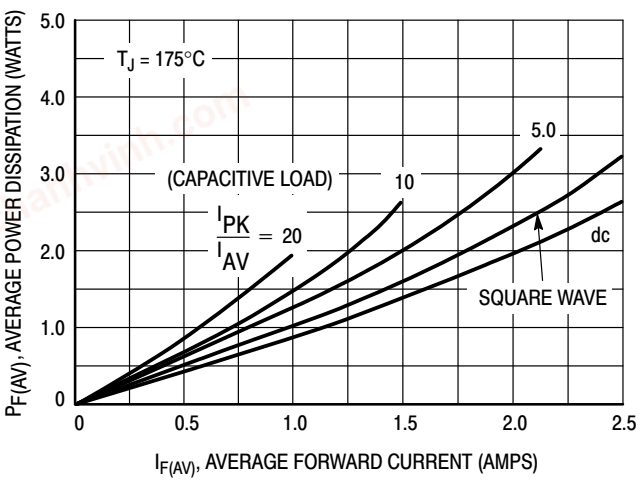


**Figure 9. Power Dissipation**

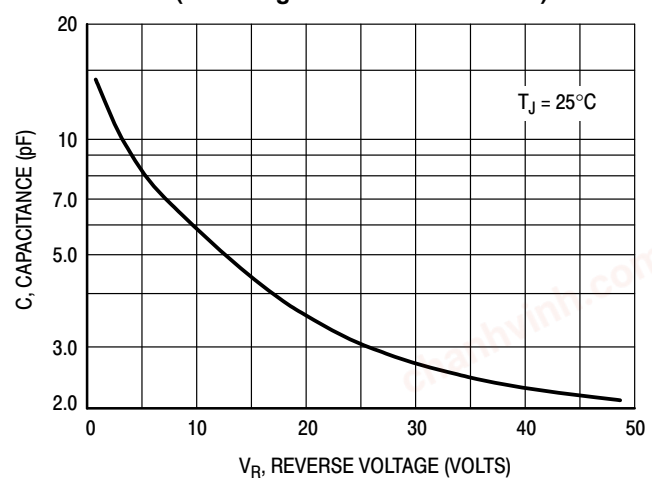


**Figure 10. Typical Capacitance**

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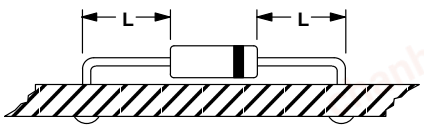
## NOTE 2. — AMBIENT MOUNTING DATA

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.

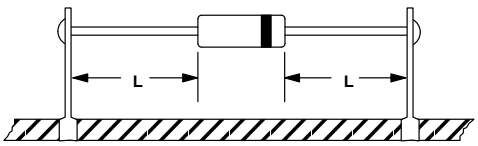
**TYPICAL VALUES FOR $R_{\theta JA}$ IN STILL AIR**

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

**MOUNTING METHOD 1**

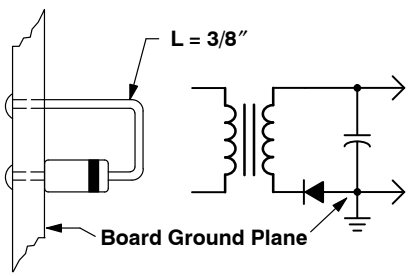



**MOUNTING METHOD 2**




**Vector Pin Mounting**

**MOUNTING METHOD 3**




**P.C. Board with**
**1−1/2″ X 1−1/2″ Copper Surface**

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# 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.

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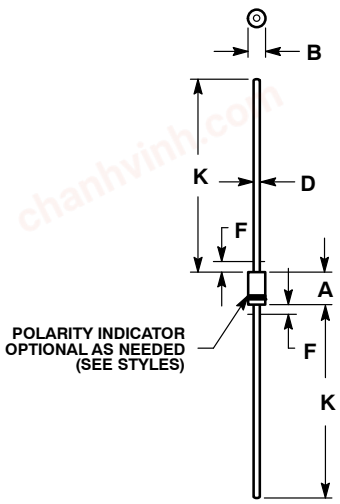
# MUR120 Series

## PACKAGE DIMENSIONS

**AXIAL LEAD**
CASE 59–10
ISSUE U




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.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | 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 | --- |

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

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**MUR120/D**