

# MUR120 Series

Preferred Devices

## 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
- Pb-Free Packages are Available\*

### Mechanical Characteristics

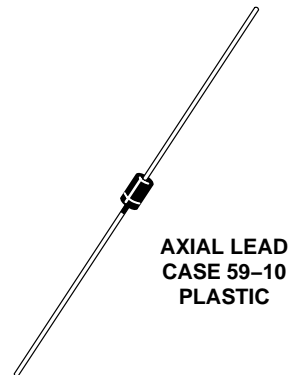
- Case: Epoxy, Molded
- Weight: 0.4 gram (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 220°C Max. for 10 Seconds, 1/16" from case
- Shipped in plastic bags, 1000 per bag
- Available Tape and Reeled, 5000 per reel, by adding a "RL" suffix to the part number
- Polarity: Cathode Indicated by Polarity Band



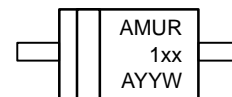
ON Semiconductor®

<http://onsemi.com>

ULTRAFAST RECTIFIERS  
1.0 A, 50 V – 600 V



### MARKING DIAGRAM



MUR = Device Code  
1xx = Specific Device Code  
A = Assembly Location  
YY = Year  
W = Work Week

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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

\*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 1)	$I_{F(AV)}$	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							$^\circ\text{C}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

## THERMAL CHARACTERISTICS

Maximum Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	Note 1	$^\circ\text{C/W}$
---	-----------------	--------	--------------------

## ELECTRICAL CHARACTERISTICS

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

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

## ORDERING INFORMATION

Device	Marking	Package	Shipping <sup>†</sup>
MUR105	MUR105	Axial Lead	1000 Units/Bag
MUR105RL	MUR105	Axial Lead	5000 Units/Tape & Reel
MUR110	MUR110	Axial Lead	1000 Units/Bag
MUR110RL	MUR110	Axial Lead	5000 Units/Tape & Reel
MUR115	MUR115	Axial Lead	1000 Units/Bag
MUR115RL	MUR115	Axial Lead	5000 Units/Tape & Reel
MUR120	MUR120	Axial Lead	1000 Units/Bag
MUR120RL	MUR120	Axial Lead	5000 Units/Tape & Reel
MUR120RLG	MUR120	Axial Lead (Pb-Free)	5000 Units/Tape & Reel
MUR130	MUR130	Axial Lead	1000 Units/Bag
MUR130RL	MUR130	Axial Lead	5000 Units/Tape & Reel
MUR140	MUR140	Axial Lead	1000 Units/Bag
MUR140RL	MUR140	Axial Lead	5000 Units/Tape & Reel
MUR160	MUR160	Axial Lead	1000 Units/Bag
MUR160RL	MUR160	Axial Lead	5000 Units/Tape & Reel
MUR160RLG	MUR160	Axial Lead (Pb-Free)	5000 Units/Tape & Reel

<sup>†</sup>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.

# MUR120 Series

## MUR105, MUR110, MUR115, MUR120

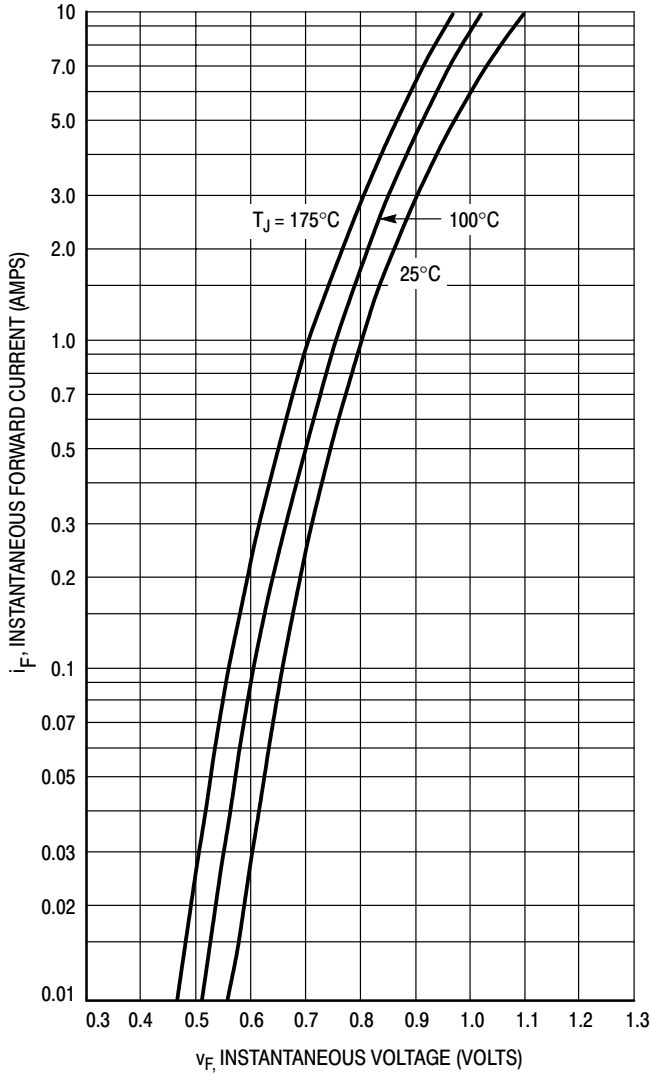


Figure 1. Typical Forward Voltage

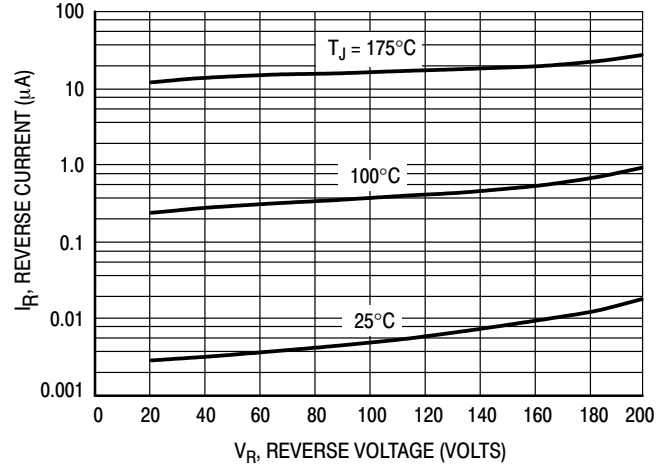


Figure 2. Typical Reverse Current\*

\* 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  $V_R$ .

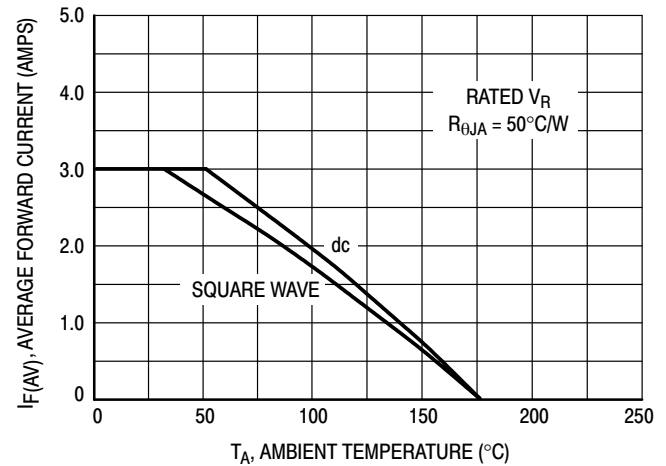


Figure 3. Current Derating  
(Mounting Method #3 Per Note 1)

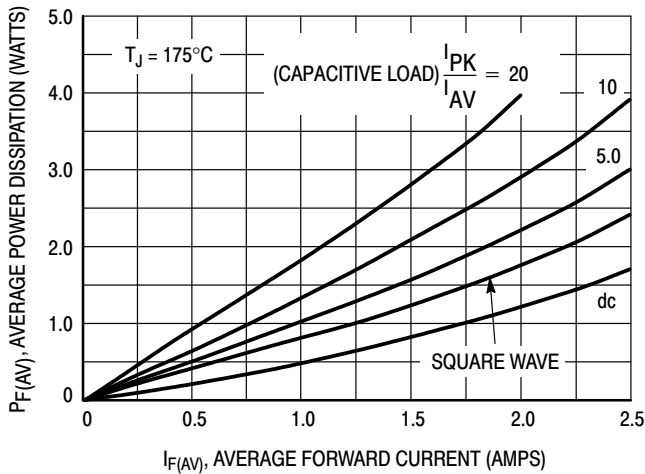


Figure 4. Power Dissipation

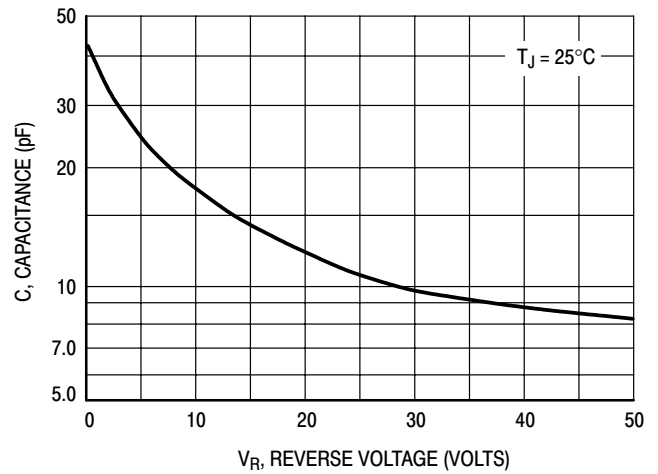


Figure 5. Typical Capacitance

# MUR120 Series

## MUR130, MUR140, MUR160

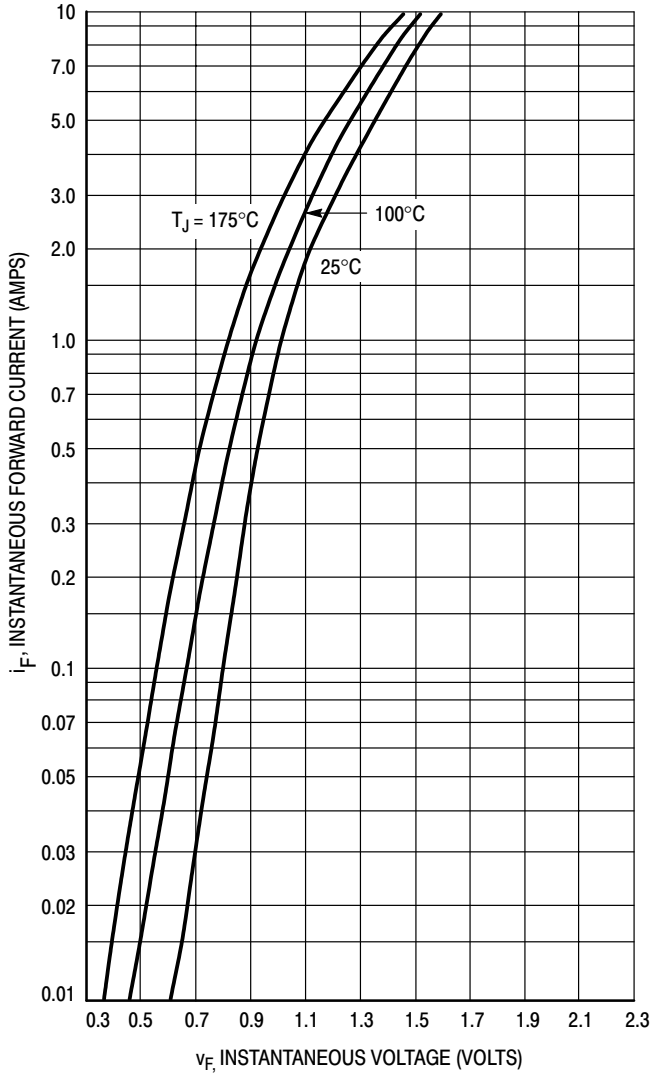


Figure 6. Typical Forward Voltage

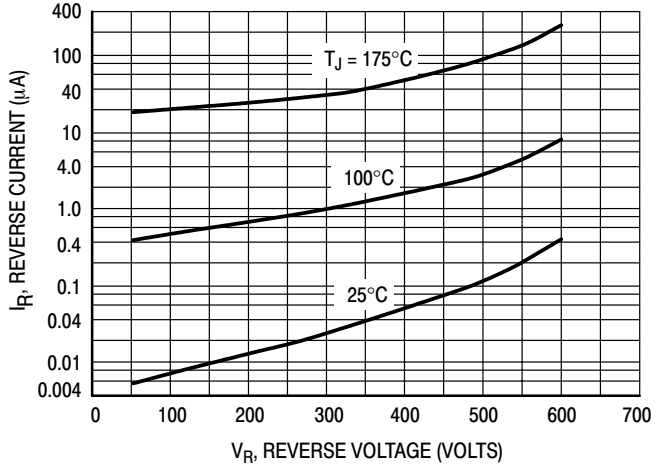


Figure 7. Typical Reverse Current\*

\* 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  $V_R$ .

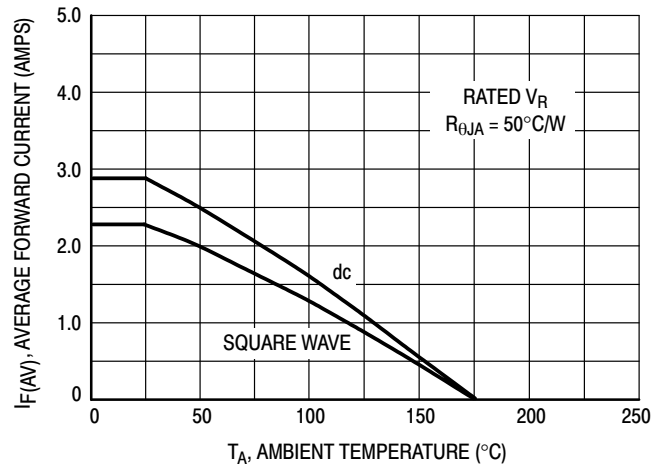


Figure 8. Current Derating  
(Mounting Method #3 Per Note 1)

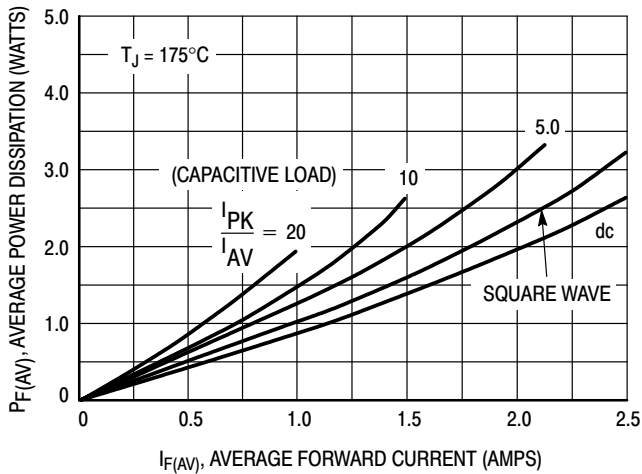


Figure 9. Power Dissipation

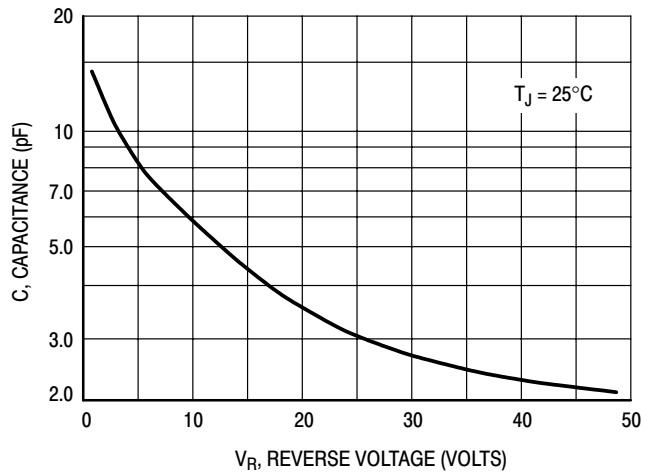


Figure 10. Typical Capacitance

# MUR120 Series

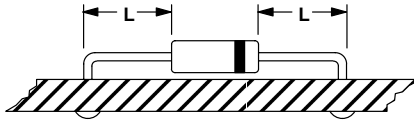
## NOTE 1. — AMBIENT MOUNTING DATA

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.

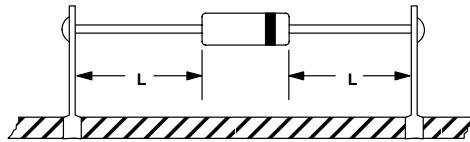
### TYPICAL VALUES FOR $R_{\theta JA}$ IN STILL AIR

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

#### MOUNTING METHOD 1

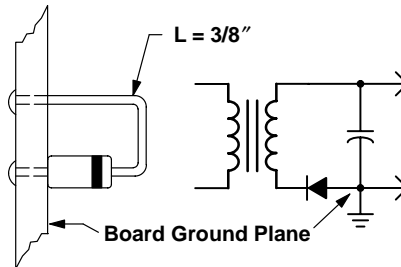


#### MOUNTING METHOD 2



#### Vector Pin Mounting

#### MOUNTING METHOD 3

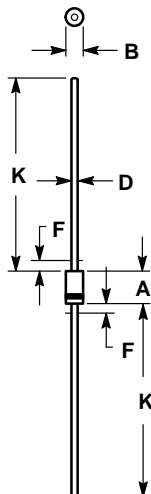


#### P.C. Board with 1-1/2" X 1-1/2" Copper Surface

# MUR120 Series

## PACKAGE DIMENSIONS

### AXIAL LEAD CASE 59-10 ISSUE S




#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 59-04 OBSOLETE, NEW STANDARD 59-09.
4. 59-03 OBSOLETE, NEW STANDARD 59-10.
5. ALL RULES AND NOTES ASSOCIATED WITH JEDEC DO-41 OUTLINE SHALL APPLY
6. POLARITY DENOTED BY CATHODE BAND.
7. 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	---

SWITCHMODE is a trademark of Semiconductor Components Industries, LLC.

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

#### PUBLICATION ORDERING INFORMATION

##### LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor  
P.O. Box 61312, Phoenix, Arizona 85082-1312 USA  
Phone: 480-829-7710 or 800-344-3860 Toll Free USA/Canada  
Fax: 480-829-7709 or 800-344-3867 Toll Free USA/Canada  
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free  
USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center  
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051  
Phone: 81-3-5773-3850

ON Semiconductor Website: <http://onsemi.com>

Order Literature: <http://www.onsemi.com/litorder>

For additional information, please contact your local Sales Representative.