

# Switch-mode Power Rectifier

**60 V, 40 A**

## MBR40L60CTG

### Features and Benefits

- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capability
- 40 A Total (20 A Per Diode Leg)
- Guard-Ring for Stress Protection
- This Device is Pb-Free and is RoHS Compliant

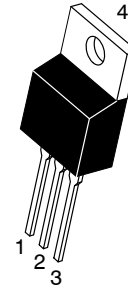
### Applications

- Power Supply – Output Rectification
- Power Management
- Instrumentation

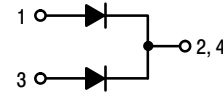
### Mechanical Characteristics:

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

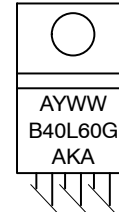
## SCHOTTKY BARRIER RECTIFIER 40 AMPERES, 60 VOLTS



TO-220  
CASE 221A  
STYLE 6



### MARKING DIAGRAM



A	= Assembly Location
Y	= Year
WW	= Work Week
B40L60	= Device Code
G	= Pb-Free Device
AKA	= Polarity Designator

### ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

# MBR40L60CTG

## MAXIMUM RATINGS (Per Diode Leg)

Symbol	Rating	Value	Unit
V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	60	V
I <sub>F(AV)</sub>	Average Rectified Forward Current (Per Leg) (Rated V <sub>R</sub> ) T <sub>C</sub> = 130°C (Per Device)	20 40	A
I <sub>FSM</sub>	Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	240	A
T <sub>J</sub>	Operating Junction Temperature (Note 1)	-55 to +150	°C
T <sub>stg</sub>	Storage Temperature	-65 to +175	°C
	ESD Ratings: Machine Model = C Human Body Model = 3B	> 400 > 8000	V

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. The heat generated must be less than the thermal conductivity from Junction-to-Ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ .

## THERMAL CHARACTERISTICS

Symbol	Characteristic	Value	Unit
R <sub>θJC</sub> R <sub>θJA</sub>	Maximum Thermal Resistance Junction-to-Case Junction-to-Ambient	1.8 70	°C/W

## ELECTRICAL CHARACTERISTICS (Per Diode Leg)

Symbol	Characteristic	Typ	Max	Unit
V <sub>F</sub>	Maximum Instantaneous Forward Voltage (Note 2) (I <sub>F</sub> = 20 A, T <sub>C</sub> = 25°C) (I <sub>F</sub> = 20 A, T <sub>C</sub> = 125°C) (I <sub>F</sub> = 40 A, T <sub>C</sub> = 25°C) (I <sub>F</sub> = 40 A, T <sub>C</sub> = 125°C)	0.56 0.53 0.75 0.69	0.61 0.58 0.81 0.74	V
i <sub>R</sub>	Maximum Instantaneous Reverse Current (Note 2) (Rated DC Voltage, T <sub>C</sub> = 25°C) (Rated DC Voltage, T <sub>C</sub> = 125°C)	210 95	550 175	μA mA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

# MBR40L60CTG

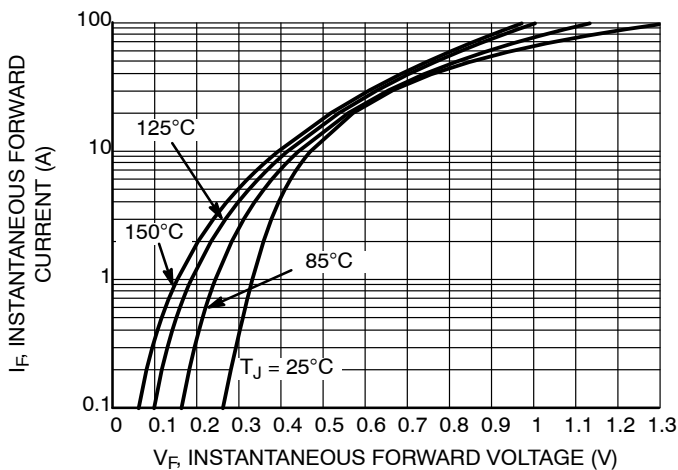


Figure 1. Typical Forward Voltage

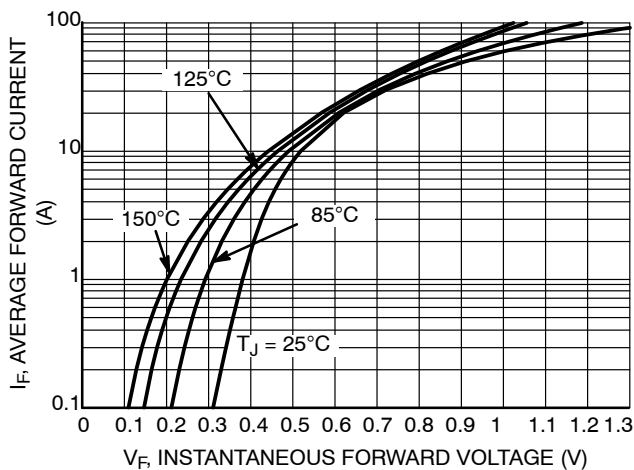


Figure 2. Maximum Forward Voltage

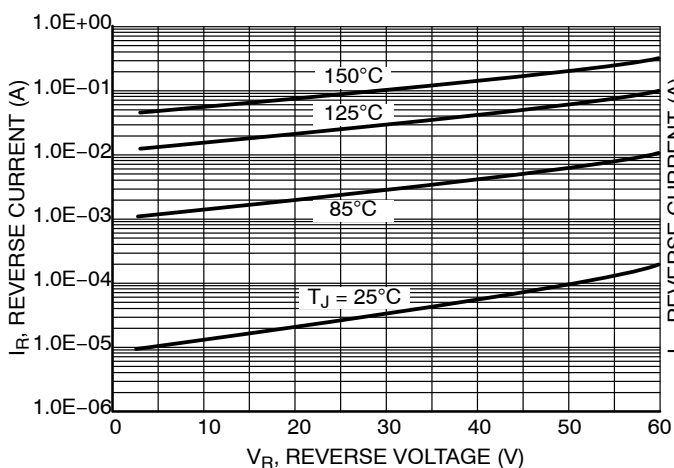


Figure 3. Typical Reverse Current

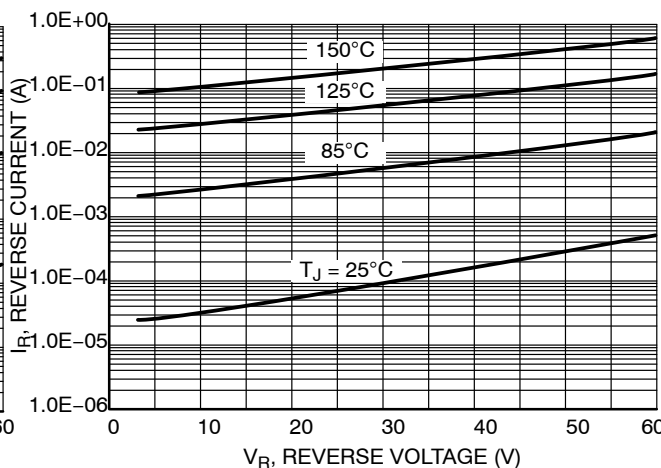


Figure 4. Maximum Reverse Current

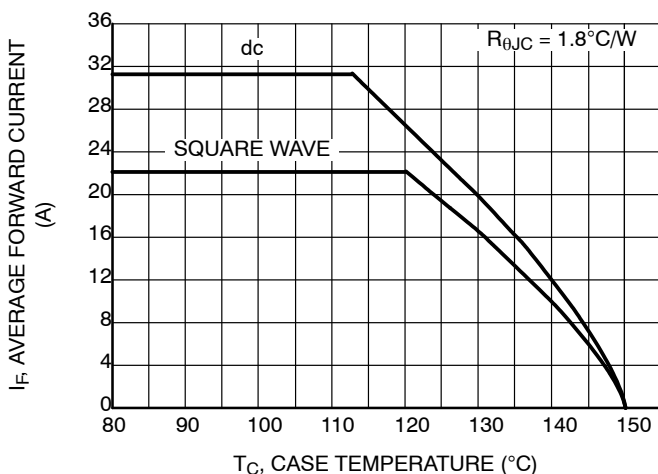


Figure 5. Current Derating, Case per Leg

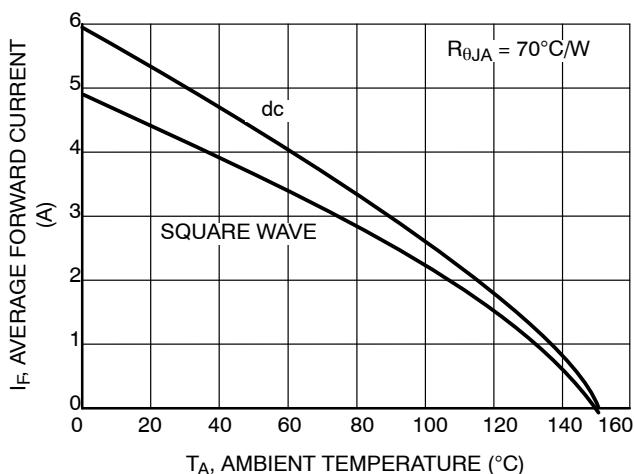


Figure 6. Current Derating, Ambient per Leg

# MBR40L60CTG

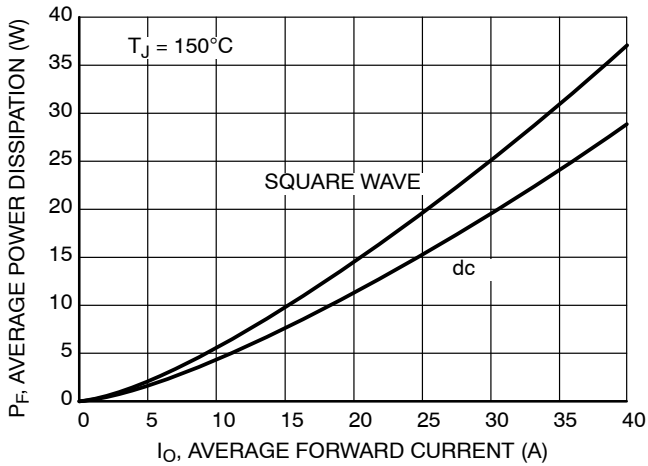


Figure 7. Forward Power Dissipation

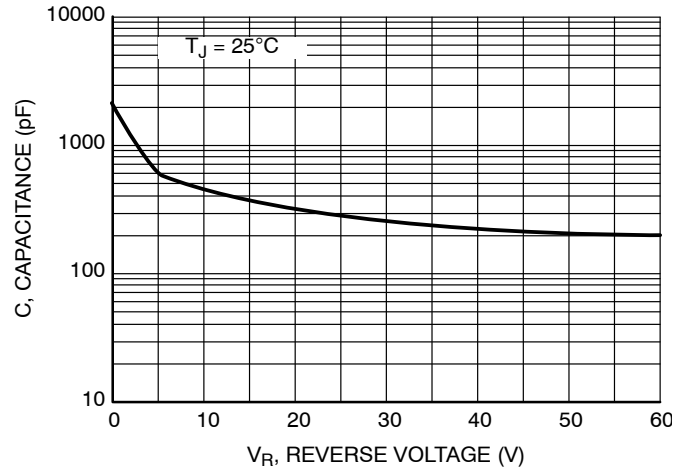


Figure 8. Capacitance

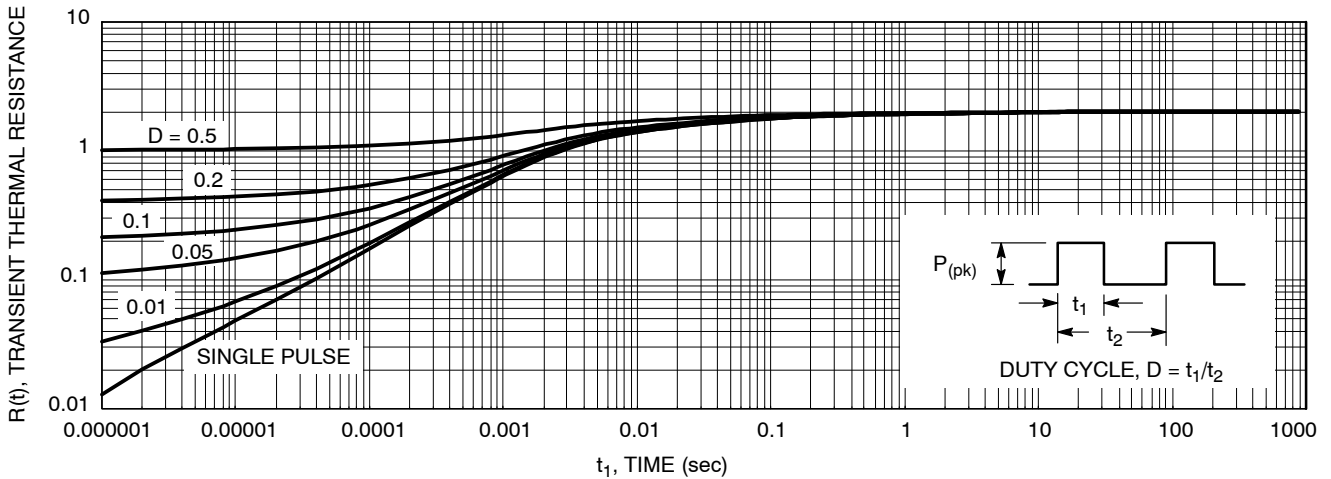


Figure 9. Thermal Response Junction-to-Case for MBR40L60CT

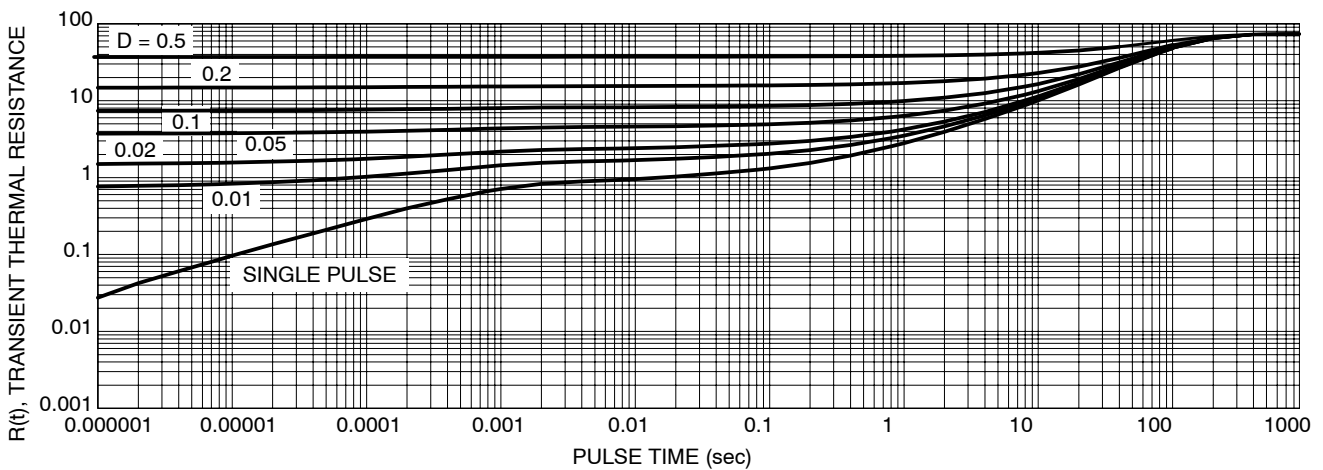
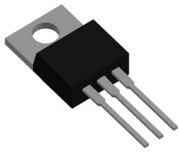


Figure 10. Thermal Response Junction-to-Ambient for MBR40L60CT

# MBR40L60CTG

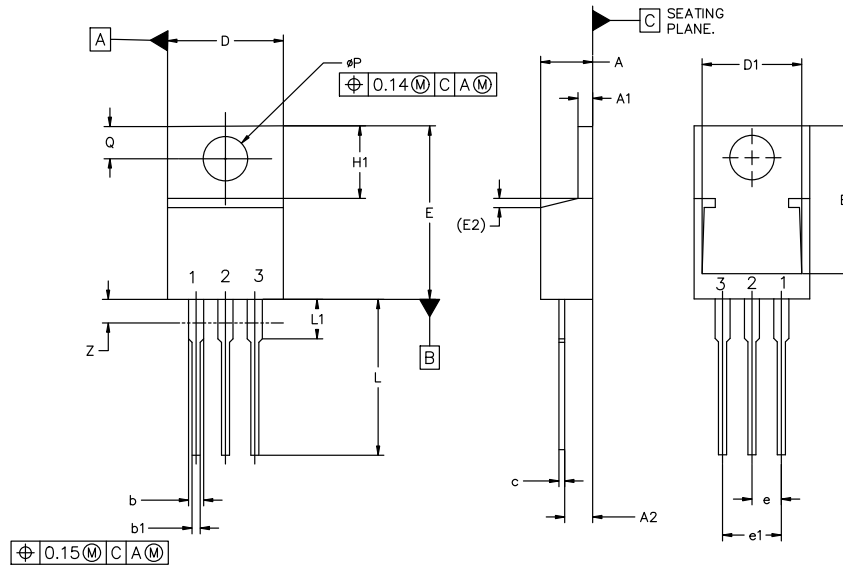
## DEVICE ORDERING INFORMATION

Device Order Number	Package Type	Shipping
MBR40L60CTG	TO-220 (Pb-Free)	50 Units / Rail



TO-220-3 10.10x15.12x4.45, 2.54P  
CASE 221A  
ISSUE AL

DATE 05 FEB 2025



MILLIMETERS			
DIM	MIN	NOM	MAX
A	4.07	4.45	4.83
A1	1.15	1.28	1.41
A2	2.04	2.42	2.79
b	1.15	1.34	1.52
b1	0.64	0.80	0.96
c	0.36	0.49	0.61
D	9.66	10.10	10.53
D1	8.43	8.63	8.83
E	14.48	15.12	15.75
E1	12.58	12.78	12.98
E2	1.27 REF		

MILLIMETERS			
DIM	MIN	NOM	MAX
e	2.42	2.54	2.66
e1	4.83	5.08	5.33
H1	5.97	6.22	6.47
L	12.70	13.49	14.27
L1	2.80	3.45	4.10
Q	2.54	2.79	3.04
φP	3.60	3.85	4.09
Z	---	---	3.48

- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
  2. CONTROLLING DIMENSION: MILLIMETERS.
  3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

- |  |  |   |  |
|--|--|---|--|
| <p>STYLE 1:<br/>PIN 1. BASE<br/>2. COLLECTOR<br/>3. EMITTER<br/>4. COLLECTOR</p> | <p>STYLE 2:<br/>PIN 1. BASE<br/>2. EMITTER<br/>3. COLLECTOR<br/>4. EMITTER</p> | <p>STYLE 3:<br/>PIN 1. CATHODE<br/>2. ANODE<br/>3. GATE<br/>4. ANODE</p>    | <p>STYLE 4:<br/>PIN 1. MAIN TERMINAL 1<br/>2. MAIN TERMINAL 2<br/>3. GATE<br/>4. MAIN TERMINAL 2</p> |
| <p>STYLE 5:<br/>PIN 1. GATE<br/>2. DRAIN<br/>3. SOURCE<br/>4. DRAIN</p>          | <p>STYLE 6:<br/>PIN 1. ANODE<br/>2. CATHODE<br/>3. ANODE<br/>4. CATHODE</p>    | <p>STYLE 7:<br/>PIN 1. CATHODE<br/>2. ANODE<br/>3. CATHODE<br/>4. ANODE</p> | <p>STYLE 8:<br/>PIN 1. CATHODE<br/>2. ANODE<br/>3. EXTERNAL TRIP/DELAY<br/>4. ANODE</p>              |
| <p>STYLE 9:<br/>PIN 1. GATE<br/>2. COLLECTOR<br/>3. EMITTER<br/>4. COLLECTOR</p> | <p>STYLE 10:<br/>PIN 1. GATE<br/>2. SOURCE<br/>3. DRAIN<br/>4. SOURCE</p>      | <p>STYLE 11:<br/>PIN 1. DRAIN<br/>2. SOURCE<br/>3. GATE<br/>4. SOURCE</p>   | <p>STYLE 12:<br/>PIN 1. MAIN TERMINAL 1<br/>2. MAIN TERMINAL 2<br/>3. GATE<br/>4. NOT CONNECTED</p>  |

<b>DOCUMENT NUMBER:</b>	<b>98ASB42148B</b>	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
<b>DESCRIPTION:</b>	<b>TO-220-3 10.10x15.12x4.45, 2.54P</b>	<b>PAGE 1 OF 1</b>

onsemi and ONSEMI are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi 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. onsemi does not convey any license under its patent rights nor the rights of others.

**onsemi**, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** 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. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** 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. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** 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 **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## ADDITIONAL INFORMATION

### TECHNICAL PUBLICATIONS:

Technical Library: [www.onsemi.com/design/resources/technical-documentation](http://www.onsemi.com/design/resources/technical-documentation)  
onsemi Website: [www.onsemi.com](http://www.onsemi.com)

### ONLINE SUPPORT: [www.onsemi.com/support](http://www.onsemi.com/support)

For additional information, please contact your local Sales Representative at [www.onsemi.com/support/sales](http://www.onsemi.com/support/sales)