

# MBRD1035CTL Series, SBRD81035CTL Series

## Switch Mode Schottky Power Rectifier

### DPAK Power Surface Mount Package

The MBRD1035CTL employs the Schottky Barrier principle in a large area metal-to-silicon power diode. State of the art geometry features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency switching power supplies, free wheeling diode and polarity protection diodes.

#### Features

- Highly Stable Oxide Passivated Junction
- Guardring for Stress Protection
- Matched Dual Die Construction –  
May be Paralleled for High Current Output
- High dv/dt Capability
- Short Heat Sink Tap Manufactured – Not Sheared
- Very Low Forward Voltage Drop
- Epoxy Meets UL 94 V-0 @ 0.125 in
- SBRD8 Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free and are RoHS Compliant\*

#### 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: 260°C Max. for 10 Seconds
- ESD Rating:
  - ◆ Human Body Model = 3B (> 8 kV)
  - ◆ Machine Model = C (> 400 V)

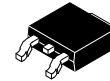
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



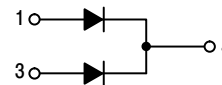
ON Semiconductor®

<http://onsemi.com>

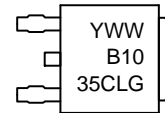
**SCHOTTKY BARRIER  
RECTIFIER  
10 AMPERES  
35 VOLTS**



DPAK  
CASE 369C



#### MARKING DIAGRAM



Y = Year  
WW = Work Week  
B1035CL = Device Code  
G = Pb-Free Package

#### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

## MBRD1035CTL Series, SBRD81035CTL Series

### MAXIMUM RATINGS

| Rating  | Symbol                          | Value       | Unit             |
|---|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                                      | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 35          | V                |
| Average Rectified Forward Current<br>(At Rated $V_R$ , $T_C = 115^\circ\text{C}$ )<br>Per Leg<br>Per Package                | $I_O$                           | 5.0<br>10   | A                |
| Peak Repetitive Forward Current<br>(At Rated $V_R$ , Square Wave, 20 kHz, $T_C = 115^\circ\text{C}$ )<br>Per Leg            | $I_{FRM}$                       | 10          | A                |
| Non-Repetitive Peak Surge Current<br>(Surge applied at rated load conditions, halfwave, single phase, 60 Hz)<br>Per Package | $I_{FSM}$                       | 50          | A                |
| Storage / Operating Case Temperature  | $T_{stg}, T_C$                  | -55 to +150 | $^\circ\text{C}$ |
| Operating Junction Temperature (Note 1)   | $T_J$                           | -55 to +150 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated $V_R$ , $T_J = 25^\circ\text{C}$ )  | dv/dt                           | 10,000      | V/ $\mu\text{s}$ |

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

| Rating  | Symbol          | Value | Unit                      |
|---|-----------------|-------|---------------------------|
| Thermal Resistance, Junction-to-Case<br>Per Leg             | $R_{\theta JC}$ | 3.0   | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Ambient (Note 2)<br>Per Leg | $R_{\theta JA}$ | 137   | $^\circ\text{C}/\text{W}$ |

2. Rating applies when using minimum pad size, FR4 PC Board

### ELECTRICAL CHARACTERISTICS

| Rating   | Symbol | Value                        | Unit |
|--|--------|------------------------------|------|
| Maximum Instantaneous Forward Voltage (Note 3) (See Figure 2)<br>Per Leg<br>( $I_F = 5$ Amps, $T_J = 25^\circ\text{C}$ )<br>( $I_F = 5$ Amps, $T_J = 100^\circ\text{C}$ )<br>( $I_F = 10$ Amps, $T_J = 25^\circ\text{C}$ )<br>( $I_F = 10$ Amps, $T_J = 100^\circ\text{C}$ ) | $V_F$  | 0.47<br>0.41<br>0.56<br>0.55 | V    |
| Maximum Instantaneous Reverse Current (Note 3) (See Figure 4)<br>Per Leg<br>( $V_R = 35$ V, $T_J = 25^\circ\text{C}$ )<br>( $V_R = 35$ V, $T_J = 100^\circ\text{C}$ )<br>( $V_R = 17.5$ V, $T_J = 25^\circ\text{C}$ )<br>( $V_R = 17.5$ V, $T_J = 100^\circ\text{C}$ )       | $I_R$  | 2.0<br>30<br>0.20<br>5.0     | 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.

3. Pulse Test: Pulse Width  $\leq 250 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

# MBRD1035CTL Series, SBRD81035CTL Series

## ORDERING INFORMATION

| Device           | Package           | Shipping†                 |
|------------------|-------------------|---------------------------|
| MBRD1035CTLG     | DPAK<br>(Pb-Free) | 75 Units / Rail           |
| SBRD81035CTLG*   |                   | 75 Units / Rail           |
| MBRD1035CTLT4G   |                   | 2,500 Units / Tape & Reel |
| SBRD81035CTLT4G* |                   | 2,500 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.

\*SBRD8 Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

## TYPICAL CHARACTERISTICS

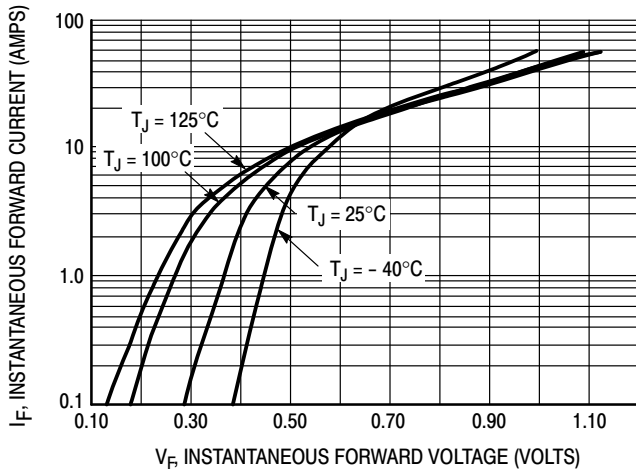


Figure 1. Typical Forward Voltage Per Leg

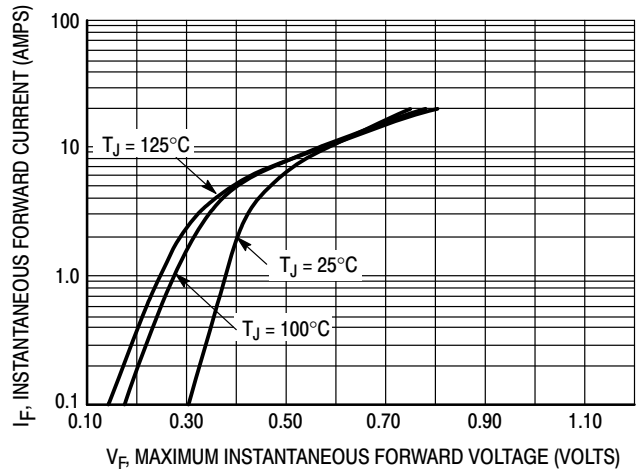


Figure 2. Maximum Forward Voltage Per Leg

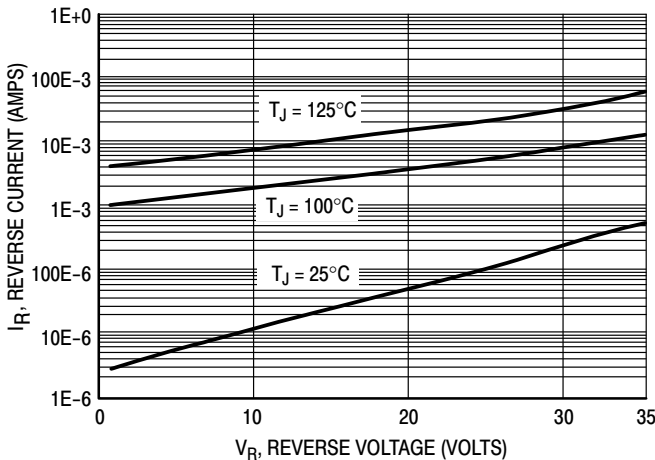


Figure 3. Typical Reverse Current Per Leg

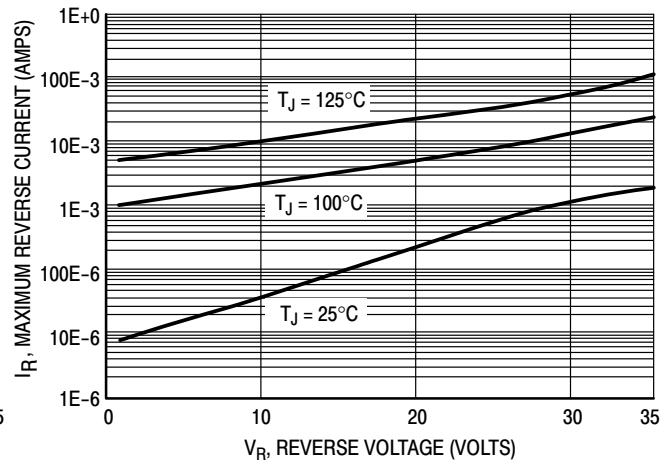


Figure 4. Maximum Reverse Current Per Leg

# MBRD1035CTL Series, SBRD81035CTL Series

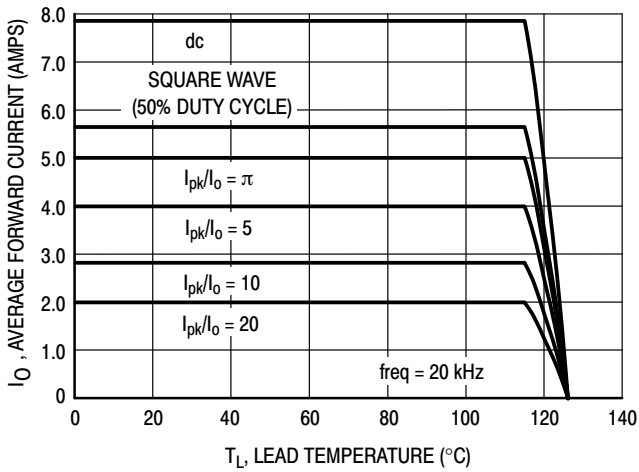


Figure 5. Current Derating Per Leg

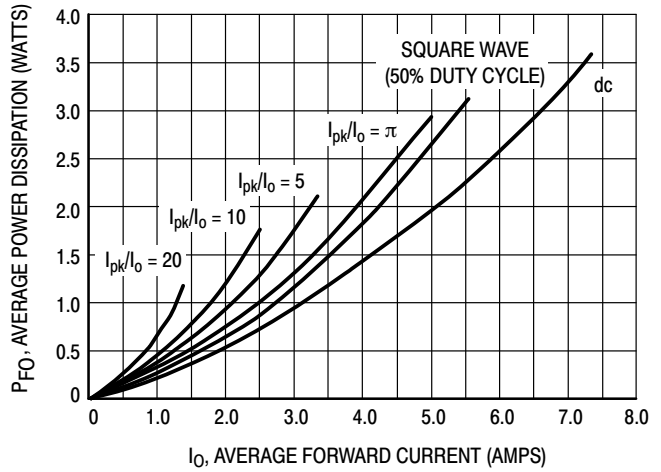


Figure 6. Forward Power Dissipation Per Leg

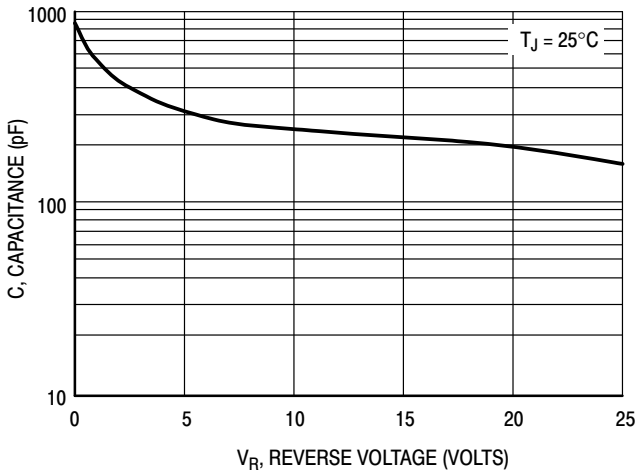


Figure 7. Capacitance Per Leg

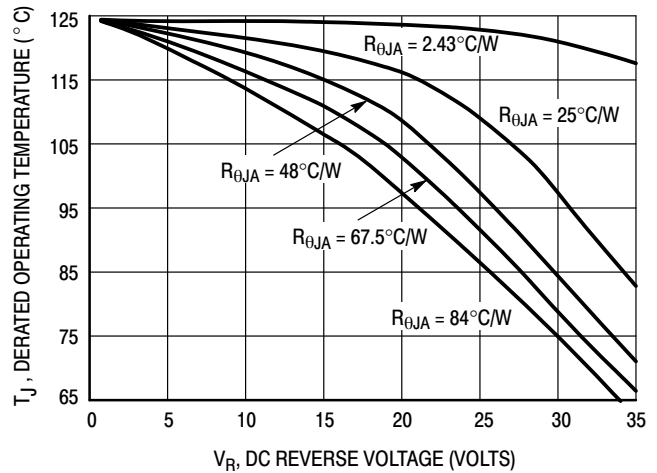


Figure 8. Typical Operating Temperature Derating Per Leg \*

\* Reverse power dissipation and the possibility of thermal runaway must be considered when operating this device under any reverse voltage conditions. Calculations of  $T_J$  therefore must include forward and reverse power effects. The allowable operating  $T_J$  may be calculated from the equation:

$$T_J = T_{Jmax} - r(t)(P_f + P_r) \text{ where}$$

$r(t)$  = thermal impedance under given conditions,  
 $P_f$  = forward power dissipation, and  
 $P_r$  = reverse power dissipation

This graph displays the derated allowable  $T_J$  due to reverse bias under DC conditions only and is calculated as  $T_J = T_{Jmax} - r(t)P_r$ , where  $r(t) = R_{thja}$ . For other power applications further calculations must be performed.

# MBRD1035CTL Series, SBRD81035CTL Series

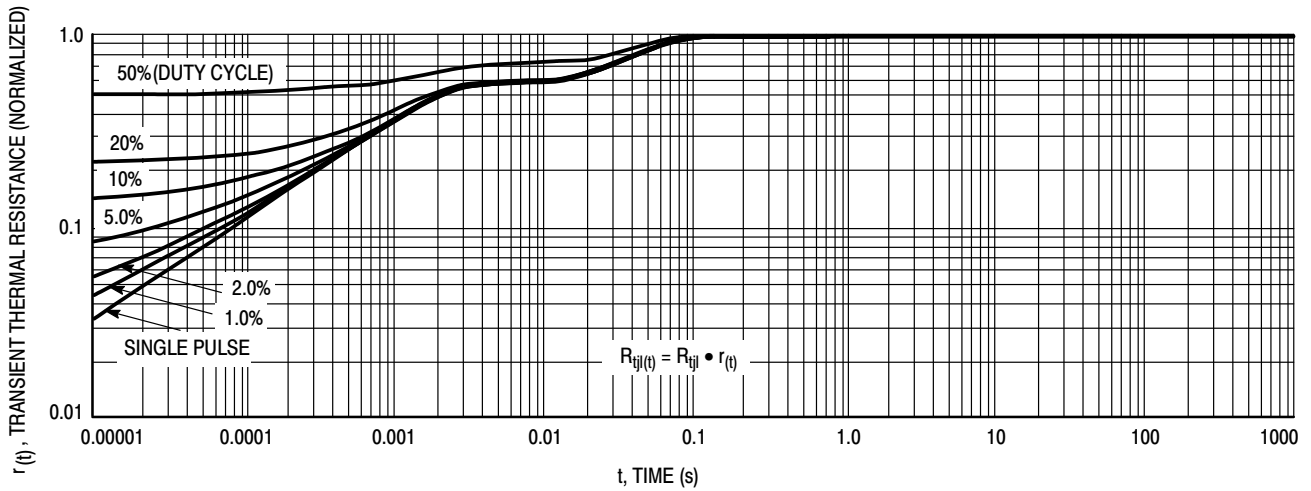


Figure 9. Thermal Response Junction to Case (Per Leg)

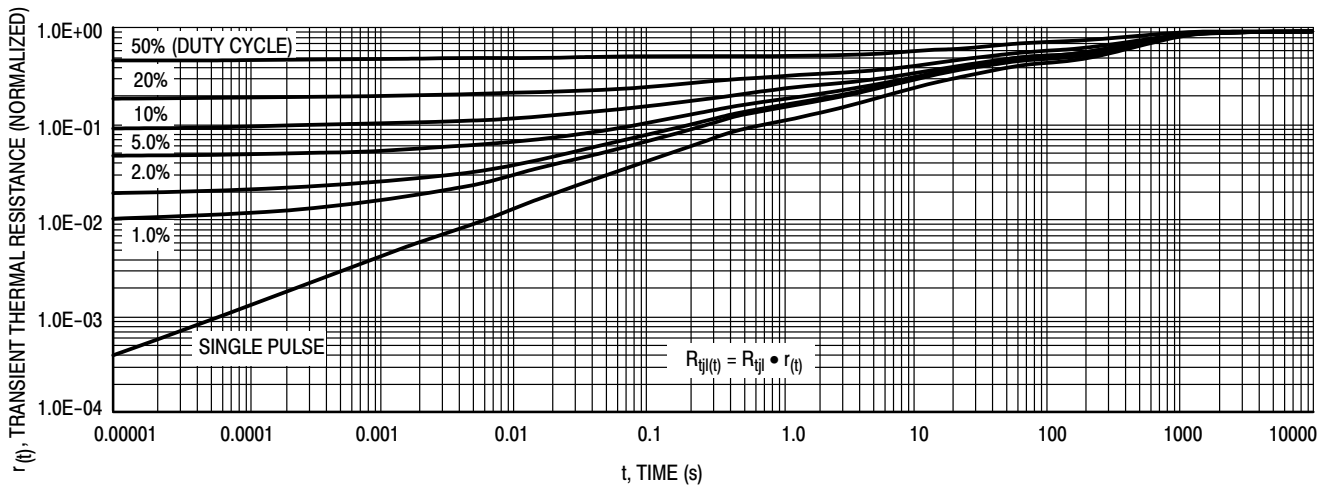
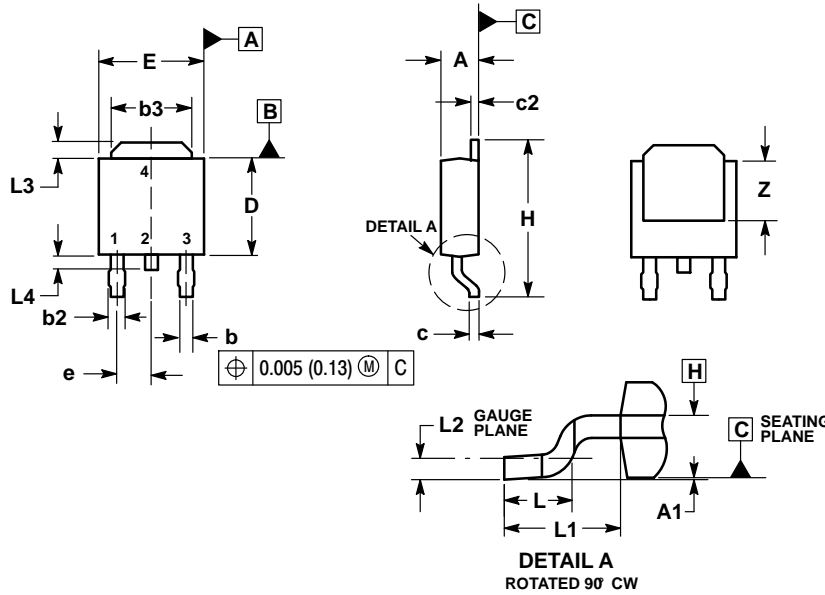


Figure 10. Thermal Response Junction to Ambient (Per Leg)

# MBRD1035CTL Series, SBRD81035CTL Series

## PACKAGE DIMENSIONS

### DPAK (SINGLE GAUGE) CASE 369C ISSUE D

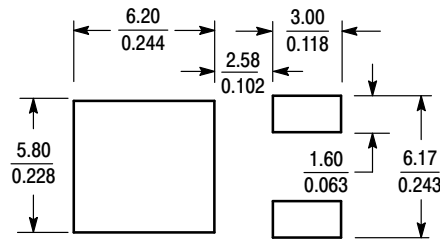


#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS b3, L3 and Z.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
5. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
6. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.086     | 0.094 | 2.18        | 2.38  |
| A1  | 0.000     | 0.005 | 0.00        | 0.13  |
| b   | 0.025     | 0.035 | 0.63        | 0.89  |
| b2  | 0.030     | 0.045 | 0.76        | 1.14  |
| b3  | 0.180     | 0.215 | 4.57        | 5.46  |
| c   | 0.018     | 0.024 | 0.46        | 0.61  |
| c2  | 0.018     | 0.024 | 0.46        | 0.61  |
| D   | 0.235     | 0.245 | 5.97        | 6.22  |
| E   | 0.250     | 0.265 | 6.35        | 6.73  |
| e   | 0.090 BSC |       | 2.29 BSC    |       |
| H   | 0.370     | 0.410 | 9.40        | 10.41 |
| L   | 0.055     | 0.070 | 1.40        | 1.78  |
| L1  | 0.108 REF |       | 2.74 REF    |       |
| L2  | 0.020 BSC |       | 0.51 BSC    |       |
| L3  | 0.035     | 0.050 | 0.89        | 1.27  |
| L4  | ---       | 0.040 | ---         | 1.01  |
| Z   | 0.155     | ---   | 3.93        | ---   |

### SOLDERING FOOTPRINT\*



SCALE 3:1  $\left( \frac{\text{mm}}{\text{inches}} \right)$

\*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 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 5163, Denver, Colorado 80217 USA  
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
Email: orderlit@onsemi.com

**N. American Technical Support:** 800-282-9855 Toll Free  
USA/Canada  
**Europe, Middle East and Africa Technical Support:**  
Phone: 421 33 790 2910  
**Japan Customer Focus Center**  
Phone: 81-3-5817-1050

**ON Semiconductor Website:** [www.onsemi.com](http://www.onsemi.com)  
**Order Literature:** <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[ON Semiconductor:](#)

[MBRD1035CTLG](#) [MBRD1035CTLT4G](#) [SBRD81035CTLG](#)