

MBR4015LWT

SWITCHMODE™ Schottky Power Rectifier TO247 Power Package

This device employs the Schottky Barrier principle in a large area metal-to-silicon power rectifier. Features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency switching power supplies; free wheeling diodes and polarity protection diodes.

Features

- Highly Stable Oxide Passivated Junction
- Guardring for Overvoltage Protection
- Low Forward Voltage Drop
- Dual Diode Construction; Terminals 1 and 3 May Be Connected for Parallel Operation at Full Rating.
- Full Electrical Isolation without Additional Hardware
- Pb-Free Package is Available*

Mechanical Characteristics

- Case: Molded Epoxy
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight: 4.3 Grams (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

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	15	V
Working Peak Reverse Voltage	V_{RWM}		
DC Blocking Voltage	V_R		
Average Rectified Forward Current (At Rated V_R , $T_C = 120^\circ\text{C}$)	I_O	20 40	A Per Leg Per Package
Peak Repetitive Forward Current, (At Rated V_R , Square Wave, 20 kHz, $T_C = 95^\circ\text{C}$)	I_{FRM}	40	A Per Leg
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) Per Package	I_{FSM}	120	A
Storage/Operating Case Temperature	T_{stg}, T_C	-55 to +150	°C
Operating Junction Temperature (Note 1)	T_J	-55 to +150	°C
Voltage Rate of Change, (Rated V_R , $T_J = 25^\circ\text{C}$)	dv/dt	10,000	V/ μs

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.

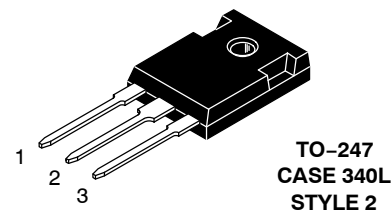
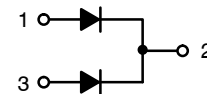
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



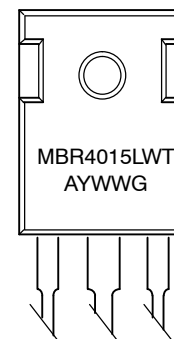
ON Semiconductor®

<http://onsemi.com>

SCHOTTKY BARRIER RECTIFIER 40 AMPERES, 15 VOLTS



MARKING DIAGRAM



MBR4015LWT = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
G = Pb-Free Package

ORDERING INFORMATION

Device	Package	Shipping
MBR4015LWT	TO-247	30 Units / Rail
MBR4015LWTG	TO-247 (Pb-Free)	30 Units / Rail

MBR4015LWT

THERMAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.57	$^{\circ}C/W$
Junction-to-Ambient	$R_{\theta JA}$	55	$^{\circ}C/W$

ELECTRICAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Maximum Instantaneous Forward Voltage (Note 2), See Figure 2 Per Leg ($I_F = 20$ A) ($I_F = 40$ A)	V_F	$T_J = 25^{\circ}C$	V
		$T_J = 100^{\circ}C$	
Maximum Instantaneous Reverse Current (Note 2), See Figure 4 Per Leg ($V_R = 15$ V) ($V_R = 7.5$ V)	I_R	$T_J = 25^{\circ}C$	mA
		$T_J = 100^{\circ}C$	

- The heat generated must be less than the thermal conductivity from Junction-to-Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.
- Pulse Test: Pulse Width ≤ 250 μs , Duty Cycle $\leq 2\%$.

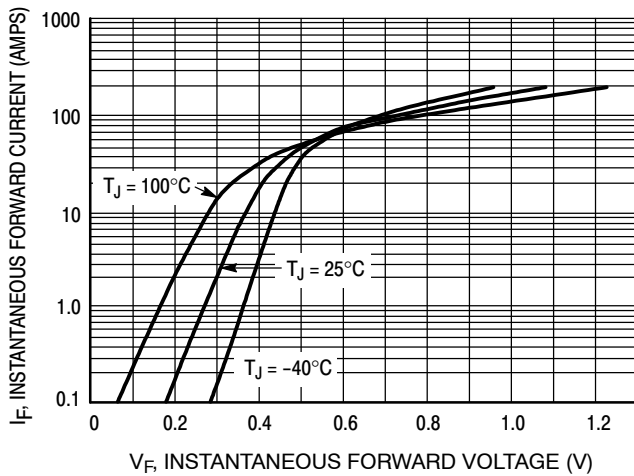


Figure 1. Typical Forward Voltage Per Leg

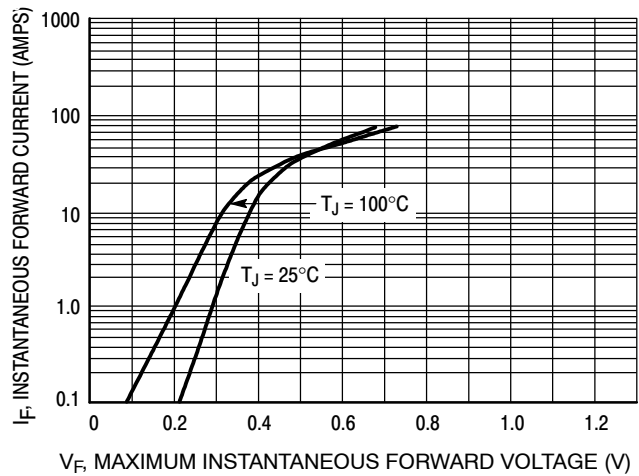


Figure 2. Maximum Forward Voltage Per Leg

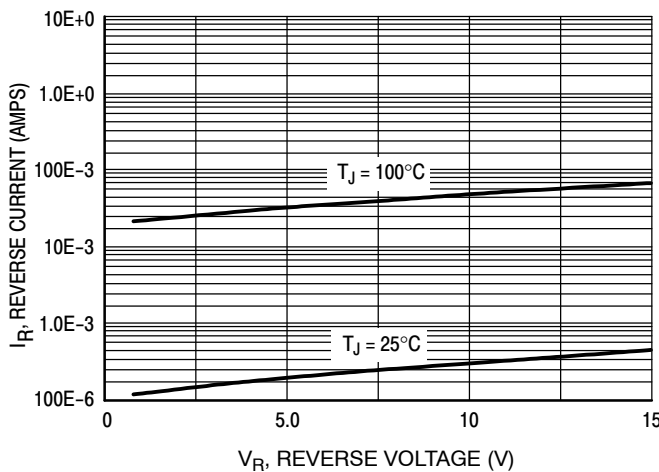


Figure 3. Typical Reverse Current Per Leg

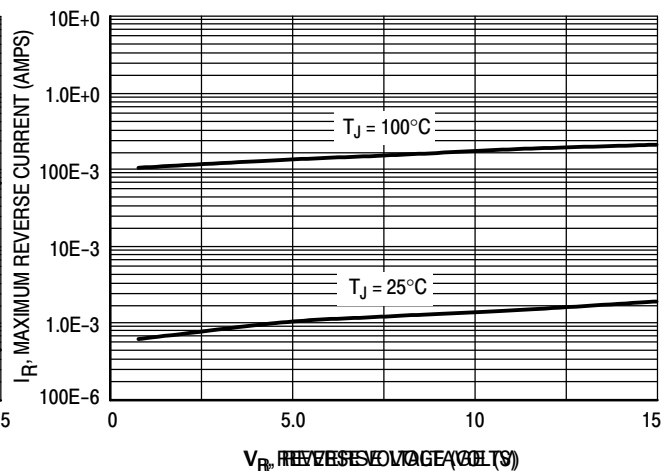


Figure 4. Maximum Reverse Current Per Leg

MBR4015LWT

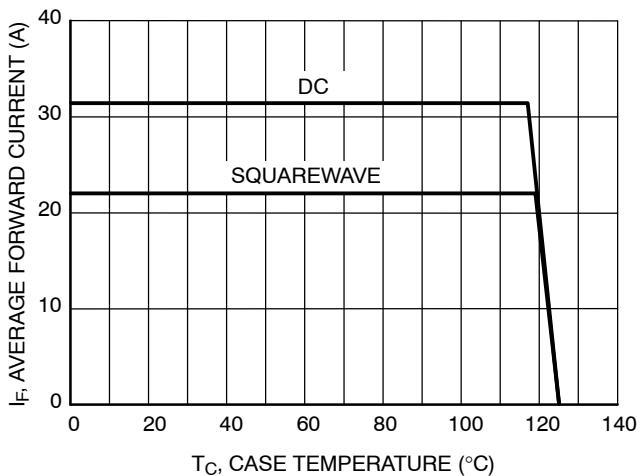


Figure 5. Current Derating Per Leg

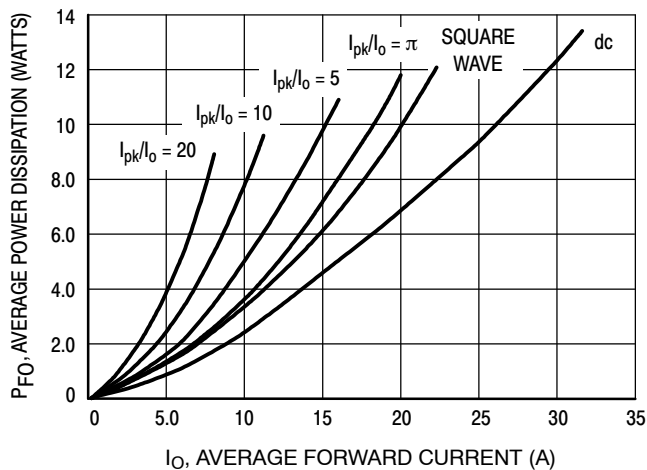


Figure 6. Forward Power Dissipation Per Leg

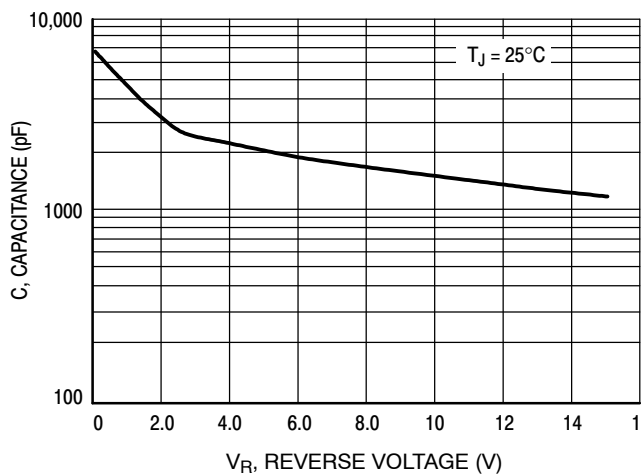


Figure 7. Capacitance Per Leg

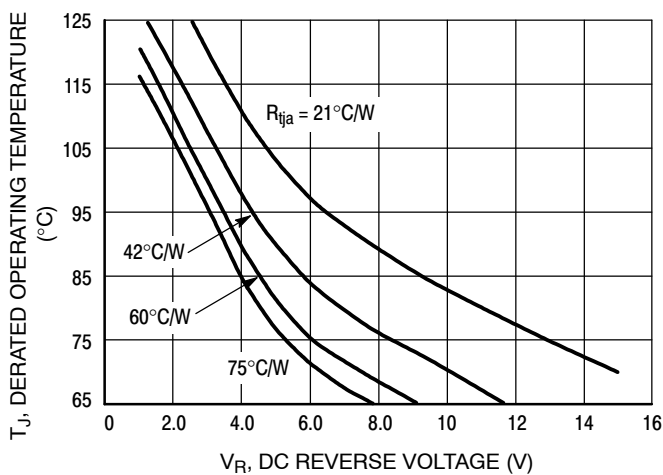


Figure 8. Typical Operating Temperature Derating Per Leg*

*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: $T_J = T_{Jmax} - r(t)(P_f + P_r)$ 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.

MBR4015LWT

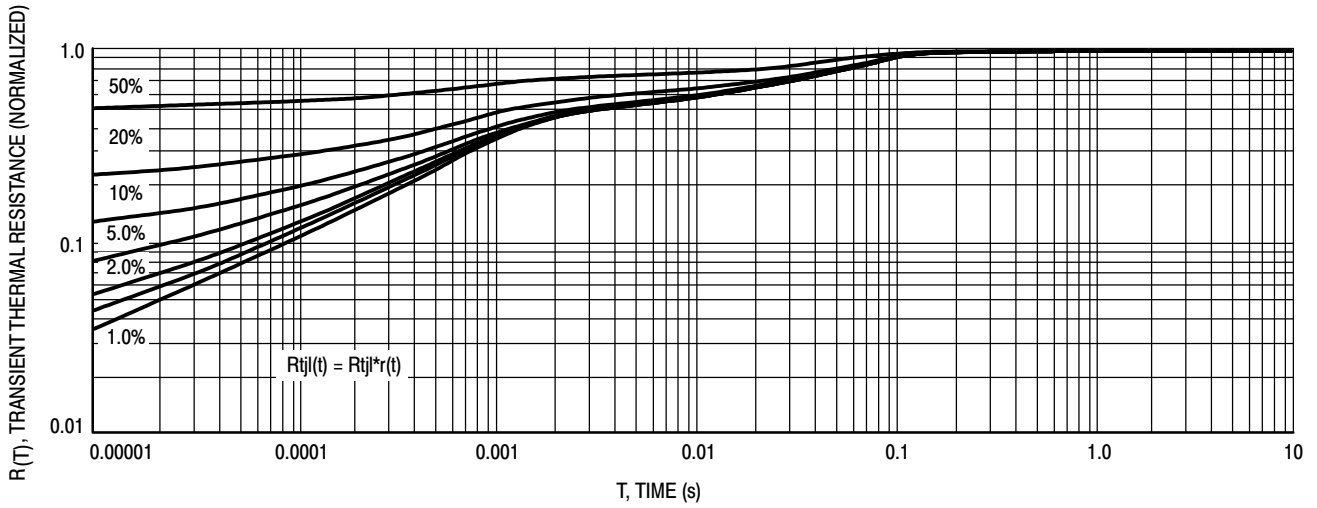


Figure 9. Thermal Response Junction to Lead (Per Leg)

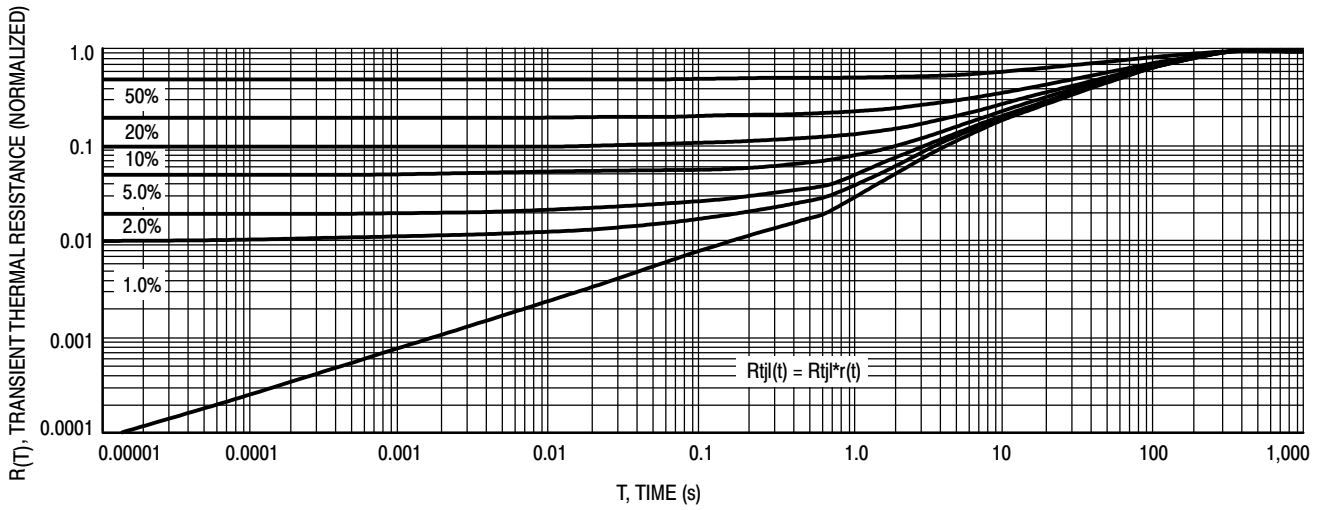
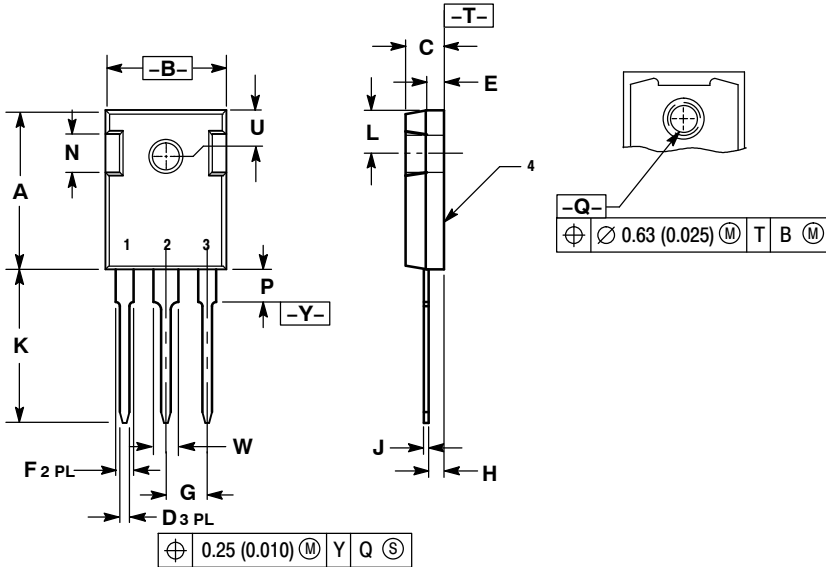


Figure 10. Thermal Response Junction to Ambient (Per Leg)

MBR4015LWT

PACKAGE DIMENSIONS

TO-247
CASE 340L-02
ISSUE E



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	20.32	21.08	0.800	0.830
B	15.75	16.26	0.620	0.640
C	4.70	5.30	0.185	0.209
D	1.00	1.40	0.040	0.055
E	1.90	2.60	0.075	0.102
F	1.65	2.13	0.065	0.084
G	5.45 BSC		0.215 BSC	
H	1.50	2.49	0.059	0.098
J	0.40	0.80	0.016	0.031
K	19.81	20.83	0.780	0.820
L	5.40	6.20	0.212	0.244
N	4.32	5.49	0.170	0.216
P	---	4.50	---	0.177
Q	3.55	3.65	0.140	0.144
U	6.15 BSC		0.242 BSC	
W	2.87	3.12	0.113	0.123

- STYLE 2:
PIN 1. ANODE
2. CATHODE (S)
3. ANODE 2
4. CATHODES (S)

SWITCHMODE is a trademark of Semiconductor Components Industries, LLC.

ON Semiconductor and **ON** 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: 81-3-5773-3850

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative

www.BDTIC.com/ON/ MBR4015LWT/D