

# MBR4015LWT

## SWITCHMODE™ Schottky Power Rectifier

### TO247 Power Package

Employing 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.

- 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

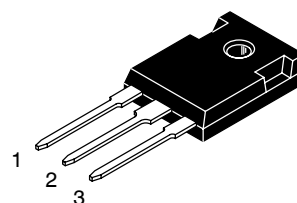
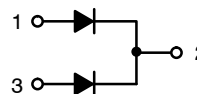
- Case: Molded Epoxy
- Epoxy Meets UL 94, V-O at 0.125
- Weight: 4.3 grams (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped in 30 Units Per Plastic Tube
- Marking: B4015L



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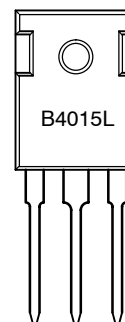
<http://onsemi.com>

### SCHOTTKY BARRIER RECTIFIER 40 AMPERES 15 VOLTS



TO-247  
CASE 340L  
STYLE 2

#### MARKING DIAGRAM



B4015L = Device Code

#### ORDERING INFORMATION

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

\*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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## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	15	V
Average Rectified Forward Current (At Rated $V_R$ , $T_C = 120^\circ\text{C}$ ) Per Leg Per Package	$I_O$	20 40	A
Peak Repetitive Forward Current, (At Rated $V_R$ , Square Wave, 20 kHz, $T_C = 95^\circ\text{C}$ ) Per Leg	$I_{FRM}$	40	A
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 +125	$^\circ\text{C}$
Operating Junction Temperature	$T_J$	-55 to +125	$^\circ\text{C}$
Voltage Rate of Change (Rated $V_R$ , $T_J = 25^\circ\text{C}$ )	dv/dt	10,000	V/ $\mu\text{s}$

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

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

## ELECTRICAL CHARACTERISTICS

Rating	Symbol	Value		Unit
Maximum Instantaneous Forward Voltage (Note 1), See Figure 2 Per Leg  ( $I_F = 20\text{ A}$ ) ( $I_F = 40\text{ A}$ )	$V_F$	$T_J = 25^\circ\text{C}$	$T_J = 100^\circ\text{C}$	V
		0.42	0.36	
		0.50	0.48	
Maximum Instantaneous Reverse Current (Note 1), See Figure 4 Per Leg  ( $V_R = 15\text{ V}$ ) ( $V_R = 7.5\text{ V}$ )	$I_R$	$T_J = 25^\circ\text{C}$	$T_J = 100^\circ\text{C}$	mA
		5.0	530	
		2.7	370	

1. Pulse Test: Pulse Width  $\leq 250\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

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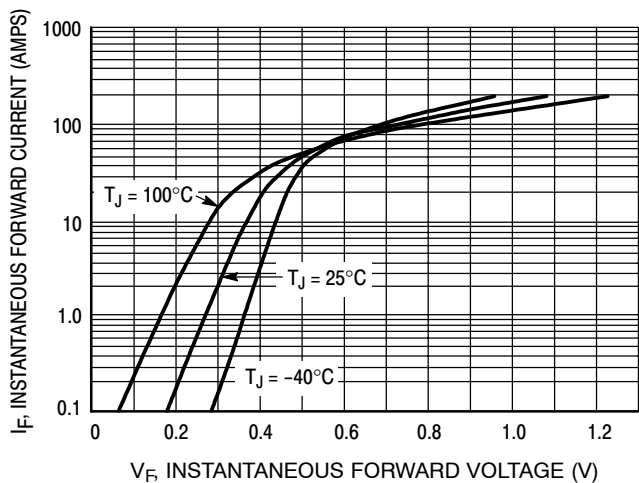


Figure 1. Typical Forward Voltage Per Leg

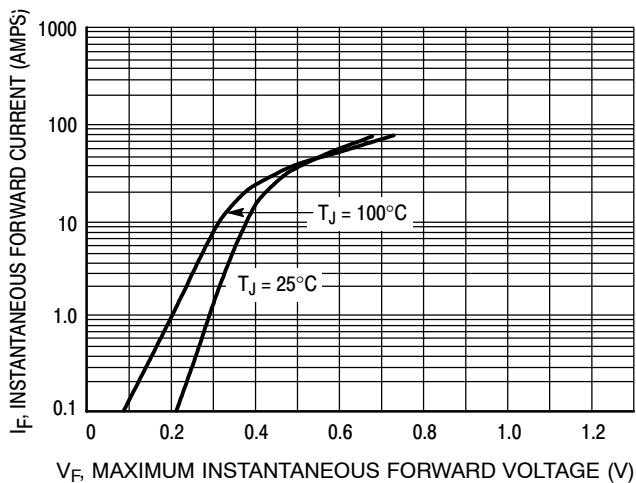


Figure 2. Maximum Forward Voltage Per Leg

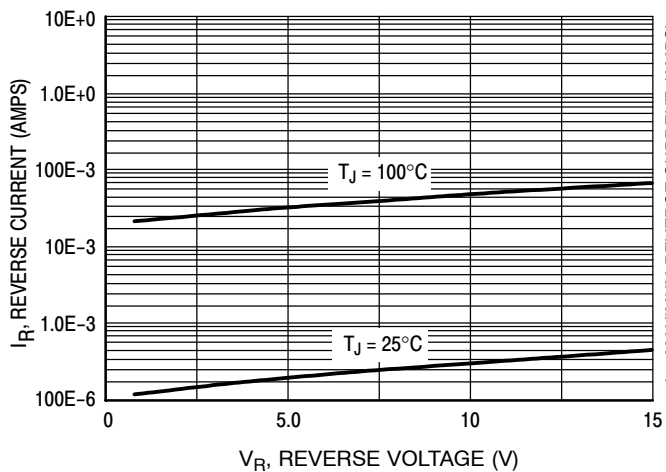


Figure 3. Typical Reverse Current Per Leg

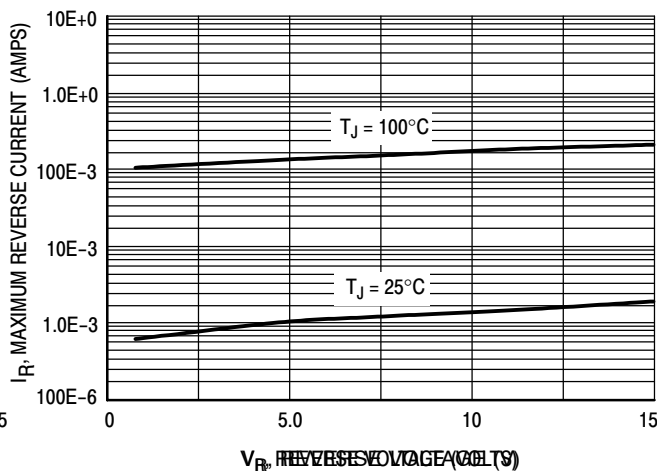


Figure 4. Maximum Reverse Current Per Leg

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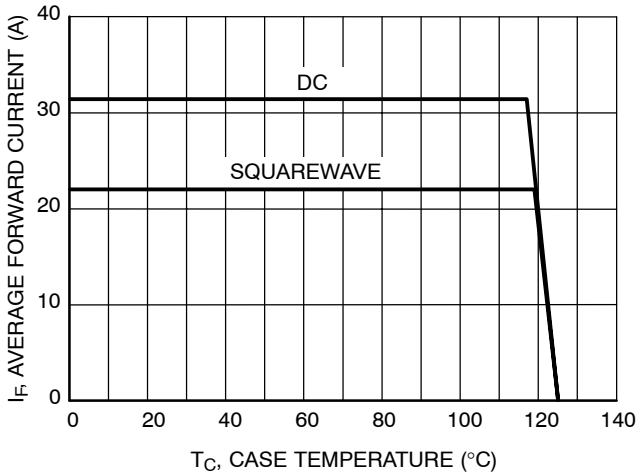


Figure 5. Current Derating Per Leg

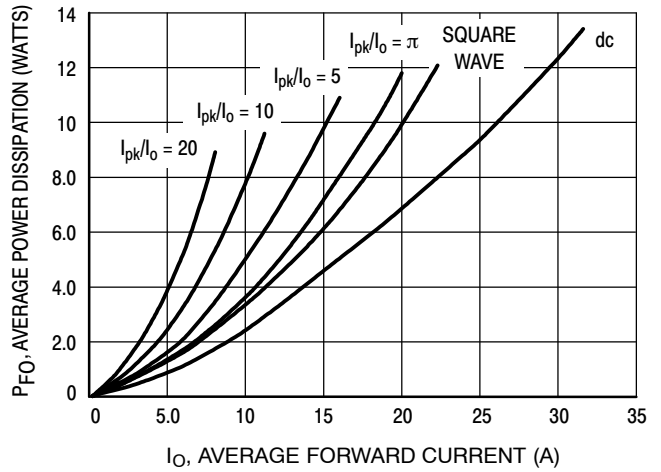


Figure 6. Forward Power Dissipation Per Leg

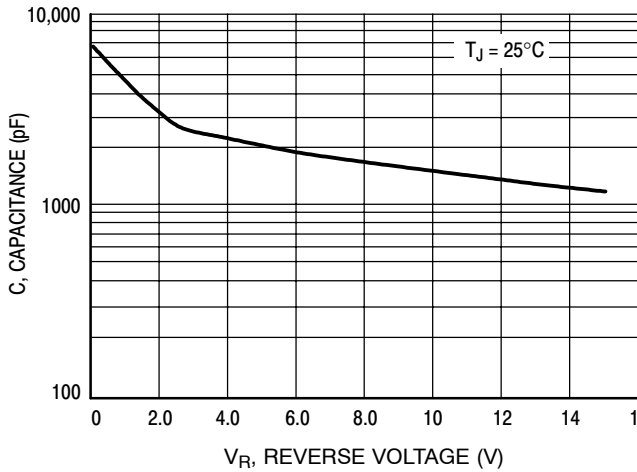


Figure 7. Capacitance Per Leg

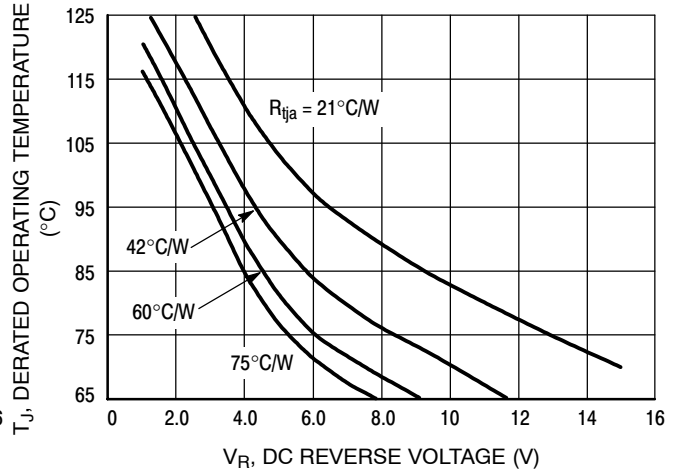


Figure 8. Typical Operating Temperature Derating Per Leg\*

\*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.

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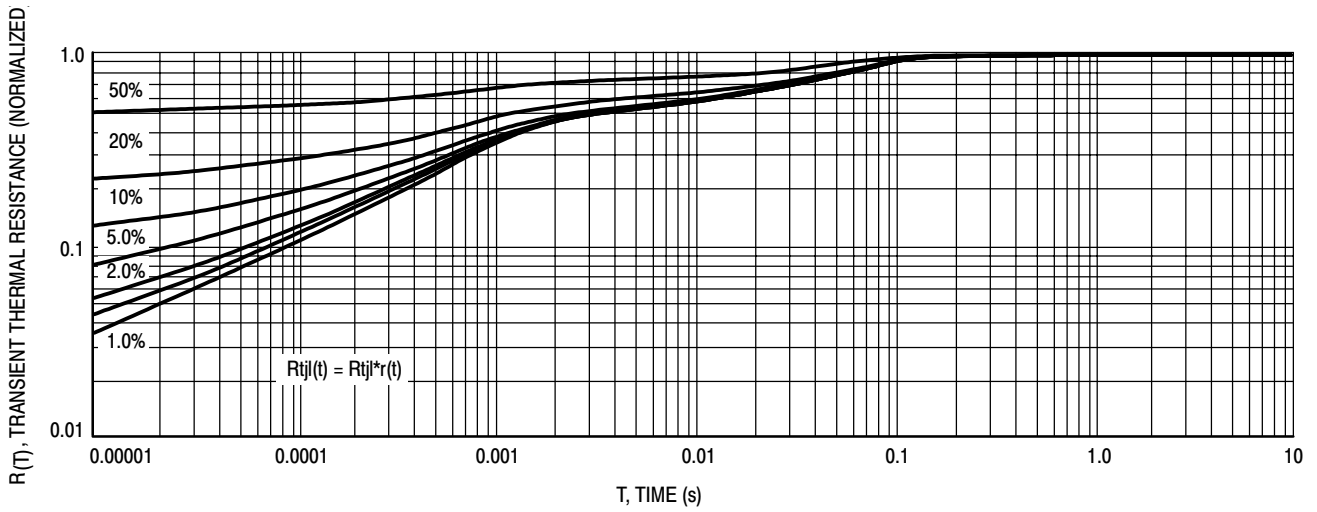


Figure 9. Thermal Response Junction to Lead (Per Leg)

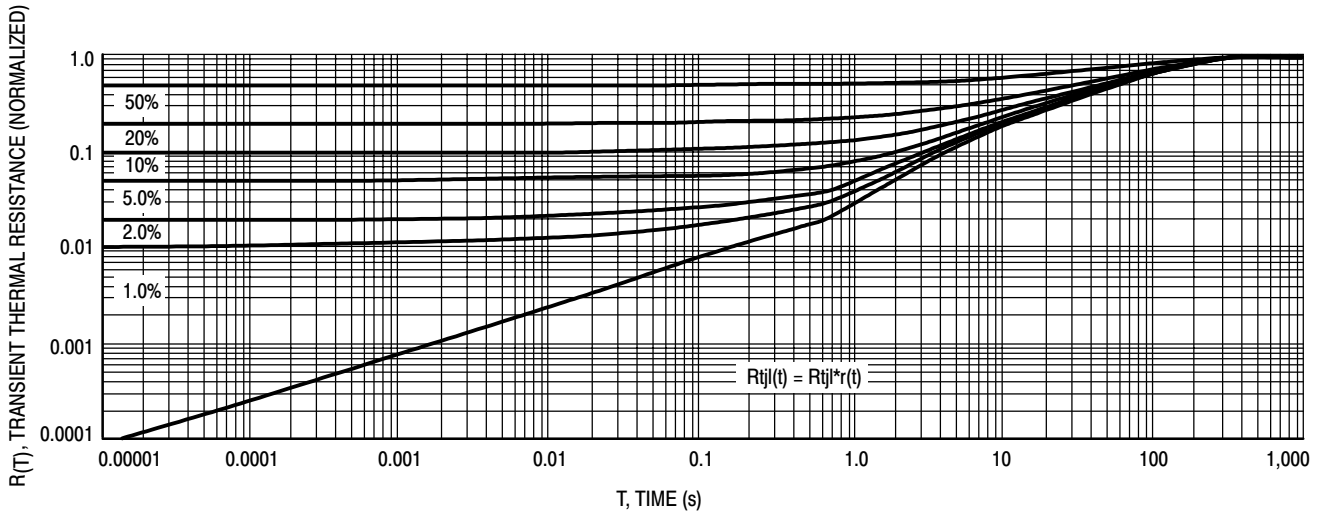


Figure 10. Thermal Response Junction to Ambient (Per Leg)

