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 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°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°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 +150	°C
Operating Junction Temperature (Note 1)	T_J	−55 to +150	°C
Voltage Rate of Change, (Rated V_R, T_J = 25°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.

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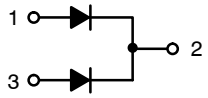
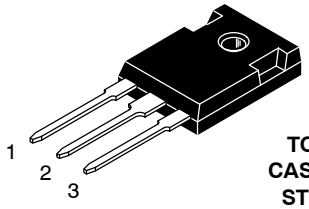
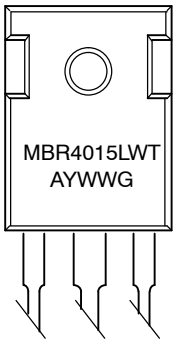
SCHOTTKY BARRIER RECTIFIER 40 AMPERES, 15 VOLTS





TO−247
CASE 340L
STYLE 2

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

Publication Order Number:
MBR4015LWT/D

THERMAL CHARACTERISTICS

Rating		Symbol	Value	Unit
Thermal Resistance, Junction−to−Case	Per Leg	$R_{\theta JC}$	0.57	°C/W
Junction−to−Ambient	Per Leg	$R_{\theta JA}$	55	

ELECTRICAL CHARACTERISTICS

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

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

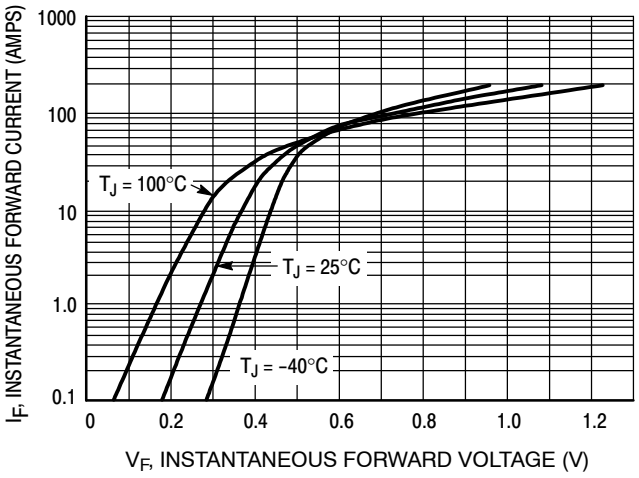


Figure 1. Typical Forward Voltage Per Leg

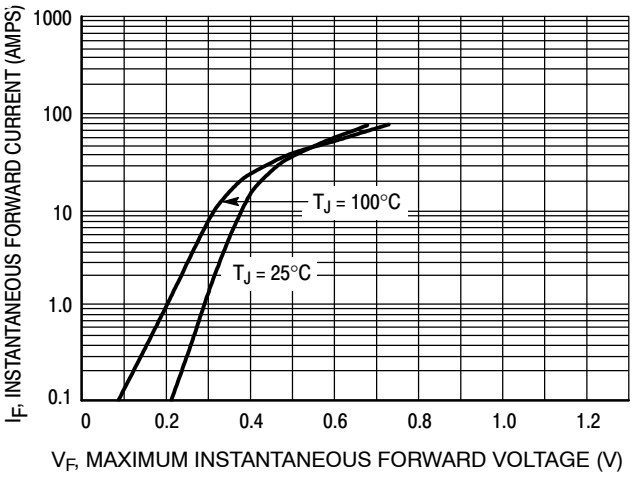


Figure 2. Maximum Forward Voltage Per Leg

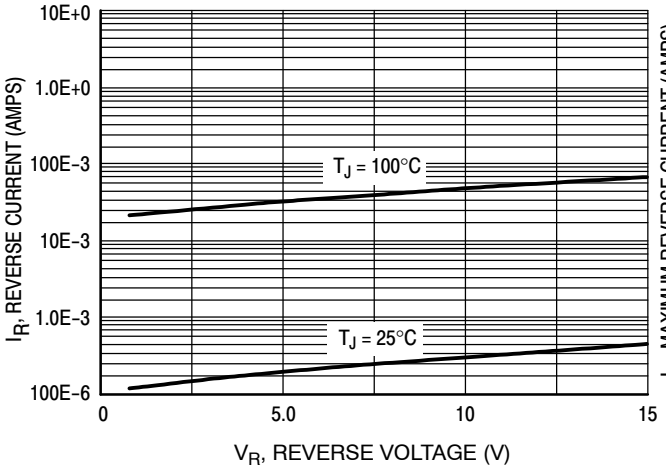


Figure 3. Typical Reverse Current Per Leg

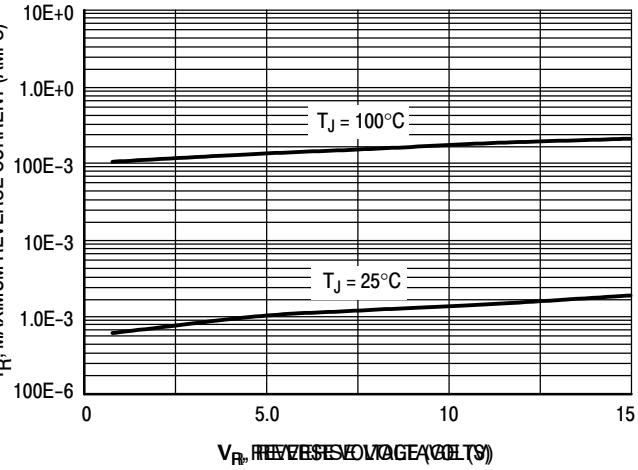


Figure 4. Maximum Reverse Current Per Leg

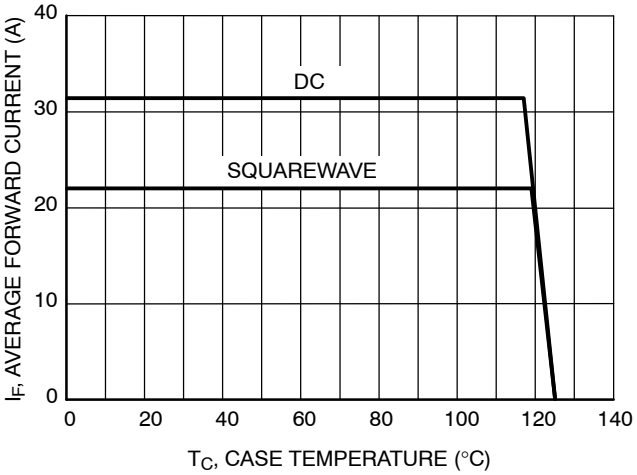


Figure 5. Current Derating Per Leg

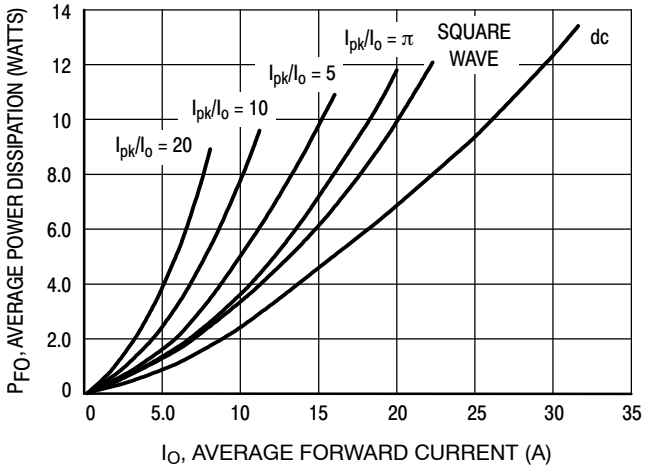


Figure 6. Forward Power Dissipation Per Leg

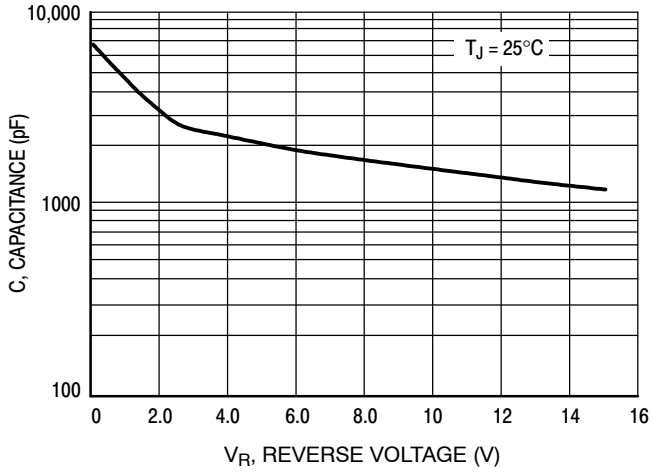


Figure 7. Capacitance Per Leg

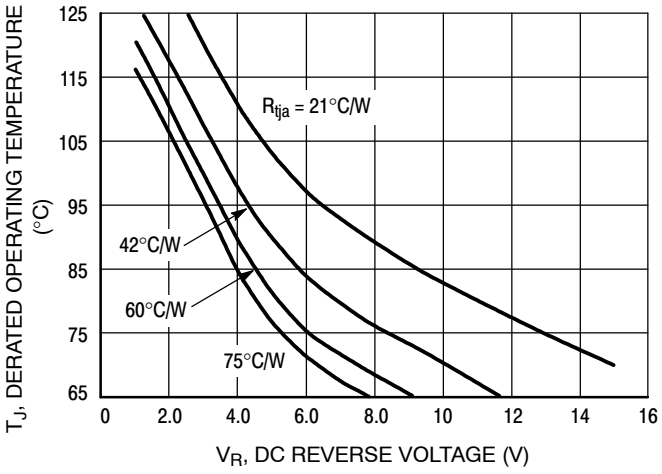


Figure 8. Typical Operating Temperature Derating Per Leg*

*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: $T_J = T_{Jmax} - r(t)(Pf + Pr)$ where
r(t) = thermal impedance under given conditions,
Pf = forward power dissipation, and
Pr = reverse power dissipation
This graph displays the derated allowable T_J due to reverse bias under DC conditions only and is calculated as $T_J = T_{Jmax} - r(t)Pr$, where r(t) = Rthja. For other power applications further calculations must be performed.

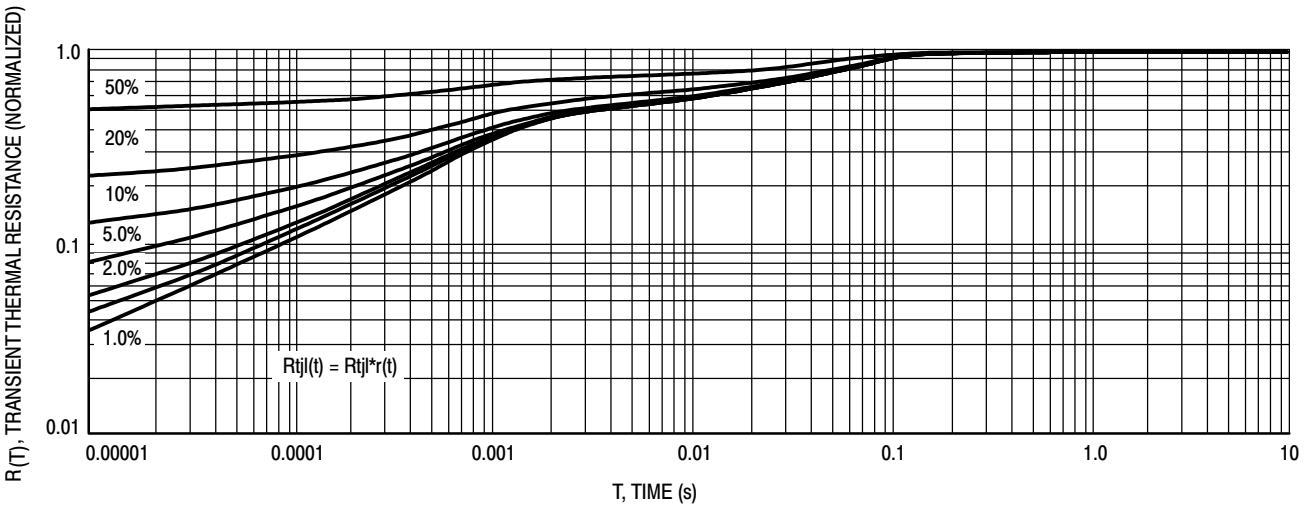


Figure 9. Thermal Response Junction to Lead (Per Leg)

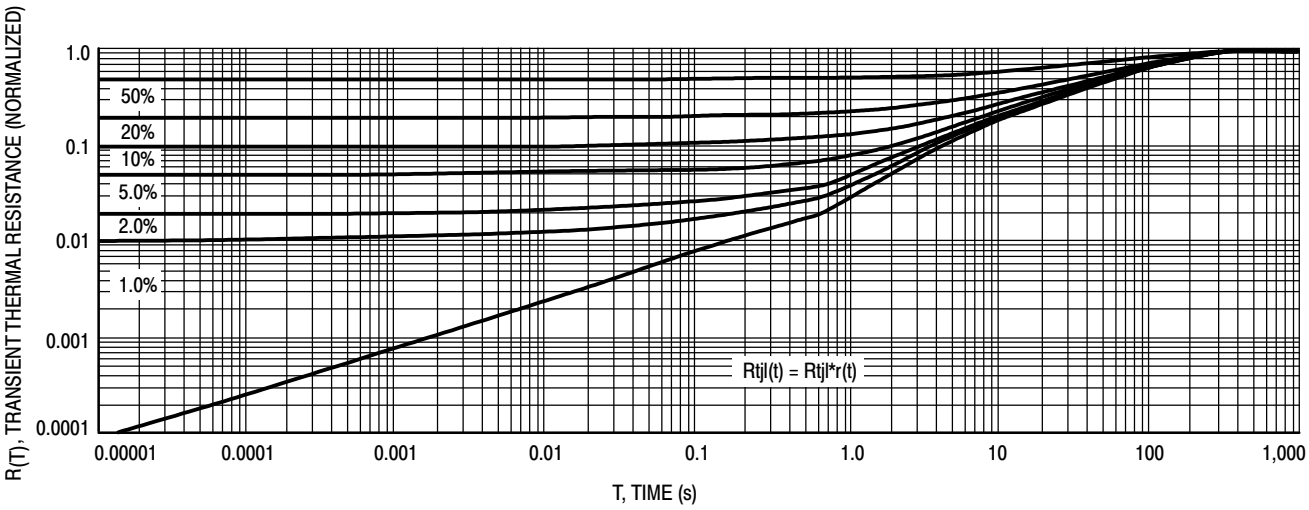
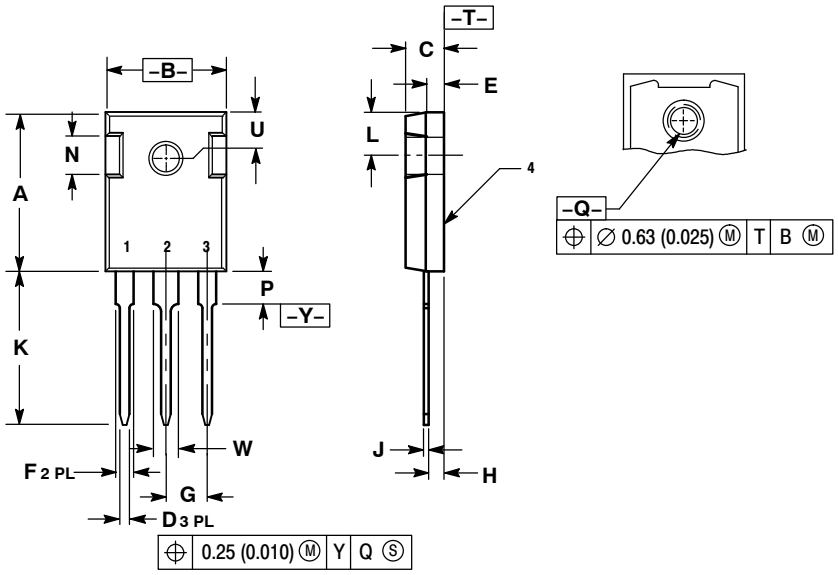


Figure 10. Thermal Response Junction to Ambient (Per Leg)

PACKAGE DIMENSIONS

TO−247
CASE 340L−02
ISSUE E



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

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	20.32	21.08	0.800	8.30
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)

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PUBLICATION ORDERING INFORMATION

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