Bulletin PD-20623 rev. B 10/06

International
IOR Rectifier

# MBR40L15CW

## SCHOTTKY RECTIFIER

## 2 x 20 Amps

$I_{F(AV)}$ = 40Amp
$V_R$ = 15V

### Major Ratings and Characteristics

| Characteristics | Value | Units |
|---|---|---|
| $I_{F(AV)}$ Rectangular waveform | 40 | A |
| $V_{RRM}$ | 15 | V |
| $I_{FSM}$ @ tp = 5 µs sine | 700 | A |
| $V_F$ @ 20Apk, $T_J$=125°C (per leg, Typical) | 0.26 | V |
| $T_J$ | - 55 to 125 | °C |

### Description/ Features

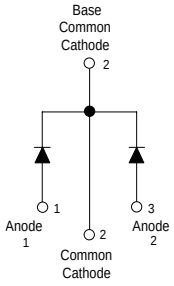
The MBR40L15CW center tap Schottky rectifier module has been optimized for ultra low forward voltage drop specifically for the OR-ing of parallel power supplies. The proprietary barrier technology allows for reliable operation up to 125 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

- 125°C $T_J$ operation ($V_R$ < 5V)
- Center tap module
- Optimized for OR-ing applications
- Ultra low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance

## Case Styles



TO-247AC



## Voltage Ratings

| | Part number | MBR40L15CW |
|---|---|---|
| $V_R$ | Max. DC Reverse Voltage (V) @ $T_J$ = 100 °C | 15 |
| $V_{RWM}$ | Max. Working Peak Reverse Voltage (V) @ $T_J$ = 100 °C | |

## Absolute Maximum Ratings

| | Parameters | Value | Units | Conditions | |
|---|---|---|---|---|---|
| $I_{F(AV)}$ | Max. Average Forward (Per Leg) | 20 | A | 50% duty cycle @ $T_C$ = 86°C, rectangular wave form | |
| | Current * See Fig. 5 (Per Device) | 40 | | | |
| $I_{FSM}$ | Max. Peak One Cycle Non-Repetitive | 700 | A | 5µs Sine or 3µs Rect. pulse | Following any rated load condition and with rated $V_{RRM}$ applied |
| | Surge Current (Per Leg) * See Fig. 7 | 330 | | 10ms Sine or 6ms Rect. pulse | |
| $E_{AS}$ | Non-Repetitive Avalanche Energy (Per Leg) | 5 | mJ | $T_J$ = 25 °C, $I_{AS}$ = 2 Amps, L = 6 mH | |
| $I_{AR}$ | Repetitive Avalanche Current (Per Leg) | 2 | A | Current decaying linearly to zero in 1 µsec<br>Frequency limited by $T_J$ max. $V_A$ = 1.5 x $V_R$ typical | |

## Electrical Specifications

| | Parameters | Value Typ. | Value Max. | Units | Conditions | |
|---|---|---|---|---|---|---|
| $V_{FM}$ | Forward Voltage Drop (Per Leg) * See Fig. 1 (1) | | 0.42 | V | @ 20A | $T_J$ = 25 °C |
| | | | 0.52 | V | @ 40A | |
| | | 0.26 | 0.34 | V | @ 20A | $T_J$ = 125 °C |
| | | 0.37 | 0.50 | V | @ 40A | |
| $I_{RM}$ | Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | - | 10 | mA | $T_J$ = 25 °C | $V_R$ = rated $V_R$ |
| | | - | 600 | mA | $T_J$ = 100 °C | |
| $V_{F(TO)}$ | Threshold Voltage | 0.182 | | V | $T_J$ = $T_J$ max. | |
| $r_t$ | Forward Slope Resistance | 7.6 | | mΩ | | |
| $C_T$ | Max. Junction Capacitance (Per Leg) | - | 2000 | pF | $V_R$ = 5$V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C | |
| $L_S$ | Typical Series Inductance (Per Leg) | 8 | - | nH | Measured lead to lead 5mm from package body | |
| dv/dt | Max. Voltage Rate of Change (Rated $V_R$) | 10000 | | V/ µs | | |

(1) Pulse Width < 300µs, Duty Cycle <2%

## Thermal-Mechanical Specifications

| | Parameters | | Value | Units | Conditions |
|---|---|---|---|---|---|
| $T_J$ | Max. Junction Temperature Range | | -55 to 125 | °C | |
| $T_{stg}$ | Max. Storage Temperature Range | | -55 to 150 | °C | |
| $R_{thJC}$ | Max. Thermal Resistance Junction to Case (Per Leg) | | 1.4 | °C/W | DC operation * See Fig. 4 |
| $R_{thJC}$ | Max. Thermal Resistance Junction to Case (Per Package) | | 0.7 | °C/W | DC operation |
| $R_{thCS}$ | Typical Thermal Resistance, Case to Heatsink | | 0.24 | °C/W | Mounting surface , smooth and greased |
| wt | Approximate Weight | | 6 (0.21) | g (oz.) | |
| T | Mounting Torque | Min. | 6 (5) | Kg-cm (lbf-in) | Non-lubricated threads |
| | | Max. | 12 (10) | | |
| | Case Style | | TO-247AC (TO-3P) | | JEDEC |

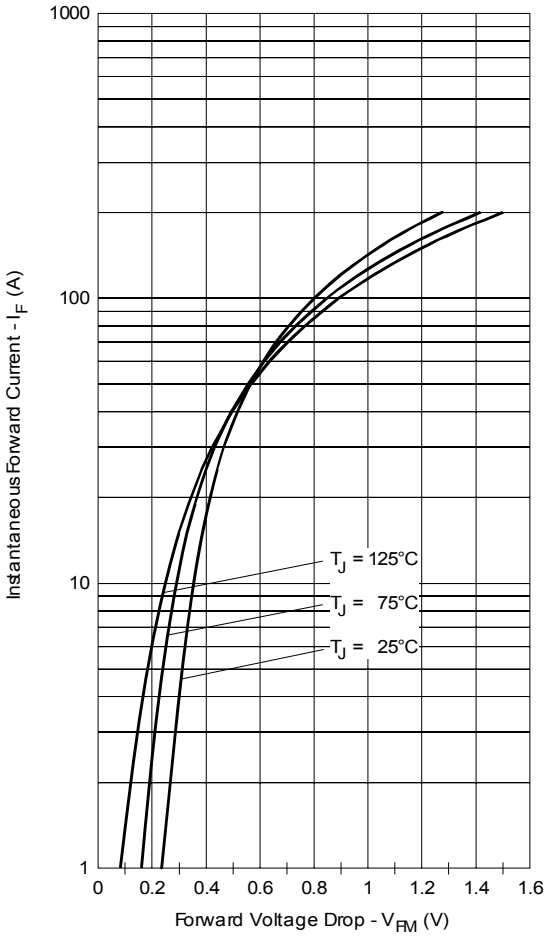



Fig. 1 - Maximum Forward Voltage Drop Characteristics

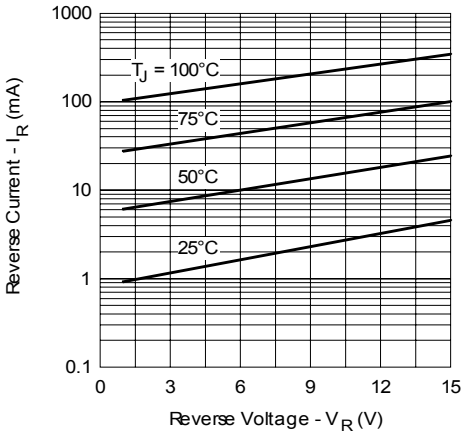



Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

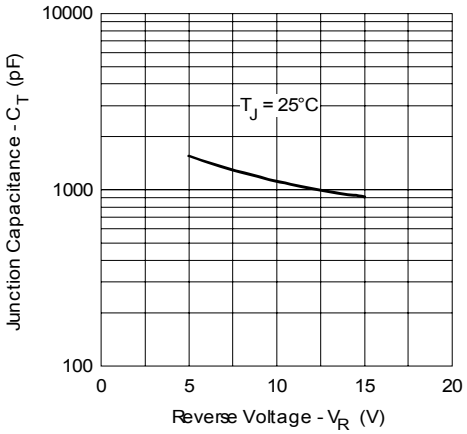



Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

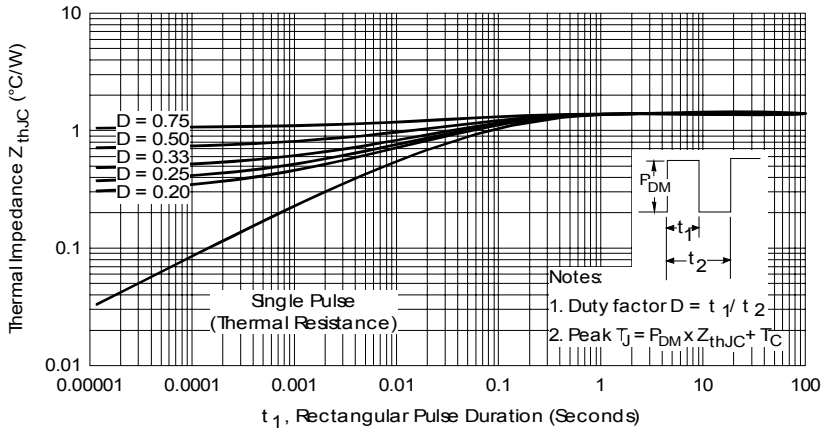



Fig. 4 - Maximum Thermal Impedance $Z_{thJC}$ Characteristics

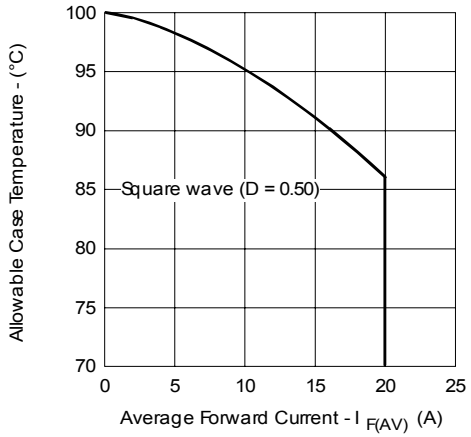



Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

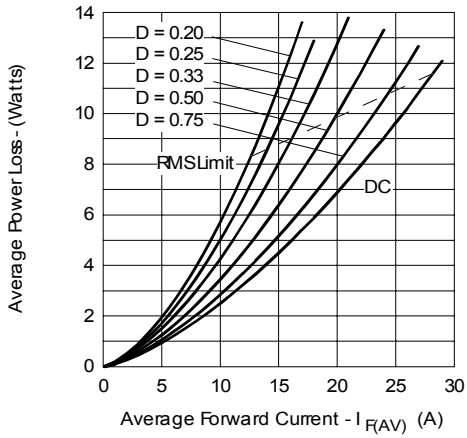



Fig. 6 - Forward Power Loss Characteristics

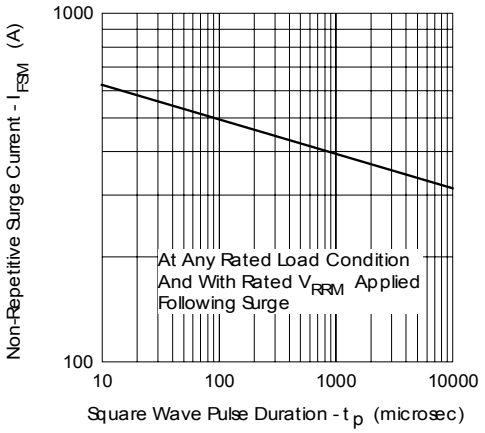



Fig. 7 - Maximum Non-Repetitive Surge Current

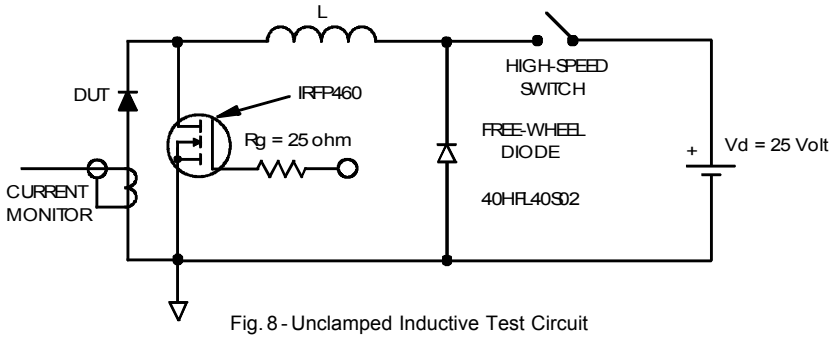
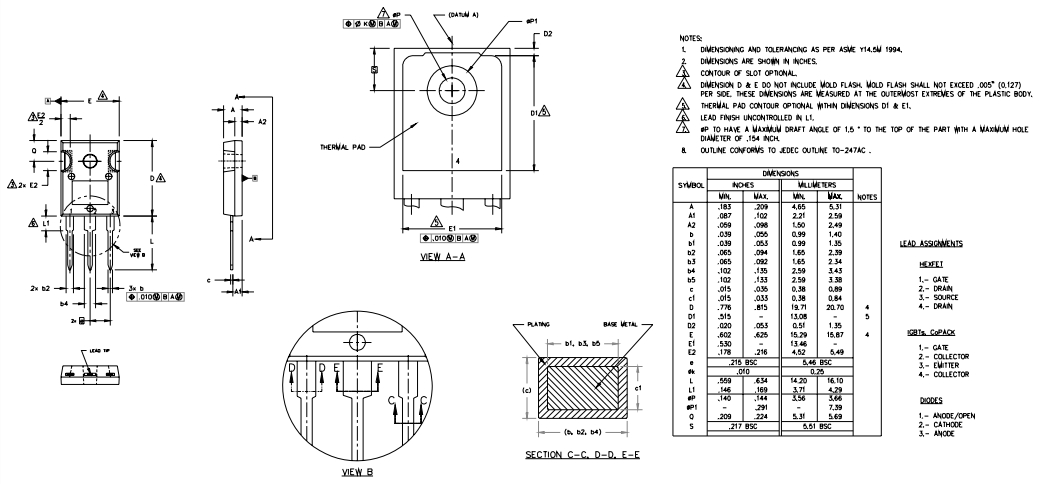



Fig. 8 - Unclamped Inductive Test Circuit

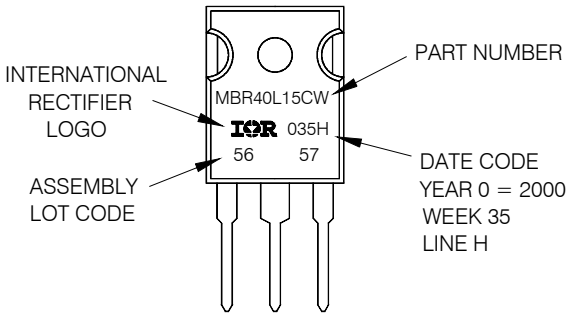
## Outline Table




**Conform to JEDEC outline TO-247AC (TO-3P)**
Dimensions in millimeters and (inches)

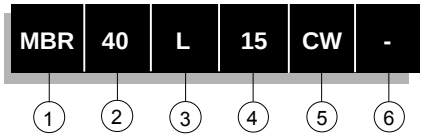
## Marking Information

EXAMPLE: THIS IS A MBR40L15CW
WITH ASSEMBLY
LOT CODE 5657
ASSEMBLED ON WW 35, 2000
IN ASSEMBLY LINE "H"



## Ordering Information Table

**Device Code**




| | | |
|---|---|---|
| 1 | - | Schottky MBR Series |
| 2 | - | Currrent Rating (40 = 40A) |
| 3 | - | L = Low Forward Voltage |
| 4 | - | Voltage Rating (15 = 15V) |
| 5 | - | Circuit Configuration :<br>Center Tap TO-247 |
| 6 | - | • none = Standard Production<br>• PbF = Lead-Free |

Tube Standard Pack Quantity : 25 pieces

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

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