Bulletin PD-20823 rev. A 11/06

International
IOR Rectifier

MBR40L15CWPbF

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

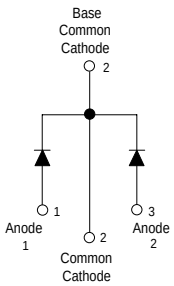
Description/ Features

The MBR40L15CWPbF 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
- Lead-Free ("PbF" suffix)

Case Styles

TO-247AC



Voltage Ratings

	Part number	MBR40L15CWPbF
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 Frequency limited by T_J max. V_A = 1.5 x V_R typical	

Electrical Specifications

	Parameters	Value		Units	Conditions	
		Typ.	Max.			
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 = 5V_{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	10000		V/ µs	(Rated V_R)	

(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
	Marking Device		MBR40L15CW		

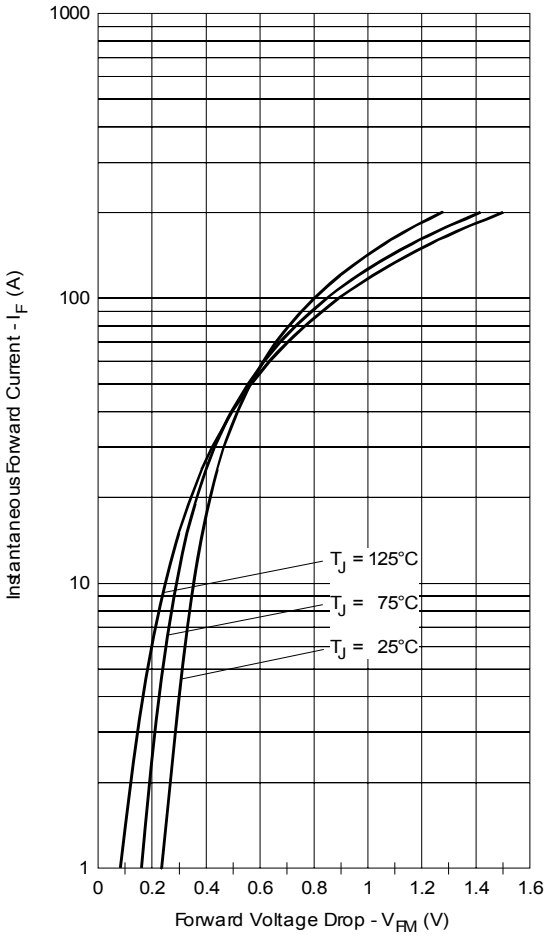


Fig. 1 - Maximum Forward Voltage Drop Characteristics

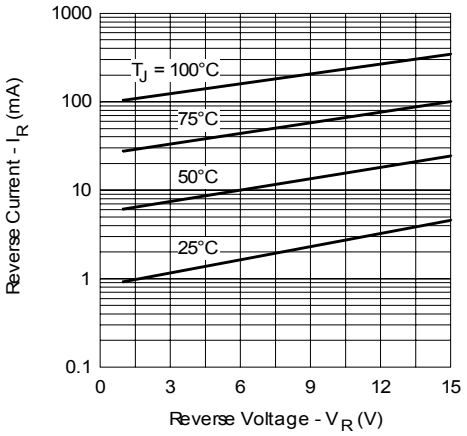


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

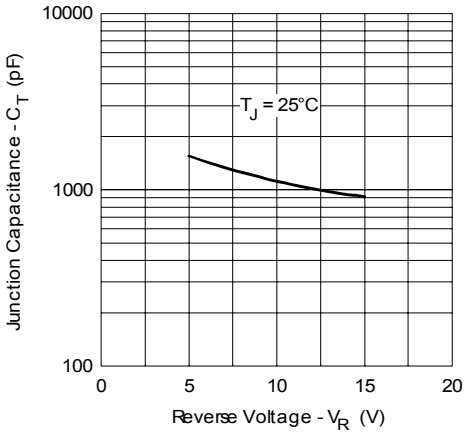


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

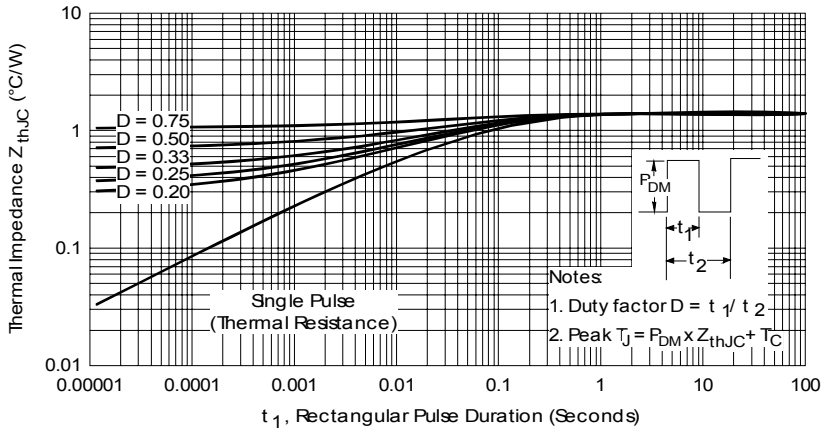


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

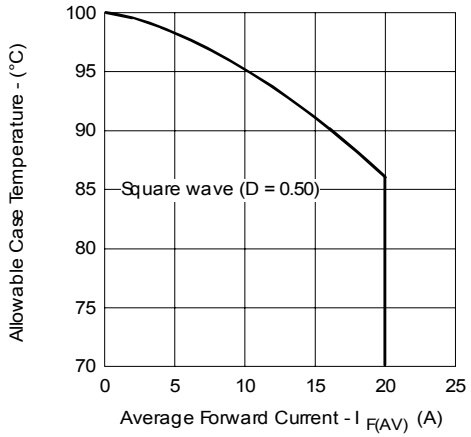


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

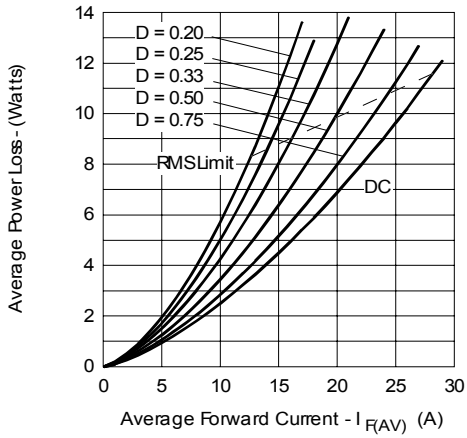


Fig. 6 - Forward Power Loss Characteristics

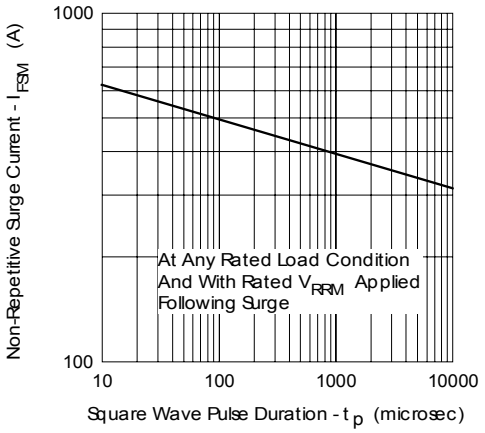


Fig. 7 - Maximum Non-Repetitive Surge Current

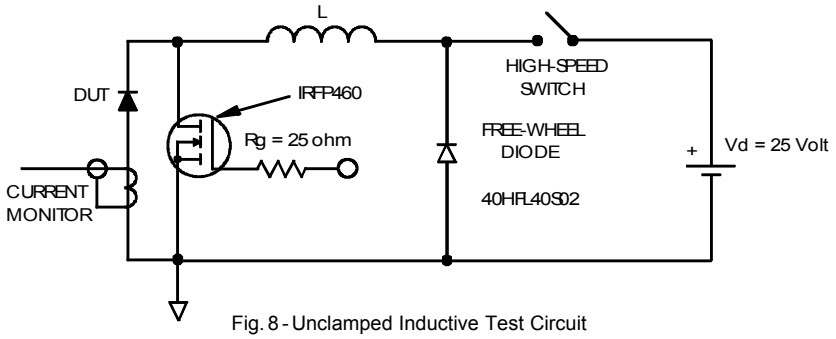
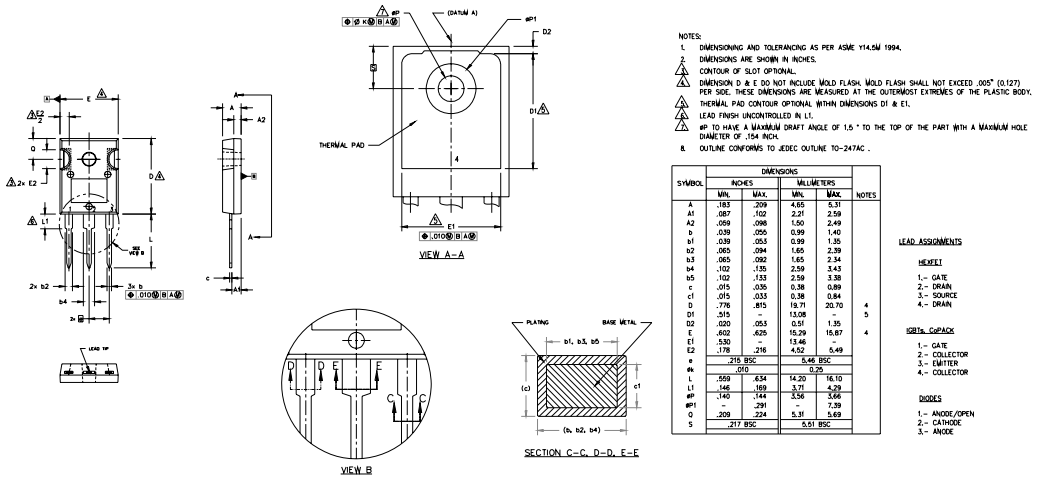


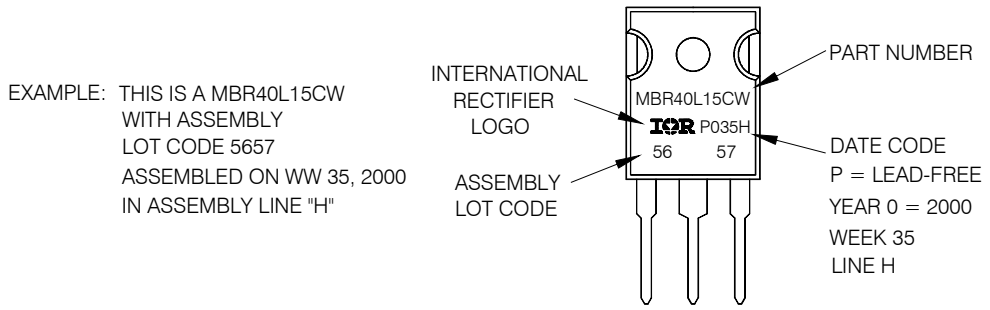
Fig. 8 - Unclamped Inductive Test Circuit

Outline Table



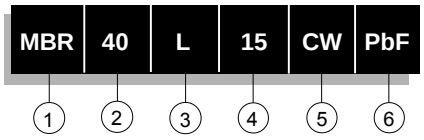
Conform to JEDEC outline TO-247AC (TO-3P)
Dimensions in millimeters and (inches)

Marking Information



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 : Center Tap TO-247
6	-	• none = Standard Production • 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 and Lead-Free.
Qualification Standards can be found on IR's Web site.

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