Bulletin PD-20814 rev. A 11/06

International
IOR Rectifier

MBR4060WTPbF

SCHOTTKY RECTIFIER

40 Amp

$I_{F(AV)}$ = 40Amp
V_R = 60V

Major Ratings and Characteristics

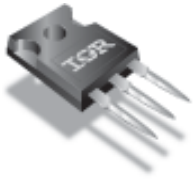
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	60	V
I_{FSM} @tp = 5 µs sine	1020	A
V_F @20 Apk, T_J=125°C (per leg)	0.62	V
T_J	- 55 to 150	°C

Description/ Features

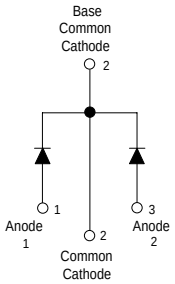
The MBR4060WTPbF center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150° C T_J operation
- Center tap TO-247 package
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

Case Styles



TO-247



Voltage Ratings

	Part number	MBR4060WTPbF
V_R	Max. DC Reverse Voltage (V)	60
V_{RWM}	Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

	Parameters		Values	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current	(Per Device)	40	A	@ T_C = 108°C, 50% duty cycle, rectangular waveform	
		(Per Leg)	20			
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) See fig.7		1020	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
			265		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)		13	mJ	T_J = 25 °C, I_{AS} = 1.5 Amps, L = 11.5 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)		1.5	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	Values	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1)	0.72	V	@ 20A	T_J = 25 °C
		0.62	V	@ 20A	T_J = 125 °C
I_{RM}	Max. Instantaneus Reverse Current	1.0	mA	T_J = 25°C	Rated DC voltage
		100	mA	T_J = 125°C	
C_T	Max. Junction Capacitance	720	pF	V_R = 5V_{DC} (test signal range 100Khz to 1Mhz) 25°C	
L_S	Typical Series Inductance	7.5	nH	Measured from top of terminal to mounting plane	
dv/dt	Max. Voltage Rate of Change (Rated V_R)	10000	V/µs		

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

Thermal-Mechanical Specifications

	Parameters		Values	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 150	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 150	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Package)		2.20	°C/W	DC operation
R_{thCS}	Typical Thermal Resistance Case to Heatsink		1.10	°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)	
		Max.	12 (10)		
	Case Style		TO-247AC (TO-3P)		JEDEC
	Device Marking		MBR4060WT		

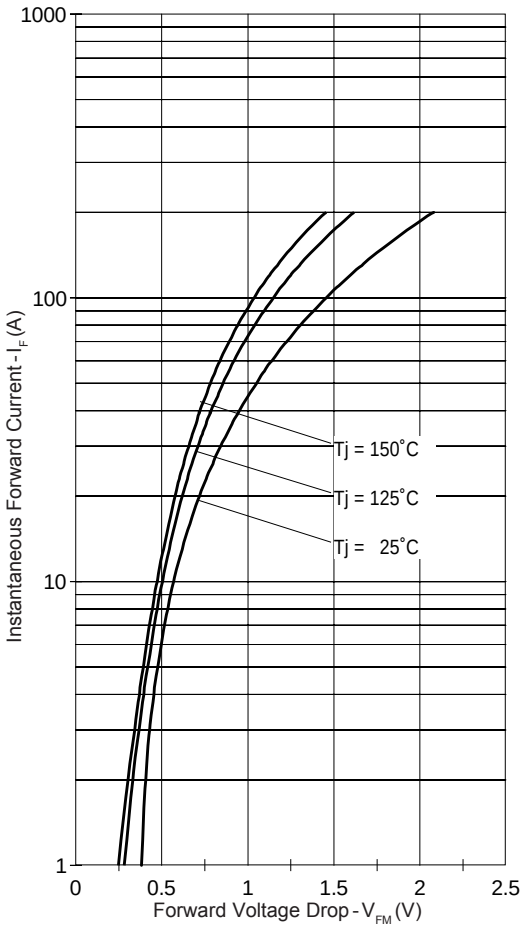


Fig. 1 - Max. Forward Voltage Drop Characteristics

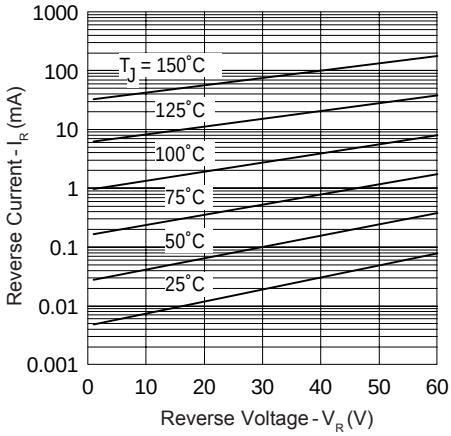


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

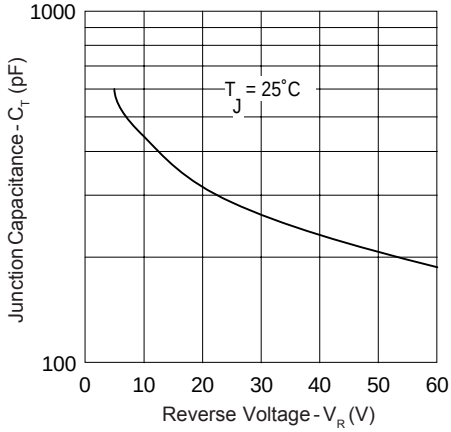


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

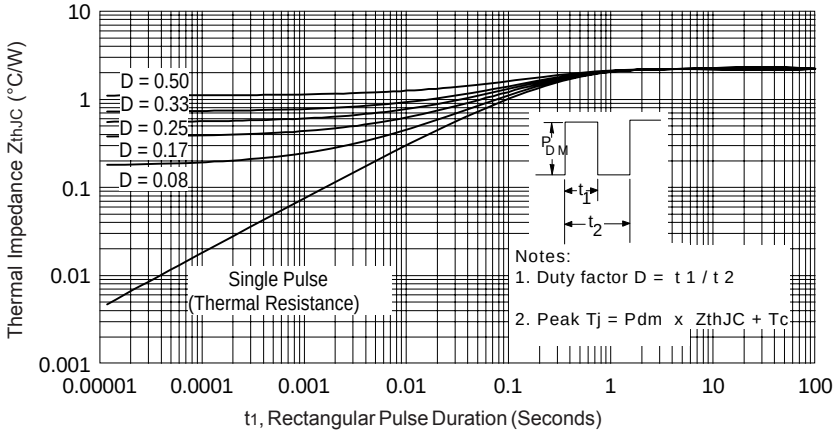


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

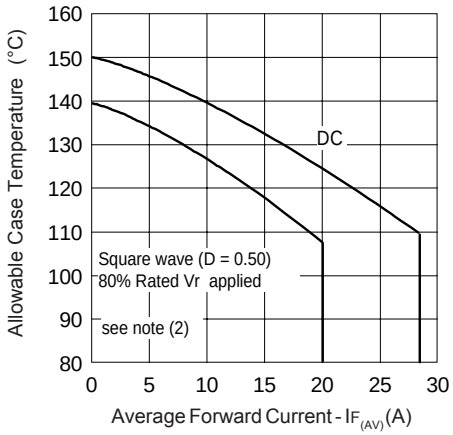


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

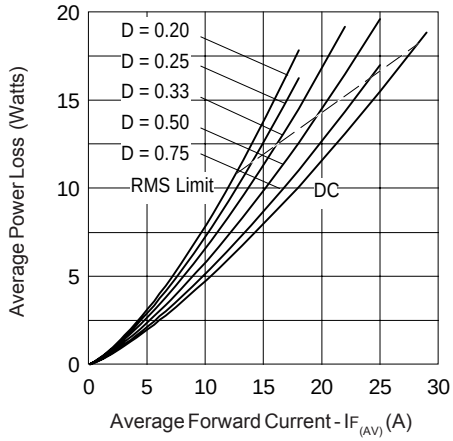


Fig. 6 - Forward Power Loss Characteristics

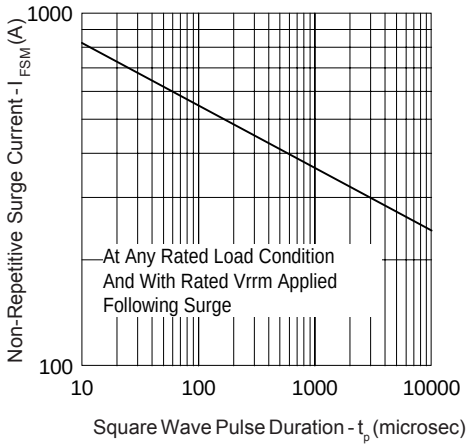


Fig. 7 - Max. Non-Repetitive Surge Current

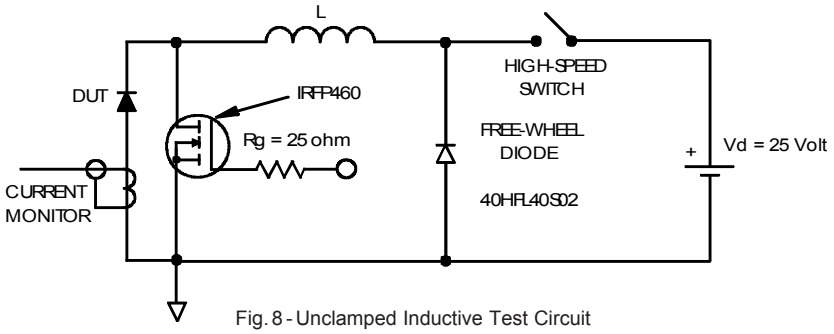
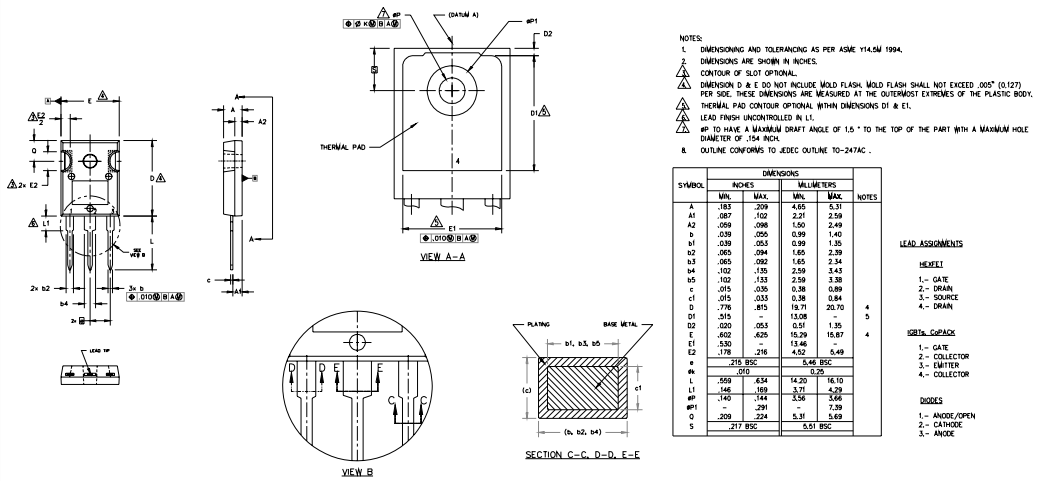


Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = 80% rated V_R

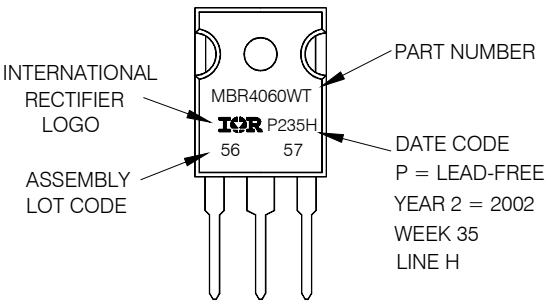
Outline Table



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

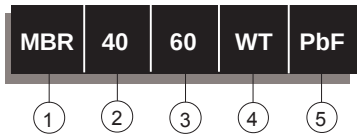
Marking Information

EXAMPLE: THIS IS A MBR4060WT
WITH ASSEMBLY
LOT CODE 5657
ASSEMBLED ON WW 35, 2002
IN ASSEMBLY LINE "H"



Ordering Information Table

Device Code



1	-	Schottky MBR Series
2	-	Currrent Rating (40 = 40A)
3	-	Voltage Rating (60 = 60V)
4	-	Circuit Configuration : Center Tap (Dual) TO-247
5	-	• none = Standard Production • PbF = Lead-Free

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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