

International
IR Rectifier

MBR6045WTPbF

SCHOTTKY RECTIFIER

60 Amp

$$I_{F(AV)} = 60\text{Amp}$$

$$V_R = 45\text{V}$$

Major Ratings and Characteristics

Characteristics	Value	Units
$I_{F(AV)}$ Rectangular waveform	60	A
V_{RRM}	45	V
I_{FSM} @ $t_p = 5 \mu\text{s}$ sine	2900	A
V_F @ 30 Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.55	V
T_J	-55 to 150	$^\circ\text{C}$

Description/Features

The MBR6045WTPbF 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	MBR6045WTPbF
V _R Max. DC Reverse Voltage (V)	45
V _{RWM} Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Parameters	Values	Units	Conditions
I _{F(AV)} Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	30	A	50% duty cycle @ T _C = 122°C, rectangular wave form
	60		
I _{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	2900	A	5µs Sine or 3µs Rect. pulse
	360		10ms Sine or 6ms Rect. pulse
E _{AS} Non-Repetitive Avalanche Energy (Per Leg)	27	mJ	T _J = 25 °C, I _{AS} = 4 Amps, L = 3.4 mH
I _{AR} Repetitive Avalanche Current (Per Leg)	6	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 (Per Leg) * See Fig. 1 (1)	0.62	V	@ 30A
	0.75	V	@ 60A
	0.55	V	@ 30A
I _{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1	mA	T _J = 25 °C
	150	mA	T _J = 125 °C
V _{F(TO)} Threshold Voltage	0.27	V	T _J = T _J max.
r _t Forward Slope Resistance	7.3	mΩ	
C _T Max. Junction Capacitance (Per Leg)	1400	pF	V _R = 5V _{DC} (test signal range 100Khz to 1Mhz) 25°C
L _S Typical Series Inductance (Per Leg)	7.5	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	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 Leg) * See Fig. 4	1.0	°C/W	DC operation
R _{thJC} Max. Thermal Resistance Junction to Case (Per Package)	0.5	°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)	
	Max. 12 (10)		
Case Style	TO-247AC(TO-3P)		JEDEC
Marking Device	MBR6045WT		

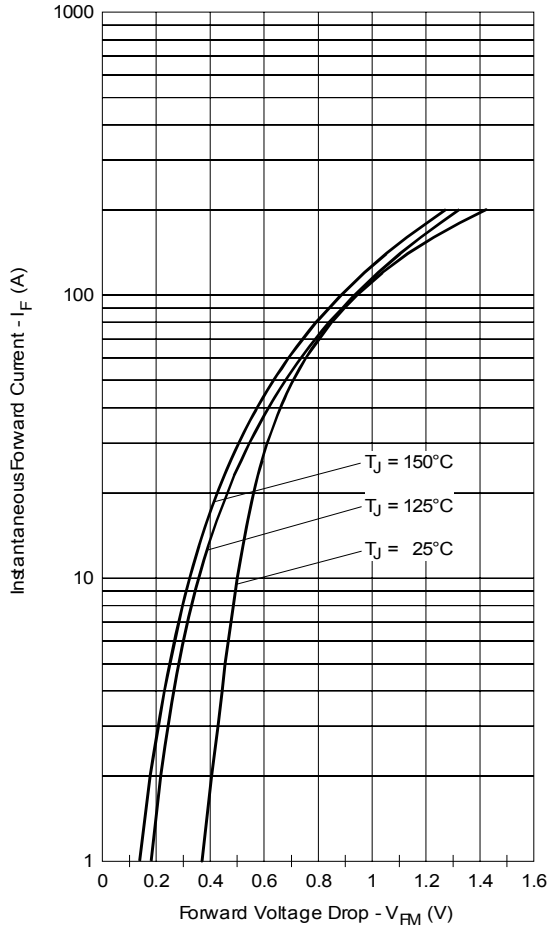


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

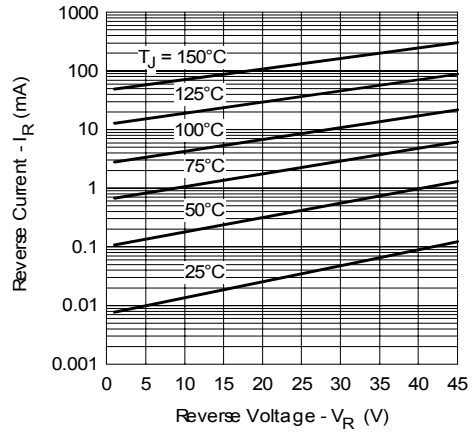


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

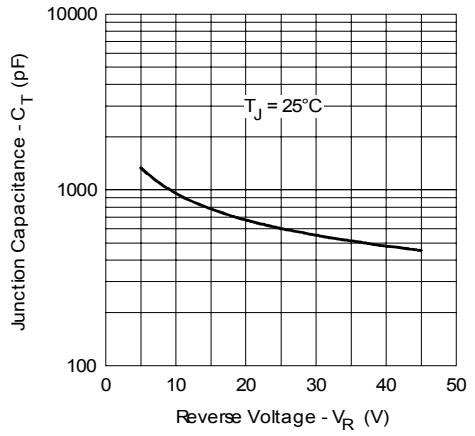


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

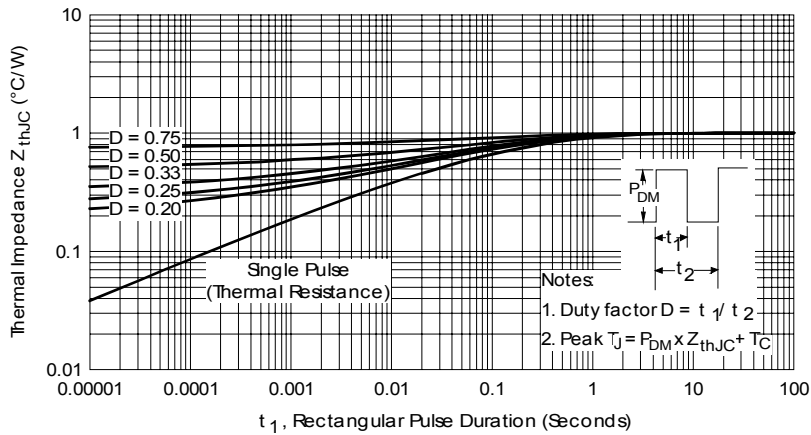


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

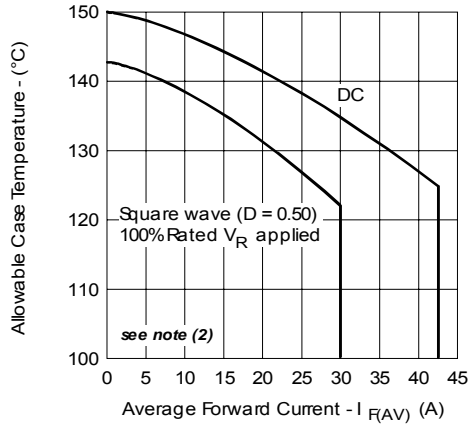


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

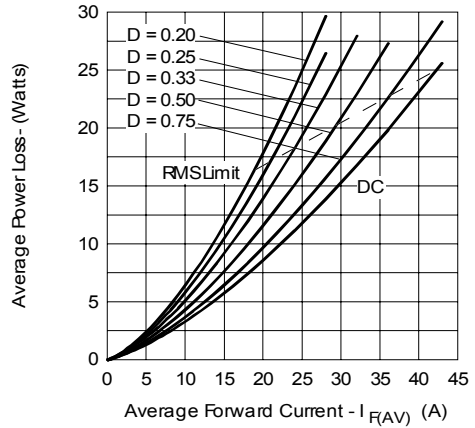


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

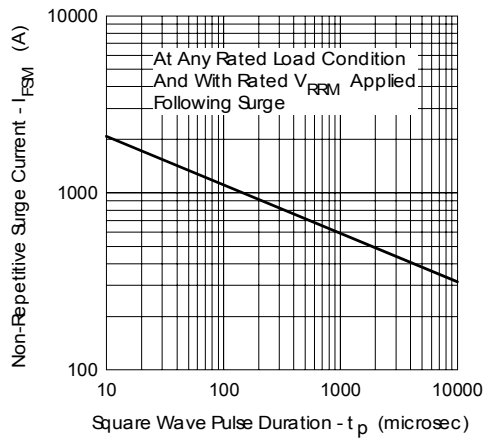


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

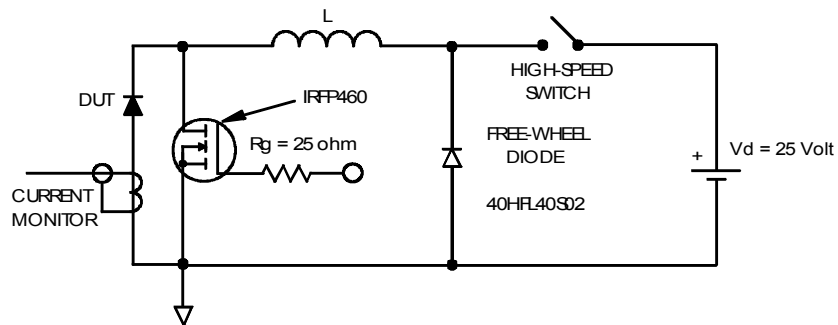


Fig. 8 - Unclamped Inductive Test Circuit

- (2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
 $Pd = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
 $Pd_{REV} = \text{Inverse Power Loss} = V_{R1} \times I_{R1} (1 - D)$; $I_{R1} @ V_{R1} = 100\% \text{ rated } V_R$

Outline Table

NOTES:
 1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M 1994.
 2. DIMENSIONS ARE SHOWN IN INCHES.
 3. CONTOUR OF SLOT OPTIONAL.
 4. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005" (0.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
 5. THERMAL PAD CONTOUR OPTIONAL, WITHIN DIMENSIONS D1 & E1.
 6. LEAD FINISH UNCONTROLLED PL/L.
 7. #P TO HAVE A MAXIMUM DRAFT ANGLE OF 1.5° TO THE TOP OF THE PART WITH A MAXIMUM HOLE DIAMETER OF .154 INCH.
 8. OUTLINE CONFORMS TO JEDEC OUTLINE TO-247AC.

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	.182	.209	4.65	5.31	
A1	.087	.102	2.21	2.59	
A2	.058	.088	1.50	2.24	
b	.039	.055	0.99	1.40	
b1	.039	.053	0.99	1.35	
b2	.065	.094	1.65	2.39	
b3	.065	.092	1.65	2.34	
b4	.102	.125	2.59	3.18	
b5	.102	.135	2.59	3.38	
c	.015	.035	0.38	0.89	
c1	.015	.033	0.38	0.84	
D	.778	.815	19.71	20.70	4
D1	.315	-	7.98	-	4
D2	.220	.253	5.61	6.36	5
E	.602	.625	15.29	15.87	4
E1	.530	-	13.46	-	
E2	.178	.216	4.52	5.49	
#	.215 BSC		5.45 BSC		
L	.509	.634	12.92	16.10	
L1	.148	.169	3.71	4.29	
#P	.140	.144	3.56	3.66	
#P1	.201	-	5.09	-	
Q	.209	.224	5.31	5.69	
S	.217 BSC		5.51 BSC		

LEAD ASSIGNMENTS
 1- GATE
 2- DRAIN
 3- SOURCE
 4- DRAIN

IRF's GoPAC
 1- GATE
 2- COLLECTOR
 3- BARRIER
 4- COLLECTOR

DIODES
 1- ANODE/OPEN
 2- CATHODE
 3- ANODE

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

Marking Information

EXAMPLE: THIS IS A MBR6045WT WITH ASSEMBLY LOT CODE 5657 ASSEMBLED ON WW 35, 2002 IN ASSEMBLY LINE "H"

INTERNATIONAL RECTIFIER LOGO
 ASSEMBLY LOT CODE
 PART NUMBER
 DATE CODE
 P = LEAD-FREE
 YEAR 2 = 2002
 WEEK 35
 LINE H

Ordering Information Table

Device Code				
MBR	60	45	WT	PbF
①	②	③	④	⑤
1	-	Schottky MBR Series		
2	-	Current Rating (60 = 60A)		
3	-	Voltage Rating (45 = 45V)		
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.