

$I_{F(AV)} = 7.5\text{Amp}$
 $V_R = 35 - 45\text{V}$

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	7.5	A
V_{RRM}	35 - 45	V
I_{FSM} @ tp = 5 μ s sine	690	A
V_F @ 7.5Apk, $T_J = 125^\circ\text{C}$	0.57	V
T_J range	- 65 to 150	$^\circ\text{C}$

Description/ Features

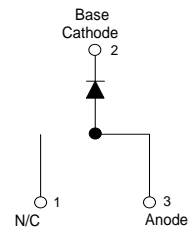
The MBRB7.. Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150 $^\circ\text{C}$ junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150 $^\circ\text{C}$ T_J operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

Case Styles



D²PAK



Voltage Ratings

Parameters	MBRB735PbF	MBRB745PbF
V _R Max. DC Reverse Voltage (V)	35	45
V _{RWM} Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

Parameters	MBR..	Units	Conditions
I _{F(AV)} Max. Average Forward Current	7.5	A	@ T _C = 131 °C (Rated V _R)
I _{FSM} Non-Repetitive Peak Surge Current	690	A	5µs Sine or 3µs Rect. pulse Surge applied at rated load condition halfwave single phase 60Hz
	150		
E _{AS} Non-Repetitive Avalanche Energy	7	mJ	T _J = 25 °C, I _{AS} = 2 Amps, L = 3.5 mH
I _{AR} Repetitive Avalanche Current	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	MBR..	Units	Conditions
V _{FM} Max. Forward Voltage Drop(1)	0.84	V	@ 15A T _J = 25 °C
	0.57	V	@ 7.5A T _J = 125 °C
	0.72	V	@ 15A
I _{RM} Max. Instantaneous Reverse Current (1)	0.1	mA	T _J = 25 °C Rated DC voltage
	15	mA	T _J = 125 °C
C _T Max. Junction Capacitance	400	pF	V _R = 5V _{DC} (test signal range 100Khz to 1Mhz) 25°C
L _S Typical Series Inductance	8.0	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	MBR..	Units	Conditions
T _J Max. Junction Temperature Range	-65 to 150	°C	
T _{stg} Max. Storage Temperature Range	-65 to 175	°C	
R _{thJC} Max. Thermal Resistance Junction to Case	3.0	°C/W	DC operation
R _{thCS} Typical Thermal Resistance, Case to Heatsink	0.50	°C/W	Mounting surface, smooth and greased
wt Approximate Weight	2 (0.07)	g (oz.)	
T Mounting Torque	Min. 6 (5)	Kg-cm (lbf-in)	
	Max. 12 (10)		
Marking Device	MBRB7..		Case style D ² Pak

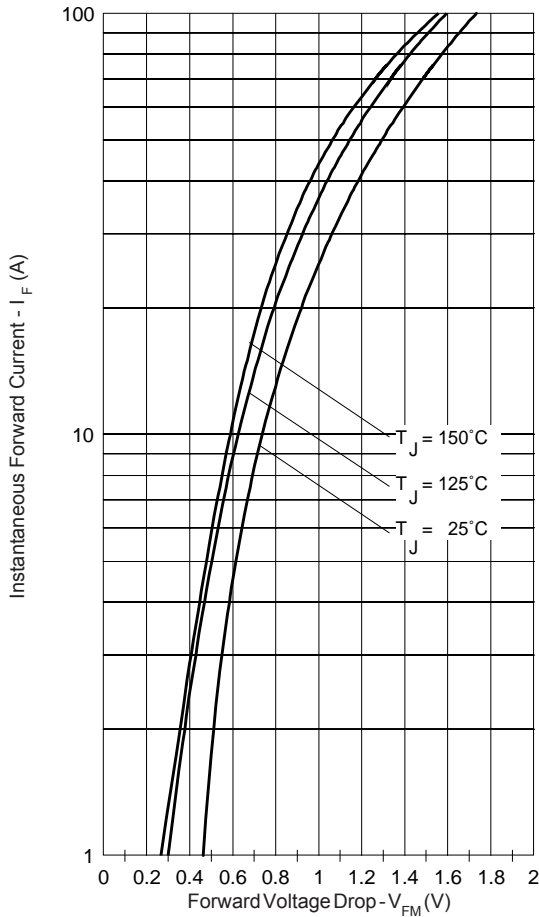


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

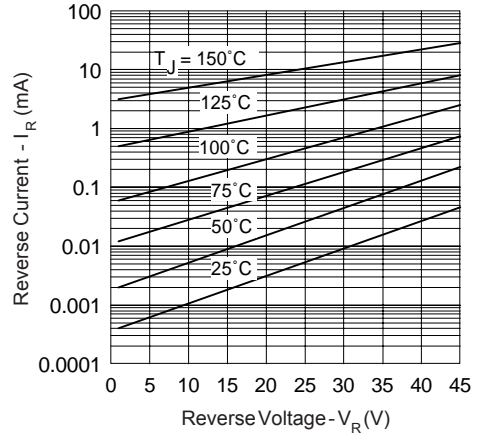


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

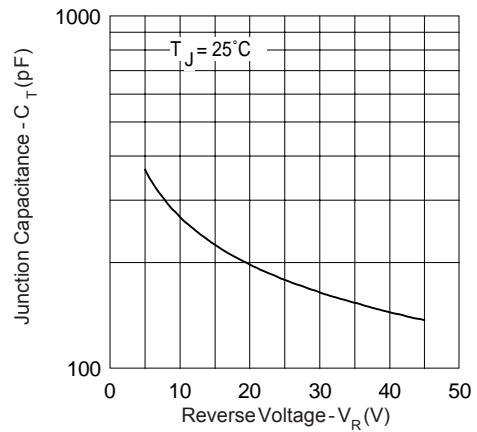


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

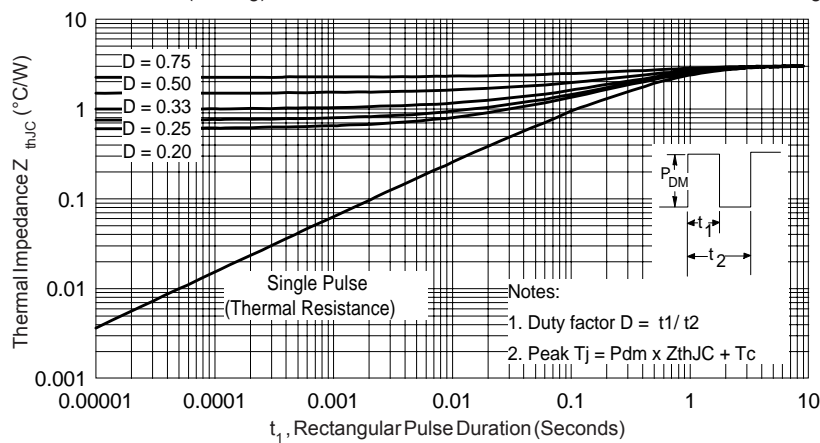


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

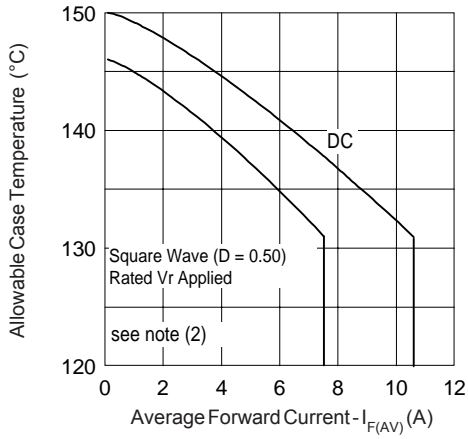


Fig. 5- Max. Allowable Case Temperature Vs. Average Forward Current

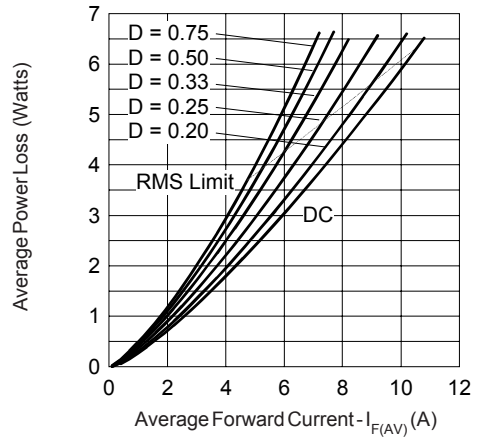


Fig. 6- Forward Power Loss Characteristics

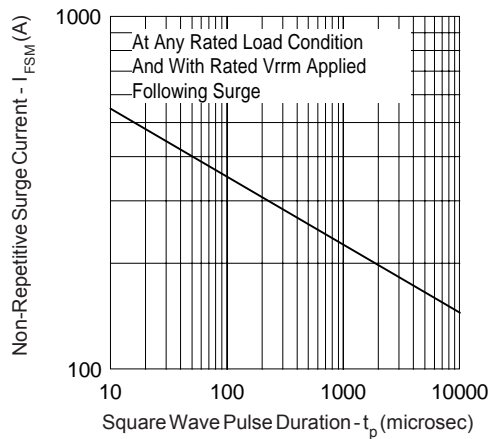


Fig. 7- Max. Non-Repetitive Surge Current (Per Leg)

(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);
 $Pd_{REV} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = \text{rated } V_R$

Outline Table

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES]
3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
4. DIMENSION b1 AND c1 APPLY TO BASE METAL ONLY.
5. CONTROLLING DIMENSION: INCH.

SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	.160	.190	4
A1	0.00	0.254	.000	.010	
b	0.51	0.99	.020	.039	
b1	0.51	0.89	.020	.035	4
b2	1.14	1.78	.045	.070	
c	0.38	0.74	.015	.029	4
c1	0.38	0.58	.015	.023	
c2	1.14	1.65	.045	.065	3
D	8.51	9.65	.335	.380	
D1	6.86		.270		3
E	9.65	10.67	.380	.420	
E1	6.22		.245		
e	2.54 BSC		.100 BSC		
H	14.61	15.88	.575	.625	
L	1.78	2.79	.070	.110	
L1		1.65	.065		
L2	1.27	1.78	.050	.070	
L3	0.25 BSC		.010 BSC		
L4	4.78	5.28	.188	.208	
m	17.78		.700		
m1	8.89		.350		
n	11.43		.450		
o	2.08		.082		
p	3.81		.150		
R	0.51	0.71	.020	.028	
θ	90°	93°	90°	93°	

LEAD ASSIGNMENTS

HEXFET
1.- GATE
2, 4.- DRAIN
3.- SOURCE

IGBTs...CoPACK
1.- GATE
2, 4.- COLLECTOR
3.- EMITTER

DIODES
1.- ANODE *
2, 4.- CATHODE
3.- ANODE

* PART DEPENDENT.

Conform to JEDEC outline D²Pak (SMD-220)
Dimensions in millimeters and (inches)

Part Marking Information

EXAMPLE: THIS IS A MBRB745
LOT CODE 8024
ASSEMBLED ON WW 02, 2000

Note: "P" in assembly line position indicates "Lead-Free"

INTERNATIONAL RECTIFIER LOGO

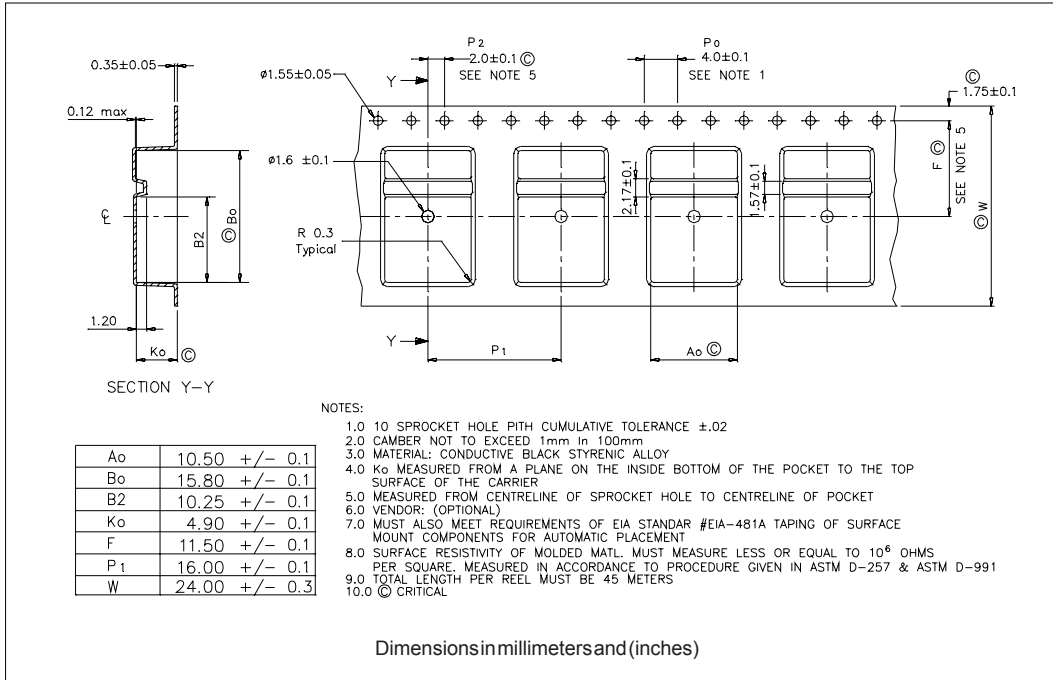
ASSEMBLY LOT CODE

PART NUMBER

DATE CODE

YEAR 0 = 2000
WEEK 02
P = LEAD-FREE

Tape & Reel Information



Ordering Information Table

Device Code	MBR	B	7	45	TRL	PbF
	1	2	3	4	5	6

- 1** - Essential Part Number
- 2** - B = Surface Mount
None = TO-220
- 3** - Current Rating (7.5A)
- 4** - Voltage code: Code = V_{RRM}

35	= 35V
45	= 45V
- 5** -
 - none = Tube (50 pieces)
 - TRL = Tape & Reel (Left Oriented - for D²Pak only)
 - TRR = Tape & Reel (Right Oriented - for D²Pak only)
- 6** -
 - none = Standard Production
 - PbF = Lead-Free

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MBR745
*****
* This model has been developed by *
* Wizard SPICE MODEL GENERATOR (1999) *
* (International Rectifier Corporation) *
* contains Proprietary Information *
*****
* SPICE Model Diode is composed by a *
* simple diode plus paralalled VCG2T *
*****
.SUBCKT MBR745 ANO CAT
D1 ANO 1 DMOD (0.03191)
*Define diode model
.MODEL DMOD D(IS=9.72464638473799E-05A,N=1.30648926537753,BV=52V,
+IBV=0.195508065728349A,RS=0.000727548,CJO=1.94829876431799E-08,
+VJ=2.27282978121533,XTI=2,EG=0.854458710837653)
*****
*Implementation of VCG2T
VX 1 2 DC 0V
R1 2 CAT TRES 1E-6
.MODEL TRES RES(R=1,TC1=27.6281424524011)
GP1 ANO CAT VALUE={-ABS(I(VX))*(EXP(((((-5.219758E-03/27.62814)*(V(2,CAT)*1E6)/(I(VX)+1E-6)-
1))+1)*7.000165E-02*ABS(V(ANO,CAT))))-1}}
*****
.ENDS MBR745

Thermal Model Subcircuit
.SUBCKT MBR745 5 1

CTHERM1 5 4 1.05E+00
CTHERM2 4 3 4.44E+00
CTHERM3 3 2 1.16E+01
CTHERM4 2 1 6.12E+01

R THERM1 5 4 1.33E+00
R THERM2 4 3 1.19E+00
R THERM1 3 2 3.81E-01
R THERM1 2 1 9.54E-02

.ENDS MBR745
    
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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.