

International
IR Rectifier

MBR16.. Series MBRB16.. Series

SCHOTTKY RECTIFIER

16 Amp

$$I_{F(AV)} = 16\text{Amp}$$

$$V_R = 35 - 45\text{V}$$

Major Ratings and Characteristics

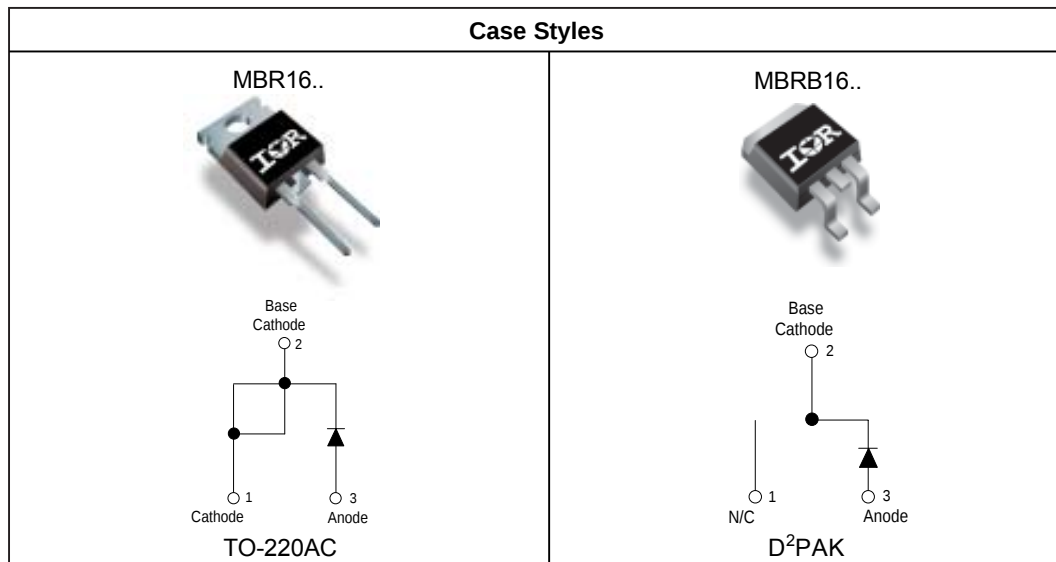
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	16	A
V_{RRM} range	35-45	V
I_{FSM} @ $t_p = 5\mu\text{s}$ sine	1800	A
V_F @16Apk, $T_J = 125^\circ\text{C}$	0.57	V
T_J range	-65 to 150	$^\circ\text{C}$

Description/ Features

The MBR16.. Schottky rectifier has been optimized for low reverse leakage at high temperature. 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
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

Case Styles



Voltage Ratings

Part number	MBR1635	MBR1645
V_R Max. DC Reverse Voltage (V)	35	45
V_{RWM} Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

Parameters	MBR16..	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	16	A	@ $T_C = 134^\circ\text{C}$, (Rated V_R)
I_{FSM} Non-Repetitive Peak Surge Current	1800	A	5 μs Sine or 3 μs Rect. pulse Following any rated load condition and with rated V_{RWM} applied
	150		Surge applied at rated load condition halfwave single phase 60Hz
E_{AS} Non-Repetitive Avalanche Energy	24	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 3.6$ Amps, $L = 3.7$ mH
I_{AR} Repetitive Avalanche Current	3.6	A	Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Parameters	MBR16..	Units	Conditions
V_{FM} Max. Forward Voltage Drop (1)	0.63	V	@ 16A $T_J = 25^\circ\text{C}$
	0.57	V	@ 16A $T_J = 125^\circ\text{C}$
I_{RM} Max. Instantaneous Reverse Current (1)	0.2	mA	$T_J = 25^\circ\text{C}$
	40	mA	$T_J = 125^\circ\text{C}$ Rated DC voltage
C_T Max. Junction Capacitance	1400	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 < 300 μs , Duty Cycle <2%

Thermal-Mechanical Specifications

Parameters		MBR16..	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	1.50	°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)			
Case Style		TO-220AC, D ² PAK			JEDEC
Marking Device		MBR1645			Case Style TO-220
		MBRB1645			Case Style D ² Pak

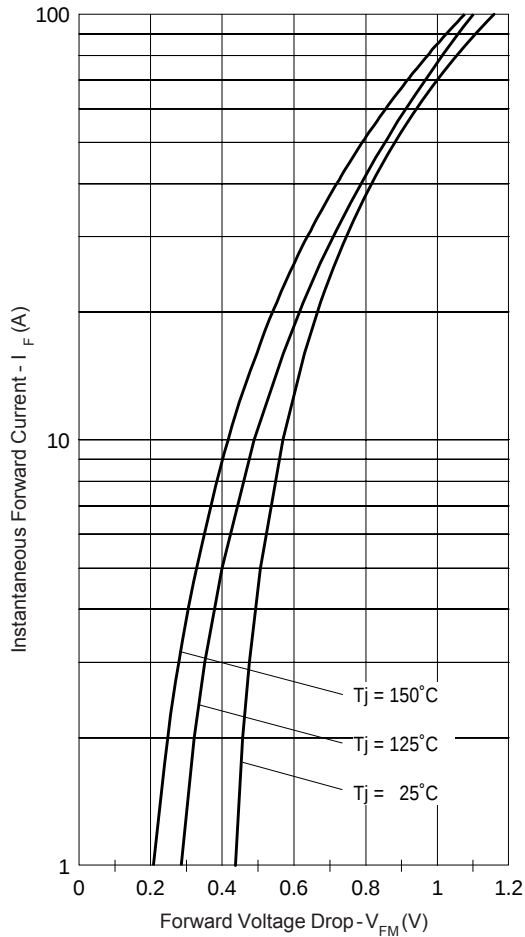


Fig.1-Maximum Forward Voltage Drop Characteristics

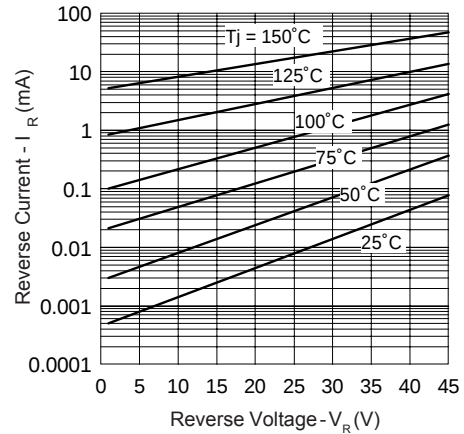


Fig.2-Typical Values of Reverse Current Vs. Reverse Voltage

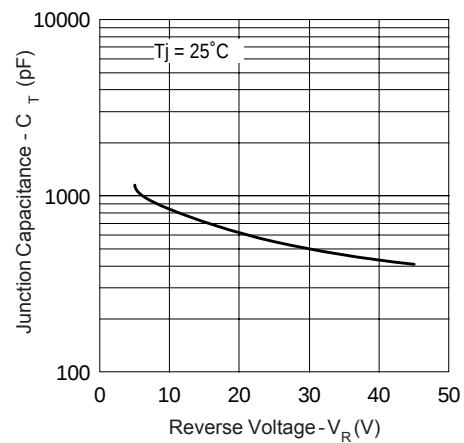


Fig.3-Typical Junction Capacitance Vs. Reverse Voltage

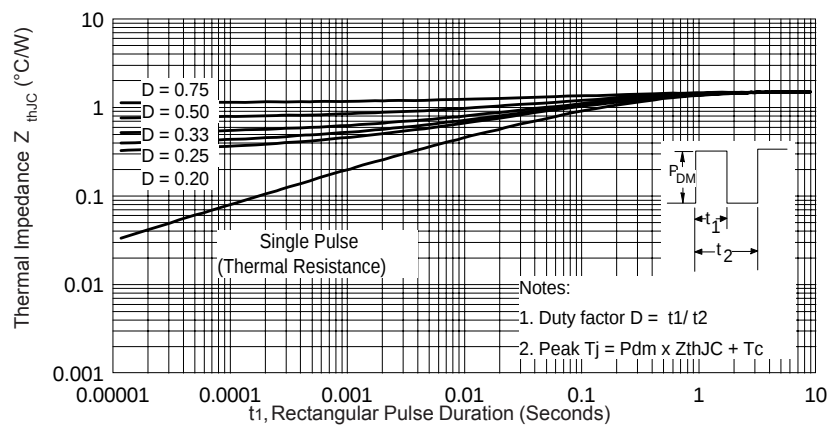


Fig.4-Max. Thermal Impedance Z_{thJC} Characteristics

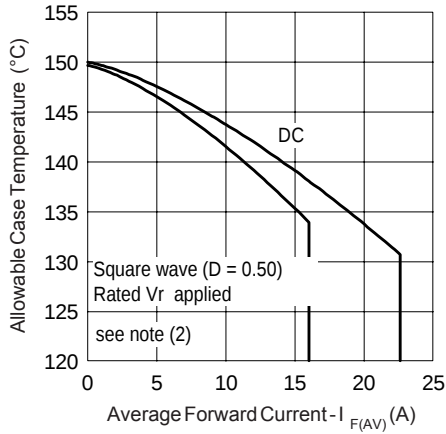


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

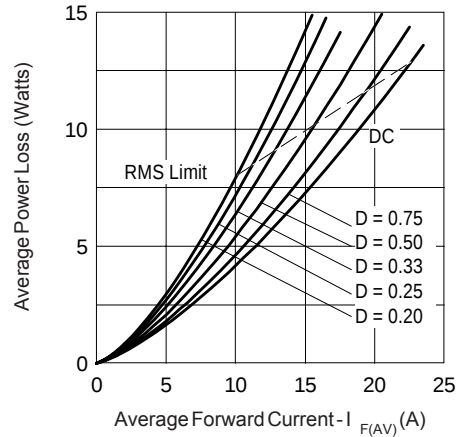


Fig. 6 - Forward Power Loss Characteristics

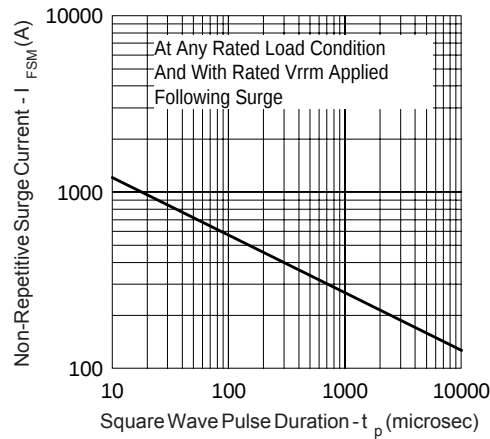


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

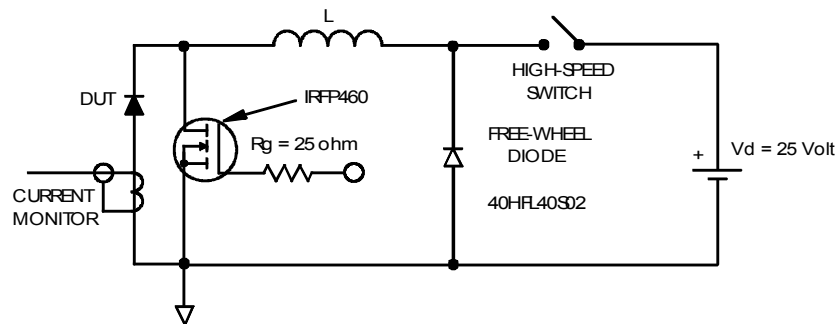


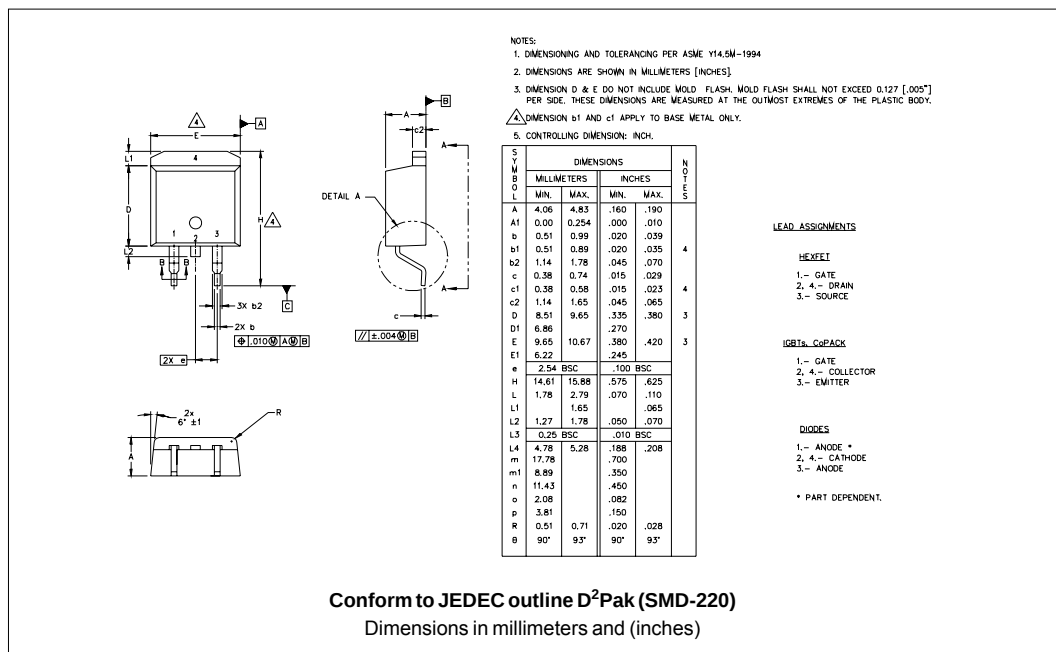
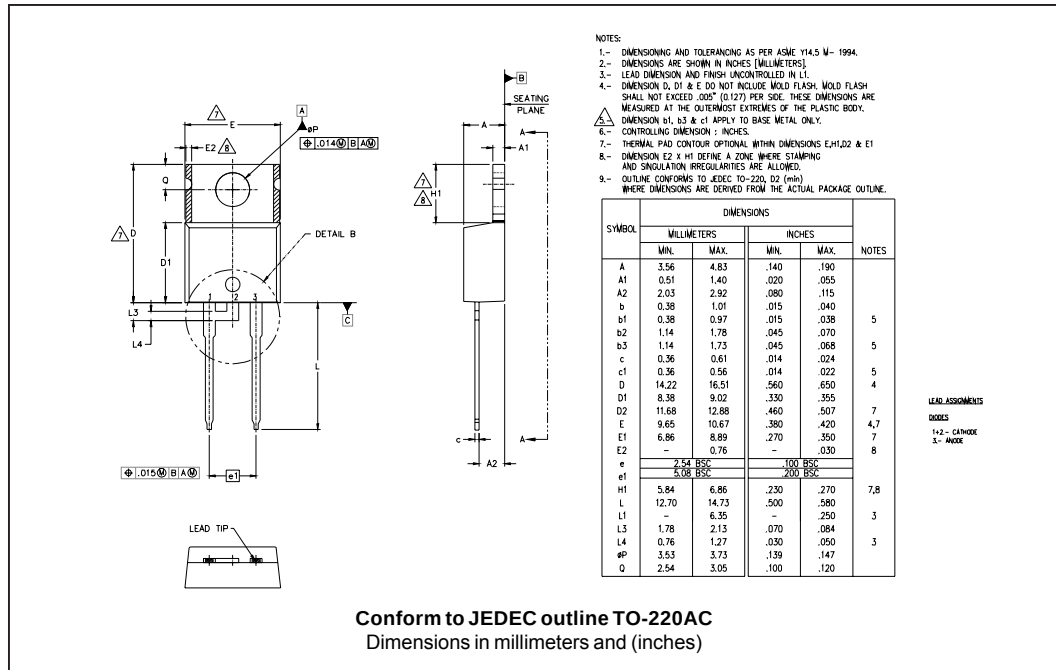
Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;

P_d = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

$P_{d_{REV}}$ = Inverse Power Loss = $V_{R1} \times I_{R1} (1 - D)$; $I_{R1} @ V_{R1}$ = rated V_R applied

Outline Table



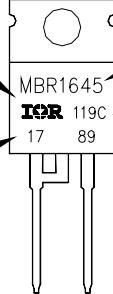
Part Marking Information

TO-220AC

EXAMPLE: THIS IS A MBR1645
LOT CODE 1789
ASSEMBLED ON WW 19, 2001
IN THE ASSEMBLY LINE "C"

INTERNATIONAL
RECTIFIER
LOGO

ASSEMBLY
LOT CODE



PART NUMBER

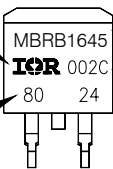
DATE CODE
YEAR 1 = 2001
WEEK 19
LINE C

D²Pak

EXAMPLE: THIS IS A MBRB1645
LOT CODE 8024
ASSEMBLED ON WW 02, 2000

INTERNATIONAL
RECTIFIER
LOGO

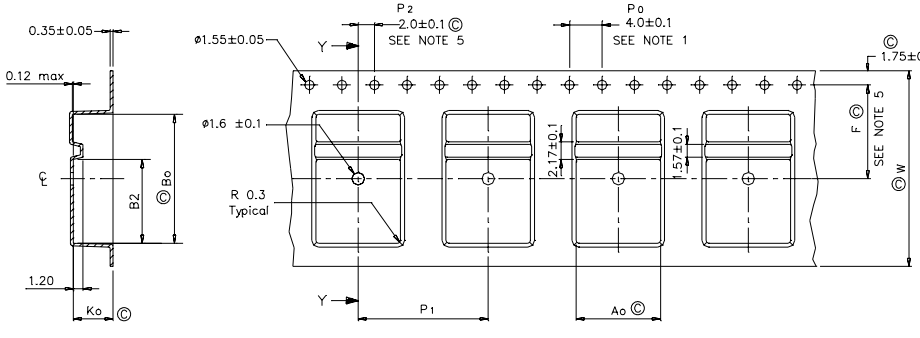
ASSEMBLY
LOT CODE



PART NUMBER

DATE CODE
YEAR 0 = 2000
WEEK 02
LINE C

Tape & Reel Information



SECTION Y-Y

Ao	10.50	+/- 0.1
Bo	15.80	+/- 0.1
B2	10.25	+/- 0.1
Ko	4.90	+/- 0.1
F	11.50	+/- 0.1
P1	16.00	+/- 0.1
W	24.00	+/- 0.3

NOTES:

- 1.0 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE ±.02
- 2.0 CAMBER NOT TO EXCEED 1mm in 100mm
- 3.0 MATERIAL: CONDUCTIVE BLACK STYRENEIC ALLOY
- 4.0 Ko MEASURED FROM A PLANE ON THE INSIDE BOTTOM OF THE POCKET TO THE TOP SURFACE OF THE CARRIER
- 5.0 MEASURED FROM CENTRELINE OF SPROCKET HOLE TO CENTRELINE OF POCKET
- 6.0 VENDOR: (OPTIONAL)
- 7.0 MUST ALSO MEET REQUIREMENTS OF EIA STANDAR #EIA-481A TAPING OF SURFACE MOUNT COMPONENTS FOR AUTOMATIC PLACEMENT
- 8.0 SURFACE RESISTIVITY OF MOLDED MATL. MUST MEASURE LESS OR EQUAL TO 10⁶ OHMS PER SQUARE. MEASURED IN ACCORDANCE TO PROCEDURE GIVEN IN ASTM D-257 & ASTM D-991
- 9.0 TOTAL LENGTH PER REEL MUST BE 45 METERS
- 10.0 © CRITICAL

Dimensions in millimeters and (inches)

Ordering Information Table

Device Code

MBR	B	16	45	TRL	-
1	2	3	4	5	6

1

- Schottky MBR Series

2

- Package Style:

- none = TO-220
- B = D²PAK

3

- Current Rating (16 = 16A)

4

- Voltage Ratings

35 = 35V

45 = 45V

5

- • none = Tube

- TRR = Tape & Reel (Right Oriented)
- TRL = Tape & Reel (Left Oriented)

6

- • none = Standard Production

- PbF = Lead-Free

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.

International
IR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
Visit us at www.irf.com for sales contact information. 06/06