

International
IOR Rectifier

MBR1535CT
MBR1545CT

SCHOTTKY RECTIFIER

15 Amp

Major Ratings and Characteristics

Characteristics	MBR15..CT	Units
$I_{F(AV)}$ Rectangular waveform	15	A
V_{RRM}	35/45	V
I_{FSM} @ tp = 5 μ s sine	690	A
V_F @ 7.5 Apk, $T_J = 125^\circ\text{C}$	0.57	V
T_J	-65 to 150	$^\circ\text{C}$

Description/ Features

The MBR15..CT center tap 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.

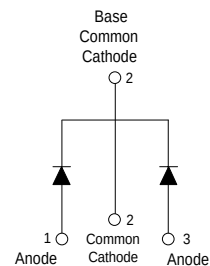
- 150°C T_J operation
- Center tap TO-220 package
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

Case Styles

MBR15..CT



TO-220AB



Voltage Ratings

Part number	MBR1535CT	MBR1545CT
V_R Max. DC Reverse Voltage (V)	35	45
V_{RWM} Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

Parameters	Value	Units	Conditions
$I_{F(AV)}$ Max. Aver. Forward Current (Per Leg) (Per Device)	7.5 15	A	@ $T_C = 131^\circ\text{C}$ (Rated V_R)
I_{FSM} Max. Peak One Cycle Non Repetitive Surge	690 150	A	5 μs Sine or 3 μs Rect. pulse Following any rated load condition and with rated V_{RRM} applied Surge applied at rated load condition halfwave single phase 60Hz
E_{AS} Non-Repetitive Avalanche Energy	7	mJ	(Per Leg) $T_J = 25^\circ\text{C}$, $I_{AS} = 2\text{Amps}$, $L = 3.5\text{mH}$
I_{AR} Repetitive Avalanche Current (Per Leg)	2	A	Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Parameters	Value	Units	Conditions
V_{FM} Max. Forward Voltage Drop (1)	0.84 0.57 0.72	V	@ 15A @ 7.5A @ 15A
I_{RM} Max. Instantaneous Reverse Current (1)	0.1 15	mA	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$
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 < 300 μs , Duty Cycle <2%

Thermal-Mechanical Specifications

Parameters	Value	Units	Conditions
T_J Max. Junction Temperature Range	-65 to 150	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-65 to 175	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case	3.0	$^\circ\text{C/W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.50	$^\circ\text{C/W}$	Mounting surface, smooth and greased
R_{thJA} Max. Thermal Resistance Junction	60	$^\circ\text{C/W}$	DC operation
wt Approximate Weight	2 (0.07)	g (oz.)	
T Mounting Torque	Min. 6 (5) Max. 12 (10)	Kg-cm (lbf-in)	
Case Style	TO-220AB		JEDEC

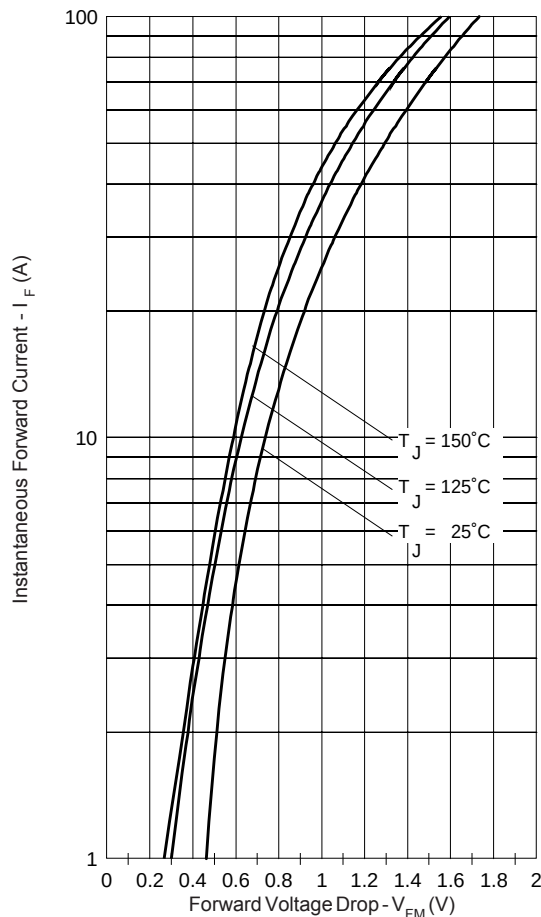


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

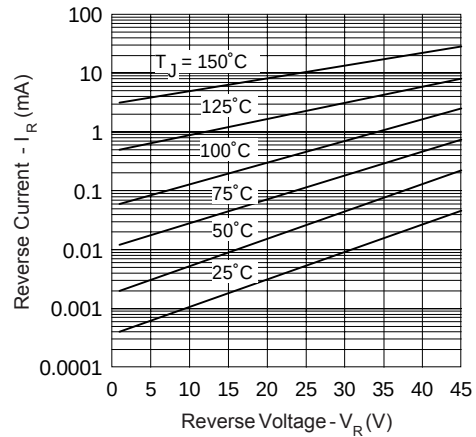


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

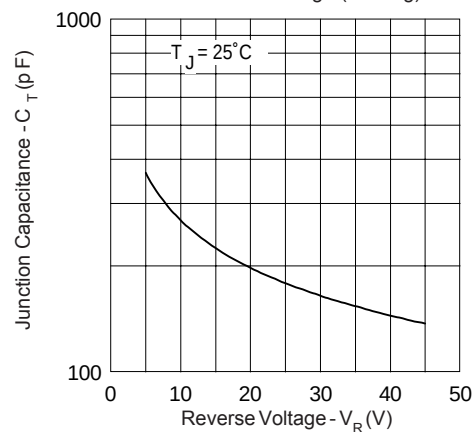


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

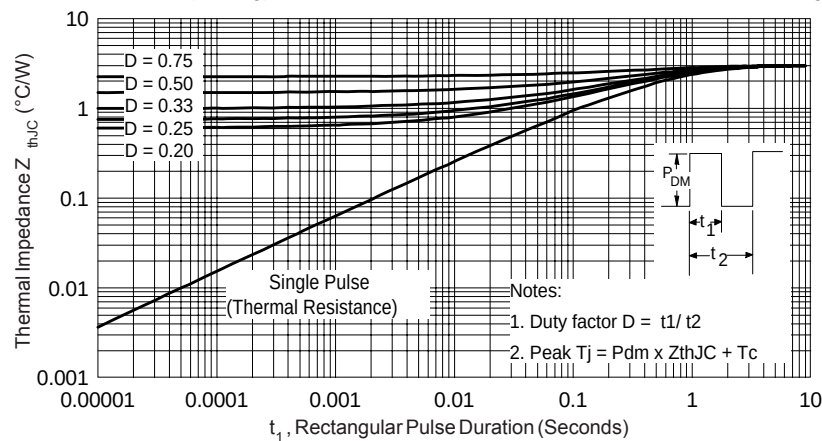


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

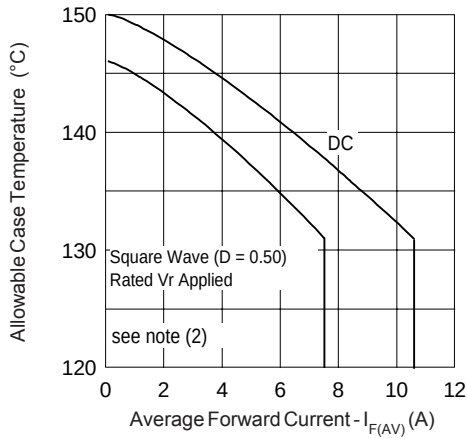


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

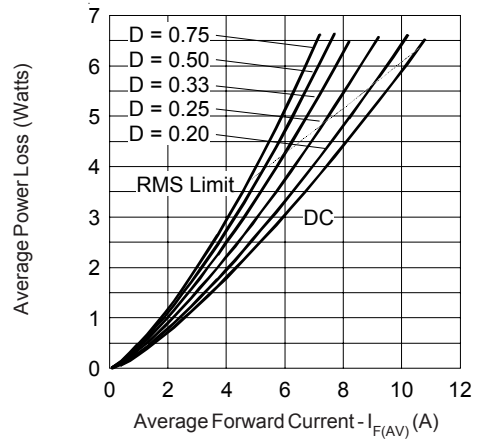


Fig. 6 - Forward Power Loss Characteristics

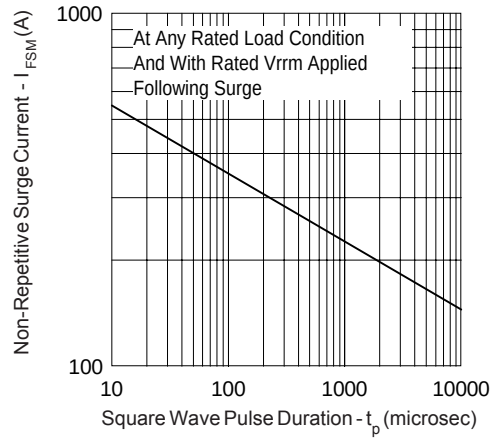


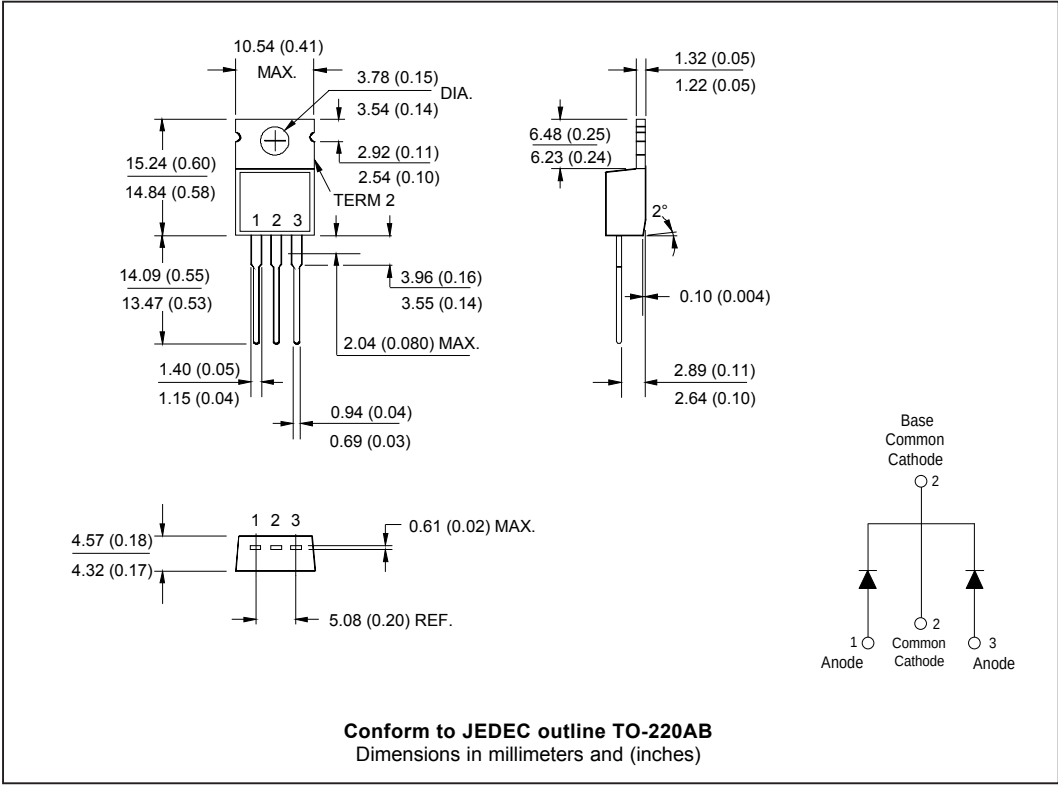
Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

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

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

Outline Table



Ordering Information Table

Device Code			
MBR	15	45	CT
1	2	3	4
1	-	Essential Part Number	
2	-	Current Rating	
3	-	Voltage code: Code = V_{RRM}	35 = 35V 45 = 45V
4	-	CT = Essential Part Number	

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MBR1545CT
*****
*      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 MBR1545 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 MBR1545

Thermal Model Subcircuit
.SUBCKT MBR1545 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 MBR1545

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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. 07/03