

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
 Http://www.100y.com.tw

Bulletin PD-2.318 rev. D 05/04

International **IR** Rectifier

MBR15..CT MBRB15..CT MBR15..CT-1

SCHOTTKY RECTIFIER

15 Amp

Major Ratings and Characteristics

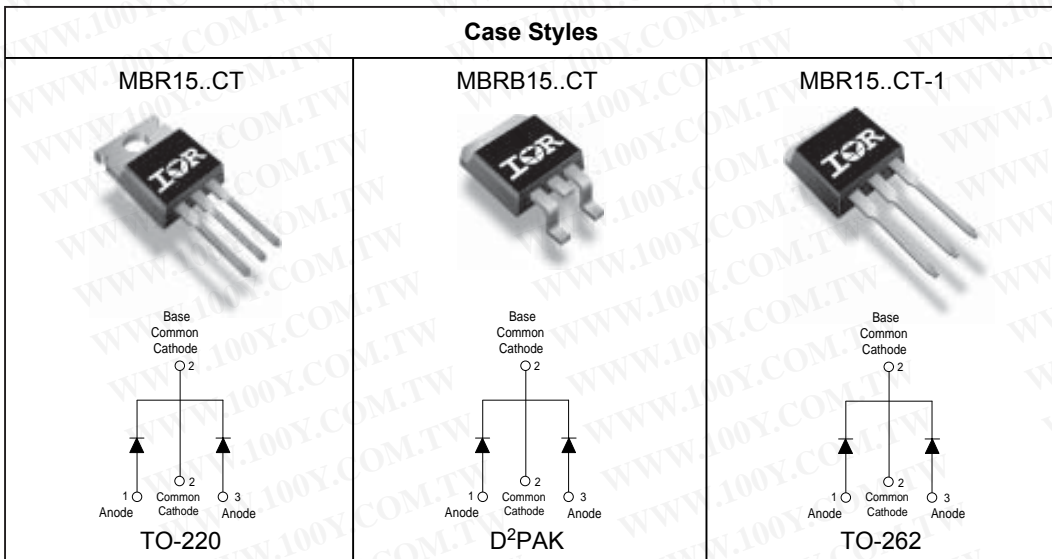
Characteristics	MBR15..CT	Units
$I_{F(AV)}$ Rectangular waveform	15	A
V_{RRM}	35/45	V
I_{FSM} @ tp = 5 μ s sine	690	A
V_F @ 7.5 Apk, $T_J = 125^\circ\text{C}$	0.57	V
T_J	-65 to 150	$^\circ\text{C}$

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



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Voltage Ratings

Parameters	MBR1535CT MBRB1535CT MBR1535CT-1	MBR1545CT MBRB1545CT MBR1545CT-1
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	A	@ $T_C = 131^\circ\text{C}$ (Rated V_R)
	15		
I_{FSM} Max. Peak One Cycle Non Repetitive Surge	690	A	5 μs Sine or 3 μs Rect. pulse Surge applied at rated load condition halfwave single phase 60Hz
	150		
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	V	@ 15A, $T_J = 25^\circ\text{C}$
	0.57	V	@ 7.5A, $T_J = 125^\circ\text{C}$
	0.72	V	@ 15A, $T_J = 125^\circ\text{C}$
I_{RM} Max. Instantaneous Reverse Current (1)	0.1	mA	$T_J = 25^\circ\text{C}$
	15	mA	$T_J = 125^\circ\text{C}$ Rated DC voltage
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 (Per Leg)	3.0	$^\circ\text{C}/\text{W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.50	$^\circ\text{C}/\text{W}$	Mounting surface, smooth and greased
R_{thJA} Max. Thermal Resistance Junction	60	$^\circ\text{C}/\text{W}$	DC operation
wt Approximate Weight	2 (0.07)	g (oz.)	
T Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)
	Max.	12 (10)	
Device Marking	MBR15..CT		Case style TO-220
	MBRB15..CT		Case style D ² Pak
	MBR15..CT-1		Case style TO-262

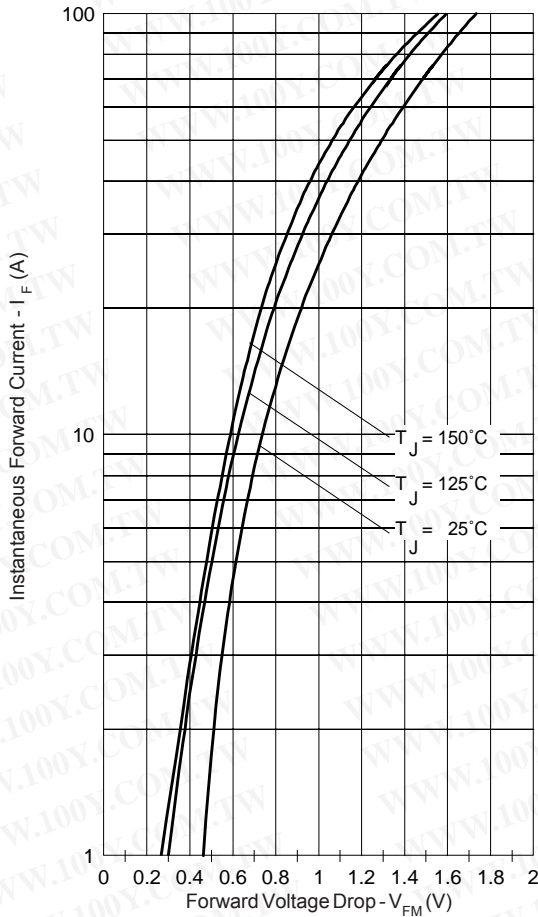


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

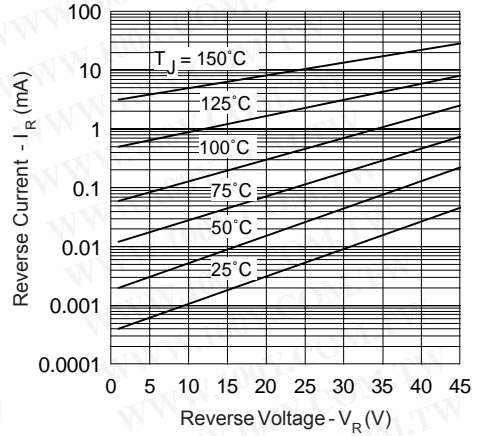


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

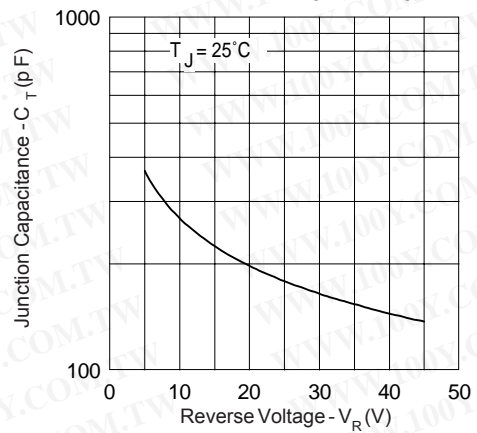


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

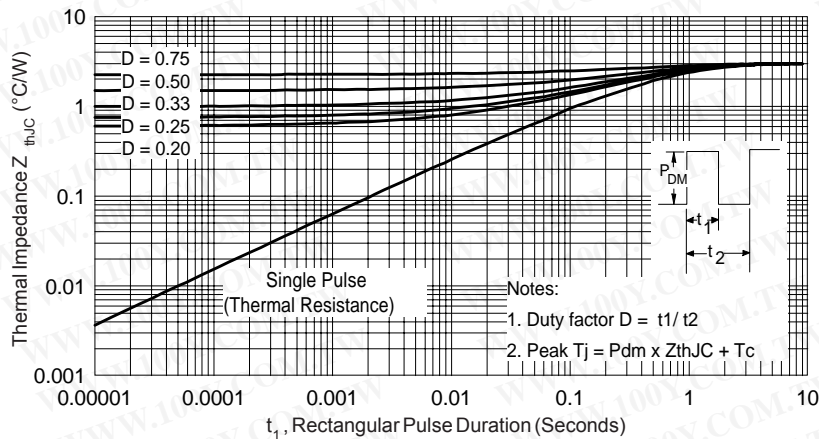


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

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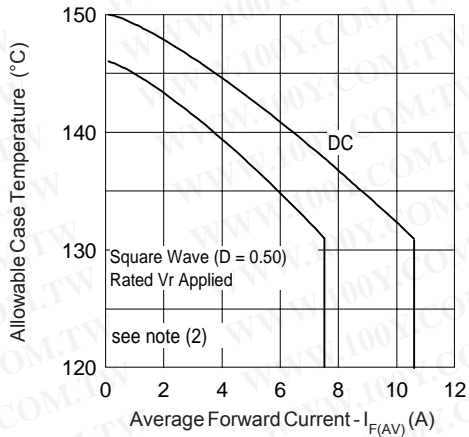


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

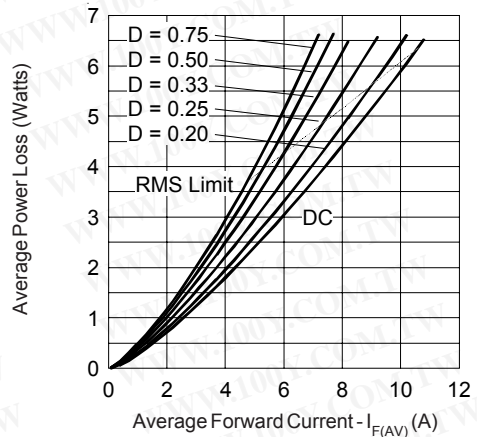


Fig. 6 - Forward Power Loss Characteristics

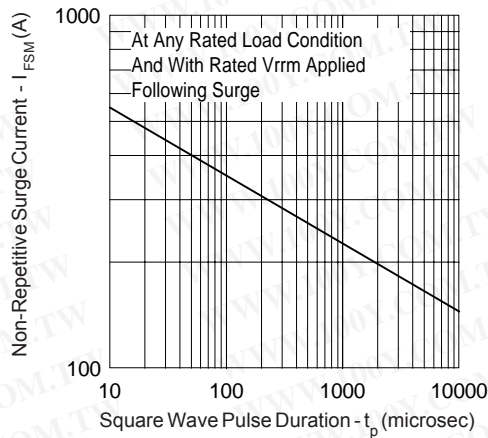
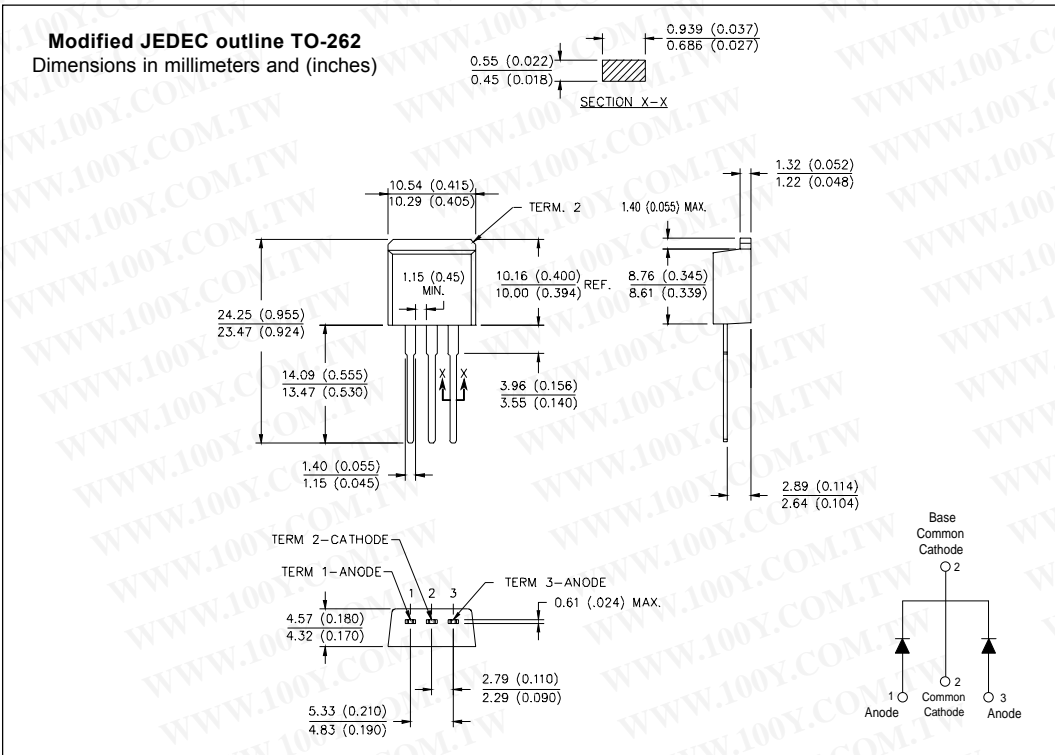
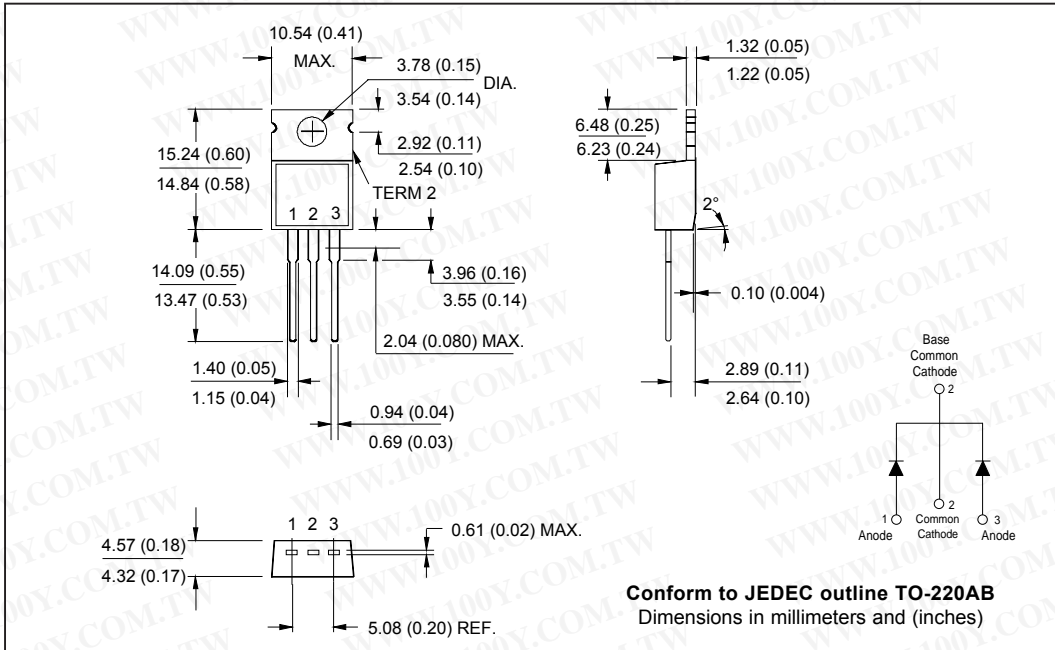


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

(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

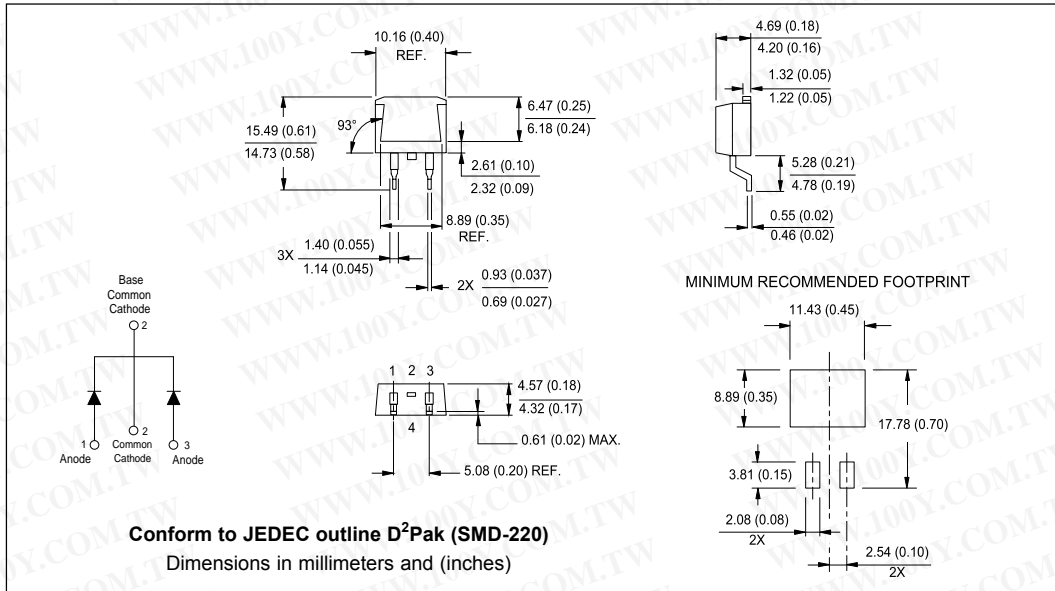


MBR15..CT, MBRB15..CT, MBR15..CT-1

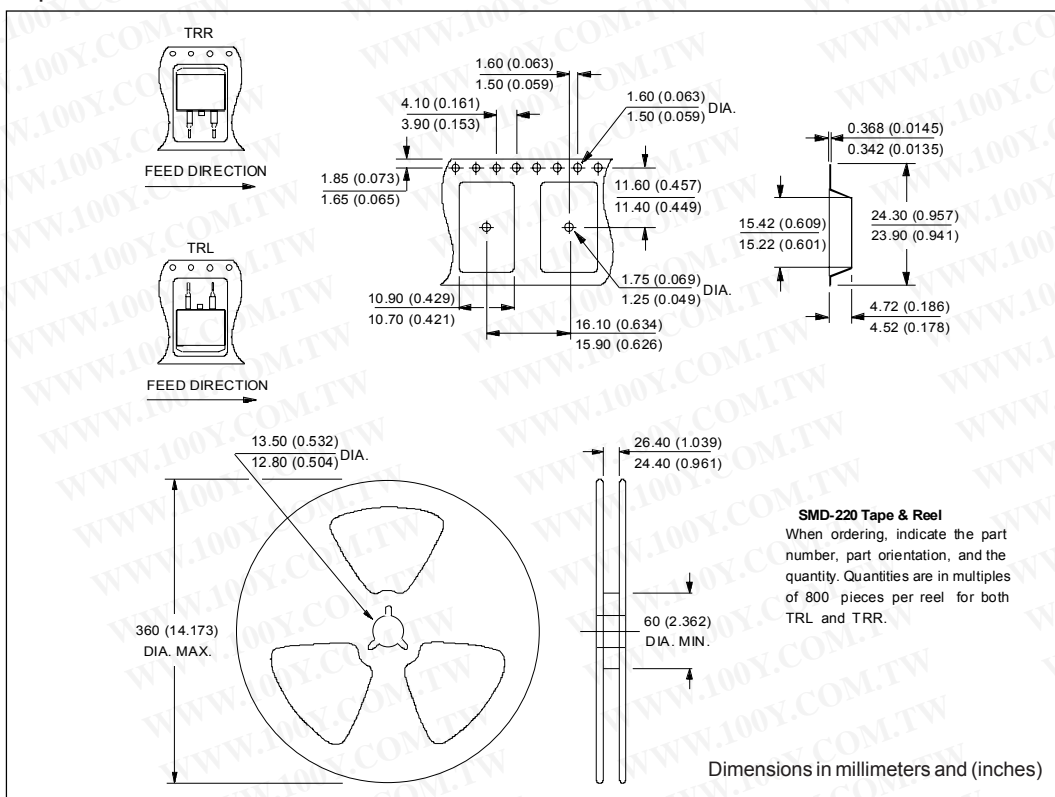
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Outline Table



Tape & Reel Information



Part Marking Information

EXAMPLE: THIS IS A MBR1545CT
 LOT CODE 1789
 ASSEMBLED ON WW 19, 2000
 IN THE ASSEMBLY LINE "C"

TO-220

INTERNATIONAL RECTIFIER LOGO

ASSEMBLY LOT CODE

PART NUMBER

DATE CODE
 YEAR 0 = 2000
 WEEK 19
 LINE C

EXAMPLE: THIS IS A MBRB1545CT
 LOT CODE 8024
 ASSEMBLED ON WW 02, 2000
 IN THE ASSEMBLY LINE "L"

D²PAK

INTERNATIONAL RECTIFIER LOGO

ASSEMBLY LOT CODE

PART NUMBER

DATE CODE
 YEAR 0 = 2000
 WEEK 02
 LINE L

EXAMPLE: THIS IS A MBR1545CT-1
 LOT CODE 1789
 ASSEMBLED ON WW 19, 1999
 IN THE ASSEMBLY LINE "C"

TO-262

INTERNATIONAL RECTIFIER LOGO

ASSEMBLY LOT CODE

PART NUMBER

DATE CODE
 YEAR 9 = 1999
 WEEK 19
 LINE C

MBR15..CT, MBRB15..CT, MBR15..CT-1

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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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Ordering Information Table

Device Code						
1	2	3	4	5	6	7
MBR	B	15	45	CT	-1	TRL
1	- Essential Part Number					
2	- B = D ² Pak only					
3	- Current Rating (15 = 15A)					
4	- Voltage Rating					
5	- CT = Essential Part Number					
6	- "-1" = TO-262 only					
7	<ul style="list-style-type: none"> • none = Tube (50 pieces) • TRL = Tape & Reel (Left Oriented - for D²Pak only) • TRR = Tape & Reel (Right Oriented - for D²Pak only) 					

35	= 35V
45	= 45V

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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.

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