



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

**SCHOTTKY RECTIFIER**

**15 Amp**

$I_{F(AV)} = 15\text{Amp}$   
 $V_R = 35 - 45\text{V}$

**Major Ratings and Characteristics**




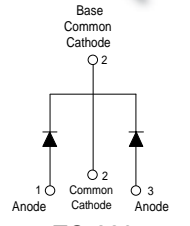
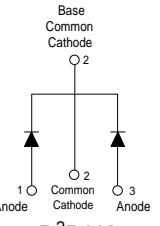
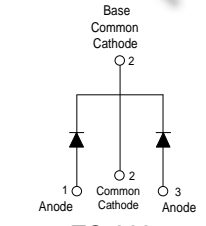
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	15	A
$V_{RRM}$	35-45	V
$I_{FSM}$ @ $t_p = 5 \mu\text{s}$ sine	690	A
$V_F$ @ $7.5\text{Apk}, T_J = 125^\circ\text{C}$	0.57	V
$T_J$	-65 to 150	$^\circ\text{C}$

**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  $150^\circ\text{C}$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- $150^\circ\text{C}$   $T_J$  operation
- 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	MBRB15..CT	MBR15..CT-1
		
 <p>TO-220</p>	 <p>D<sup>2</sup>PAK</p>	 <p>TO-262</p>

Voltage Ratings

Parameters	MBR1535CT MBRB1535CT MBR1535CT-1	MBR1545CT MBRB1545CT MBR1545CT-1
V <sub>R</sub> Max. DC Reverse Voltage (V)	35	45
V <sub>RWM</sub> Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

Parameters	Value	Units	Conditions
I <sub>F(AV)</sub> Max. Aver. Forward Current (Per Leg) (Per Device)	7.5 15	A	@ T <sub>C</sub> = 131 °C (Rated V <sub>R</sub> )
I <sub>FSM</sub> Max. Peak One Cycle Non Repetitive Surge	690 150	A	5µs Sine or 3µs Rect. pulse Surge applied at rated load condition halfwave single phase 60Hz Following any rated load condition and with rated V <sub>RRM</sub> applied
E <sub>AS</sub> Non-Repetitive Avalanche Energy	7	mJ	(Per Leg) T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 2 Amps, L = 3.5 mH
I <sub>AR</sub> Repetitive Avalanche Current (Per Leg)	2	A	Current decaying linearly to zero in 1 µsec Frequency limited by T <sub>J</sub> max. V <sub>A</sub> = 1.5 x V <sub>R</sub> typical

Electrical Specifications

Parameters	Value	Units	Conditions
V <sub>FM</sub> Max. Forward Voltage Drop (1)	0.84 0.57 0.72	V	@ 15A @ 7.5A @ 15A T <sub>J</sub> = 25 °C T <sub>J</sub> = 125 °C
I <sub>RM</sub> Max. Instantaneous Reverse Current (1)	0.1 15	mA	T <sub>J</sub> = 25 °C T <sub>J</sub> = 125 °C Rated DC voltage
C <sub>T</sub> Max. Junction Capacitance	400	pF	V <sub>R</sub> = 5V <sub>DC</sub> (test signal range 100Khz to 1Mhz) 25°C
L <sub>S</sub> Typical Series Inductance	8.0	nH	Measured from top of terminal to mounting plane
dv/dt Max. Voltage Rate of Change (Rated V <sub>R</sub> )	10000	V/ µs	

(1) Pulse Width < 300µs, Duty Cycle <2%

Thermal-Mechanical Specifications

Parameters	Value	Units	Conditions
T <sub>J</sub> Max. Junction Temperature Range	-65 to 150	°C	
T <sub>stg</sub> Max. Storage Temperature Range	-65 to 175	°C	
R <sub>thJC</sub> Max. Thermal Resistance Junction to Case (Per Leg)	3.0	°C/W	DC operation
R <sub>thCS</sub> Typical Thermal Resistance, Case to Heatsink	0.50	°C/W	Mounting surface, smooth and greased
R <sub>thJA</sub> Max. Thermal Resistance Junction	60	°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)	
Device Marking	MBR15..CT MBRB15..CT MBR15..CT-1		Case style TO-220 Case style D <sup>2</sup> Pak Case style TO-262

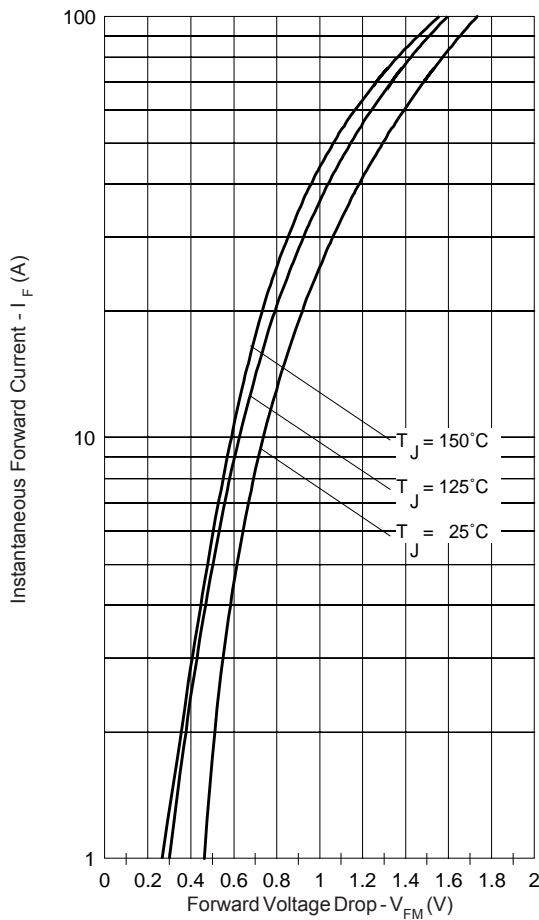


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

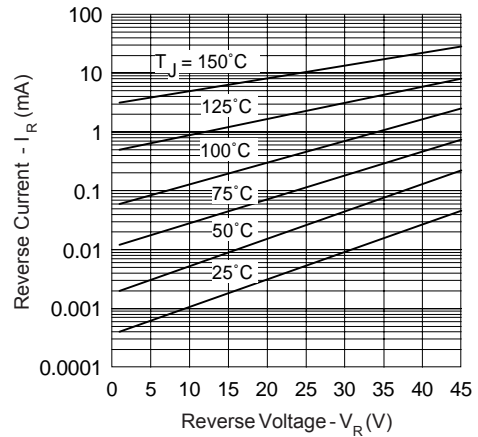


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

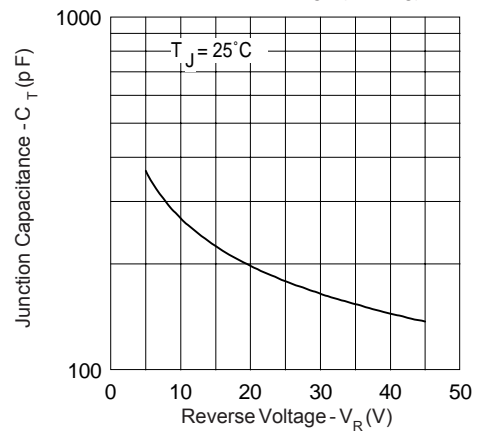


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

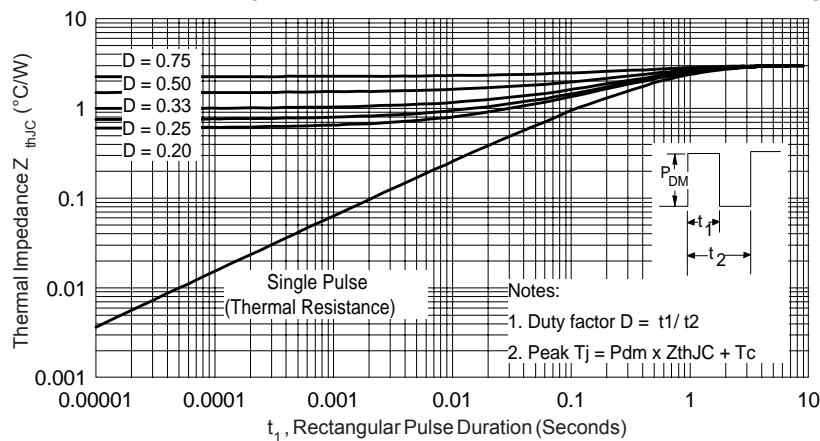


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

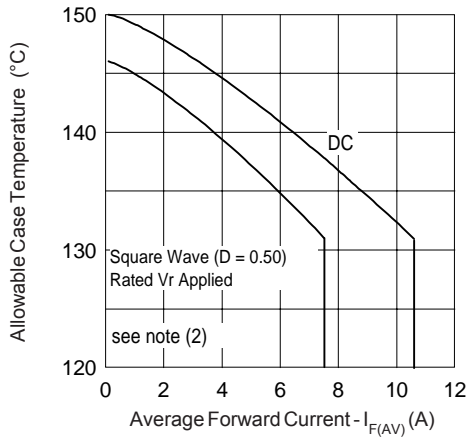


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

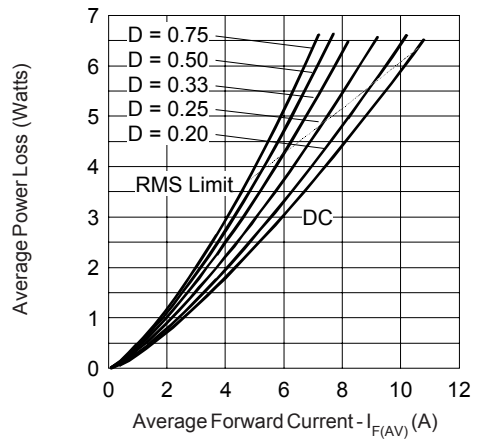


Fig. 6 - Forward Power Loss Characteristics

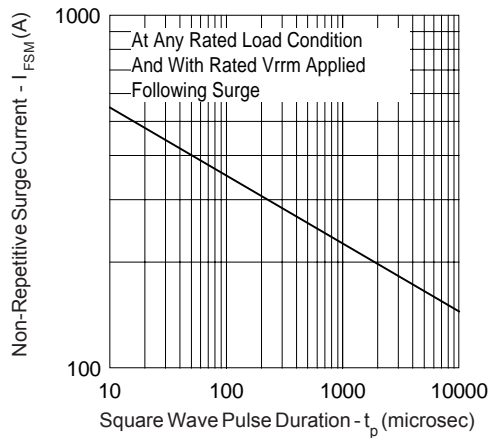


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

(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- LEAD DIMENSIONS AND FLASH UNCONTROLLED IN 1.
- 4- DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .025 [0.010] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
- 5- DIMENSION b1, b2 & c1 APPLY TO BASE METAL ONLY.
- 6- CONTROLLING DIMENSION: INCH.
- 7- INTERNAL PILE COUPLER OPTIONAL WITH DIMENSIONS E1, D2 & E1
- 8- DIMENSION D2 IS NOT DEFINED A 75% WIRE DRAWING AND SOLDER IMPEDEMENTS ARE ALLOWED.
- 9- OUTLINE CONFORMS TO JEDEC TO-220 EXCEPT A2 (MIN) AND D2 (MAX) THESE DIMENSIONS ARE DERIVED FROM THE ACTUAL PACKAGE OUTLINE.

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	3.56	4.83	.140	.190	
A1	0.51	1.40	.020	.055	
A2	2.03	2.82	.080	.115	
b	0.38	1.01	.015	.040	5
b1	0.38	0.81	.015	.038	
b2	1.14	1.78	.045	.070	5
b3	1.14	1.73	.045	.068	
c	0.16	0.61	.014	.024	5
c1	0.36	0.56	.014	.022	5
D	14.22	16.51	.560	.650	4
D1	6.36	9.02	.330	.355	
D2	11.68	12.88	.460	.507	7
E	9.65	10.67	.380	.420	4, 7
E1	6.86	8.89	.270	.350	7
E2	0.78	-	.030	-	8
e	2.54 BSC	-	.100 BSC	-	
e1	5.84	6.86	.230	.270	7, 8
H	12.70	14.73	.500	.580	
L	-	6.35	-	.250	
L1	-	6.35	-	.250	
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	-	
q	0.51	0.71	.020	.028	
θ	90°	93°	90°	93°	

**LEAD ASSIGNMENTS**

- 1.- GATE
- 2.- DRAIN
- 3.- SOURCE

**IGBTs, Co-PACK**

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

**DIODES**

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

\* PART DEPENDENT.

**Conform to JEDEC outline TO-220AB**

**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 [0.005] 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	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	.160	.190	
A1	0.00	0.254	.000	.010	
b	0.51	0.99	.020	.039	4
b1	0.51	0.89	.020	.035	
b2	1.14	1.78	.045	.070	
c	0.38	0.74	.015	.029	4
c1	0.38	0.68	.015	.023	
c2	1.14	1.65	.045	.065	
D	8.51	9.65	.335	.380	3
D1	6.86	-	.270	-	
E	9.65	10.67	.380	.420	3
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	1.78	1.65	.070	.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	-	
q	0.51	0.71	.020	.028	
θ	90°	93°	90°	93°	

**LEAD ASSIGNMENTS**

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

**IGBTs, Co-PACK**

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

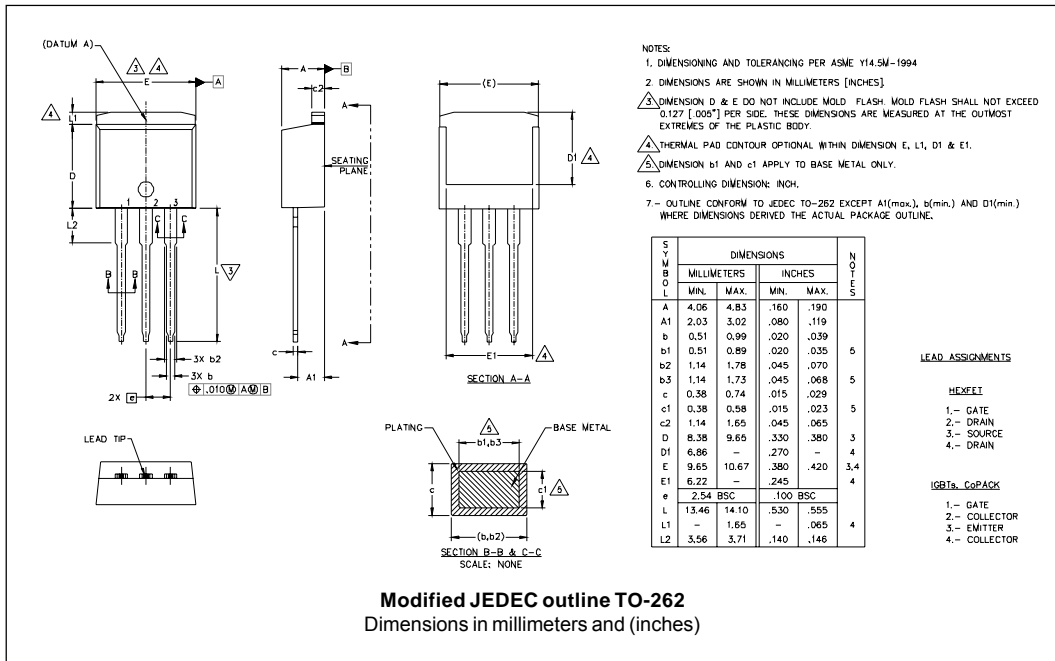
**DIODES**

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

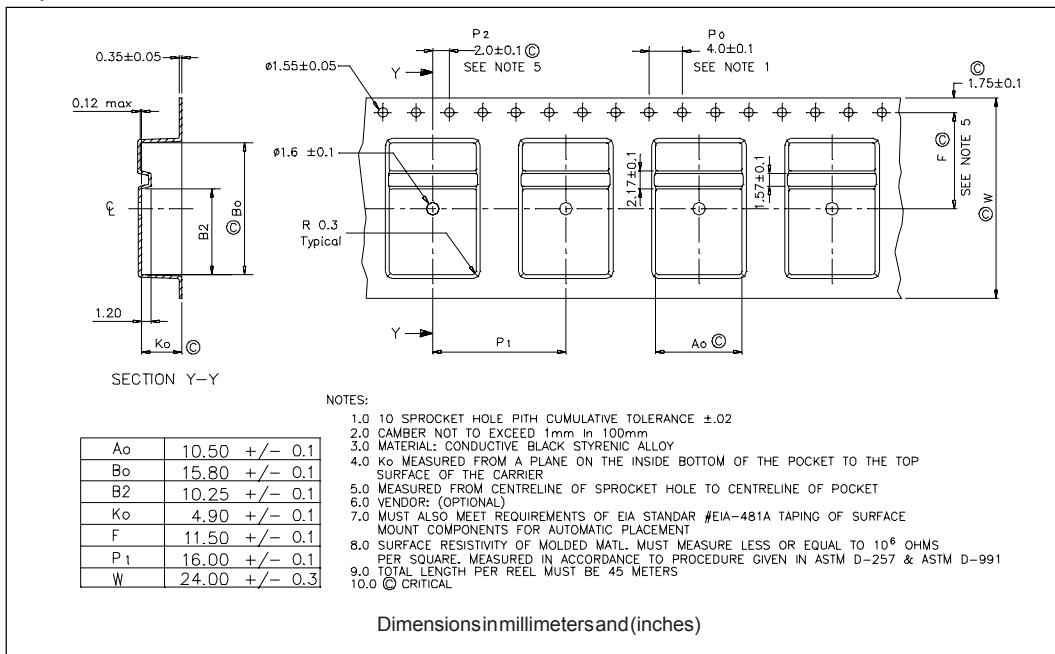
\* PART DEPENDENT.

**Conform to JEDEC outline D<sup>2</sup>Pak (SMD-220)**  
Dimensions in millimeters and (inches)

Outline Table



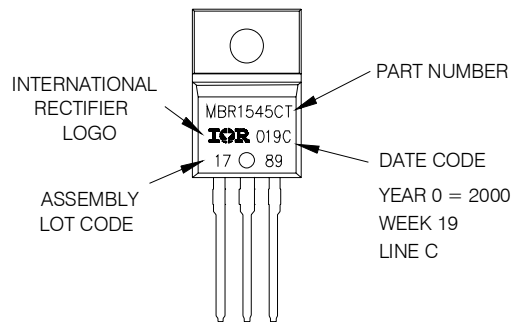
Tape & Reel Information



Part Marking Information

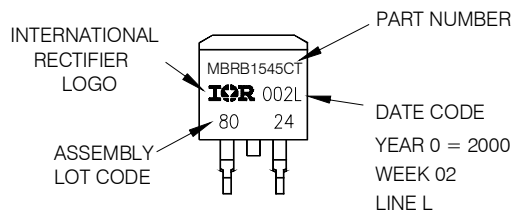
TO-220

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



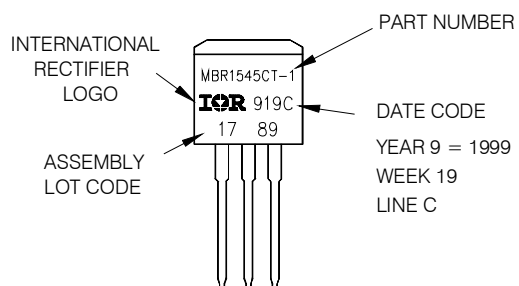
D<sup>2</sup>PAK

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



TO-262

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



```

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 paralled 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

RTHERM1      5      4      1.33E+00
RTHERM2      4      3      1.19E+00
RTHERM1      3      2      3.81E-01
RTHERM1      2      1      9.54E-02

.ENDS MBR1545
    
```



Ordering Information Table

Device Code																	
	<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;"><b>MBR</b></td> <td style="padding: 5px;"><b>B</b></td> <td style="padding: 5px;"><b>15</b></td> <td style="padding: 5px;"><b>45</b></td> <td style="padding: 5px;"><b>CT</b></td> <td style="padding: 5px;"><b>-1</b></td> <td style="padding: 5px;"><b>TRL</b></td> <td style="padding: 5px;"><b>-</b></td> </tr> <tr> <td style="text-align: center;">(1)</td> <td style="text-align: center;">(2)</td> <td style="text-align: center;">(3)</td> <td style="text-align: center;">(4)</td> <td style="text-align: center;">(5)</td> <td style="text-align: center;">(6)</td> <td style="text-align: center;">(7)</td> <td style="text-align: center;">(8)</td> </tr> </table>	<b>MBR</b>	<b>B</b>	<b>15</b>	<b>45</b>	<b>CT</b>	<b>-1</b>	<b>TRL</b>	<b>-</b>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>MBR</b>	<b>B</b>	<b>15</b>	<b>45</b>	<b>CT</b>	<b>-1</b>	<b>TRL</b>	<b>-</b>										
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)										
<b>1</b>	- Essential Part Number																
<b>2</b>	- <ul style="list-style-type: none"> <li>• B = D<sup>2</sup>Pak <span style="float: right;"><b>6</b> none</span></li> <li>• none = TO-220 <span style="float: right;"><b>6</b> none</span></li> <li>• none = TO-262 <span style="float: right;"><b>6</b> = -1</span></li> </ul>																
<b>3</b>	- Current Rating (15 = 15A)																
<b>4</b>	- Voltage Ratings <span style="float: right; border: 1px solid black; padding: 2px;">35 = 35V 45 = 45V</span>																
<b>5</b>	- CT = Essential Part Number																
<b>6</b>	- <ul style="list-style-type: none"> <li>• none = TO-220 <span style="float: right;"><b>2</b> none</span></li> <li>• none = D<sup>2</sup>Pak <span style="float: right;"><b>2</b> = B</span></li> <li>• -1 = TO-262 <span style="float: right;"><b>2</b> none</span></li> </ul>																
<b>7</b>	- <ul style="list-style-type: none"> <li>• none = Tube (50 pieces)</li> <li>• TRL = Tape &amp; Reel (Left Oriented - for D<sup>2</sup>Pak only)</li> <li>• TRR = Tape &amp; Reel (Right Oriented - for D<sup>2</sup>Pak only)</li> </ul>																
<b>8</b>	- <ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free (for TO-220/TO-262 and D<sup>2</sup>Pak tube)</li> <li>• P = Lead-Free (for D<sup>2</sup>Pak TRR and TRL)</li> </ul>																

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.