



MBR20..CT
MBRB20..CT
MBR20..CT-1

SCHOTTKY RECTIFIER

20 Amp

$I_{F(AV)} = 20\text{Amp}$
 $V_R = 35 - 45\text{V}$

Major Ratings and Characteristics

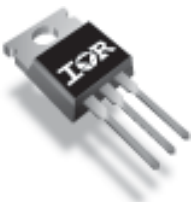
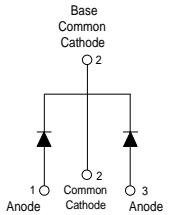

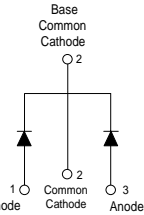

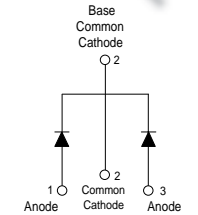
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform (Per Device)	20	A
I_{FRM} @ $T_C = 135^\circ\text{C}$ (Per Leg)	20	A
V_{RRM}	35-45	V
I_{FSM} @ $t_p = 5 \mu\text{s}$ sine	1060	A
V_F @ 10Apk, $T_J = 125^\circ\text{C}$	0.57	V
T_J range	-65 to 150	$^\circ\text{C}$

Description/ Features

This 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 and D²Pak packages
- 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

MBR20..CT	MBRB20..CT	MBR20..CT-1
 <p>Base Common Cathode</p> <p>2</p>  <p>1 Anode 2 Common Cathode 3 Anode</p> <p>TO-220</p>	 <p>Base Common Cathode</p> <p>2</p>  <p>1 Anode 2 Common Cathode 3 Anode</p> <p>D²PAK</p>	 <p>Base Common Cathode</p> <p>2</p>  <p>1 Anode 2 Common Cathode 3 Anode</p> <p>TO-262</p>

Voltage Ratings

Parameters	MBR2035CT MBRB2035CT MBR2035CT-1	MBR2045CT MBRB2045CT MBR2045CT-1
V _R Max. DC Reverse Voltage (V)	35	45
V _{RWM} Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

Parameters	Values	Units	Conditions
I _{F(AV)} Max. Average Forward (Per Leg) Current (Per Device)	10	A	@ T _C = 135°C, (Rated V _R)
	20		
I _{FRM} Peak Repetitive Forward Current (Per Leg)	20	A	Rated V _R , square wave, 20kHz T _C = 135°C
I _{FSM} Non Repetitive Peak Surge Current	1060	A	5µs Sine or 3µs Rect. pulse Following any rated load condition and with rated V _{RRM} applied Surge applied at rated load conditions halfwave, single phase, 60Hz
	150		
E _{AS} Non-Repetitive Avalanche Energy	8	mJ	(Per Leg) T _J = 25°C, I _{AS} = 2 Amps, L = 4 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 x V _R typical

Electrical Specifications

Parameters	Values	Units	Conditions	
V _{FM} Max. Forward Voltage Drop (1)	0.84	V	@ 20A	T _J = 25°C
	0.57	V	@ 10A	T _J = 125°C
	0.72	V	@ 20A	
I _{RM} Max. Instantaneous Reverse Current (1)	0.1	mA	T _J = 25°C	Rated DC voltage
	15	mA	T _J = 125°C	
V _{F(TO)} Threshold Voltage	0.354	V	T _J = T _J max.	
r _t Forward Slope Resistance	17.6	mΩ		
C _T Max. Junction Capacitance	600	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	Values	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 (Per Leg)	2.0	°C/W	DC operation
R _{thCS} Typical Thermal Resistance Case to Heatsink	0.50	°C/W	Mounting surface, smooth and greased Only for TO-220
wt Approximate Weight	2 (0.07)	g (oz.)	
T Mounting Torque	Min. 6 (5)	Kg-cm (lbf-in)	Non-lubricated threads
	Max. 12 (10)		

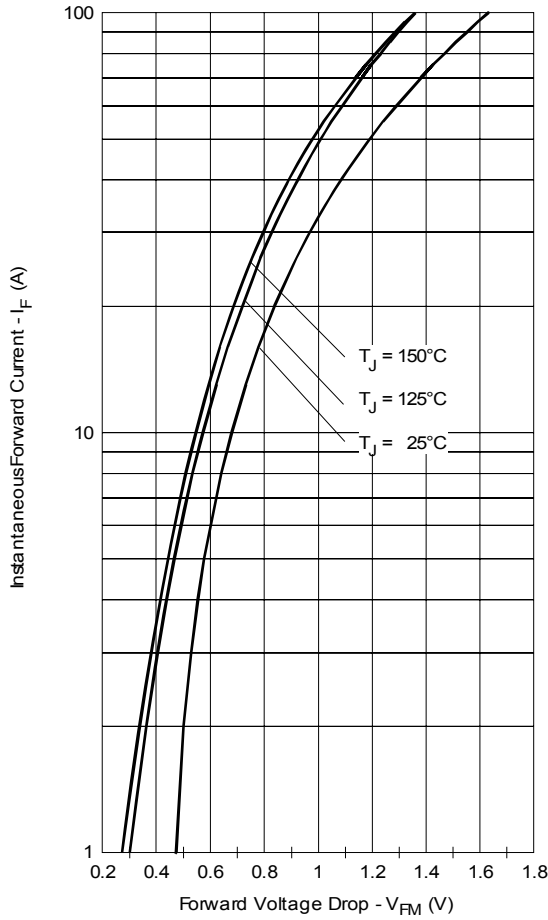


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

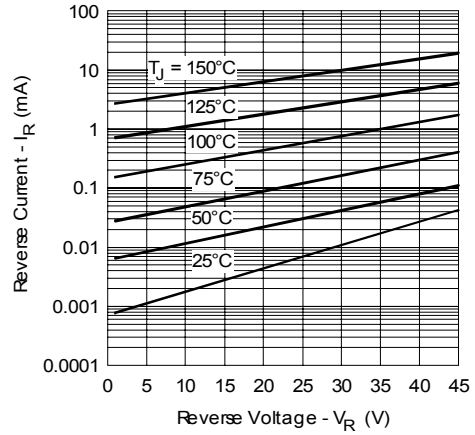


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

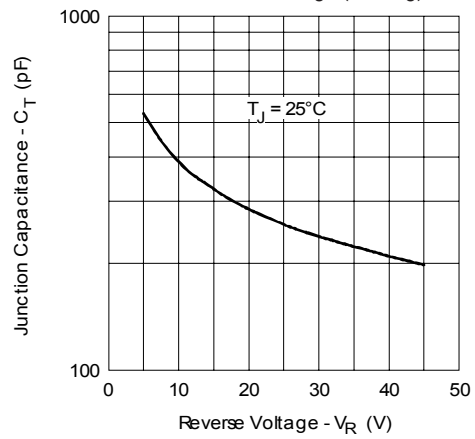


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

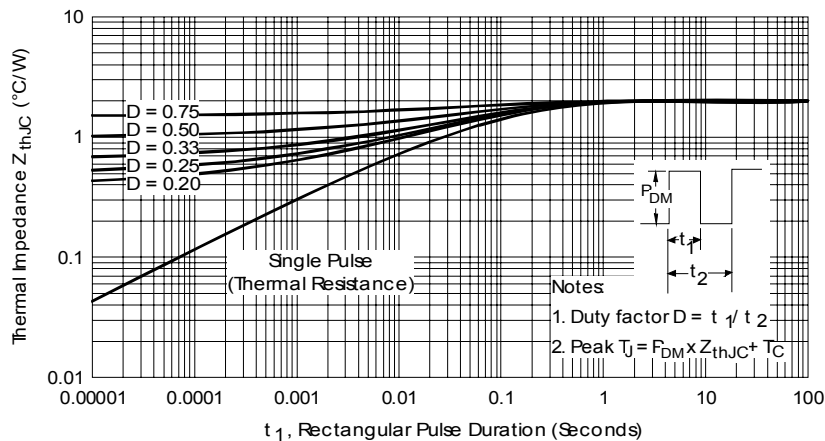


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

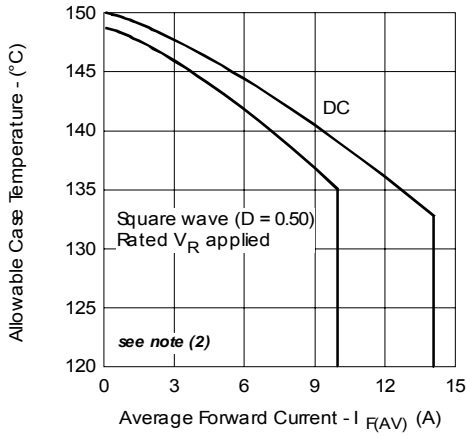


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

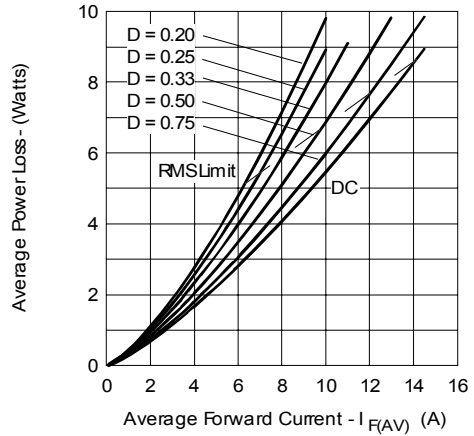


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

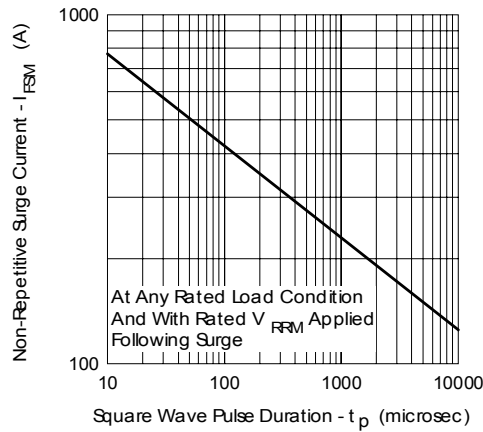
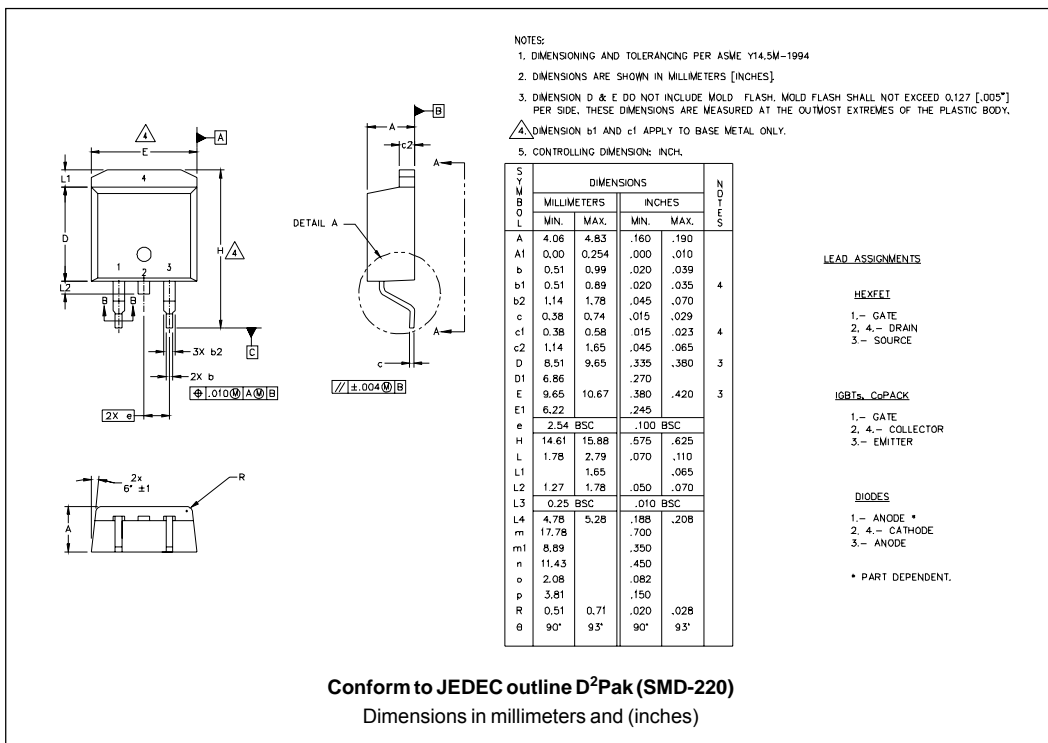
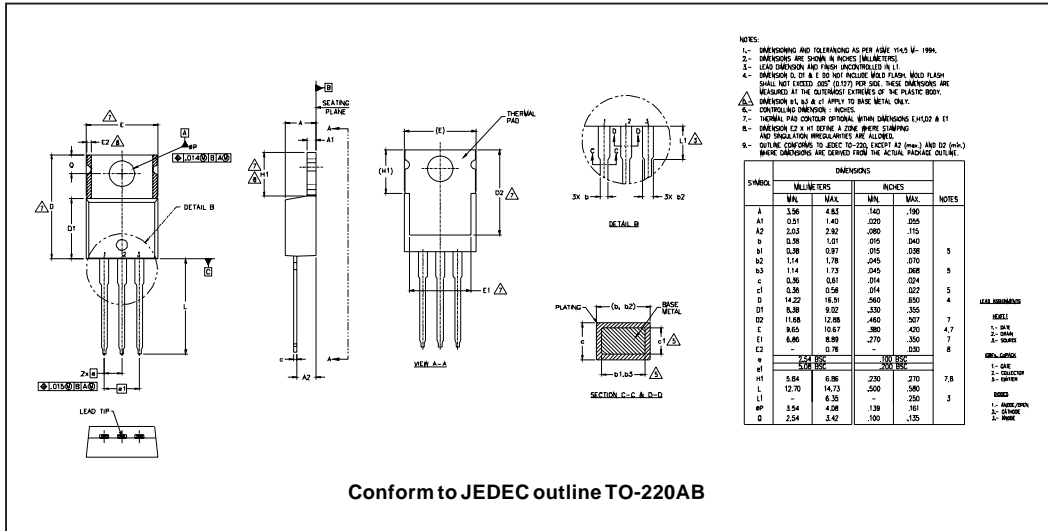


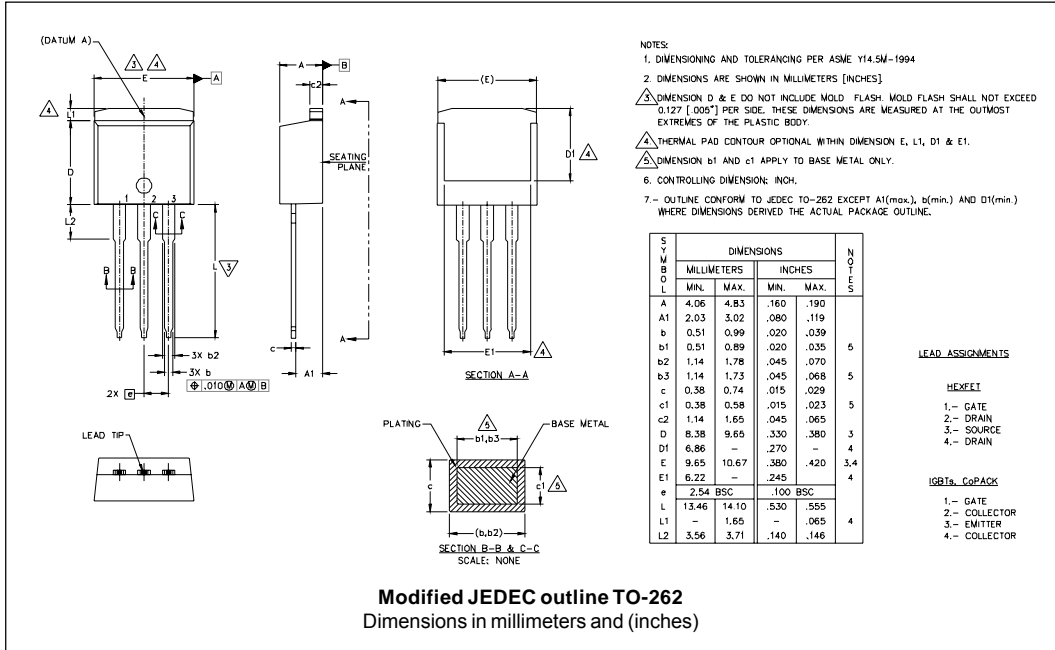
Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
 Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
 Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = rated V_R

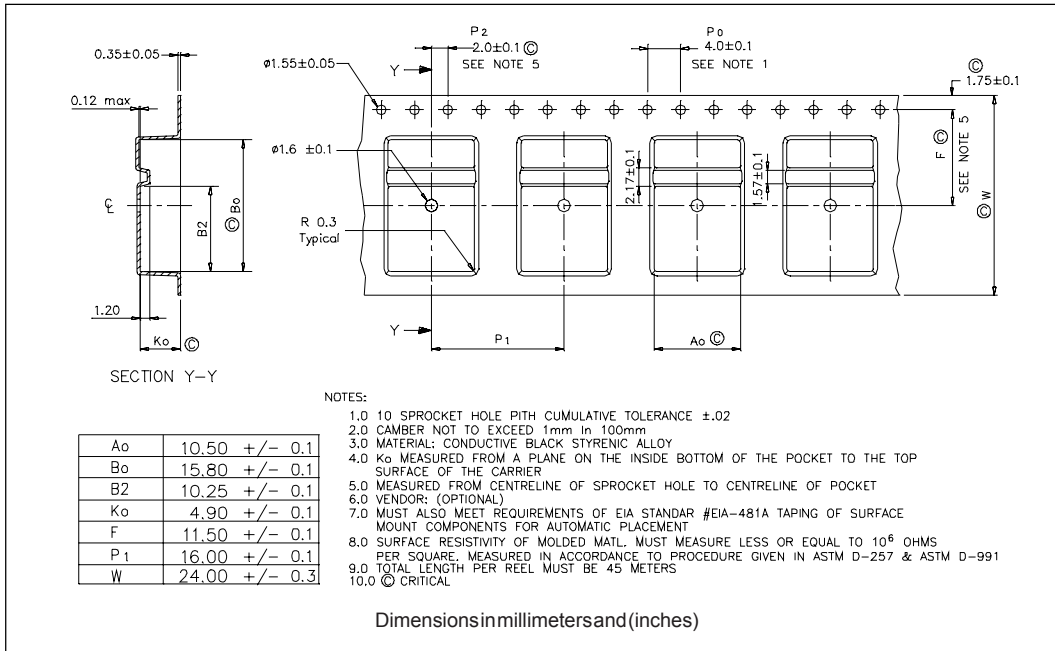
Outline Table



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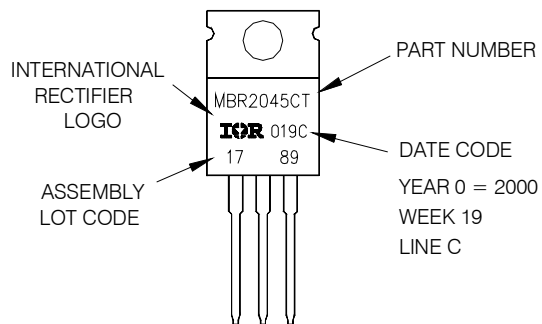
Tape & Reel Information



Part Marking Information

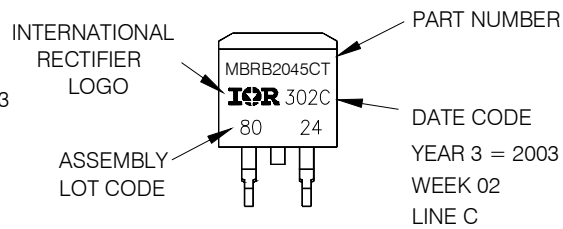
TO-220

EXAMPLE: THIS IS A MBR2045CT
 LOT CODE 1789
 ASSEMBLED ON WW 19, 2000
 IN THE ASSEMBLY LINE "C"



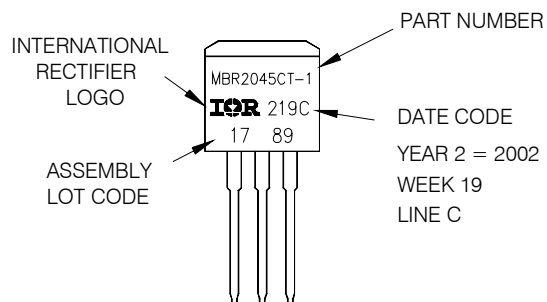
D²PAK

EXAMPLE: THIS IS A MBRB2045CT
 LOT CODE 8024
 ASSEMBLED ON WW 02, 2003
 IN ASSEMBLY LINE "C"



TO-262

EXAMPLE: THIS IS A MBR2045CT-1
 LOT CODE 1789
 ASSEMBLED ON WW 19, 2002
 IN ASSEMBLY LINE "C"



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MBR2045CT
*****
* This model has been developed by *
* Wizard SPICE MODEL GENERATOR (1999) *
* (International Rectifier Corporation) *
* Contain Proprietary Information *
*****
* SPICE Model Diode is composed by a *
* simple diode plus paralalled VCG2T *
*****
.SUBCKT MBR2045CT ANOCAT
D1 ANO 1 DMOD (0.03215)
*Define diode model
.MODEL DMOD (IS=3.22473520069593E-04, N=1.51153417806053, BV=52V,
+IBV=-0.64831328218128A, RS=0.00042438, CJO=2.77992867902976E-08,
+VJ=2.31227489200041, XTI=2, EG=0.682207095559952)
*****
*Implementation of VCG2T
VX 1 2 DC 0V
R1 2 CAT TRES 1E-6
.MODEL TRES RES (R=1, TC1=-29.9397914371146)
GP1 ANOCAT VALUE={-ABS(I(VX))*(EXP((((1.396526E-04/-29.93979)*((V(2,CAT)*1E6)/(I(VX)+1E-6)-
1)))+1)*4.399843E-02*ABS(V(ANO,CAT)))-1}}
*****
.ENDS MBR2045CT

Thermal Model Subcircuit
.SUBCKT MBR2045CT 5 1

CTHERM1 5 4 1.43E+00
CTHERM2 4 3 1.46E+01
CTHERM3 3 2 9.30E+01
CTHERM4 2 1 1.69E+03

R THERM1 5 4 5.79E-01
R THERM2 4 3 7.72E-01
R THERM1 3 2 4.45E-01
R THERM1 2 1 1.93E-01

.ENDS MBR2045CT
    
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Ordering Information Table

Device Code																	
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MBR	B	20	45	CT	-1	TRL	-										
①	②	③	④	⑤	⑥	⑦	⑧										
1	- Essential Part Number																
2	- <ul style="list-style-type: none"> • B = D²Pak 6 none • none = TO-220 6 none • none = TO-262 6 = -1 																
3	- Current Rating (20 = 20A)																
4	- Voltage Ratings 35 = 35V 45 = 45V																
5	- CT = Essential Part Number																
6	- <ul style="list-style-type: none"> • none = TO-220 2 none • none = D²Pak 2 = B • -1 = TO-262 2 none 																
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) 																
8	- <ul style="list-style-type: none"> • none = Standard Production • PbF = Lead-Free (for TO-220TO-262 and D²Pak tube) • P = Lead-Free (for D²Pak TRR and TRL) 																

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.