



MBRB25..CTPbF MBR25..CT-1PbF

SCHOTTKY RECTIFIER

30 Amp

$$I_{F(AV)} = 30\text{Amp}$$

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

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform (Per Device)	30	A
I_{FRM} @ $T_C = 130^\circ\text{C}$ (Per Leg)	30	A
V_{RRM}	35 - 45	V
I_{FSM} @ $t_p = 5 \mu\text{s}$ sine	1060	A
V_F @ 30Apk, $T_J = 125^\circ\text{C}$	0.73	V
T_J range	-65 to 150	$^\circ\text{C}$

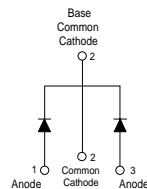
Description/ Features

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
- Lead-Free ("PbF" suffix)

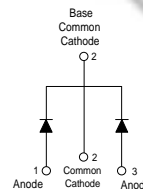
Case Styles

MBRB25..CTPbF



D²PAK

MBR25..CT-1PbF



TO-262

MBRB25..CTPbF, MBR25..CT-1PbF Series

Bulletin PD-21045 rev. A 07/06



Voltage Ratings

Parameters	MBRB2535CTPbF MBR2535CT-1PbF	MBRB2545CTPbF MBR2545CT-1PbF
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 Current (PerLeg) (PerDevice)	15 30	A	@ T _C = 130° C, (Rated V _R)
I _{FRM} Peak Repetitive Forward Current (Per Leg)	30	A	Rated V _R , square wave, 20kHz T _C = 130° C
I _{FSM} Non Repetitive Peak Surge Current	1060 150	A	5µs Sine or 3µs Rect. pulse Following any rated load condition and with rated V _{RWM} applied Surge applied at rated load conditions halfwave, single phase, 60Hz
E _{AS} Non-Repetitive Avalanche Energy (Per Leg)	16	mJ	(Per Leg) T _J = 25° C, I _{AS} = 2Amps, L = 8mH
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)	0.82 0.73	V	@ 30A T _J = 25° C @ 30A T _J = 125° C
I _{RM} Max. Instantaneous Reverse Current (1)	0.2 40	mA	T _J = 25° C T _J = 125° C Rated DC voltage
V _{F(TO)} Threshold Voltage	0.355	V	T _J = T _J max.
r _t Forward Slope Resistance	12.3	mΩ	
C _T Max. Junction Capacitance	700	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	10000	V/ µs	(Rated V _R)

(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)	1.5	°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) Max. 12(10)	Kg-cm (lbf-in)	Non-lubricated threads
Device Marking	MBRB25..CT MBR25..CT-1		Case style D ² Pak Case style TO-262

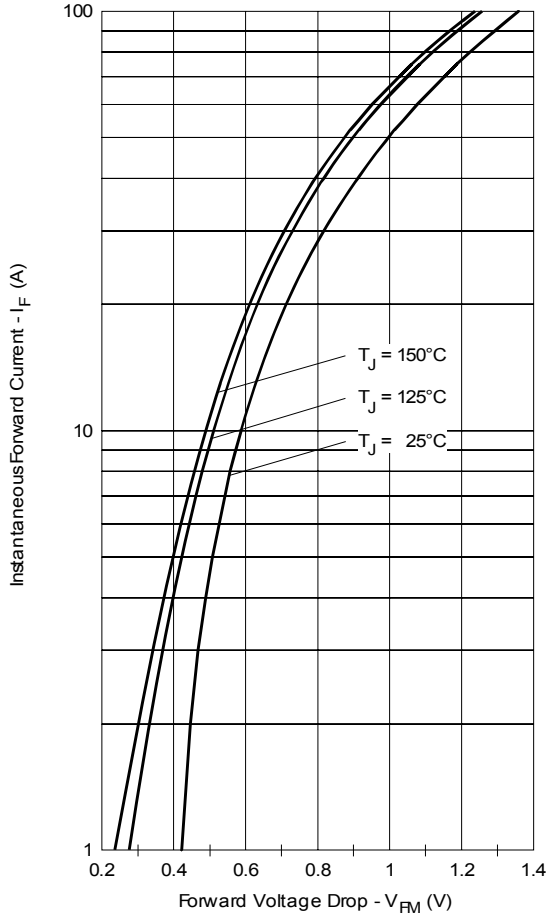


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

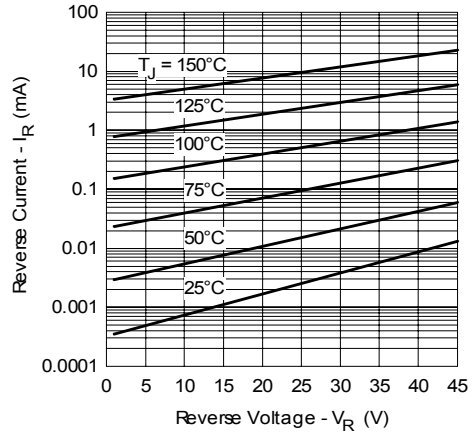


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

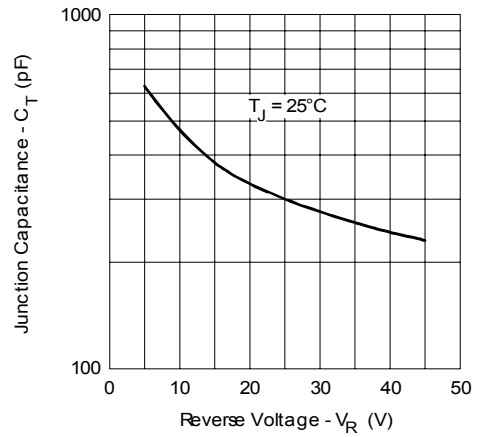


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

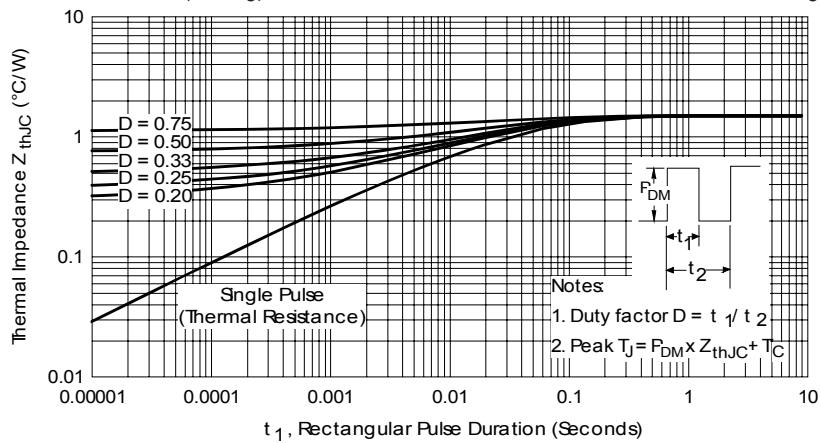


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

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International
IR Rectifier

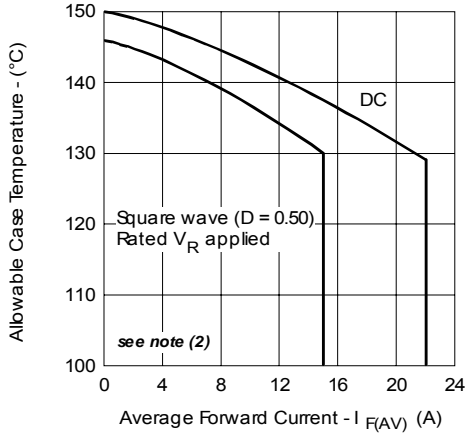


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

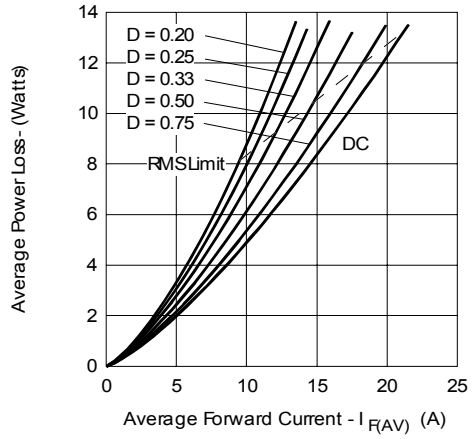


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

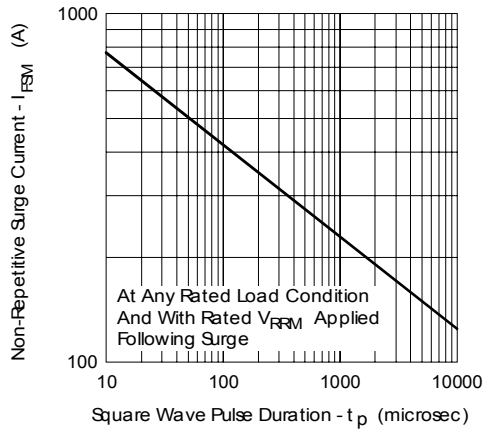


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

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

Outlines Table

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	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	.160	.190	4
A1	0.00	0.254	.000	.010	
b	0.51	0.99	.020	.039	
b1	0.51	0.89	.020	.035	4
b2	1.14	1.78	.045	.070	
c	0.38	0.74	.015	.029	3
c1	0.38	0.58	.015	.023	
c2	1.14	1.65	.045	.065	3
D	8.51	9.65	.335	.380	
D1	6.86	—	.270	—	3
E	9.65	10.67	.380	.420	
E1	6.22	—	.245	—	3
e	2.54 BSC	—	.100 BSC	—	
H	14.61	15.88	.575	.625	4
L	1.78	2.79	.070	.110	
L1	—	1.65	—	.065	4
L2	1.27	1.78	.050	.070	
L3	0.25 BSC	—	.010 BSC	—	4
L4	4.78	5.28	.188	.208	
m	17.78	—	.700	—	4
m1	8.89	—	.350	—	
n	11.43	—	.450	—	4
o	2.08	—	.082	—	
p	3.81	—	.150	—	4
R	0.51	0.71	.020	.028	
θ	90°	93°	90°	93°	

LEAD ASSIGNMENTS

HEXFET

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

IGBTs, CoPACK

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

DIODES

- 1.- ANODE *
- 2.- CATHODE
- 3.- ANODE

* PART DEPENDENT.

Conform to JEDEC outline D²Pak (SMD-220)
Dimensions in millimeters and (inches)

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. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSION E, L1, D1 & E1.
5. DIMENSION b1 AND c1 APPLY TO BASE METAL ONLY.
6. CONTROLLING DIMENSION: INCH.
7. - OUTLINE CONFORM TO JEDEC TO-262 EXCEPT A1(max.), b(min.) AND D1(min.) WHERE DIMENSIONS DERIVED THE ACTUAL PACKAGE OUTLINE.

SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	.160	.190	5
A1	2.03	3.02	.080	.119	
b	0.51	0.99	.020	.039	
b1	0.51	0.89	.020	.035	5
b2	1.14	1.78	.045	.070	
b3	1.14	1.73	.045	.068	5
c	0.38	0.74	.015	.029	
c1	0.38	0.58	.015	.023	5
c2	1.14	1.65	.045	.065	
D	8.38	9.65	.330	.380	3
D1	6.86	—	.270	—	
E	9.65	10.67	.380	.420	3,4
E1	6.22	—	.245	—	
e	2.54 BSC	—	.100 BSC	—	4
L	13.46	14.10	.530	.555	
L1	—	1.65	—	.065	4
L2	3.56	3.71	.140	.146	

LEAD ASSIGNMENTS

HEXFET

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

IGBTs, CoPACK

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

Modified JEDEC outline TO-262
Dimensions in millimeters and (inches)

MBRB25..CTPbF, MBR25..CT-1PbF Series

Bulletin PD-21045 rev. A 07/06



Part Marking Information

D²PAK

EXAMPLE: THIS IS A MBRB2545CT
 LOT CODE 8024
 ASSEMBLED ON WW 02, 2000

Note: "P" in assembly line position indicates "Lead-Free"

INTERNATIONAL RECTIFIER LOGO
 PART NUMBER
 DATE CODE
 YEAR 0 = 2000
 WEEK 02
 P = LEAD-FREE

TO-262

EXAMPLE: THIS IS A MBR2545CT-1
 LOT CODE 1789
 ASSEMBLED ON WW 19, 2002

Note: "P" in assembly line position indicates "Lead-Free"

INTERNATIONAL RECTIFIER LOGO
 PART NUMBER
 DATE CODE
 YEAR 2 = 2002
 WEEK 19
 P = LEAD-FREE

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 ±0.2
- 2.0 CAMBER NOT TO EXCEED 1mm in 100mm
- 3.0 MATERIAL: CONDUCTIVE BLACK STYRENIC 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	25	45	CT	-1	TRL	PbF
	1	2	3	4	5	6	7	8
1	-	Essential Part Number						
2	-	B = Surface Mount None = TO-220						
3	-	Current Rating (30A)						
4	-	Voltage code: Code = V_{RRM}						
5	-	CT = Essential Part Number						
6	-	"-1" = TO-262						
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 						

35 = 35V
 45 = 45V

Data and specifications subject to change without notice.
 This product has been designed and qualified for Industrial Level and Lead-Free.
 Qualification Standards can be found on IR's Web site.