

Bulletin PD-21011 rev. A 08/05

International
IOR Rectifier

MBR20100CTKPbF

SCHOTTKY RECTIFIER

20 Amp

$$I_{F(AV)} = 20 \text{ Amp}$$
$$V_R = 100V$$

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform (Per Device)	20	A
I_{FRM} @ $T_C = 133^{\circ}C$ (Per Leg)	20	A
V_{RRM}	100	V
I_{FSM} @ $t_p = 5 \mu s$ sine	850	A
V_F @ 10 Apk, $T_J = 125^{\circ}C$	0.65	V
T_J range	-65 to 150	$^{\circ}C$

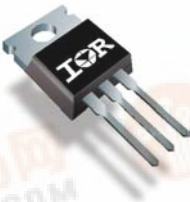
Description/ Features

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.

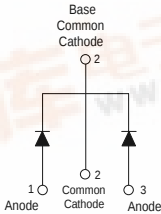
- 150° C T_J operation
- Center tap package
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead- Free ("PbF" suffix)

Case Styles

MBR20100CTKPbF



TO-220



Voltage Ratings

Parameters	MBR20100CTKpF
V_R Max. DC Reverse Voltage (V)	100
V_{RWM} Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Parameters	Values	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current (Per Leg) (Per Device)	10 20	A	@ $T_C = 133^\circ\text{C}$, (Rated V_R)
I_{FRM} Peak Repetitive Forward Current (Per Leg)	20	A	Rated V_R , square wave, 20kHz $T_C = 133^\circ\text{C}$
I_{FSM} Non Repetitive Peak Surge Current	850 150	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 conditions halfwave, single phase, 60Hz
I_{RRM} Peak Repetitive Reverse Surge Current	0.5	A	2.0 μsec 1.0 KHz
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	24	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 2$ Amps, $L = 12$ mH

Electrical Specifications

Parameters	Values	Units	Conditions
V_{FM} Max. Forward Voltage Drop (1)	0.80 0.95 0.65 0.80	V	@ 10A @ 20A @ 10A @ 20A $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$
I_{RM} Max. Instantaneous Reverse Current (1)	0.10 6	mA	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ Rated DC voltage
$V_{F(TO)}$ Threshold Voltage	0.433	V	$T_J = T_J \text{ max.}$
r_t Forward Slope Resistance	15.8	m Ω	
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	10000	V/ μs	(Rated V_R)

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

Thermal-Mechanical Specifications

Parameters	Values	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)	2.0	$^\circ\text{C/W}$	DC operation
R_{thCS} Typical Thermal Resistance Case to Heatsink	0.50	$^\circ\text{C/W}$	Mounting surface, smooth and greased Only for TO-220
R_{thJA} Max. Thermal Resistance Junction to Ambient	50	$^\circ\text{C/W}$	DC operation For D ² Pak and TO-262
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	MBR20100CTK		TO-220 package style

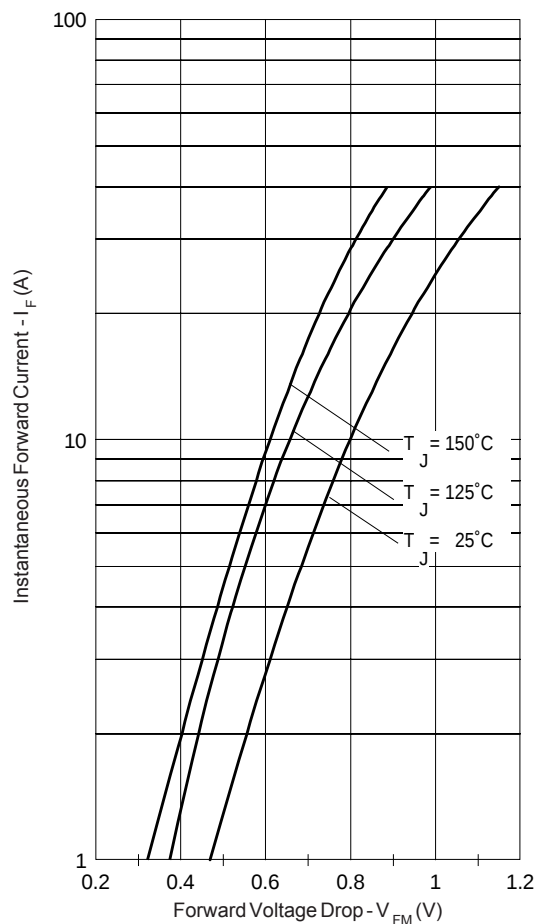


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

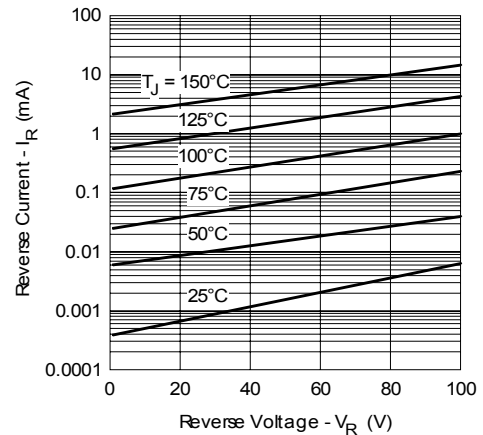


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

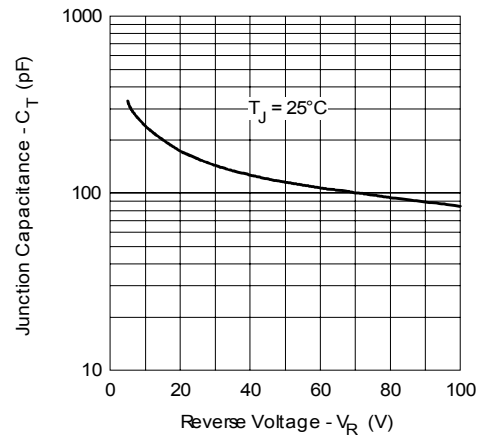


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

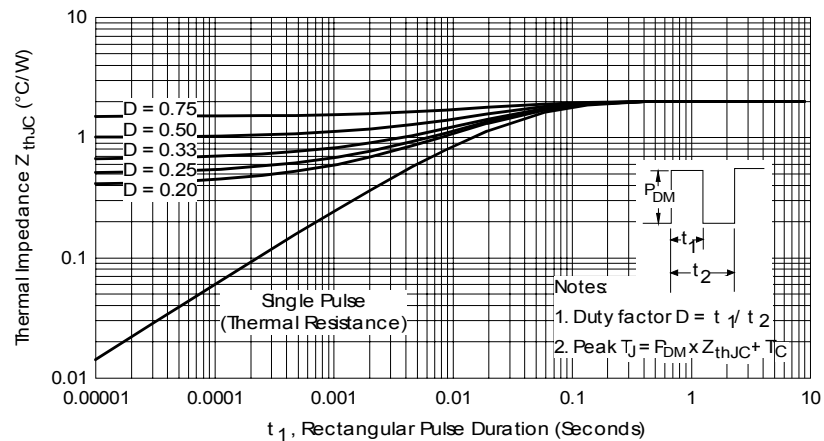


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

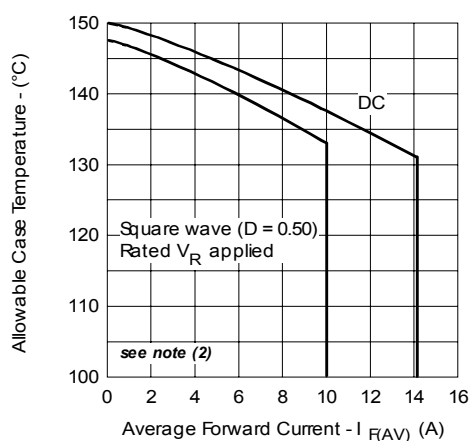


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

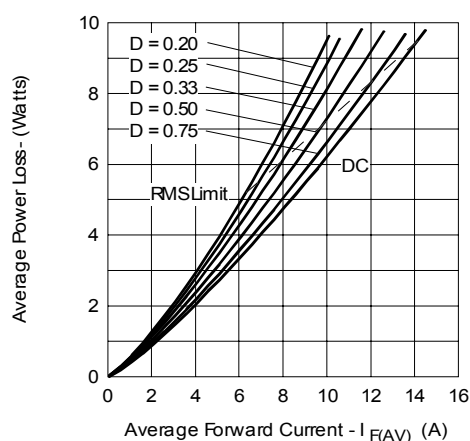


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

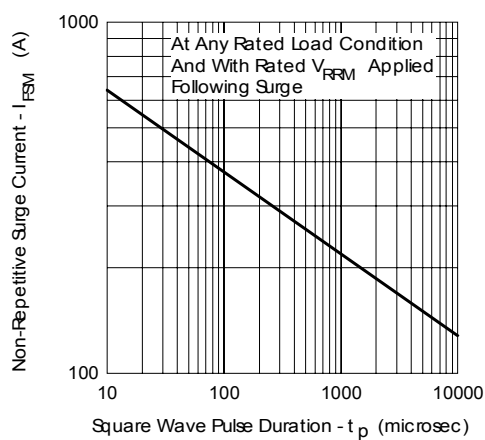


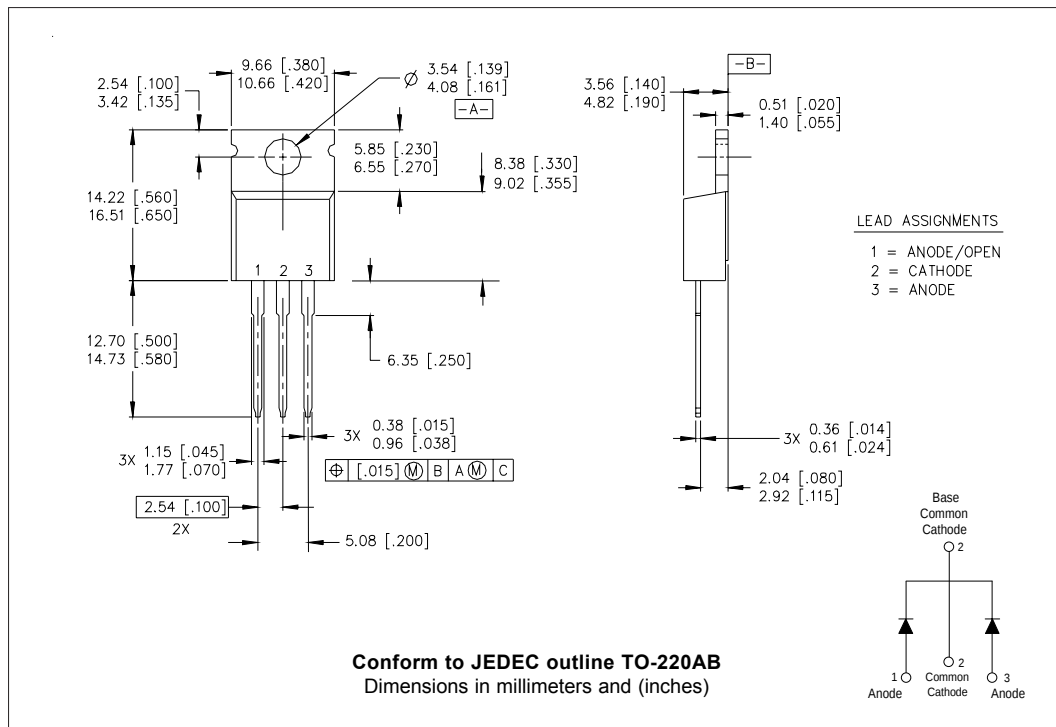
Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

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

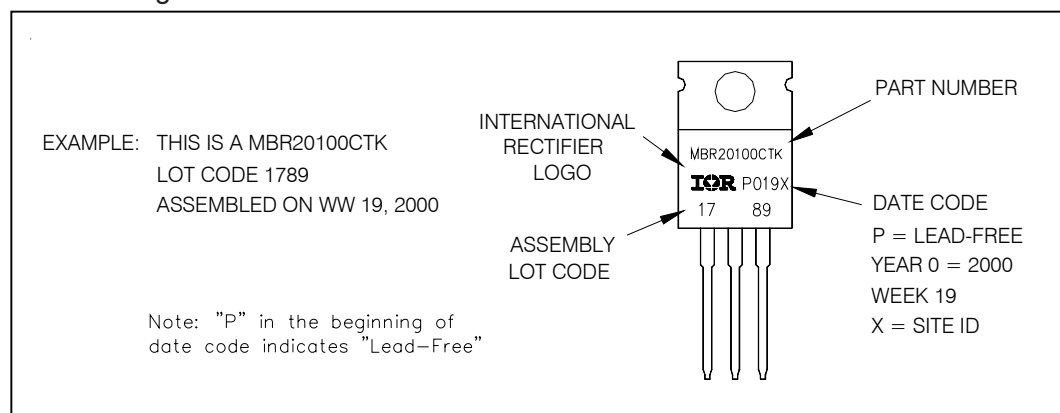
P_d = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

$P_{d_{REV}}$ = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = rated V_R

Outline Table



Part Marking Information



Ordering Information Table

Device Code

MBR	20	100	CT	K	PbF
1	2	3	4	5	6

1	-	MBR Series
2	-	Current Rating (20 = 20A)
3	-	Voltage Rating (100 = 100V)
4	-	CT = Center Tap (Dual)
5	-	K = Schottky Generation
6	-	PbF = Lead-Free

Tube Standard Pack Quantity : 50 pieces

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.

International
IR Rectifier

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