Bulletin PD-21011 rev. A 08/05

International
IOR Rectifier

MBR20100CTKPbF

SCHOTTKY RECTIFIER

20 Amp

$I_{F(AV)}$ = 20 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°C (Per Leg)	20	A
V_{RRM}	100	V
I_{FSM} @ tp = 5 µs sine	850	A
V_F @ 10 Apk, T_J = 125°C	0.65	V
T_J range	- 65 to 150	°C

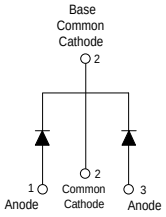
Description/ Features

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		MBR20100CTKPbF
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 (Per Leg)	10	A	@ T_C = 133° C, (Rated V_R)
	Current (Per Device)	20		
I_{FRM}	Peak Repetitive Forward Current (Per Leg)	20	A	Rated V_R, square wave, 20kHz T_C = 133° C
I_{FSM}	Non Repetitive Peak Surge Current	850	A	5µs Sine or 3µs Rect. pulse — Following any rated load condition and with rated V_{RRM} applied
		150		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 °C, I_{AS} = 2 Amps, L = 12 mH

Electrical Specifications

	Parameters	Values	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1)	0.80	V	@ 10A	T_J = 25 °C
		0.95	V	@ 20A	
		0.65	V	@ 10A	T_J = 125 °C
		0.80	V	@ 20A	
I_{RM}	Max. Instantaneus Reverse Current (1)	0.10	mA	T_J = 25 °C	Rated DC voltage
		6	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.433	V	T_J = T_J max.	
r_t	Forward Slope Resistance	15.8	mΩ		
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 < 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
R_{thJA}	Max. Thermal Resistance Junction to Ambient		50	°C/W	DC operation For D^2Pak and TO-262
wt	Approximate Weight		2 (0.07)	g (oz.)	
T	Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)	Non-lubricated threads
		Max.	12 (10)		
	Device Marking		MBR20100CTK		TO-220 package style

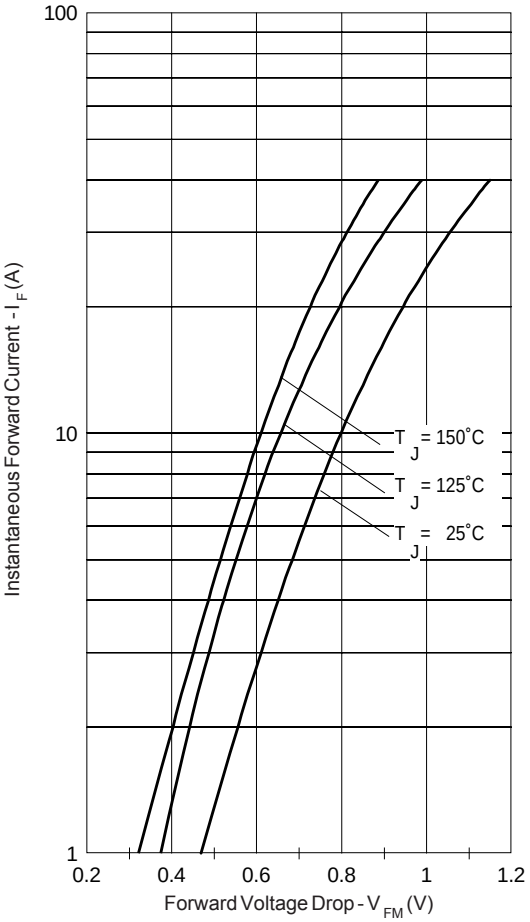


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

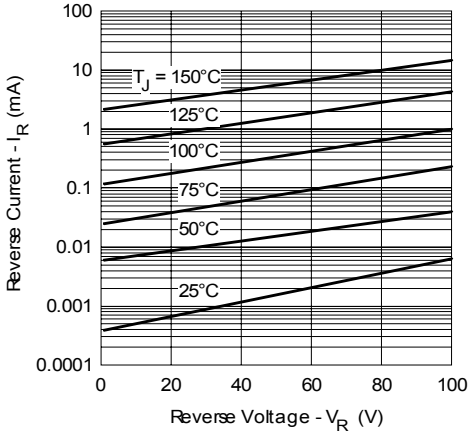


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

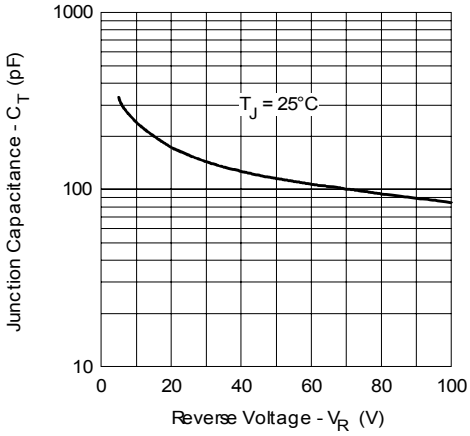


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

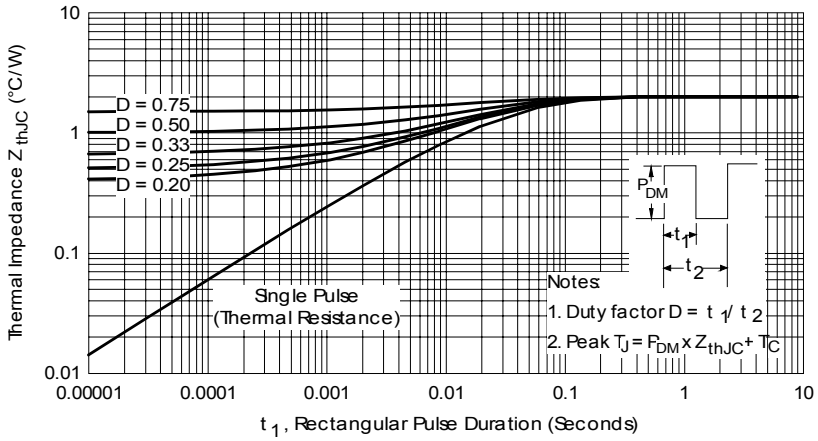


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

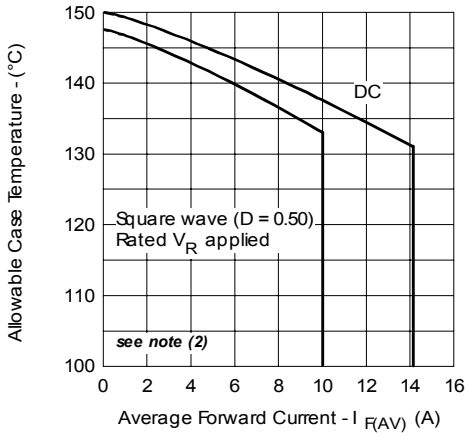


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

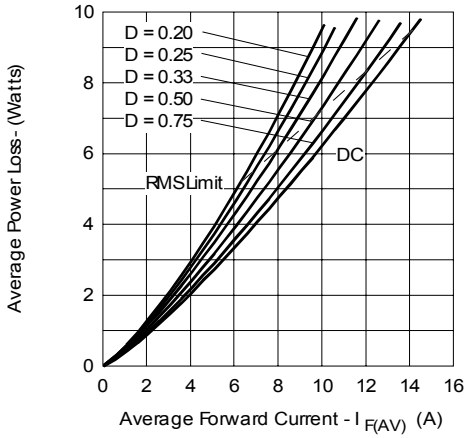


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

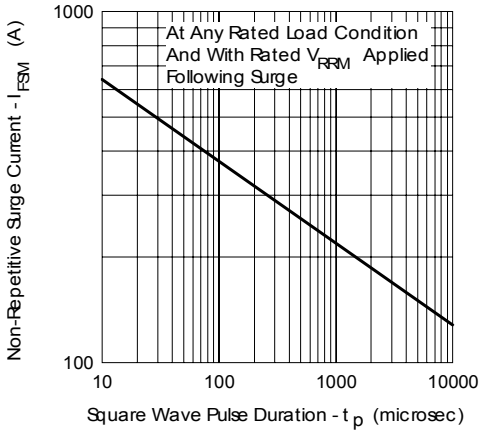
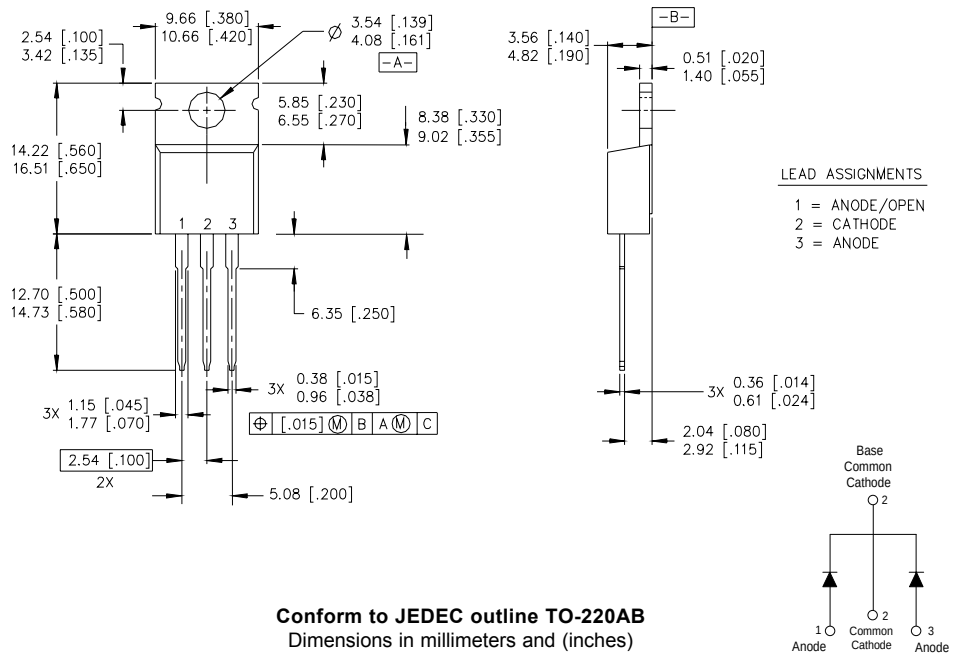


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

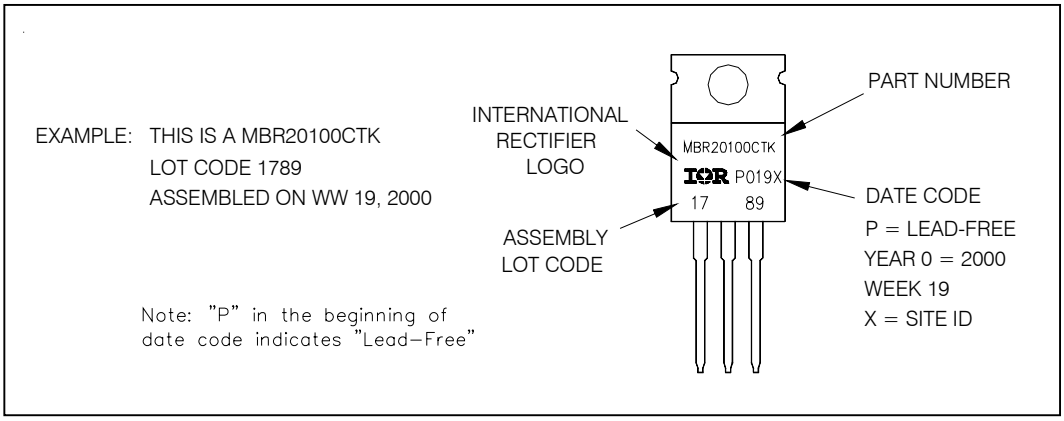
(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = rated V_R

Outline Table



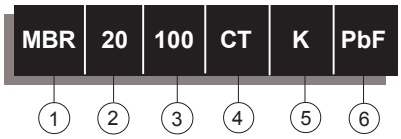
Conform to JEDEC outline TO-220AB
Dimensions in millimeters and (inches)

Part Marking Information



Ordering Information Table

Device Code



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
IOR Rectifier

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