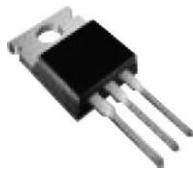
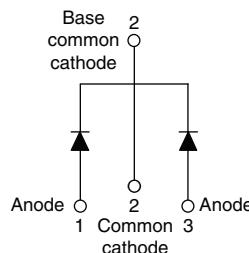


Schottky Rectifier, 20 A

ICR®


TO-220AB


PRODUCT SUMMARY

$I_{F(AV)}$	20 A
V_R	100 V

FEATURES

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


RoHS*
COMPLIANT

DESCRIPTION

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, freewheeling diodes, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform (per device)	20	A
V_{RRM}		100	V
I_{FRM}	$T_C = 133$ °C (per leg)	20	A
I_{FSM}	$t_p = 5$ μ s sine	850	
V_F	10 Apk, $T_J = 125$ °C	0.65	V
T_J	Range	- 65 to 150	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	MBR20100CTKPbF	UNITS
Maximum DC reverse voltage	V_R	100	V
Maximum working peak reverse voltage	V_{RWM}		

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Maximum average forward current per leg	$I_{F(AV)}$	$T_C = 133$ °C, rated V_R	10	A	
per device			20		
Peak repetitive forward current per leg	I_{FRM}	Rated V_R , square wave, 20 kHz, $T_C = 133$ °C	20		
Non-repetitive peak surge current	I_{FSM}	5 μ s sine or 3 μ s rect. pulse	850	A	
		Following any rated load condition and with rated V_{RRM} applied			
Surge applied at rated load conditions halfwave, single phase, 60 Hz			150		
Peak repetitive reverse surge current	I_{RRM}	2.0 μ s, 1.0 kHz	0.5		
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25$ °C, $I_{AS} = 2$ A, $L = 12$ mH	24	mJ	

* Pb containing terminations are not RoHS compliant, exemptions may apply

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop	$V_{FM}^{(1)}$	10 A	$T_J = 25 \text{ }^\circ\text{C}$	0.80	V	
		20 A		0.95		
		10 A	$T_J = 125 \text{ }^\circ\text{C}$	0.65		
		20 A		0.80		
Maximum instantaneous reverse current	$I_{RM}^{(1)}$	$T_J = 25 \text{ }^\circ\text{C}$	Rated DC voltage	0.10	mA	
		$T_J = 125 \text{ }^\circ\text{C}$		6		
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$		0.433	V	
Forward slope resistance	r_t			15.8	$\text{m}\Omega$	
Maximum junction capacitance	C_T	$V_R = 5 \text{ V}_{\text{DC}}$ (test signal range 100 kHz to 1 MHz) $25 \text{ }^\circ\text{C}$		400	pF	
Typical series inductance	L_S	Measured from top of terminal to mounting plane		8.0	nH	
Maximum voltage rate of change	dV/dt	Rated V_R		10 000	$\text{V}/\mu\text{s}$	

Note(1) Pulse width < 300 μs , duty cycle < 2 %
THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	T_J		- 65 to 150	$^\circ\text{C}$
Maximum storage temperature range	T_{Stg}		- 65 to 175	
Maximum thermal resistance, junction to case per leg	R_{thJC}	DC operation	2.0	$^\circ\text{C}/\text{W}$
Typical thermal resistance, case to heatsink	R_{thCS}		0.50	
Maximum thermal resistance, junction to ambient	R_{thJA}	DC operation (For D ² PAK and TO-262)	50	
Approximate weight			2	g
			0.07	oz.
Mounting torque	minimum maximum	Non-lubricated threads	6 (5)	$\text{kgf} \cdot \text{cm}$ (lbf · in)
			12 (10)	
Device marking		TO-220 package style	MBR20100CTK	

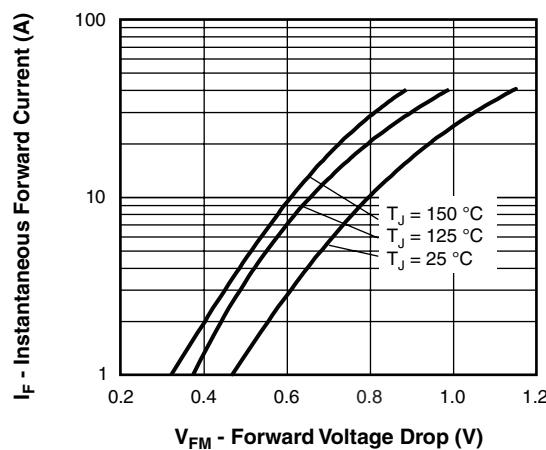


Fig. 1 - Maximum Forward Voltage Drop Characteristics
(Per Leg)

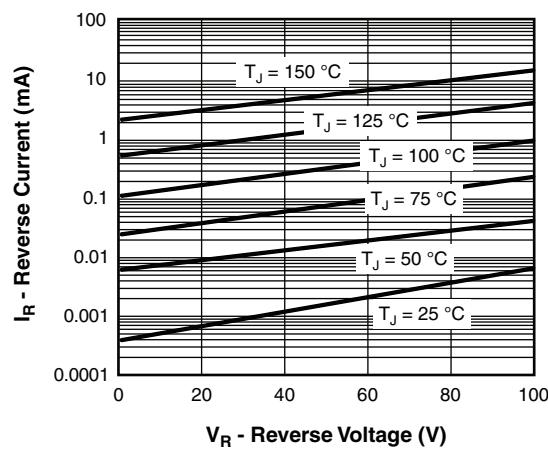


Fig. 2 - Typical Values of Reverse Current vs.
Reverse Voltage (Per Leg)

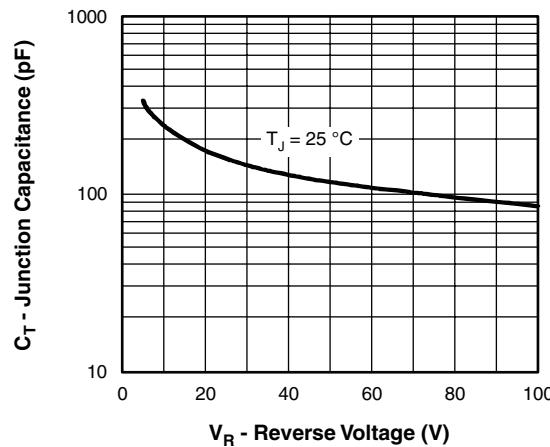


Fig. 3 - Typical Junction Capacitance vs.
Reverse Voltage (Per Leg)

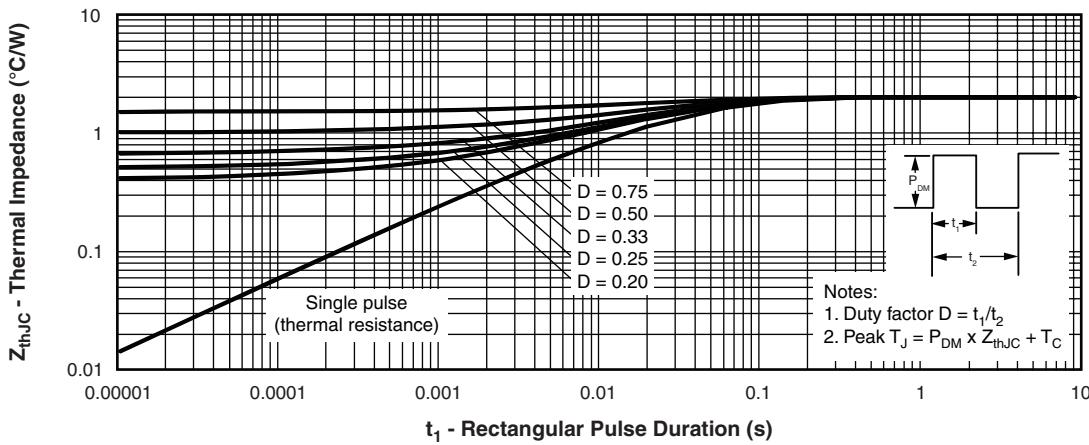


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

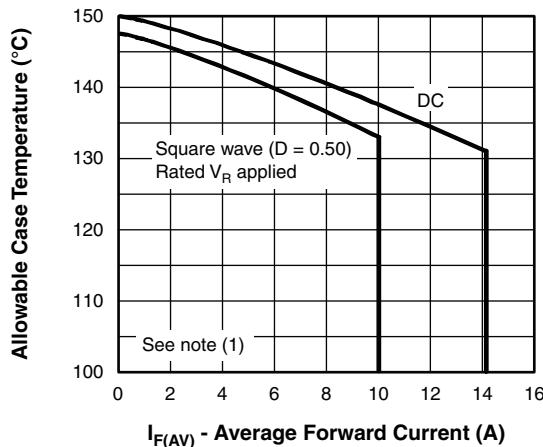


Fig. 5 - Maximum Allowable Case Temperature vs.
Average Forward Current (Per Leg)

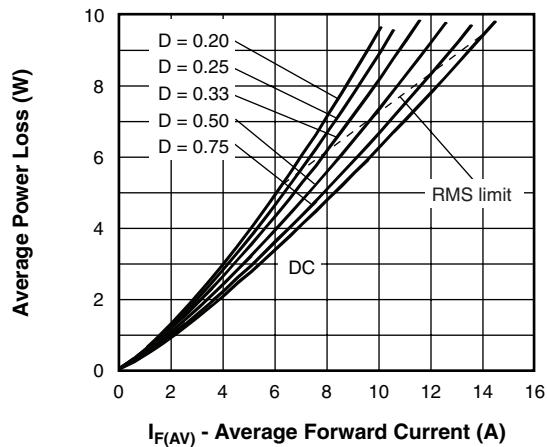


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

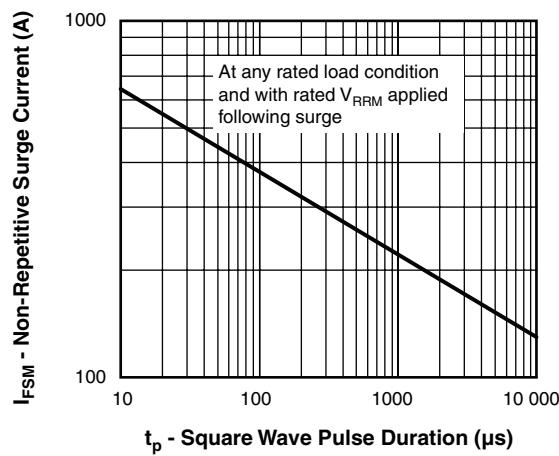


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

(1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$
 $P_d = \text{Forward power loss} = I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 $P_{dREV} = \text{Inverse power loss} = V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = \text{Rated } V_R$

ORDERING INFORMATION TABLE

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

- 1** - MBR series
- 2** - Current rating (20 = 20 A)
- 3** - Voltage rating (100 = 100 V)
- 4** - CT = Center tap (dual)
- 5** - K = Schottky generation
- 6** - PbF = Lead (Pb)-free

Tube standard pack quantity: 50 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95222
Part marking information	http://www.vishay.com/doc?95215



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