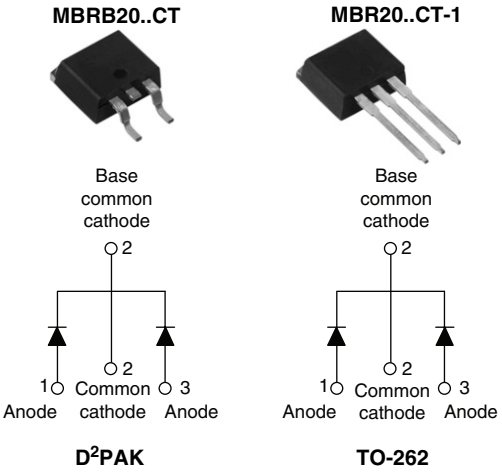
Schottky Rectifier, 2 x 10 A



FEATURES

- 150 °C T_J operation
- Low forward voltage drop
- High frequency operation
- Center tap D^2PAK and TO-262 packages
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Designed and qualified for Q101 level

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.

PRODUCT SUMMARY	
$I_{F(AV)}$	2 x 10 A
V_R	80 to 100 V

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform (per device)	20	A
I_{FRM}	T_C = 133 °C (per leg)	20	
V_{RRM}		80 to 100	V
I_{FSM}	t_p = 5 µs sine	850	A
V_F	10 Apk, T_J = 125 °C	0.70	V
T_J	Range	- 65 to 150	°C

VOLTAGE RATINGS					
PARAMETER	SYMBOL	MBRB2080CT MBR2080CT-1	MBRB2090CT MBR2090CT-1	MBRB20100CT MBR20100CT-1	UNITS
Maximum DC reverse voltage	V_R	80	90	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 µs sine or 3 µs rect. pulse; Following any rated load ondition and with rated V_{RRM} applied	850	
			Surge applied at rated load conditions halfwave, single phase, 60 Hz	150	
Peak repetitive reverse surge current		I_{RRM}	2.0 µs, 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

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	V_{FM} (1)	10 A	T_J = 25 °C	0.80	V
		20 A		0.95	
		10 A	T_J = 125 °C	0.70	
		20 A		0.85	
Maximum instantaneous reverse current	I_{RM} (1)	T_J = 25 °C	Rated DC voltage	0.10	mA
		T_J = 125 °C		6	
Threshold voltage	$V_{F(TO)}$	$T_J = T_J$ maximum		0.433	V
Forward slope resistance	r_t			15.8	mΩ
Maximum junction capacitance	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz) 25 °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	V/µs

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	°C
Maximum storage temperature range		T_{Stg}		- 65 to 175	
Maximum thermal resistance, junction to case per leg		R_{thJC}	DC operation	2.0	°C/W
Typical thermal resistance, case to heatsink		R_{thCS}	Mounting surface, smooth and greased	0.50	
Maximum thermal resistance, junction to ambient		R_{thJA}	DC operation	50	
Approximate weight				2	g
				0.07	oz.
Mounting torque	minimum		Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device			Case style D^2PAK	MBRB20100CT	
			Case style TO-262	MBR20100CT-1	

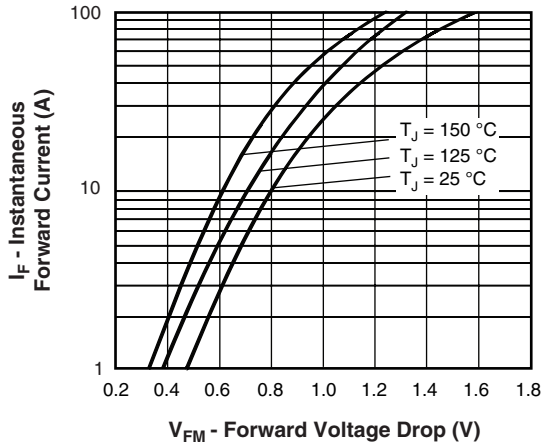


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

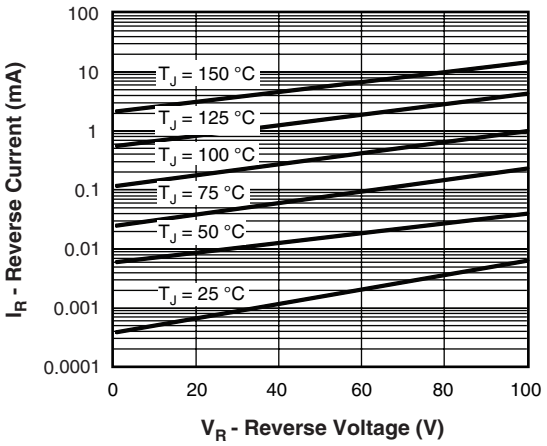


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

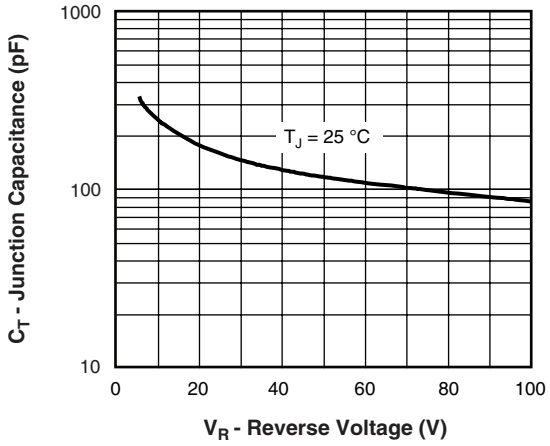


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

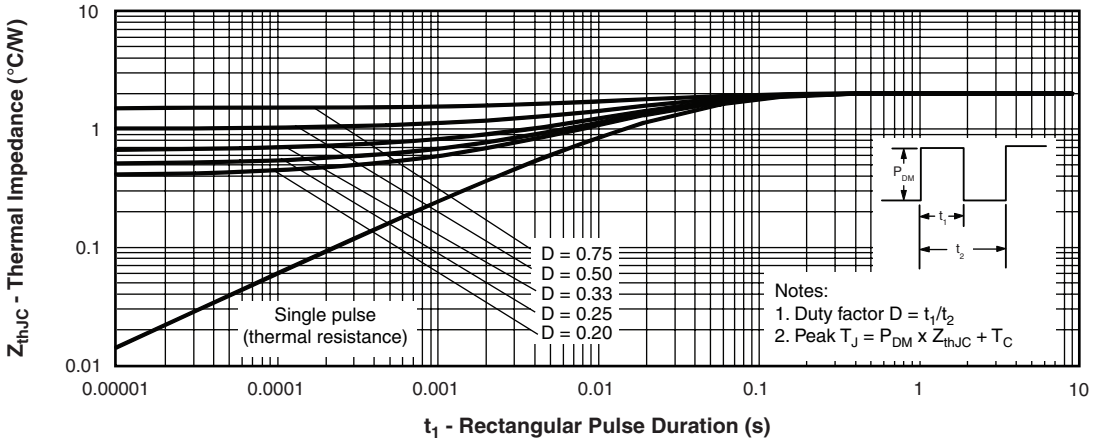


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

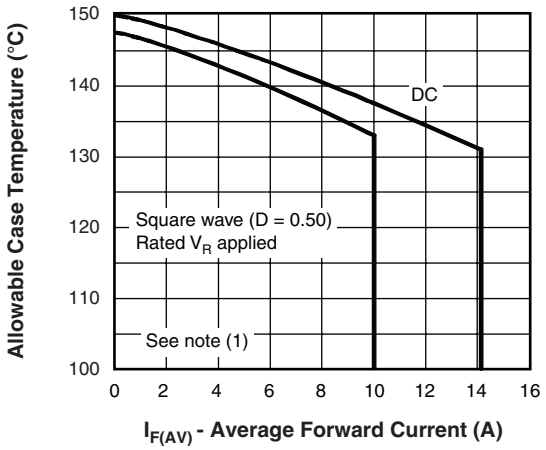


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

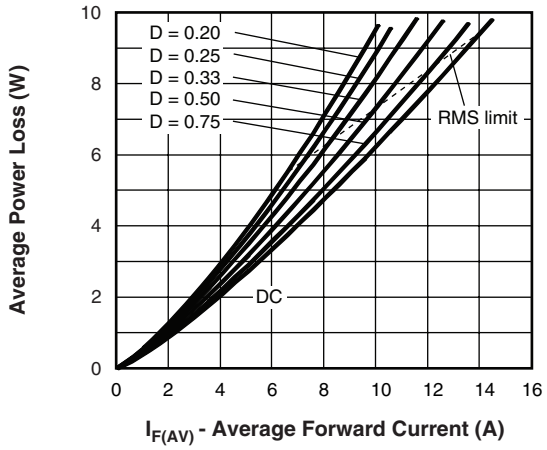


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

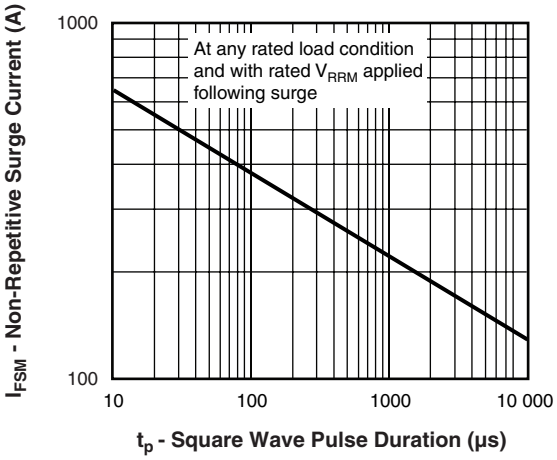


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

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

ORDERING INFORMATION TABLE

Device code

MBR	B	20	100	CT	-1	TRL	-
1	2	3	4	5	6	7	8

1 - Essential part number

2 - • B = D^2PAK 6 None
• None = TO-262 6 = -1

3 - Current rating (20 = 20 A)

4 - Voltage ratings — 80 = 80 V, 90 = 90 V, 100 = 100 V

5 - CT = Essential part number

6 • None = D^2PAK 2 = B
• -1 = TO-262 2 None

7 - • None = Tube (50 pieces)
• TRL = Tape and reel (left oriented - for D^2PAK only)
• TRR = Tape and reel (right oriented - for D^2PAK only)

8 - • None = Standard production
• PbF = Lead (Pb)-free (for TO-262 and D^2PAK tube)
• P = Lead (Pb)-free (for D^2PAK TRR and TRL)

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95014
Part marking information	http://www.vishay.com/doc?95008
Packaging information	http://www.vishay.com/doc?95032

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