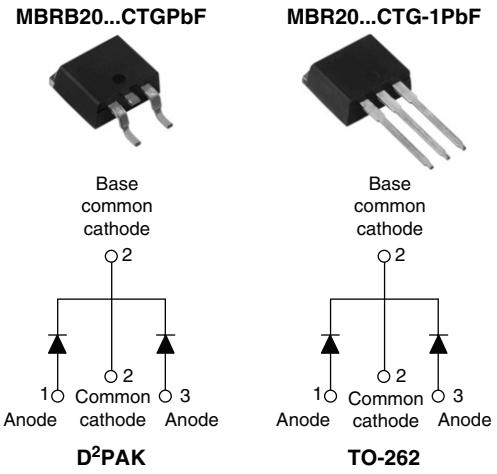
Schottky Rectifier, 2 x 10 A



FEATURES

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

Available
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.

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

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
I_{FRM}	T_C = 133 °C (per leg)	20	A
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	MBRB2080CTGPbF MBR2080CTG-1PbF	MBRB2090CTGPbF MBR2090CTG-1PbF	MBRB20100CTGPbF MBR20100CTG-1PbF	UNITS
Maximum DC reverse voltage	V_R	80	90	100	V
Maximum working peak reverse voltage	V_{RWM}				

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

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 condition and with rated V_{RRM} applied	850	
			Surge applied at rated load conditions half wave, 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	V_R = Rated V_R	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
Maximum thermal resistance junction to ambient		R_{thJA}		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	MBRB2080CTG	
				MBRB2090CTG	
				MBRB20100CTG	
			Case style TO-262	MBR2080CTG-1	
				MBR2090CTG-1	
				MBR20100CTG-1	

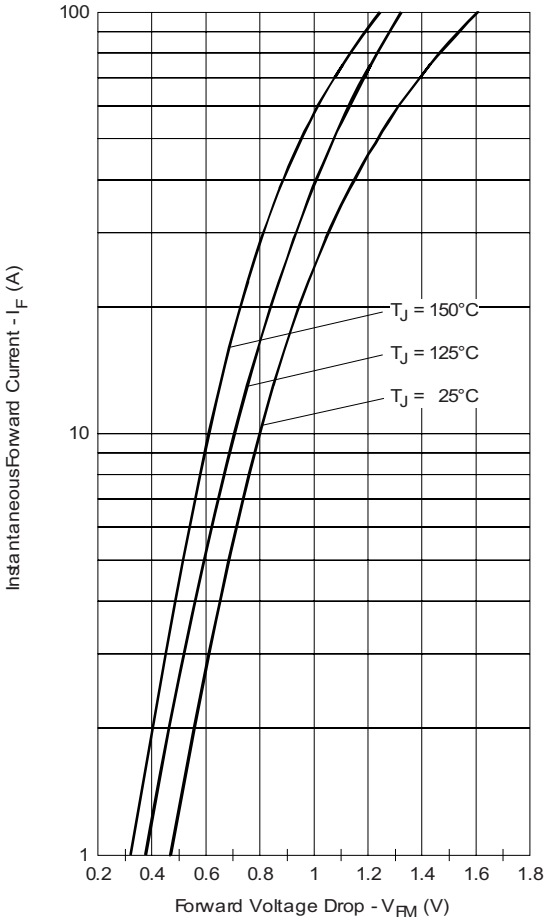


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

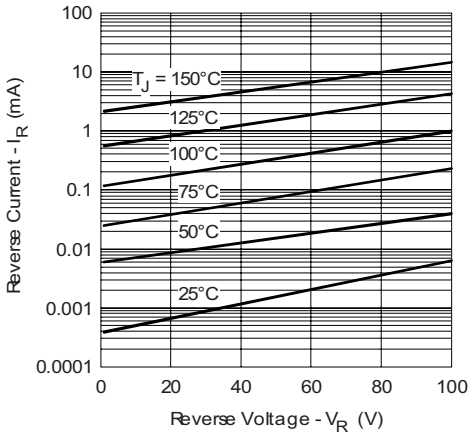


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

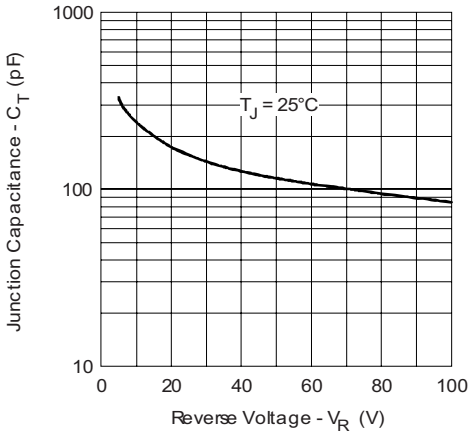


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

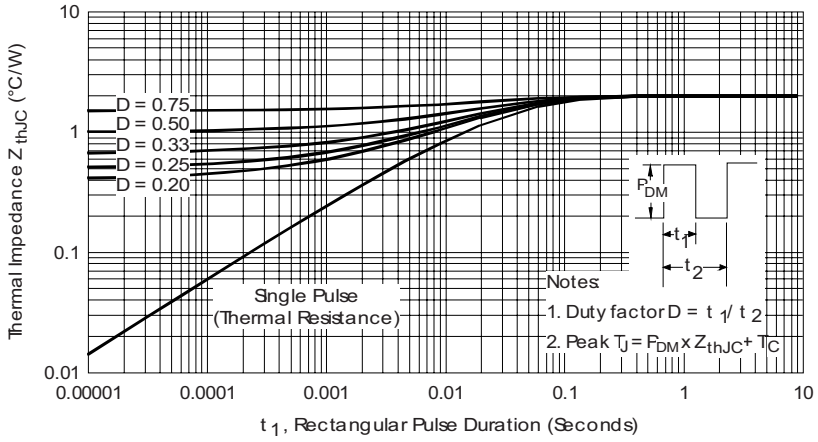


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

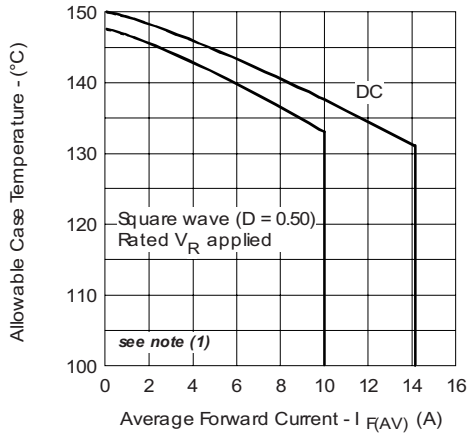


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

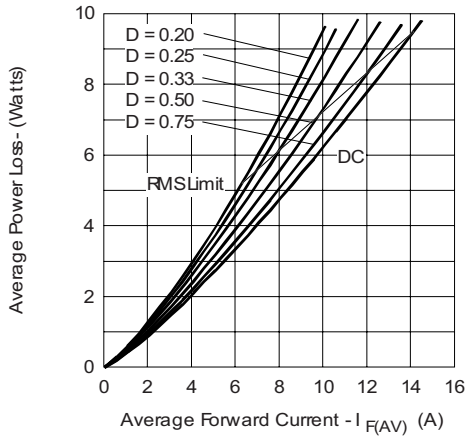


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

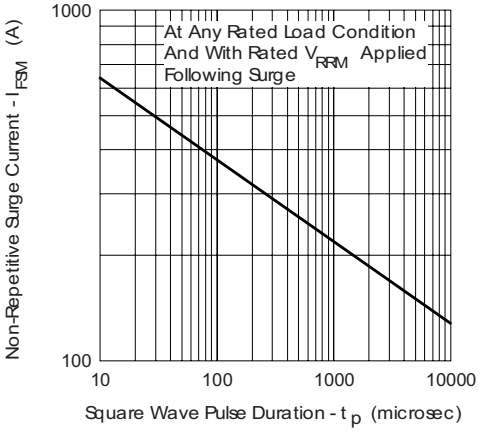


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

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	G	-1	TL	PbF
1	2	3	4	5	6	7	8	9

1 - Essential part number

2 - • B = D^2PAK
• None = TO-262

3 - Current rating (20 = 20 A)

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

5 - CT = Essential part number

6 - G = Schottky generation

7 - • None = D^2PAK
• -1 = TO-262

8 - • None = Tube (50 pieces)
• TL = Tape and reel (left oriented - for D^2PAK only)
• TR = Tape and reel (right oriented - for D^2PAK only)

9 - • None = Standard production
• PbF = Lead (Pb)-free (D^2PAK tube)
• P = Lead (Pb)-free (for D^2PAK TR and TL, and TO-262)

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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