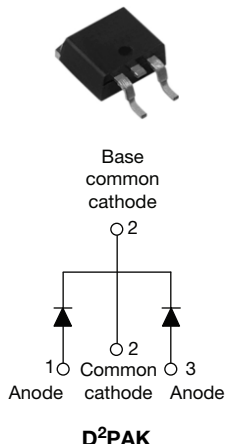
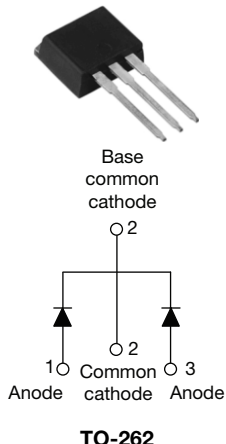


Schottky Rectifier, 2 x 10 A

VS-MBRB20..CTPbF



VS-MBR20..CT-1PbF



FEATURES

- 150 °C T_J operation
- Center tap D²PAK and TO-262 packages
- 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
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Halogen-free according to IEC 61249-2-21 definition
- Compliant to RoHS directive 2002/95/EC
- AEC-Q101 qualified



RoHS
COMPLIANT
HALOGEN
FREE

PRODUCT SUMMARY

I _{F(AV)}	2 x 10 A
V _R	35 V/45 V
I _{RM}	15 mA at 125 °C

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
I _{FRM}	T _C = 135 °C (per leg)	20	
V _R		35/45	V
I _{FSM}	t _p = 5 μs sine	1060	A
V _F	10 Apk, T _J = 125 °C	0.57	V
T _J	Range	- 65 to 150	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-MBRB2035CTPbF VS-MBR2035CT-1PbF	VS-MBRB2045CTPbF VS-MBR2045CT-1PbF	UNITS
Maximum DC reverse voltage	V _R	35	45	V
Maximum working peak reverse voltage	V _{RWM}			

VS-MBRB20..CTPbF, VS-MBR20..CT-1PbF Series



Vishay High Power Products Schottky Rectifier, 2 x 10 A

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current per leg per device	I _{F(AV)}	T _C = 135 °C, rated V _R		10	A
				20	
Peak repetitive forward current per leg	I _{FRM}	Rated V _R , square wave, 20 kHz, T _C = 135 °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	1060	
		Surge applied at rated load conditions halfwave, single phase, 60 Hz		150	
Non-repetitive avalanche energy per leg	E _{AS}	T _J = 25 °C, I _{AS} = 2 A, L = 4 mH		8	mJ
Repetitive avalanche current per leg	I _{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T _J maximum V _A = 1.5 x V _R typical		2	A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}^{(1)}$	20 A	$T_J = 25\text{ }^{\circ}\text{C}$	0.84	V
		10 A	$T_J = 125\text{ }^{\circ}\text{C}$	0.57	
		20 A		0.72	
Maximum instantaneous reverse current	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$	Rated DC voltage	0.1	mA
		$T_J = 125\text{ }^{\circ}\text{C}$		15	
Threshold voltage	$V_{F(TO)}$	$T_J = T_J$ maximum		0.354	V
Forward slope resistance	r_t			17.6	mΩ
Maximum junction capacitance	C_T	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^{\circ}\text{C}$		600	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	
Approximate weight			2	g
			0.07	oz.
Mounting torque	minimum maximum	Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
			12 (10)	
Marking device		Case style D ² PAK	MBRB2045CT	
		Case style TO-262	MBR2045CT-1	



VS-MBRB20..CTPbF, VS-MBR20..CT-1PbF Series

Schottky Rectifier, 2 x 10 A Vishay High Power Products

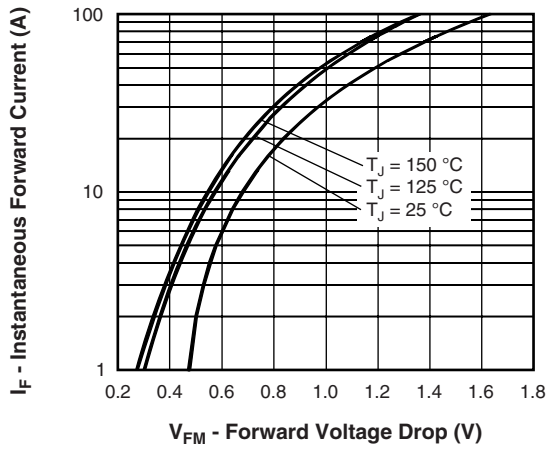


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

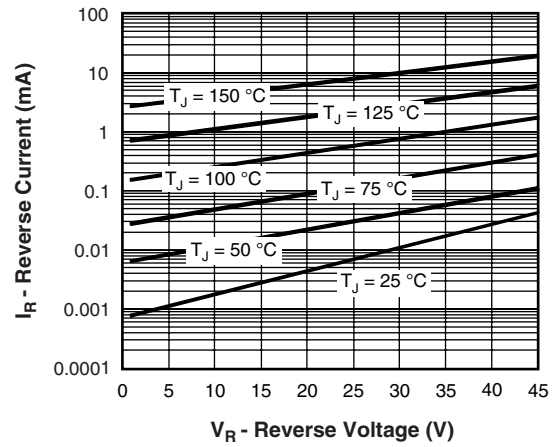


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

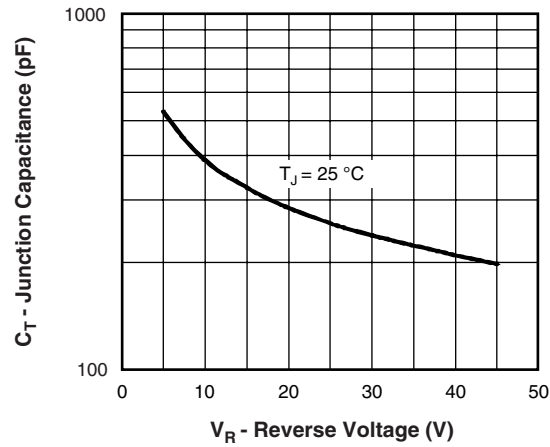


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

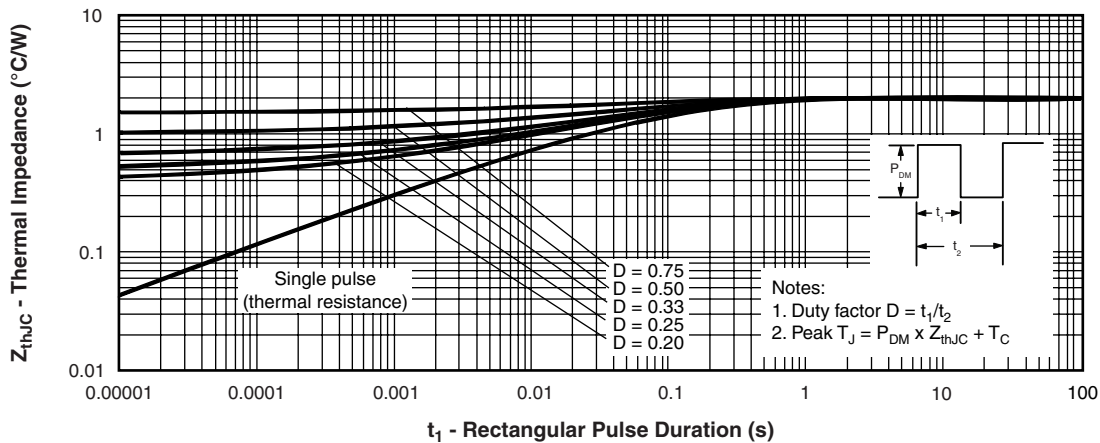


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

VS-MBRB20..CTPbF, VS-MBR20..CT-1PbF Series

Vishay High Power Products Schottky Rectifier, 2 x 10 A

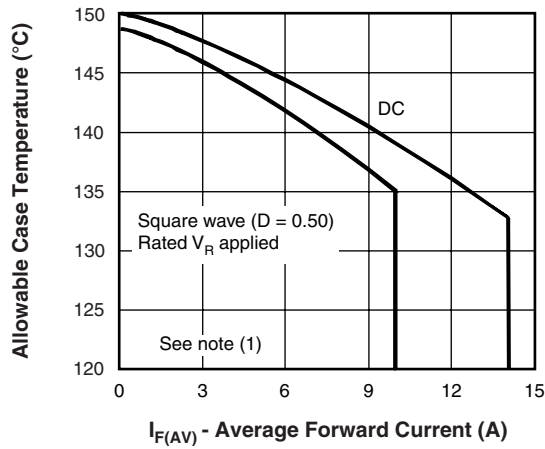


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

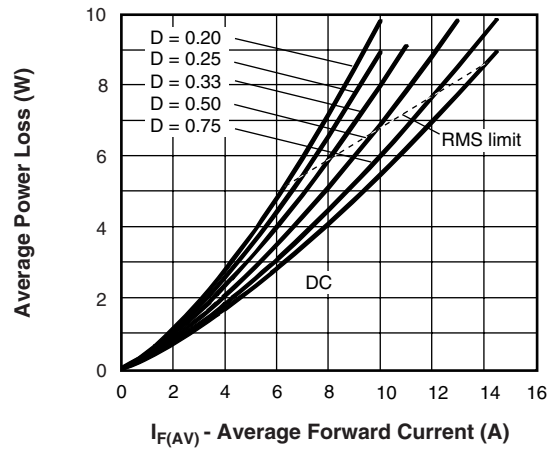


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

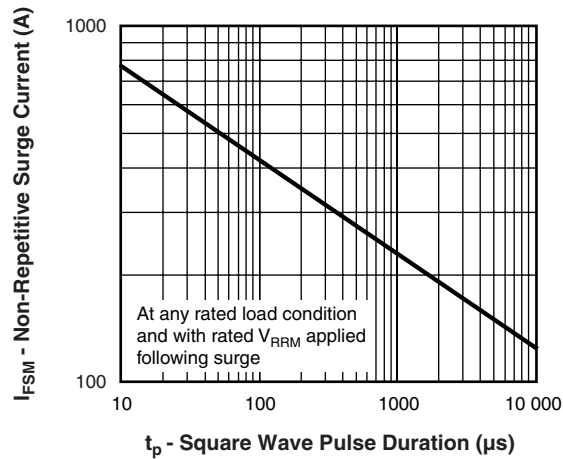


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

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



VS-MBRB20..CTPbF, VS-MBR20..CT-1PbF Series

Schottky Rectifier, 2 x 10 A Vishay High Power Products

ORDERING INFORMATION TABLE

Device code	VS-	MBR	B	20	45	CT	-1	TRL	PbF
	1	2	3	4	5	6	7	8	9

- | | | | |
|----------|---|--|------------------------|
| 1 | - | HPP product suffix | |
| 2 | - | Essential part number | |
| 3 | - | • B = D ² PAK 7 None | |
| | | • None = TO-262 7 = -1 | |
| 4 | - | Current rating (20 = 20 A) | |
| 5 | - | Voltage ratings | 35 = 35 V
45 = 45 V |
| 6 | - | CT = Essential part number | |
| 7 | - | • None = D ² PAK 3 = B | |
| | | • -1 = TO-262 3 None | |
| 8 | - | • None = Tube (50 pieces) | |
| | | • TRL = Tape and reel (left oriented - for D ² PAK only) | |
| | | • TRR = Tape and reel (right oriented - for D ² PAK only) | |
| 9 | - | • PbF = Lead (Pb)-free (for TO-262 and D ² PAK tube) | |
| | | • P = Lead (Pb)-free (for D ² PAK TRR and TRL) | |

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



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