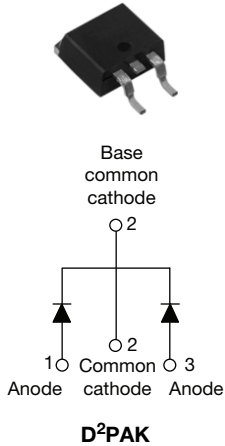
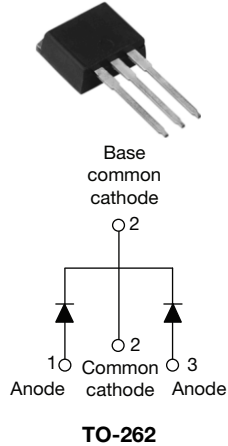


Schottky Rectifier, 2 x 10 A

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_{RRM}		35/45	V
I_{FSM}	$t_p = 5$ μ s 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	$I_{F(AV)}$	$T_C = 135\text{ }^\circ\text{C}$, rated V_R		10	A
				per leg	
				20	
Peak repetitive forward current per leg	I_{FRM}	Rated V_R , square wave, 20 kHz, $T_C = 135\text{ }^\circ\text{C}$		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}	$T_J = 25\text{ }^\circ\text{C}$, $I_{AS} = 2\text{ A}$, $L = 4\text{ mH}$		8	mJ
Repetitive avalanche current per leg	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ 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	m Ω
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	$^\circ\text{C}$
Maximum storage temperature range	T_{Stg}			- 65 to 175	
Maximum thermal resistance, junction to case per leg	R_{thJC}	DC operation		2.0	$^\circ\text{C/W}$
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

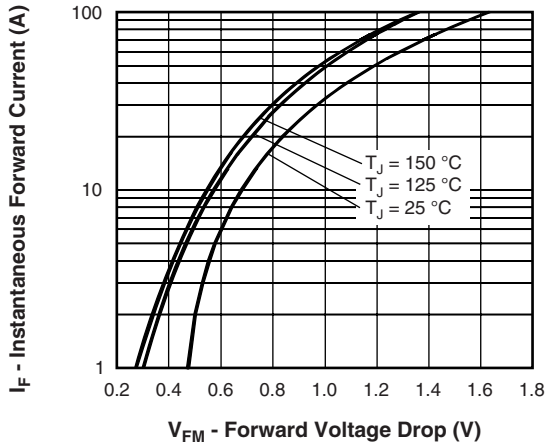


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

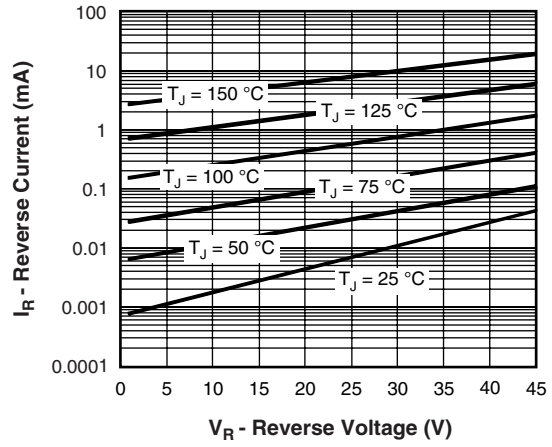


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

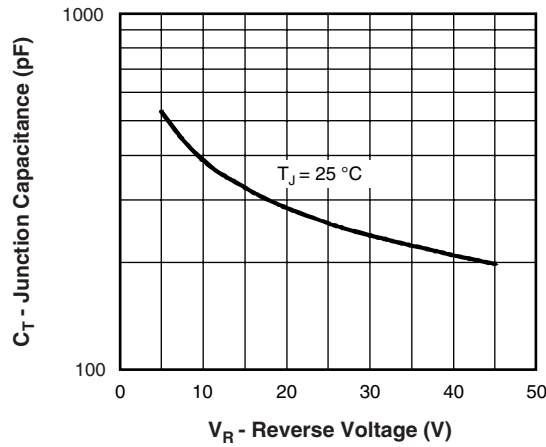


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

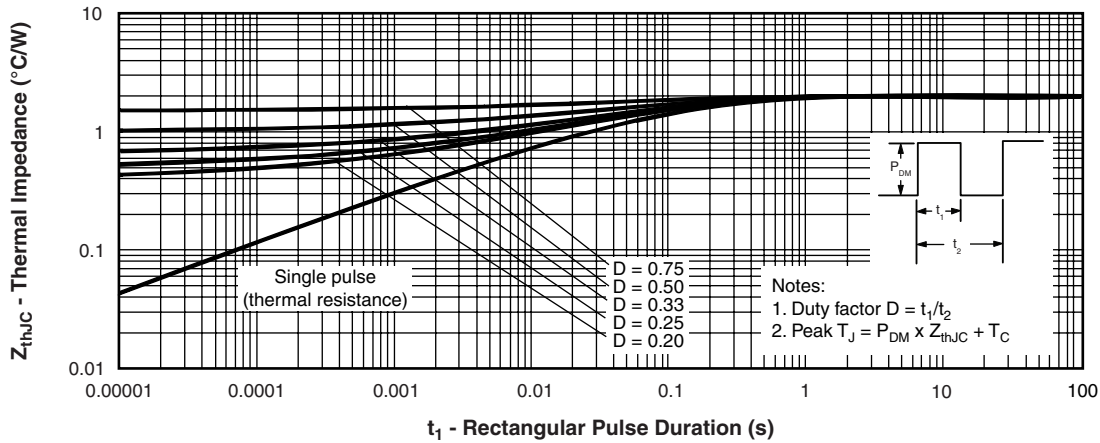


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

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



Vishay High Power Products Schottky Rectifier, 2 x 10 A

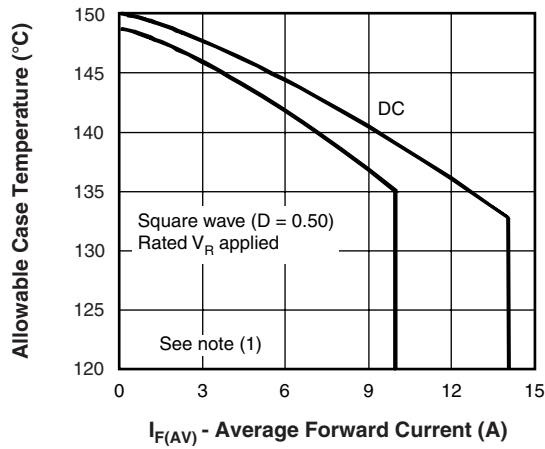


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

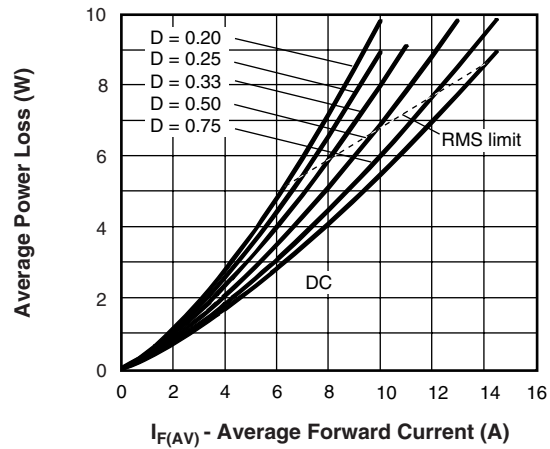


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

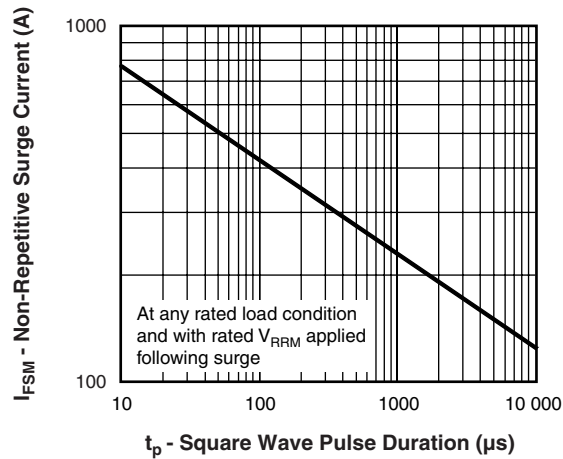


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

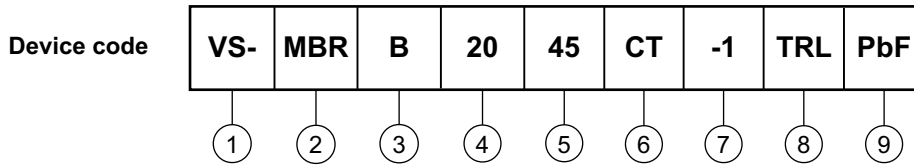
- (1) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
 Pd = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 Pd_{REV} = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = Rated V_R



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

Schottky Rectifier, 2 x 10 A Vishay High Power Products

ORDERING INFORMATION TABLE



- 1** - HPP product suffix
- 2** - Essential part number
- 3** -
 - B = D²PAK **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 = D²PAK **3** = B
 - -1 = TO-262 **3** None
- 8** -
 - None = Tube (50 pieces)
 - TRL = Tape and reel (left oriented - for D²PAK only)
 - TRR = Tape and reel (right oriented - for D²PAK only)
- 9** -
 - PbF = Lead (Pb)-free (for TO-262 and D²PAK tube)
 - P = Lead (Pb)-free (for D²PAK 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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