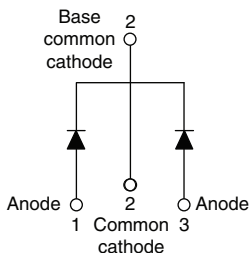




Schottky Rectifier, 2 x 10 A



TO-220AB



FEATURES

- 150 °C T_J operation
- 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
- Compliant to RoHS Directive 2002/95/EC
- Designed and qualified according to JEDEC-JESD47
- Halogen-free according to IEC 61249-2-21 definition (-N3 only)



RoHS
COMPLIANT
HALOGEN
FREE
Available

PRODUCT SUMMARY

Package	TO-220AB
I _{F(AV)}	2 x 10 A
V _R	80 V, 90 V, 100 V
V _F at I _F	0.65 V
I _{RM} max.	6 mA at 125 °C
T _J max.	150 °C
Diode variation	Common cathode
E _{AS}	24 mJ

DESCRIPTION

This center tap Schottky rectifier series 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}		80 to 100	V
I _{FRM}	T _C = 133 °C (per leg)	20	A
I _{FSM}	t _p = 5 μs sine	850	
V _F	10 A _{pk} , T _J = 125 °C	0.65	V
T _J	Range	- 65 to 150	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-MBR2080CTKPbF	VS-MBR2080CTK-N3	VS-MBR2090CTKPbF	VS-MBR2090CTK-N3	VS-MBR20100CTKPbF	VS-MBR20100CTK-N3	UNITS
Maximum DC reverse voltage	V _R	80	80	90	90	100	100	V
Maximum working peak reverse voltage	V _{RWM}							

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	I _{F(AV)}	T _C = 133 °C, rated V _R	10	A
			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	850	
		Following any rated load condition and with rated V _{RRM} applied	150	
Peak repetitive reverse surge current	I _{RRM}	2.0 μs, 1.0 kHz	0.5	mJ
Non-repetitive avalanche energy per leg	E _{AS}	T _J = 25 °C, I _{AS} = 2 A, L = 12 mH	24	



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	mΩ
Maximum junction capacitance	C_T	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$		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 μ s, 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	Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style TO-220AB	MBR2080CTK	
			MBR2090CTK	
			MBR20100CTK	

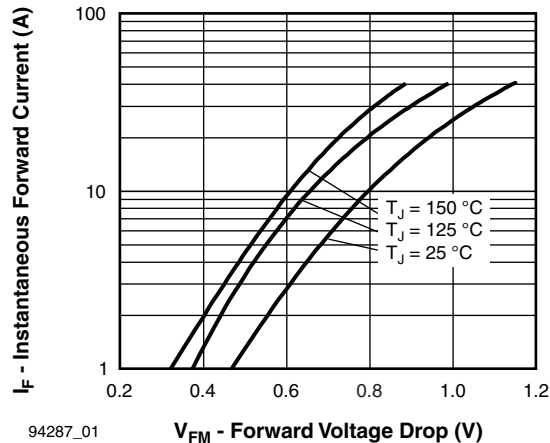


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

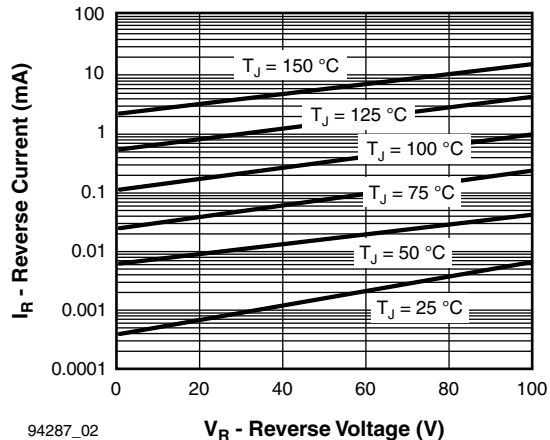


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

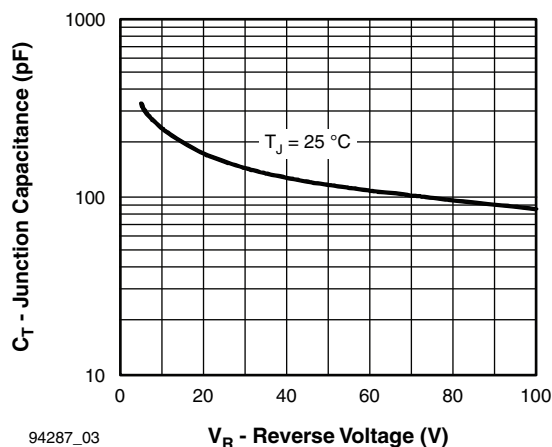


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

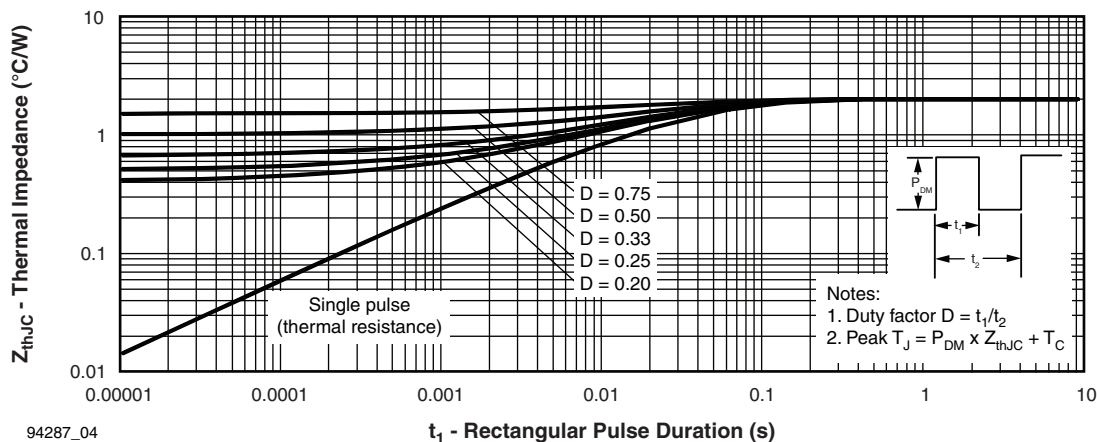


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

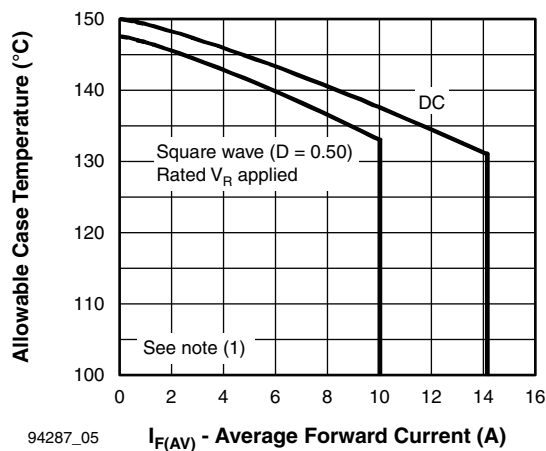


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

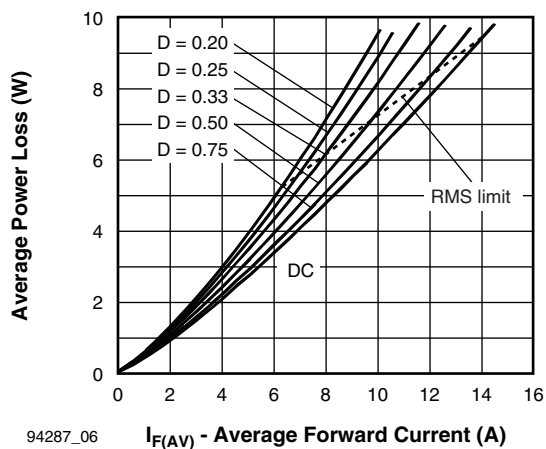


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

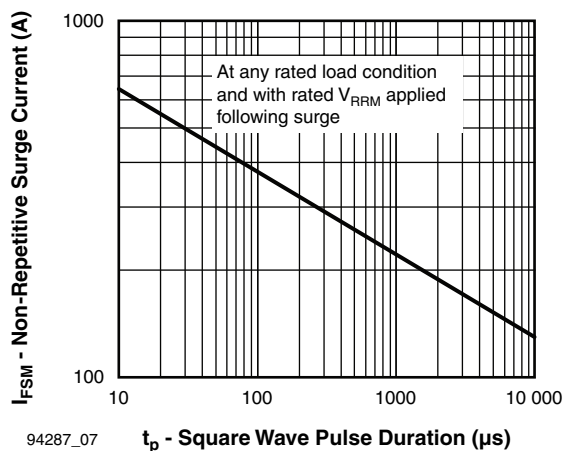


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

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



ORDERING INFORMATION TABLE

Device code	VS-	MBR	20	100	CT	K	PbF
	1	2	3	4	5	6	7

- | | | |
|----------|---|-------------------------------|
| 1 | - | Vishay Semiconductors product |
| 2 | - | MBR series |
| 3 | - | Current rating (20 = 20 A) |
| 4 | - | Voltage rating |
| 5 | - | CT = Center tap (dual) |
| 6 | - | K = Schottky generation |
| 7 | - | Environmental digit |
- 80 = 80 V
90 = 90 V
100 = 100 V
- PbF = Lead (Pb)-free and RoHS compliant
 - -N3 = Halogen-free, RoHS compliant, and totally lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-MBR2080CTKPbF	50	1000	Antistatic plastic tube
VS-MBR2080CTK-N3	50	1000	Antistatic plastic tube
VS-MBR2090CTKPbF	50	1000	Antistatic plastic tube
VS-MBR2090CTK-N3	50	1000	Antistatic plastic tube
VS-MBR20100CTKPbF	50	1000	Antistatic plastic tube
VS-MBR20100CTK-N3	50	1000	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95222
Part marking information	TO-220AB PbF www.vishay.com/doc?95225
	TO-220AB -N3 www.vishay.com/doc?95028



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