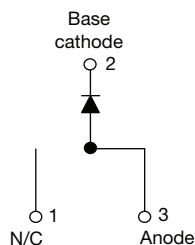


High Performance Schottky Rectifier, 10 A


D²PAK (TO-263AB)


FEATURES

- 150 °C T_J operation
- TO-220 and D²PAK 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 245 °C
- Designed and qualified according to JEDEC®-JESD 47
- AEC-Q101 qualified
- Meets JESD 201 class 1 whisker test
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

PRODUCT SUMMARY

I _{F(AV)}	10 A
V _R	35 V, 45 V
V _F at I _F	0.57 V
I _{RM}	15 mA at 125 °C
T _J max.	150 °C
E _{AS}	8 mJ
Package	D ² PAK (TO-263AB)
Diode variation	Single

DESCRIPTION

This 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	10	A
I _{FRM}	T _C = 135 °C	20	
V _{RRM}		35/45	V
I _{FSM}	t _p = 5 μs sine	1060	A
V _F	10 A _{pk} , T _J = 125 °C	0.57	V
T _J	Range	-55 to +150	C°

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-MBRB1035HM3	VS-MBRB1045HM3	UNITS
Maximum DC reverse voltage	V _R	35	45	V
Maximum working peak reverse voltage	V _{RWM}			

**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 135\text{ }^{\circ}\text{C}$, rated V_R	10	A
Peak repetitive forward current	I_{FRM}	Rated V_R , square wave, 20 kHz, $T_C = 135\text{ }^{\circ}\text{C}$	20	
Non-repetitive 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 half wave, single phase, 60 Hz	150	
Non-repetitive avalanche energy	E_{AS}	$T_J = 25\text{ }^{\circ}\text{C}$, $I_{AS} = 2\text{ A}$, $L = 4\text{ mH}$	8	mJ
Repetitive avalanche current	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 $T_J = 125\text{ }^{\circ}\text{C}$	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_f		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		-55 to 150	°C
Maximum storage temperature range	T _{Stg}		-55 to 175	
Maximum thermal resistance, junction to case	R _{thJC}	DC operation	2.0	°C/W
Typical thermal resistance, case to heatsink	R _{thCS}	Mounting surface, smooth and greased (Only for TO-220)	0.50	
Approximate weight			2	g
			0.07	oz.
Mounting torque	minimum		6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style D ² PAK (TO-263AB)	MBRB1035H	
			MBRB1045H	

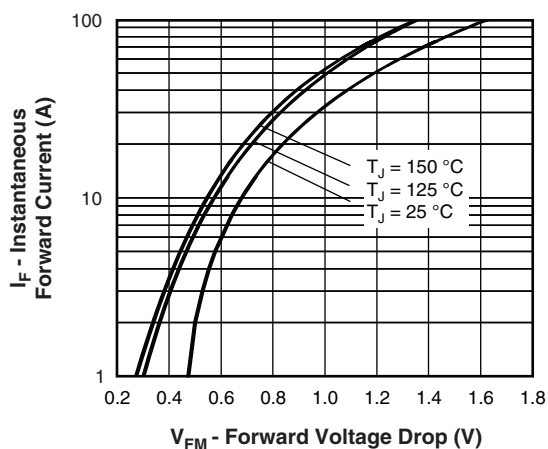


Fig. 1 - Maximum Forward Voltage Drop Characteristics

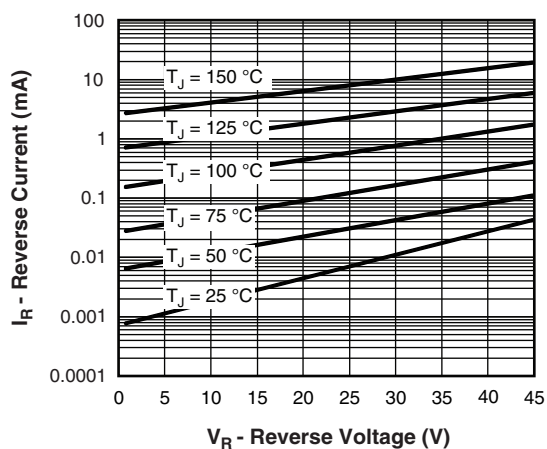


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

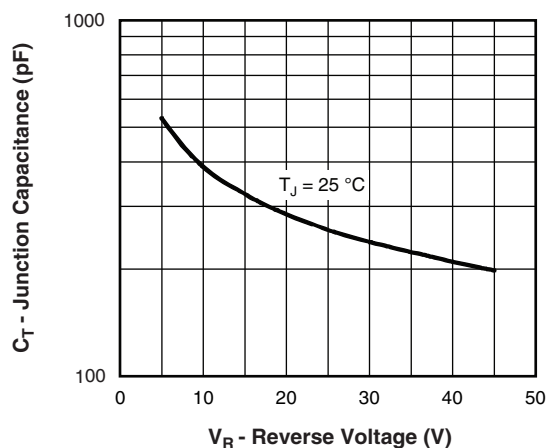
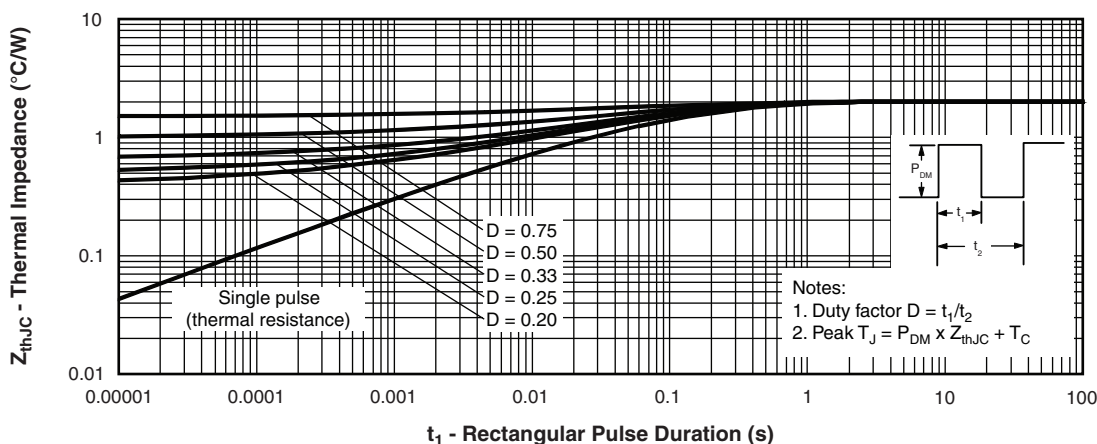


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

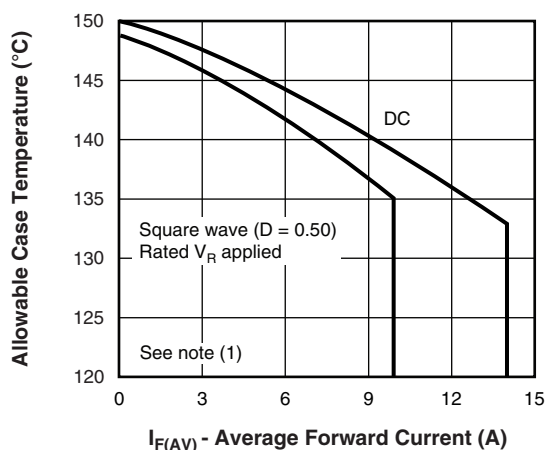


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

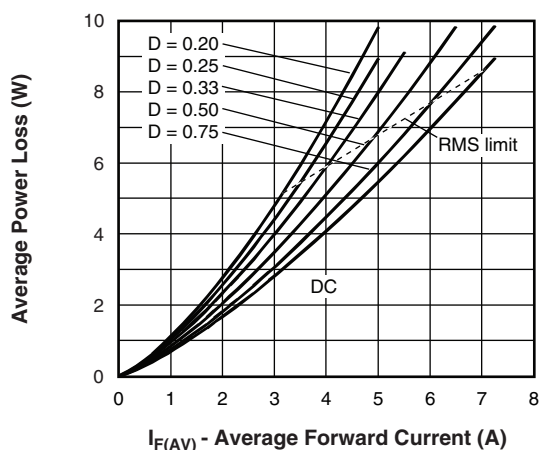


Fig. 6 - Forward Power Loss Characteristics

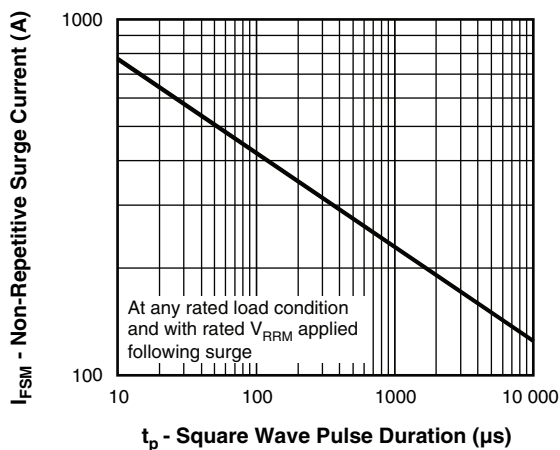


Fig. 7 - Maximum Non-Repetitive Surge Current

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	B	10	45	TRL	H	M3
	①	②	③	④	⑤	⑥	⑦	⑧

- | | | |
|----------|---|--|
| 1 | - | Vishay Semiconductors product |
| 2 | - | Essential part number |
| 3 | - | B = surface mount |
| 4 | - | Current rating (10 = 10 A) |
| 5 | - | Voltage ratings |
| 6 | - | <ul style="list-style-type: none">• None = tube• TRL = tape and reel (left oriented)• TRR = tape and reel (right oriented) |
| 7 | - | H = AEC-Q101 qualified |
| 8 | - | M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free |
- 35 = 35 V

45 = 45 V

ORDERING INFORMATION

PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-MBRB1035HM3	50	1000	Antistatic plastic tubes
VS-MBRB1035TRRH3	800	800	13" diameter reel
VS-MBRB1035TRLH3	800	800	13" diameter reel
VS-MBRB1045HM3	50	1000	Antistatic plastic tubes
VS-MBRB1045TRRH3	800	800	13" diameter reel
VS-MBRB1045TRLH3	800	800	13" diameter reel

LINKS TO RELATED DOCUMENTS

Dimensions	www.vishay.com/doc?95046
Part marking information	www.vishay.com/doc?95444
Packaging information	www.vishay.com/doc?95032
SPIICE model	www.vishay.com/doc?95293

D²PAK

DIMENSIONS in millimeters and inches

Conforms to JEDEC® outline D²PAK (SMD-220)



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190	
A1	0.00	0.254	0.000	0.010	
b	0.51	0.99	0.020	0.039	
b1	0.51	0.89	0.020	0.035	4
b2	1.14	1.78	0.045	0.070	
b3	1.14	1.73	0.045	0.068	4
c	0.38	0.74	0.015	0.029	
c1	0.38	0.58	0.015	0.023	4
c2	1.14	1.65	0.045	0.065	
D	8.51	9.65	0.335	0.380	2

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
D1	6.86	8.00	0.270	0.315	3
E	9.65	10.67	0.380	0.420	2, 3
E1	7.90	8.80	0.311	0.346	3
e	2.54 BSC		0.100 BSC		
H	14.61	15.88	0.575	0.625	
L	1.78	2.79	0.070	0.110	
L1	-	1.65	-	0.066	3
L2	1.27	1.78	0.050	0.070	
L3	0.25 BSC		0.010 BSC		
L4	4.78	5.28	0.188	0.208	

Notes

- Dimensioning and tolerancing per ASME Y14.5 M-1994
- Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- Thermal pad contour optional within dimension E, L1, D1 and E1
- Dimension b1 and c1 apply to base metal only
- Datum A and B to be determined at datum plane H
- Controlling dimension: inch
- Outline conforms to JEDEC® outline TO-263AB



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