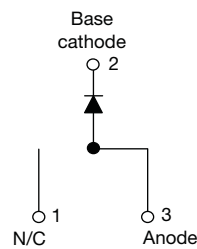


High Performance Schottky Rectifier, 10 A



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
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

PRIMARY CHARACTERISTICS

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)
Circuit configuration	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 _R		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	-65 to +150	C°

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-MBRB1035-M3	VS-MBRB1045-M3	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 °C, rated V _R	10	A
Peak repetitive forward current	I _{FRM}	Rated V _R , square wave, 20 kHz, T _C = 135 °C	20	
Non-repetitive surge current	I _{FSM}	5 μs sine or 3 μs rect. pulse	1060	
		Surge applied at rated load conditions halfwave, single phase, 60 Hz	150	
Non-repetitive avalanche energy	E _{AS}	T _J = 25 °C, I _{AS} = 2 A, L = 4 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 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	m Ω
Maximum junction capacitance	C_T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz), 25 $^\circ\text{C}$		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	R_{thJC}	DC operation		2.0	$^\circ\text{C/W}$
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)		MBRB1035	
				MBRB1045	

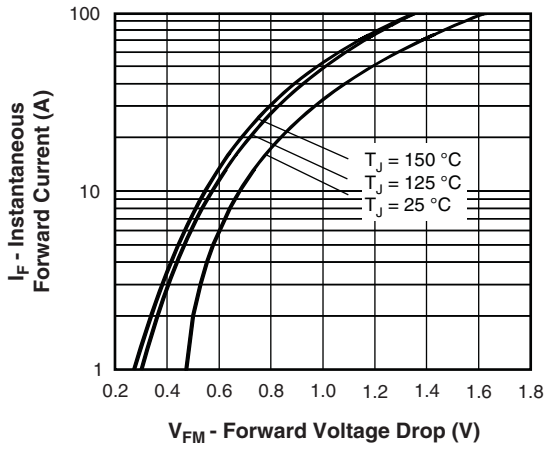


Fig. 1 - Maximum Forward Voltage Drop Characteristics

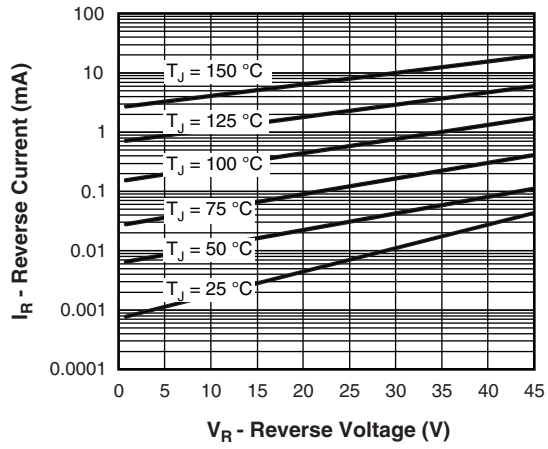


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

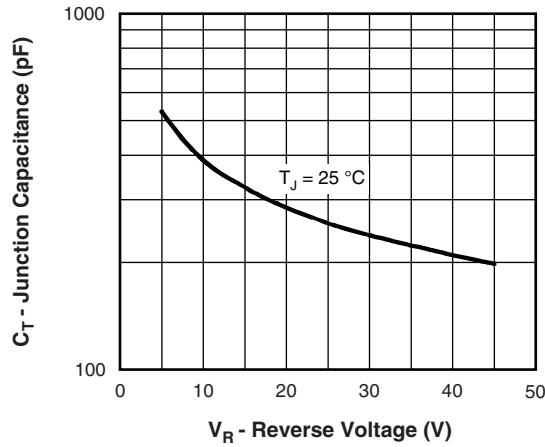


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

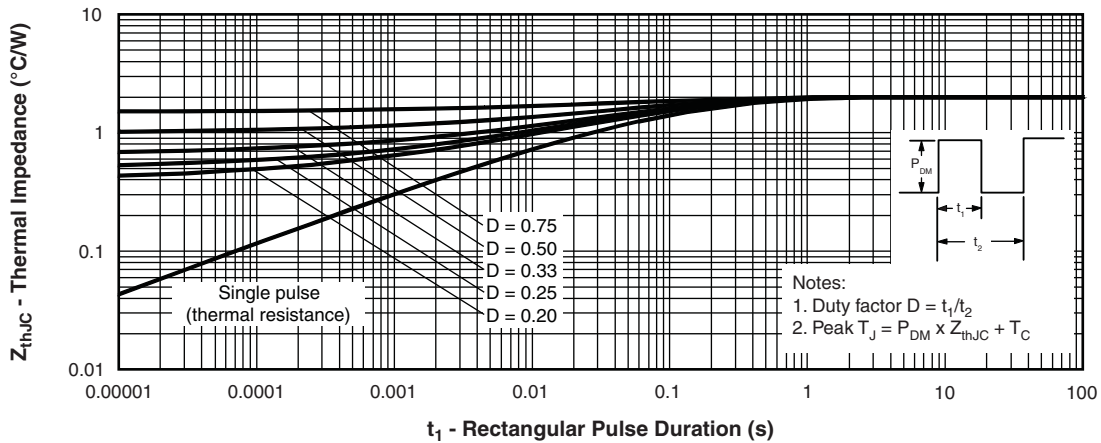


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

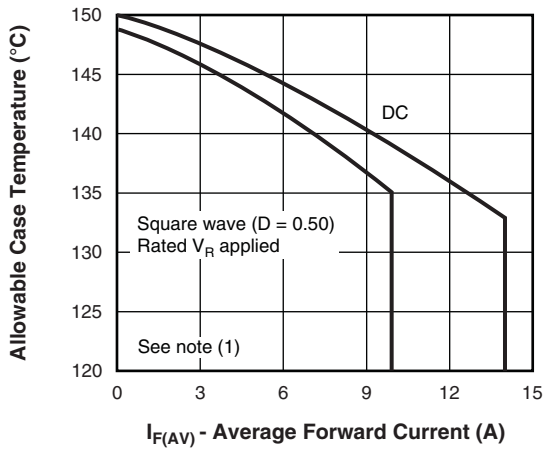


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

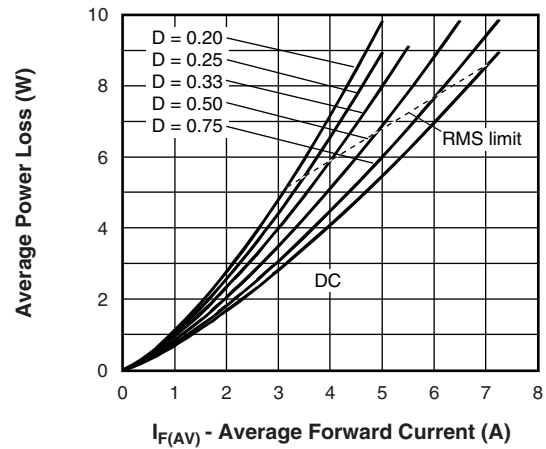


Fig. 6 - Forward Power Loss Characteristics

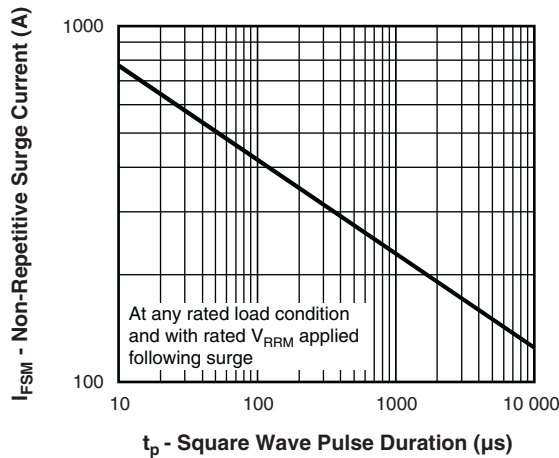


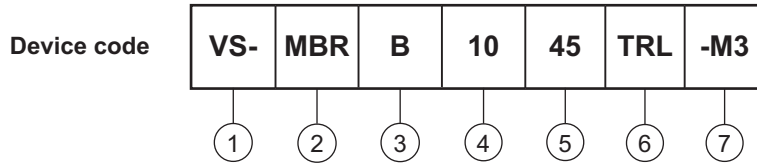
Fig. 7 - Maximum Non-Repetitive Surge Current

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



- 1** - Vishay Semiconductors product
- 2** - Essential part number
- 3** - B = surface mount
- 4** - Current rating (10 = 10 A)
- 5** - Voltage ratings

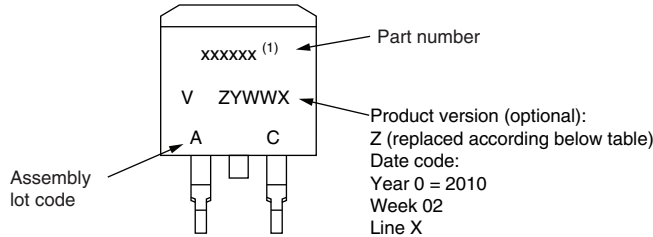
35 = 35 V
45 = 45 V
- 6** -
 - None = tube
 - TRL = tape and reel (left oriented)
 - TRR = tape and reel (right oriented)
- 7** - -M3 = halogen-free, RoHS-compliant and termination lead (Pb)-free

ORDERING INFORMATION			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-MBRB1035-M3	50	1000	Antistatic plastic tubes
VS-MBRB1035TRR-M3	800	800	13" diameter reel
VS-MBRB1035TRL-M3	800	800	13" diameter reel
VS-MBRB1045-M3	50	1000	Antistatic plastic tubes
VS-MBRB1045TRR-M3	800	800	13" diameter reel
VS-MBRB1045TRL-M3	800	800	13" diameter reel

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?96164
Part marking information	www.vishay.com/doc?95444
Packaging information	www.vishay.com/doc?96424
SPIICE model	www.vishay.com/doc?95293



D²PAK



Example: This is a xxxxxx ⁽¹⁾ with assembly lot code AC, assembled on WW 02, 2010

Note

⁽¹⁾ If part number contain "H" as last digit, product is AEC-Q101 qualified

ENVIRONMENTAL NAMING CODE (Z)	PRODUCT DEFINITION
A	Termination lead (Pb)-free
B	Totally lead (Pb)-free
E	RoHS-compliant and termination lead (Pb)-free
F	RoHS-compliant and totally lead (Pb)-free
M	Halogen-free, RoHS-compliant, and termination lead (Pb)-free
N	Halogen-free, RoHS-compliant, and totally lead (Pb)-free
G	Green

D²PAK

DIMENSIONS in millimeters and inches

Conforms to JEDEC® outline D²PAK (SMD-220)



SYMBOL	MILLIMETERS		INCHES		NOTES	SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.			MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190		D1	6.86	8.00	0.270	0.315	3
A1	0.00	0.254	0.000	0.010		E	9.65	10.67	0.380	0.420	2, 3
b	0.51	0.99	0.020	0.039		E1	7.90	8.80	0.311	0.346	3
b1	0.51	0.89	0.020	0.035	4	e	2.54 BSC		0.100 BSC		
b2	1.14	1.78	0.045	0.070		H	14.61	15.88	0.575	0.625	
b3	1.14	1.73	0.045	0.068	4	L	1.78	2.79	0.070	0.110	
c	0.38	0.74	0.015	0.029		L1	-	1.65	-	0.066	3
c1	0.38	0.58	0.015	0.023	4	L2	1.27	1.78	0.050	0.070	
c2	1.14	1.65	0.045	0.065		L3	0.25 BSC		0.010 BSC		
D	8.51	9.65	0.335	0.380	2	L4	4.78	5.28	0.188	0.208	

Notes

- (1) Dimensioning and tolerancing per ASME Y14.5 M-1994
- (2) 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
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Datum A and B to be determined at datum plane H
- (6) Controlling dimension: inches
- (7) Outline conforms to JEDEC® outline TO-263AB

D²PAK (TO-263AB)

CARRIER TAPE FOR TAPE AND REEL LEFT in millimeters



Note

(1) For dimensions, see next pages

CARRIER TAPE FOR TAPE AND REEL RIGHT in millimeters



Note

(1) For dimensions, see next pages



REEL FOR CARRIER TAPE in millimeters



CARRIER TAPE AND REEL PACKAGING D²PAK (TO-263AB)





COVER TAPE FOR CARRIER TAPE in millimeters



APPLICATION	COVER TAPE WIDTH W	COVER TAPE THICKNESS T	CARRIER TAPE WIDTH	MATERIAL
D ² PAK (TO-263AB)	21.3 ± 0.1	0.060 ± 0.01	24	Antistatic/treated/transparent/polyester



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