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Vishay Semiconductors

COMPLIANT

HALOGEN

**FREE** 

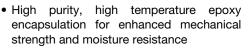
## **High Performance Schottky Rectifier, 16 A**

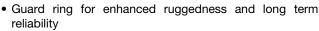


PRIMARY CHARACTERISTICS				
I <sub>F(AV)</sub>	16 A			
V <sub>R</sub>	35 V, 45 V			
V <sub>F</sub> at I <sub>F</sub>	0.57 V			
I <sub>RM</sub> max.	40 mA at 125 °C			
T <sub>J</sub> max.	150 °C			
E <sub>AS</sub>	24 mJ			
Package	TO-220AC 2L			
Circuit configuration	Single			

#### **FEATURES**

- 150 °C T<sub>J</sub> operation
- Low forward voltage drop
- · High frequency operation





- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see <a href="https://www.vishav.com/doc?99912"><u>www.vishav.com/doc?99912</u></a>

#### **DESCRIPTION**

The VS-MBR16... 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 <sub>F(AV)</sub>	Rectangular waveform	16	Α	
V <sub>RRM</sub>		35, 45	V	
I <sub>FSM</sub>	t <sub>p</sub> = 5 μs sine	1800	Α	
V <sub>F</sub>	16 A <sub>pk</sub> , T <sub>J</sub> = 125 °C	0.57	V	
T <sub>J</sub>	Range	-65 to +150	°C	

VOLTAGE RATINGS				
PARAMETER	SYMBOL	VS-MBR1635-M3	VS-MBR1645-M3	UNITS
Maximum DC reverse voltage	$V_{R}$	35	45	V
Maximum working peak reverse voltage	$V_{RWM}$	33	45	V

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	I <sub>F(AV)</sub>	$T_C$ = 134 °C, rated $V_R$		16	Α
Non-repetitive peak surge current	I <sub>ESM</sub>	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V <sub>RRM</sub> applied	1800	A
	1 0111	Surge applied at rated load of single phase, 60 Hz	condition half wave	150	
Non-repetitive avalanche energy	E <sub>AS</sub>	$T_J = 25  ^{\circ}\text{C},  I_{AS} = 3.6  \text{A},  L = 3.7  \text{mH}$		24	mJ
Repetitive avalanche current	I <sub>AR</sub>	Current decaying linearly to zero in 1 $\mu$ s Frequency limited by T <sub>J</sub> maximum V <sub>A</sub> = 1.5 x V <sub>R</sub> typical  3.6		А	



# VS-MBR1635-M3, VS-MBR1645-M3

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ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	V (1)	V <sub>FM</sub> <sup>(1)</sup> 16 A	T <sub>J</sub> = 25 °C	0.63	V
waxiinum lorward voitage drop	V FM (1)	16 A	T <sub>J</sub> = 125 °C	0.57	
Maximum instantaneous reverse current	I <sub>RM</sub> <sup>(1)</sup>	T <sub>J</sub> = 25 °C	Rated DC voltage	0.2	- mA
Maximum instantaneous reverse current	IT IRM (")	T <sub>J</sub> = 125 °C		40	
Maximum junction capacitance	C <sub>T</sub>	V <sub>R</sub> = 5 V <sub>DC</sub> (test signal range 100 kHz to 1 MHz) 25 °C 1400 pl		pF	
Typical series inductance	L <sub>S</sub>	Measured from top of terminal to mounting plane 8.0 r		nH	
Maximum voltage rate of change	dV/dt	Rated V <sub>R</sub> 10 000		V/µs	

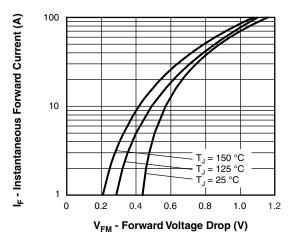
#### Note

 $<sup>^{(1)}\,</sup>$  Pulse width < 300 µs, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	TJ		-65 to +150	°C
Maximum storage temperature range	T <sub>Stg</sub>		-65 to +175	Ò
Maximum thermal resistance, junction to case	R <sub>thJC</sub>	DC operation	1.50	°C/W
Typical thermal resistance, case to heatsink	R <sub>thCS</sub>	Mounting surface, smooth and greased	0.50	C/VV
Approximate weight			2	g
Approximate weight			0.07	OZ.
Mounting torque minimum			6 (5)	kgf ⋅ cm
Mounting torque — maximum			12 (10)	(lbf · in)
Marking device		Occasional TO 000AO 01	MBR1635	
		Case style TO-220AC 2L	MBR	1645



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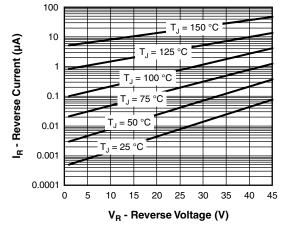


Fig. 1 - Maximum Forward Voltage Drop Characteristics

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

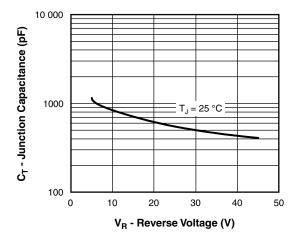


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

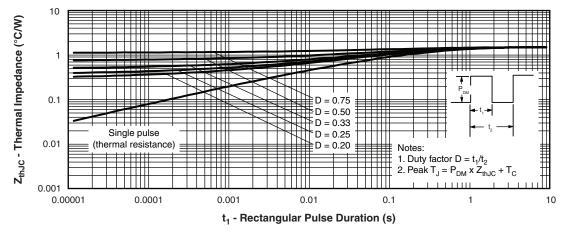


Fig. 4 - Maximum Thermal Impedance Z<sub>thJC</sub> Characteristics

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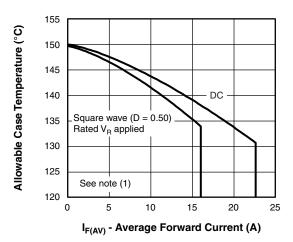


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

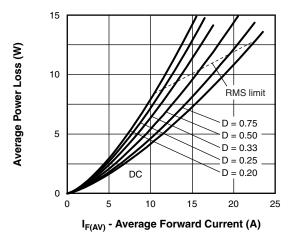


Fig. 6 - Forward Power Loss Characteristics

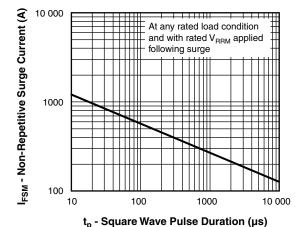


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

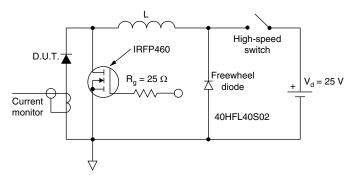


Fig. 8 - Unclamped Inductive Test Circuit

### Note

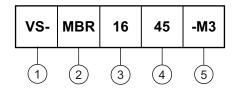
 $\begin{array}{ll} \text{(1)} & \text{Formula used: } T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}; \\ Pd = \text{forward power loss} = I_{F(AV)} \times V_{FM} \text{ at } (I_{F(AV)}/D) \text{ (see fig. 6)}; \\ Pd_{REV} = \text{inverse power loss} = V_{R1} \times I_R \text{ (1 - D); } I_R \text{ at } V_{R1} = \text{rated } V_R \text{ applied} \end{array}$ 

## VS-MBR1635-M3, VS-MBR1645-M3

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### **ORDERING INFORMATION TABLE**

**Device code** 



Vishay Semiconductors product

2 - Schottky MBR series

Current rating (16 = 16 A)

- Voltage ratings - 35 = 35 V 45 = 45 V

5 - Environmental digit

-M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free

ORDERING INFORMATION (Example)				
PREFERRED P/N	BASE QUANTITY	PACKAGING DESCRIPTION		
VS-MBR1635-M3	50	Antistatic plastic tubes		
VS-MBR1645-M3	50	Antistatic plastic tubes		

LINKS TO RELATED DOCUMENTS					
Dimensions <u>www.vishay.com/doc?96156</u>					
Part marking information	www.vishay.com/doc?95391				



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