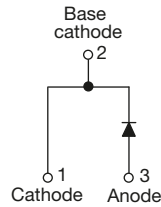


## High Performance Schottky Rectifier, 16 A



TO-220AC 2L



### FEATURES

- 150 °C T<sub>J</sub> 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
- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

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

### 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	A
V <sub>R</sub>		35, 45	V
I <sub>FSM</sub>	t <sub>p</sub> = 5 μs sine	1800	A
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 <sub>R</sub>	35	45	V
Maximum working peak reverse voltage	V <sub>RWM</sub>			

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



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}^{(1)}$	16 A	$T_J = 25\text{ }^\circ\text{C}$	0.63	V
			$T_J = 125\text{ }^\circ\text{C}$	0.57	
Maximum instantaneous reverse current	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	Rated DC voltage	0.2	mA
		$T_J = 125\text{ }^\circ\text{C}$		40	
Maximum junction capacitance	$C_T$	$V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C		1400	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/ $\mu$ s

**Note**

(1) Pulse width < 300  $\mu$ s, 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		1.50	$^\circ\text{C/W}$
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			6 (5)	kgf · cm (lbf · in)
				12 (10)	
Marking device		Case style TO-220AC 2L		MBR1635	
				MBR1645	

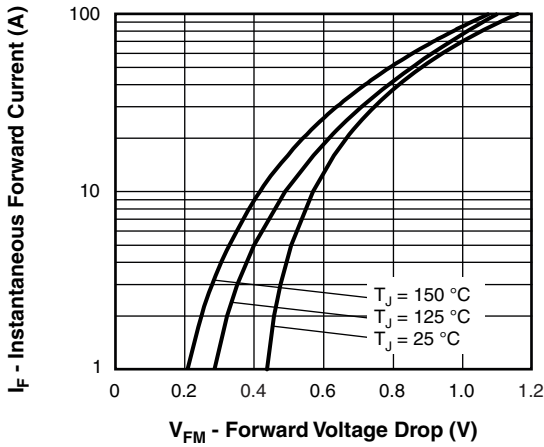


Fig. 1 - Maximum Forward Voltage Drop Characteristics

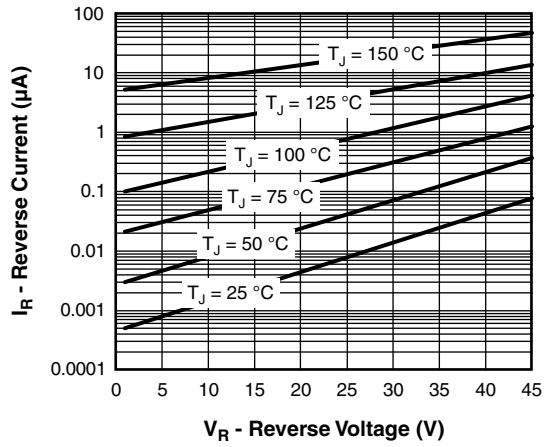


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

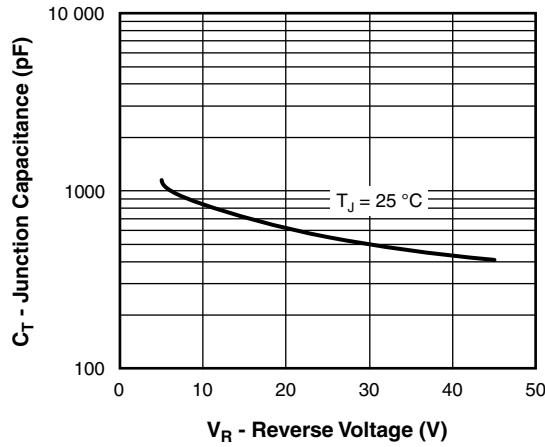


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

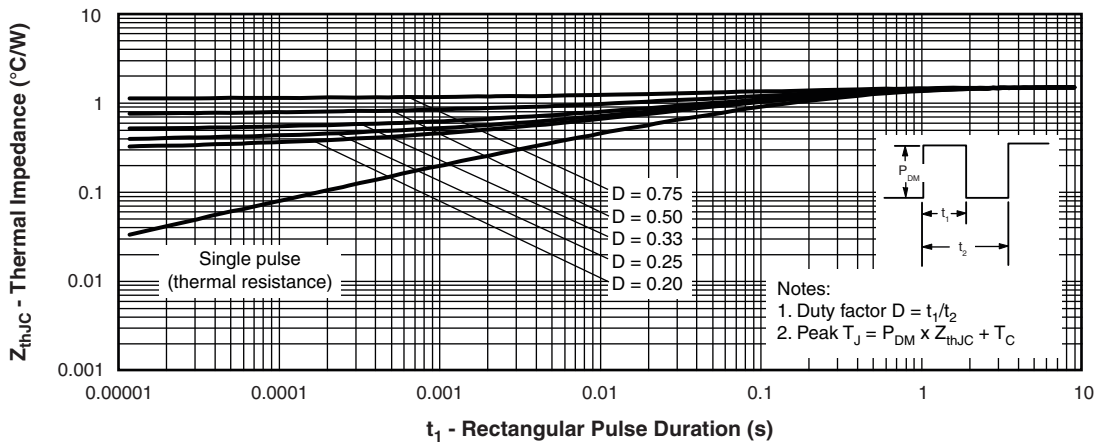


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

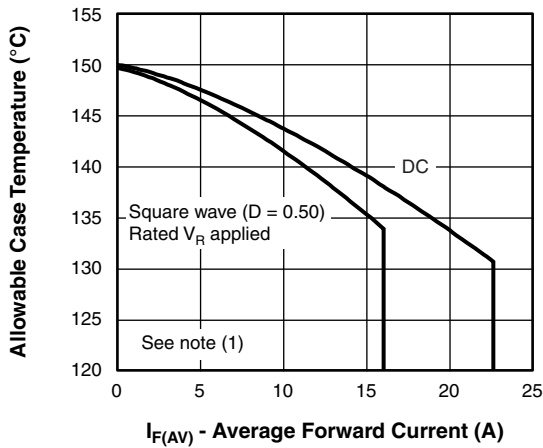


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

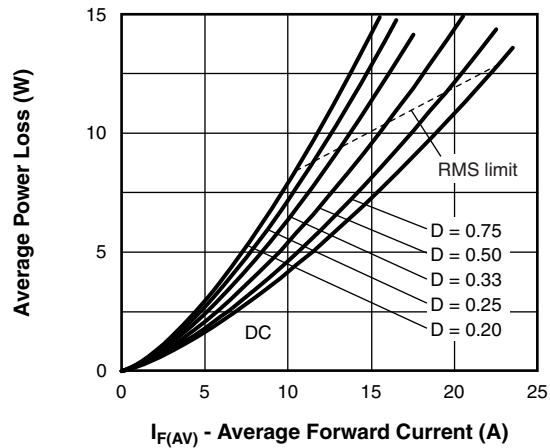


Fig. 6 - Forward Power Loss Characteristics

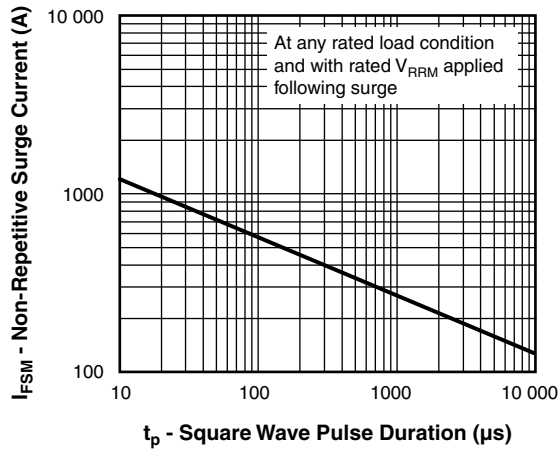


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

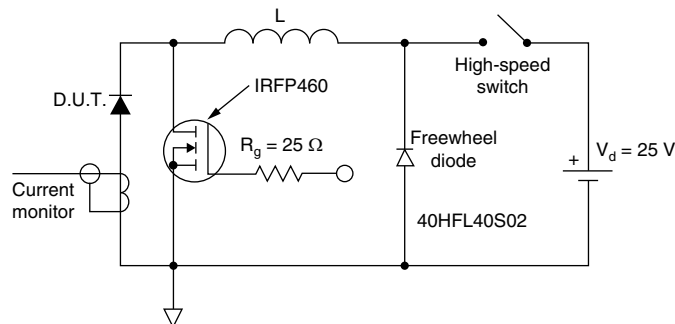


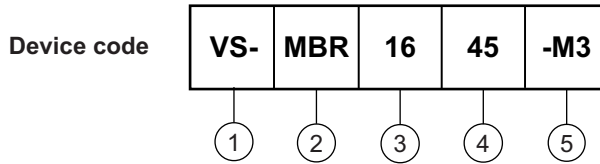
Fig. 8 - Unclamped Inductive Test Circuit

**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  $V_R$  applied



## ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
  - 2** - Schottky MBR series
  - 3** - Current rating (16 = 16 A)
  - 4** - 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	<a href="http://www.vishay.com/doc?96156">www.vishay.com/doc?96156</a>
Part marking information	<a href="http://www.vishay.com/doc?95391">www.vishay.com/doc?95391</a>



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