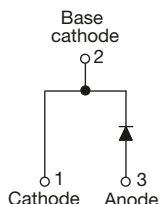


High Performance Schottky Rectifier, 16 A



TO-220AC 2L



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
- 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

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.

PRIMARY CHARACTERISTICS

I _{F(AV)}	16 A
V _R	35 V, 45 V
V _F at I _F	0.57 V
I _{RM} max.	40 mA at 125 °C
T _J max.	150 °C
E _{AS}	24 mJ
Package	TO-220AC 2L
Circuit configuration	Single

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
I _{F(AV)}	Rectangular waveform	16	A
V _{RRM}		35, 45	V
I _{FSM}	t _p = 5 µs sine	1800	A
V _F	16 A _{pk} , T _J = 125 °C	0.57	V
T _J	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}			

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	I _{F(AV)}	T _C = 134 °C, rated V _R		16	A
Non-repetitive peak surge current	I _{FSM}	5 µs sine or 3 µs rect. pulse	Following any rated load condition and with rated V _{RRM} applied	1800	A
		Surge applied at rated load condition half wave single phase, 60 Hz		150	
Non-repetitive avalanche energy	E _{AS}	T _J = 25 °C, I _{AS} = 3.6 A, L = 3.7 mH		24	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		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) $25\text{ }^{\circ}\text{C}$		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/ μ s

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	R _{thJC}	DC operation	1.50	°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		6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style TO-220AC 2L	MBR1635	
			MBR1645	

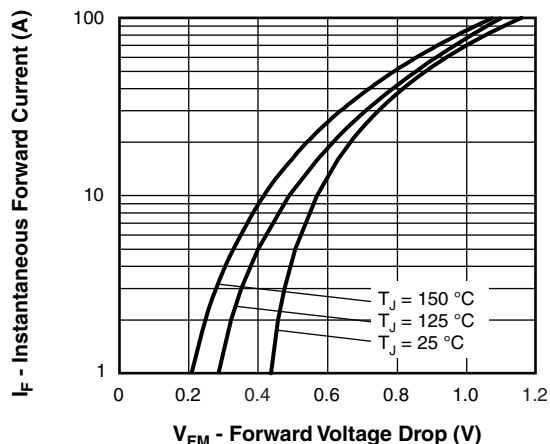


Fig. 1 - Maximum Forward Voltage Drop Characteristics

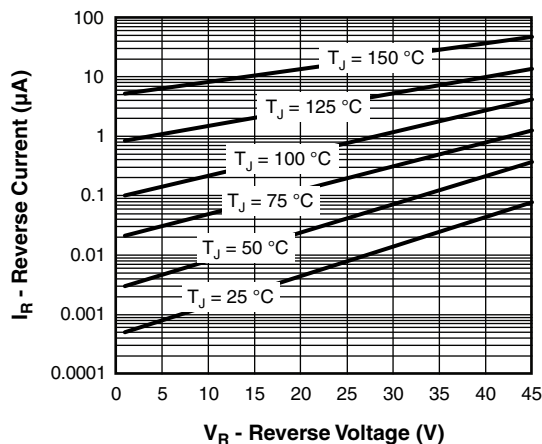


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

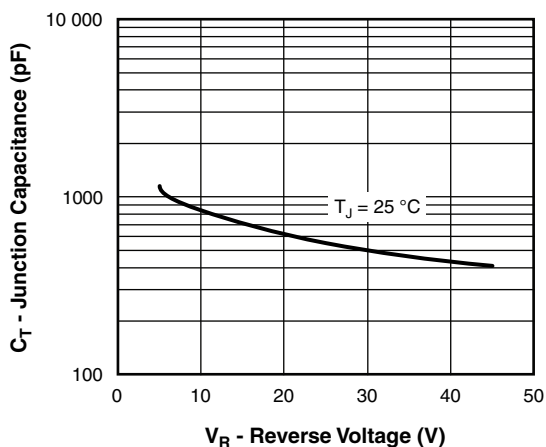
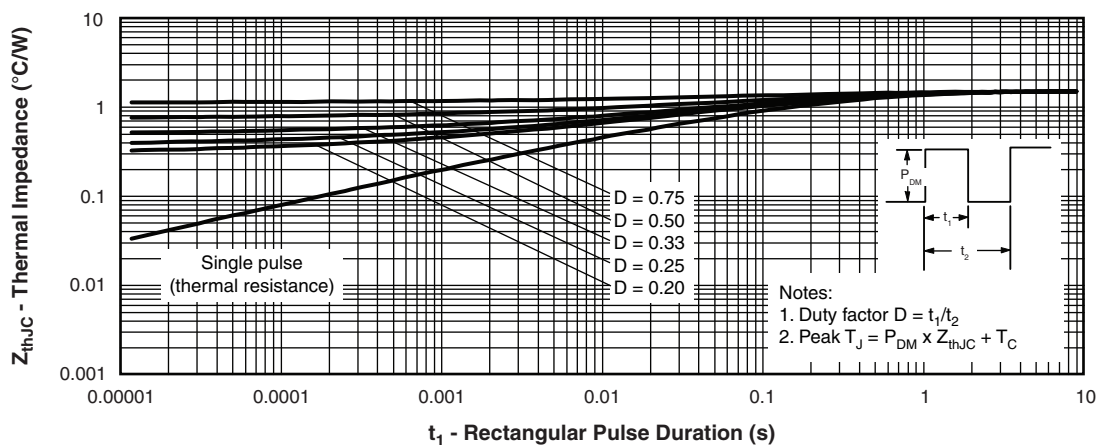


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

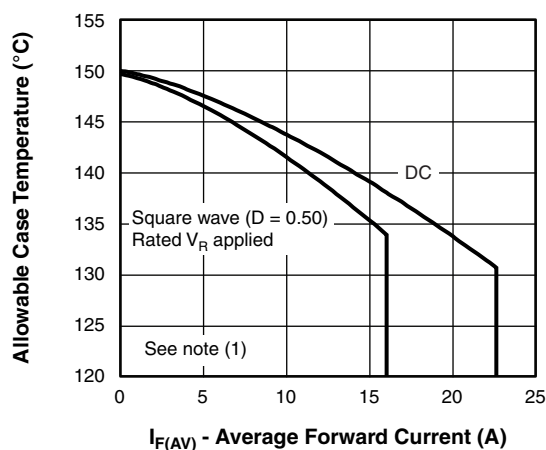


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

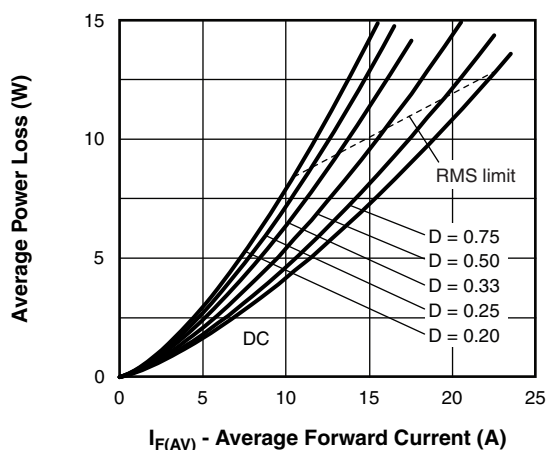


Fig. 6 - Forward Power Loss Characteristics

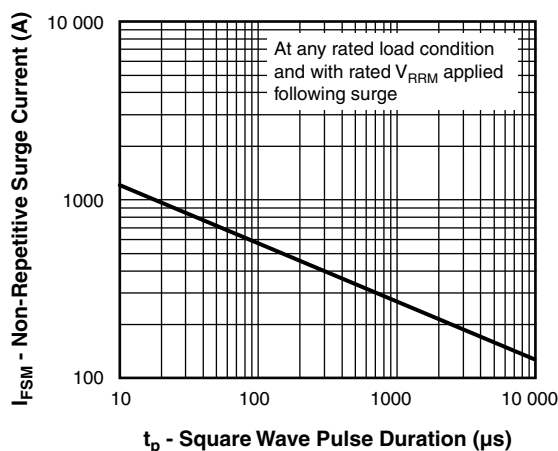


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

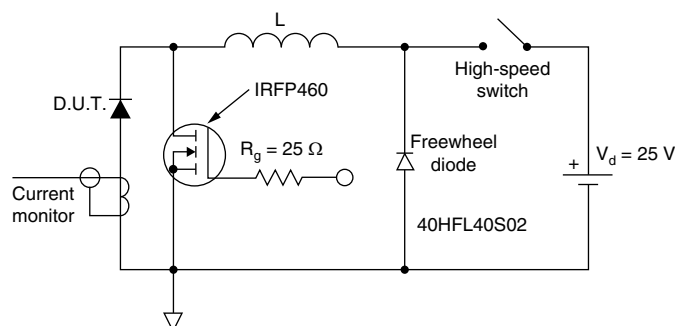


Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
 P_d = forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 P_{dREV} = inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = rated V_R applied



ORDERING INFORMATION TABLE

Device code	VS-	MBR	16	45	-M3
	1	2	3	4	5
	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	www.vishay.com/doc?96156
Part marking information	www.vishay.com/doc?95391



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