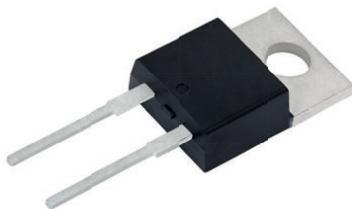
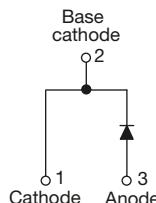


High Performance Schottky Rectifier, 7.5 A


TO-220AC 2L


RoHS
COMPLIANT
HALOGEN
FREE

FEATURES

- 150 °C T_J operation
- High frequency operation
- Low forward voltage drop
- 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

DESCRIPTION

The VS-MBR7... 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	
$I_{F(AV)}$	7.5 A
V_R	35 V, 45 V
V_F at I_F	0.57 V
I_{RM} max.	15 mA at 125 °C
T_J max.	150 °C
E_{AS}	7 mJ
Package	2L TO-220AC
Circuit configuration	Single

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	7.5	A
V_{RRM}		35/45	V
I_{FSM}	$t_p = 5 \mu s$ sine	690	A
V_F	$7.5 A_{pk}$, $T_J = 125 °C$	0.57	V
T_J	Range	-65 to +150	°C

VOLTAGE RATINGS				
PARAMETER	SYMBOL	VS-MBR735-M3	VS-MBR745-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	$I_{F(AV)}$	$T_C = 131 °C$, rated V_R		7.5	A
Non-repetitive peak surge current	I_{FSM}	5 μs sine or 3 μs rect. pulse		690	A
		Following any rated load condition and with rated V_{RRM} applied		150	
Non-repetitive avalanche energy	E_{AS}	$T_J = 25 °C$, $I_{AS} = 2 A$, $L = 3.5 \text{ mH}$		7	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⁾	15 A	T _J = 25 °C	0.84	V	
		7.5 A	T _J = 125 °C	0.57		
		15 A		0.72		
Maximum instantaneous reverse current	I _{RM} ⁽¹⁾	T _J = 25 °C	Rated DC voltage	0.1	mA	
		T _J = 125 °C		15		
Maximum junction capacitance	C _T	V _R = 5 V _{DC} (test signal range 100 kHz to 1 MHz) 25 °C		400	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		1000	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	°C	
Maximum storage temperature range	T _{Stg}			-65 to +175		
Maximum thermal resistance, junction to case	R _{thJC}	DC operation		3.0	°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 2L TO-220AC		MBR735		
				MBR745		

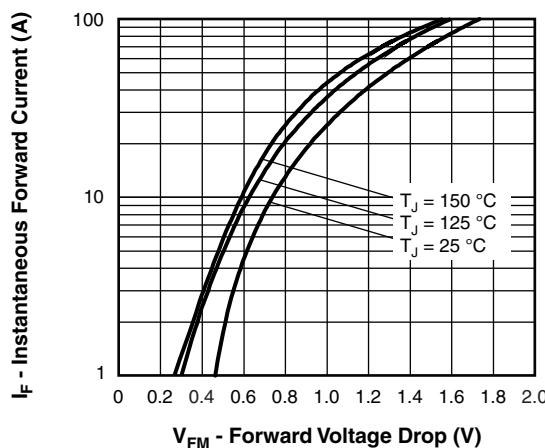


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

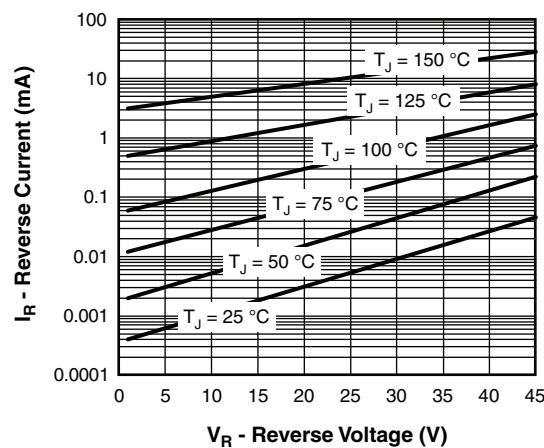


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

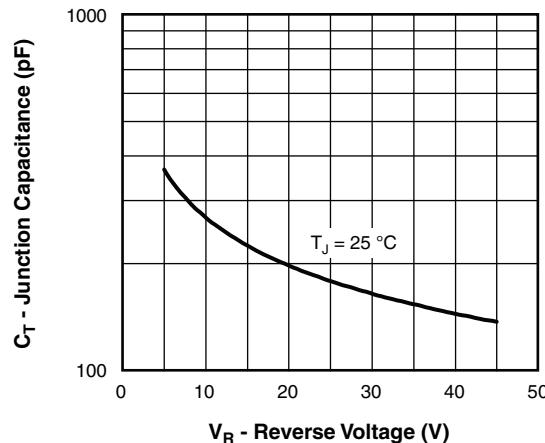


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

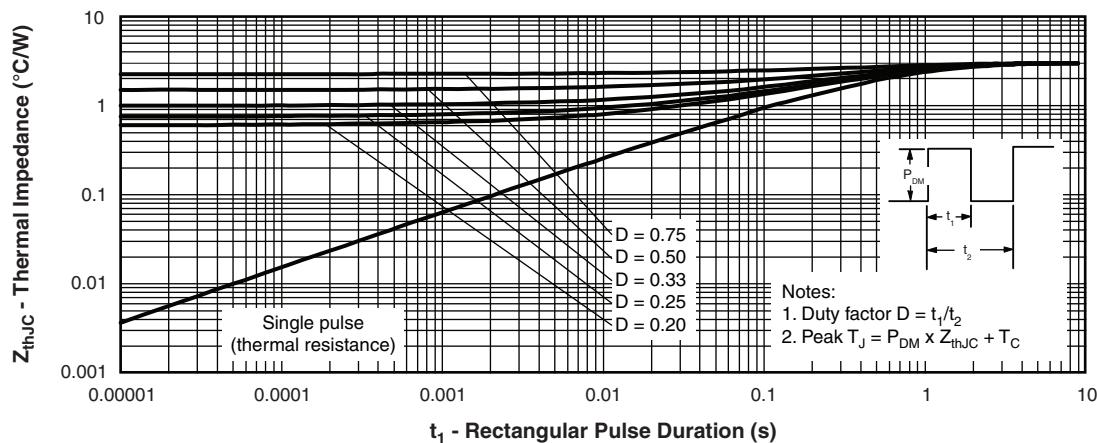


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

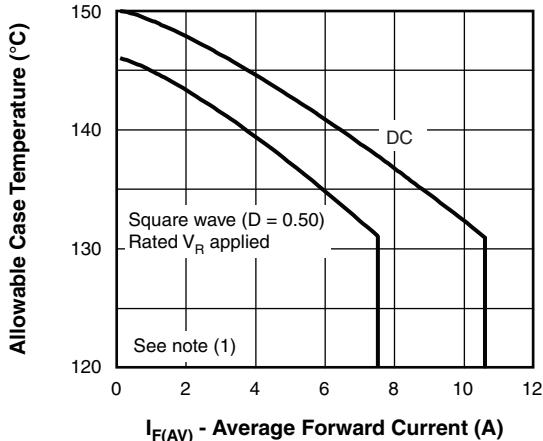


Fig. 5 - Maximum Allowable Case Temperature vs.
Average Forward Current

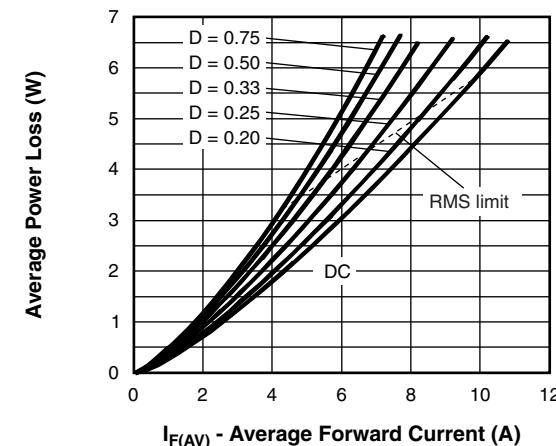


Fig. 6 - Forward Power Loss Characteristics

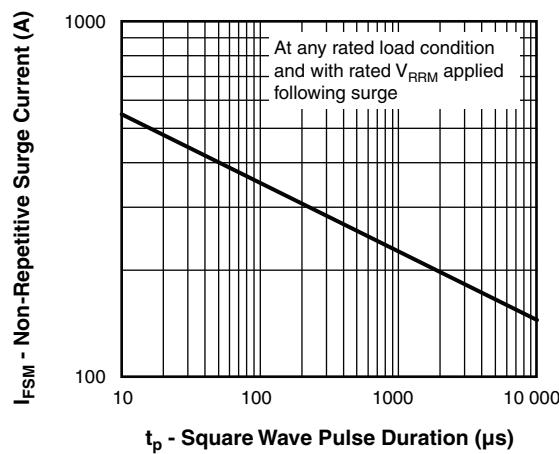
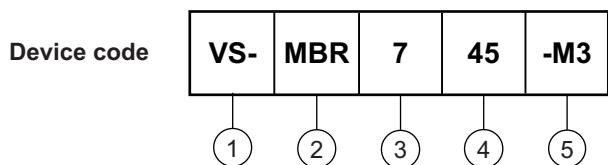


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

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

ORDERING INFORMATION TABLE


- | | |
|----------|---------------------------------|
| 1 | - Vishay Semiconductors product |
| 2 | - Schottky MBR series |
| 3 | - Current rating (7.5 A) |
| 4 | - Voltage ratings |
| 5 | - Environmental digit |
- M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free

ORDERING INFORMATION (Example)

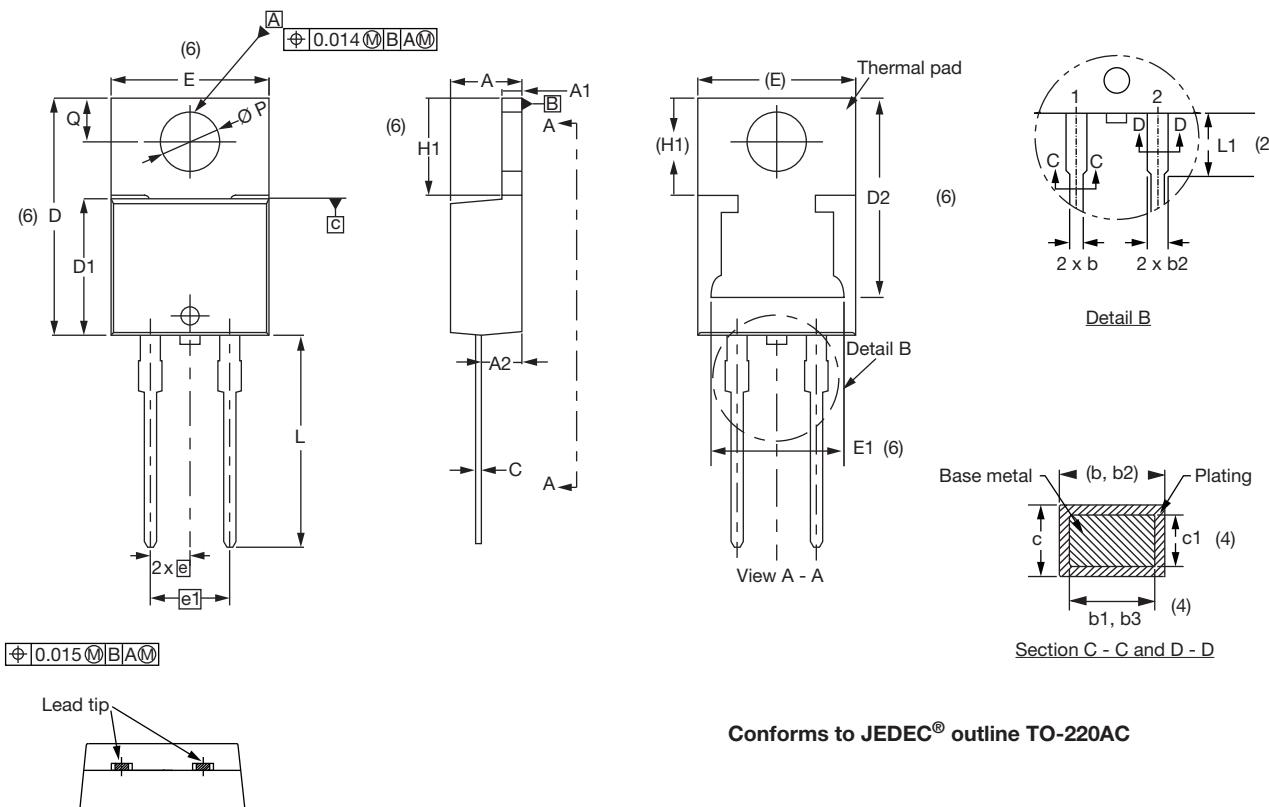
PREFERRED P/N	BASE QUANTITY	PACKAGING DESCRIPTION
VS-MBR735-M3	50	Antistatic plastic tubes
VS-MBR745-M3	50	Antistatic plastic tubes

LINKS TO RELATED DOCUMENTS

Dimensions	www.vishay.com/doc?96156
Part marking information	www.vishay.com/doc?95391
SPICE model	www.vishay.com/doc?95298

2L TO-220AC

DIMENSIONS in millimeters and inches



Conforms to JEDEC® outline TO-220AC

Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
 - (2) Lead dimension and finish uncontrolled in L1
 - (3) Dimension D, D1, 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 outermost extremes of the plastic body
 - (4) Dimension b1, b3, and c1 apply to base metal only
 - (5) Controlling dimensions: inches
 - (6) Thermal pad contour optional within dimensions E, H1, D2, and E1
 - (7) Outline conforms to JEDEC® TO-220, except D2

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