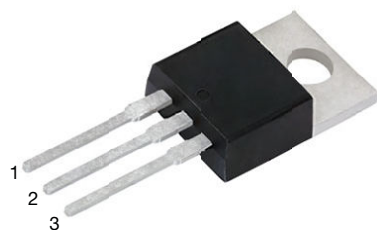
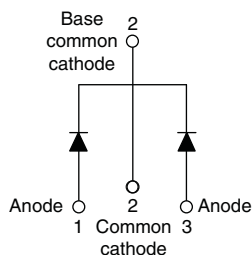




## High Performance Schottky Rectifier, 2 x 10 A



3L TO-220AB



## 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](http://www.vishay.com/doc?99912)



RoHS  
COMPLIANT  
HALOGEN  
FREE

## PRIMARY CHARACTERISTICS

$I_{F(AV)}$	2 x 10 A
$V_R$	80 V, 90 V, 100 V
$V_F$ at $I_F$	0.70 V
$I_{RM}$ max.	6 mA at 125 °C
$T_J$ max.	150 °C
$E_{AS}$	24 mJ
Package	3L TO-220AB
Circuit configuration	Common cathode

## DESCRIPTION

This center tap 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 (per device)	20	A
$I_{FRM}$	$T_C = 133$ °C per leg	20	A
$V_{RRM}$		80/100	V
$I_{FSM}$	$t_p = 5$ $\mu$ s sine	850	A
$V_F$	10 $A_{pk}$ , $T_J = 125$ °C	0.70	V
$T_J$	Range	-65 to +150	°C

## VOLTAGE RATINGS

PARAMETER	SYMBOL	MBR2080CT-M3	MBR2090CT-M3	MBR20100CT-M3	UNITS
Maximum DC reverse voltage	$V_R$	80	90	100	V
Maximum working peak reverse voltage	$V_{RWM}$				

## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 133$ °C, rated $V_R$	10	A
			20	
Peak repetitive forward current per leg	$I_{FRM}$	Rated $V_R$ , square wave, 20 kHz, $T_C = 133$ °C	20	
Non-repetitive peak surge current	$I_{FSM}$	5 $\mu$ s sine or 3 $\mu$ s rect. pulse	850	
		Surge applied at rated load conditions halfwave, single phase, 60 Hz	150	
Peak repetitive reverse surge current	$I_{RRM}$	2.0 $\mu$ s, 1.0 kHz	0.5	
Non-repetitive avalanche energy per leg	$E_{AS}$	$T_J = 25$ °C, $I_{AS} = 2$ A, $L = 12$ mH	24	mJ



ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop	$V_{FM}^{(1)}$	10 A	$T_J = 25\text{ }^{\circ}\text{C}$	0.80	V	
		20 A		0.95		
		10 A	$T_J = 125\text{ }^{\circ}\text{C}$	0.70		0.85
		20 A				
Maximum instantaneous reverse current	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$	Rated DC voltage	0.10	mA	
		$T_J = 125\text{ }^{\circ}\text{C}$		6		
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$		0.433	V	
Forward slope resistance	$r_t$			15.8	mΩ	
Maximum junction capacitance	$C_T$	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$		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 $V_R$		10 000	V/μs	

**Note**
<sup>(1)</sup> Pulse width < 300  $\mu$ s, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	T <sub>J</sub>		-65 to +150	°C
Maximum storage temperature range	T <sub>Stg</sub>		-65 to +175	
Maximum thermal resistance, junction to case per leg	R <sub>thJC</sub>	DC operation	2.0	°C/W
Typical thermal resistance, case to heatsink	R <sub>thCS</sub>	Mounting surface, smooth and greased (Only for TO-220)	0.50	
Maximum thermal resistance, junction to ambient	R <sub>thJA</sub>	DC operation (For D <sup>2</sup> PAK and TO-262)	50	
Approximate weight			2	g
			0.07	oz.
Mounting torque	minimum		6 (5)	kg· cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style 3L TO-220AB	MBR2080CT MBR2090CT MBR20100CT	

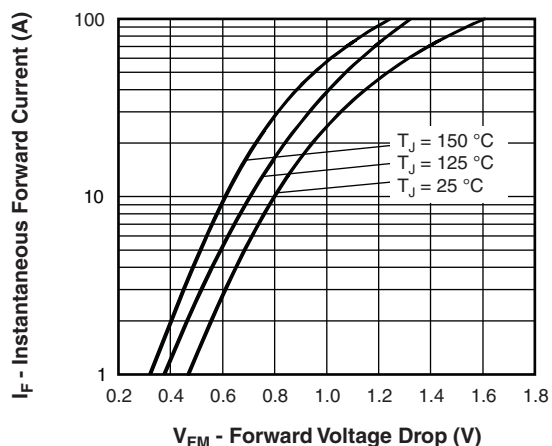


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

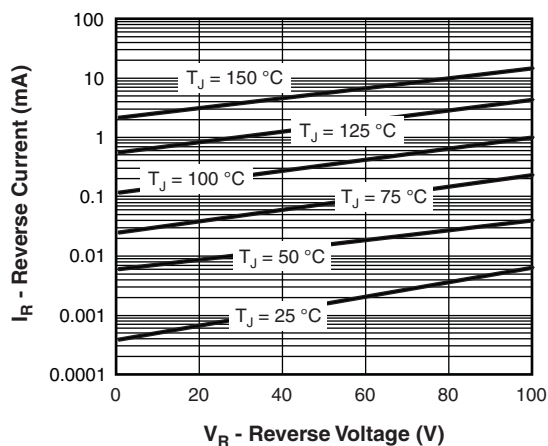


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

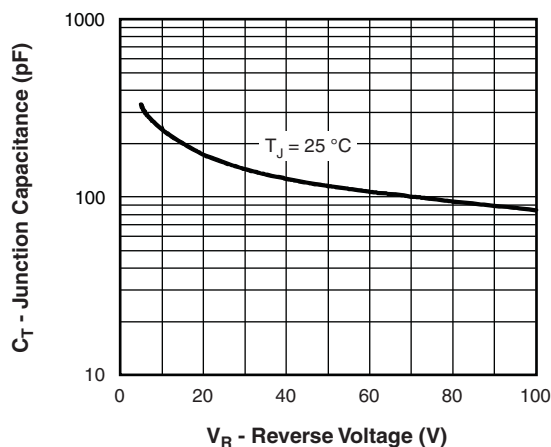


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

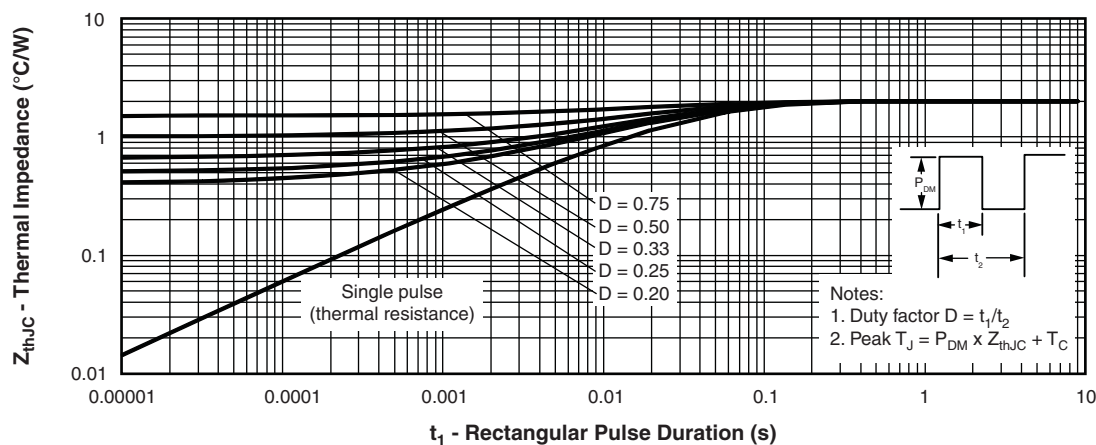


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

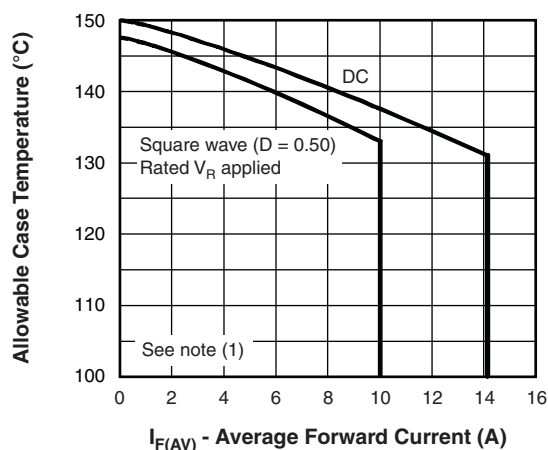


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

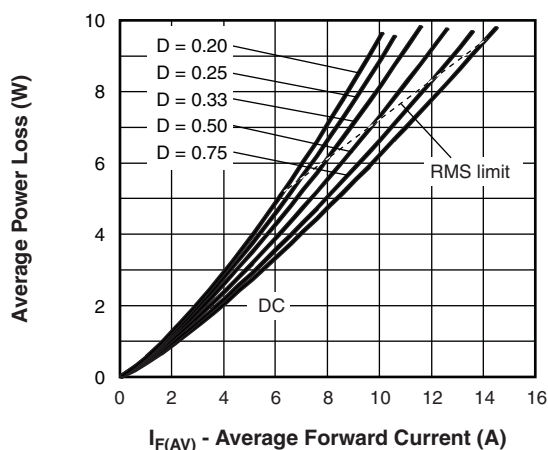


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

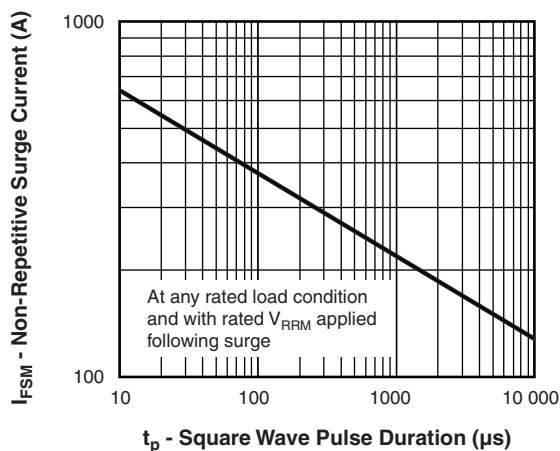


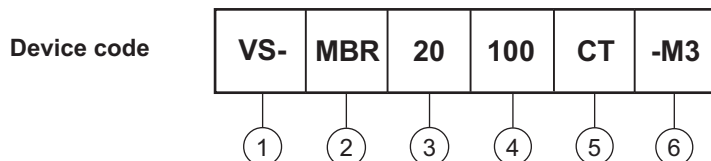
Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

## Note

- (1) Formula used:  $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$ ;  
 $P_d$  = 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  $V_R$



## ORDERING INFORMATION TABLE



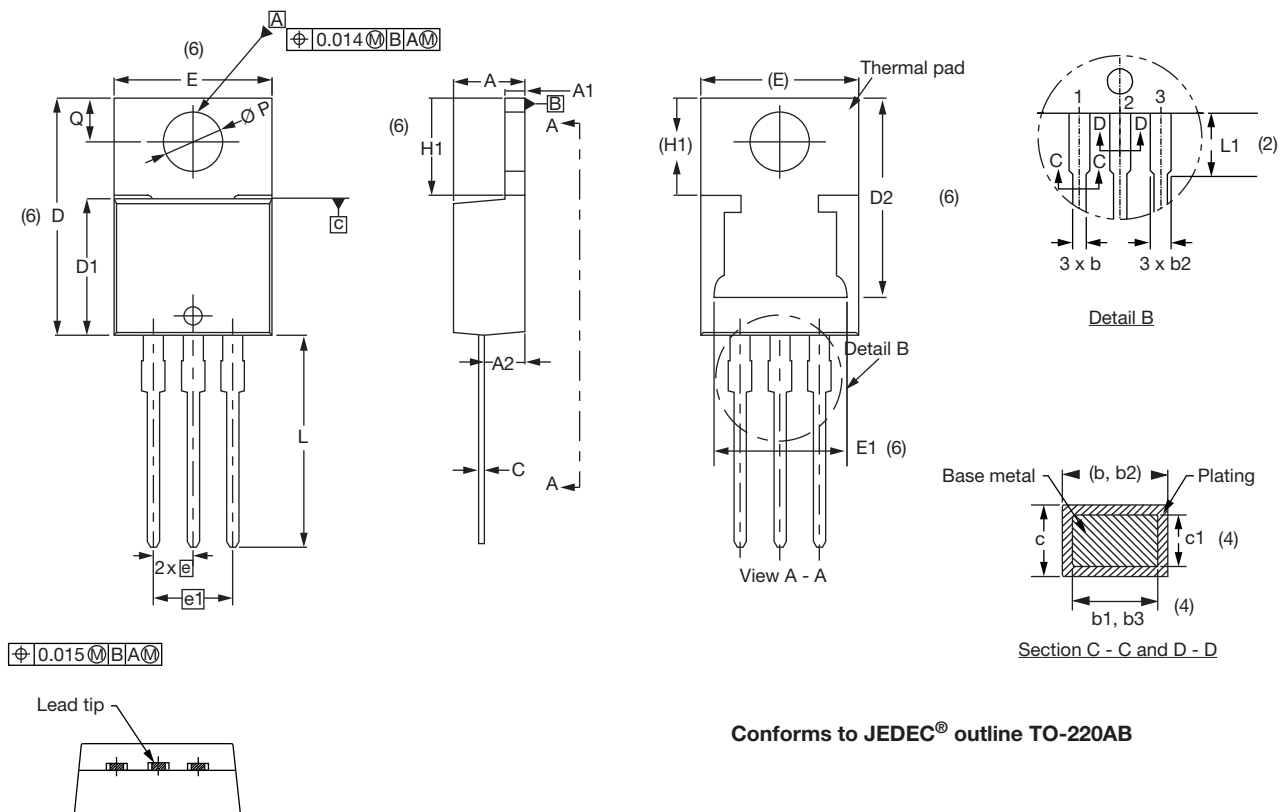
- |          |   |                               |             |
|----------|---|-------------------------------|-------------|
| <b>1</b> | - | Vishay Semiconductors product |             |
| <b>2</b> | - | Schottky MBR series           |             |
| <b>3</b> | - | Current rating (20 = 20 A)    | 080 = 80 V  |
| <b>4</b> | - | Voltage ratings               | 090 = 90 V  |
| <b>5</b> | - | CT = essential part number    | 100 = 100 V |
| <b>6</b> | - | Environmental digit           |             |
- M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-MBR2080CT-M3	50	1000	Antistatic plastic tube
VS-MBR2090CT-M3	50	1000	Antistatic plastic tube
VS-MBR20100CT-M3	50	1000	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?96154">www.vishay.com/doc?96154</a>
Part marking information	<a href="http://www.vishay.com/doc?95028">www.vishay.com/doc?95028</a>

### 3L TO-220AB

**DIMENSIONS** in millimeters and inches



Conforms to JEDEC® outline TO-220AB

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.25	4.65	0.167	0.183	
A1	1.14	1.40	0.045	0.055	
A2	2.50	2.92	0.098	0.115	
b	0.69	1.01	0.027	0.040	
b1	0.38	0.97	0.015	0.038	4
b2	1.20	1.73	0.047	0.068	
b3	1.14	1.73	0.045	0.068	4
c	0.36	0.61	0.014	0.024	
c1	0.36	0.56	0.014	0.022	4
D	14.85	15.35	0.585	0.604	3
D1	8.38	9.02	0.330	0.355	
D2	11.68	13.30	0.460	0.524	6, 7
E	10.11	10.51	0.398	0.414	3, 6
E1	6.86	8.89	0.270	0.350	6
e	2.41	2.67	0.095	0.105	
e1	4.88	5.28	0.192	0.208	
H1	6.09	6.48	0.240	0.255	6
L	13.52	14.02	0.532	0.552	
L1	3.32	3.82	0.131	0.150	2
$\varnothing P$	3.54	3.91	0.139	0.154	
Q	2.60	3.00	0.102	0.118	

#### 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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