

## Schottky Rectifier, 3 A



C-16



### FEATURES

- Low profile, axial leaded outline
- Very 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
- Compliant to RoHS Directive 2002/95/EC
- Designed and qualified for commercial level
- Halogen-free according to IEC 61249-2-21 definition (-M3 only)



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

PRODUCT SUMMARY	
Package	DO-201AD (C-16)
$I_{F(AV)}$	3 A
$V_R$	40 V
$V_F$ at $I_F$	0.49 V
$I_{RM}$ max.	20 mA at 125 °C
$T_J$ max.	150 °C
Diode variation	Single die
$E_{AS}$	6.0 mJ

### DESCRIPTION

The VS-MBR340... axial leaded Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. 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	3.0	A
$V_{RRM}$		40	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	430	A
$V_F$	3 Apk, $T_J = 25 \text{ }^\circ\text{C}$	0.6	V
$T_J$		- 40 to 150	°C

VOLTAGE RATINGS				
PARAMETER	SYMBOL	VS-MBR340	VS-MBR340-M3	UNITS
Maximum DC reverse voltage	$V_R$	40	40	V
Maximum working peak reverse voltage	$V_{RWM}$			

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current See fig. 4	$I_{F(AV)}$	50 % duty cycle at $T_C = 92 \text{ }^\circ\text{C}$ , rectangular waveform		3.0	A
Maximum peak one cycle non-repetitive surge current See fig. 6	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	Following any rated load condition and with rated $V_{RRM}$ applied	430	
		10 ms sine or 6 ms rect. pulse		80	
Non-repetitive avalanche energy	$E_{AS}$	$T_J = 25 \text{ }^\circ\text{C}$ , $I_{AS} = 1 \text{ A}$ , $L = 12 \text{ mH}$		6.0	mJ
Repetitive avalanche current	$I_{AR}$	Current decaying linearly to zero in 1 $\mu s$ Frequency limited by, $T_J$ maximum $V_A = 1.5 \times V_R$ typical		1.0	A



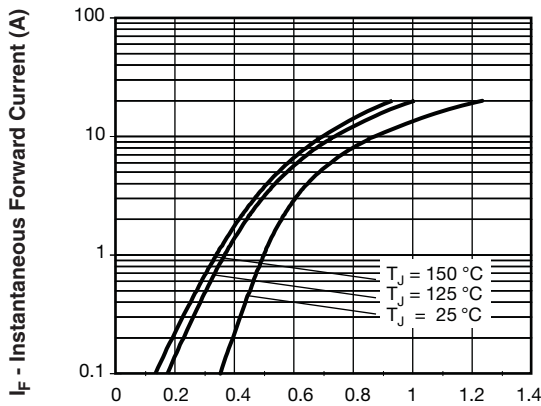
ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	1.0 A	$T_J = 25\text{ }^\circ\text{C}$	0.5	V
		3.0 A		0.6	
		9.4 A		0.85	
		1.0 A	$T_J = 125\text{ }^\circ\text{C}$	0.37	
		3.0 A		0.49	
		9.4 A		0.72	
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	0.6	mA
		$T_J = 100\text{ }^\circ\text{C}$		8	
		$T_J = 125\text{ }^\circ\text{C}$		20	
Typical junction capacitance	$C_T$	$V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^\circ\text{C}$		190	pF
Typical series inductance	$L_S$	Measured lead to lead 5 mm from package body		9.0	nH
Maximum voltage rate of change	dV/dt	Rated $V_R$		10 000	V/ $\mu\text{s}$

**Note**(1) Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %

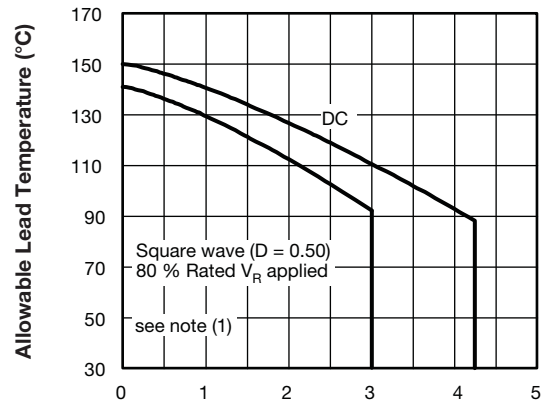
THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction and storage temperature range	$T_J^{(1)}, T_{Stg}$			- 40 to 150	$^\circ\text{C}$
Maximum thermal resistance, junction to lead	$R_{thJL}^{(2)}$	DC operation See fig. 4		28	$^\circ\text{C/W}$
Approximate weight				1.2	g
				0.042	oz.
Marking device		Case style C-16		MBR340	

**Notes**(1)  $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}}$  thermal runaway condition for a diode on its own heatsink

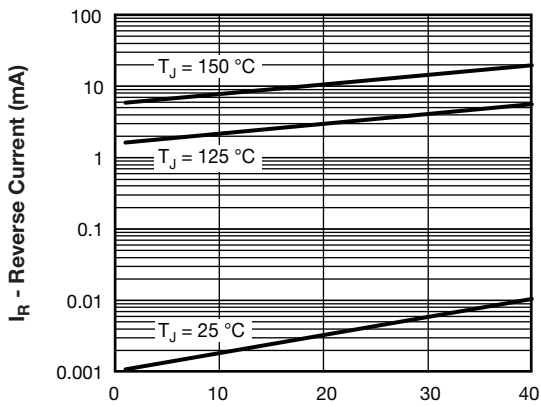
(2) Mounted 1" square PCB, thermal probe connected to lead 2 mm from package



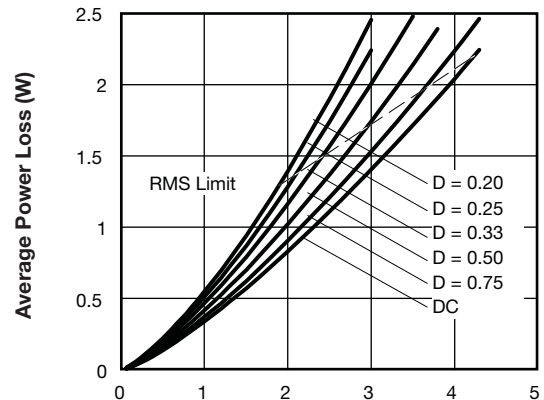
93449\_01 **V<sub>FM</sub> - Forward Voltage Drop (V)**  
Fig. 1 - Maximum Forward Voltage Drop Characteristics



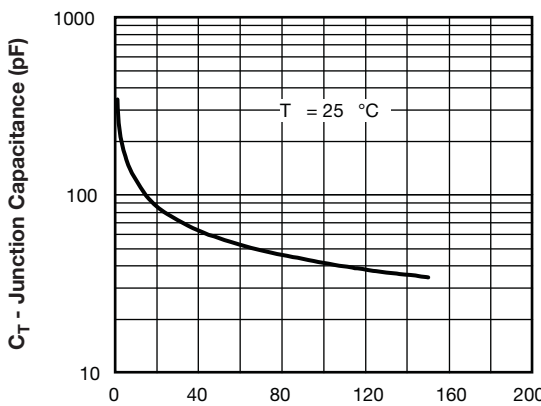
93449\_05 **I<sub>F(AV)</sub> - Average Forward Current (A)**  
Fig. 4 - Maximum Allowable Lead Temperature vs. Average Forward Current



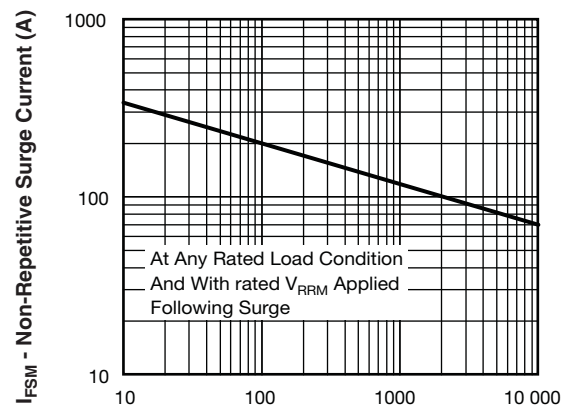
93449\_02 **V<sub>R</sub> - Reverse Voltage (V)**  
Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage



9449\_05 **Average Forward Current - I<sub>F(AV)</sub> (A)**  
Fig. 5 - Forward Power Loss Characteristics



93449\_03 **V<sub>R</sub> - Reverse Voltage (V)**  
Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage



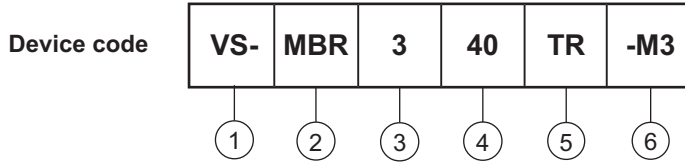
93449\_06 **t<sub>p</sub> - Square Wave Pulse Duration (μs)**  
Fig. 6 - Maximum Non-Repetitive Surge Current

**Note**

(1) Formula used:  $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$ ;  
 $P_d = \text{Forward power loss} = I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);  $P_{dREV} = \text{Inverse power loss} = V_{R1} \times I_R (1 - D)$ ;  $I_R$  at  $V_{R1} = 80\%$  rated  $V_R$



## ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Schottky MBR series
- 3** - Current rating: 3 = 3 A
- 4** - Voltage rating: 40 = 40 V
- 5** - TR = Tape and reel package  
None = Bulk package
- 6** - Environmental digit
  - None = Lead (Pb)-free and RoHS compliant
  - -M3 = Halogen-free, RoHS compliant, and terminations lead (Pb)-free

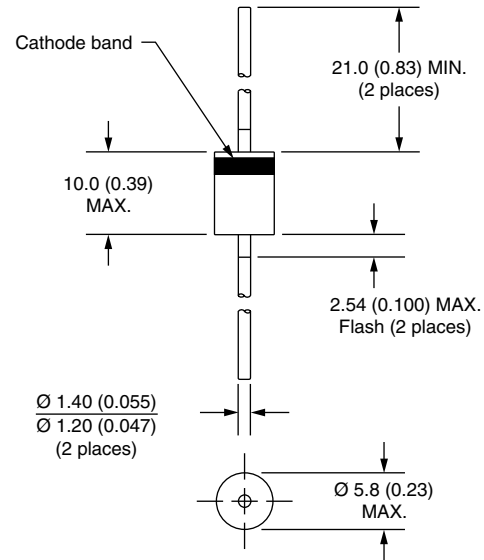
ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-MBR340	500	500	Bulk
VS-MBR340TR	1200	1200	Tape and reel
VS-MBR340-M3	500	500	Bulk
VS-MBR340TR-M3	1200	1200	Tape and reel

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95242">www.vishay.com/doc?95242</a>
Part marking information	<a href="http://www.vishay.com/doc?95304">www.vishay.com/doc?95304</a>
Packaging information	<a href="http://www.vishay.com/doc?95338">www.vishay.com/doc?95338</a>



## Axial DO-201AD (C-16)

**DIMENSIONS** in millimeters (inches)





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