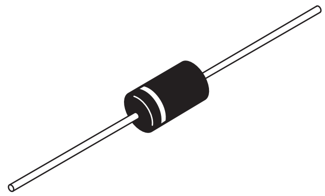
Schottky Rectifier, 3 A



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	50 V, 60 V
V_F at I_F	0.64 V
I_{RM} max.	15 mA at 125 °C
T_J max.	150 °C
Diode variation	Single die
E_{AS}	5.0 mJ

DESCRIPTION

The VS-MBR350..., VS-MBR350 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}		50/60	V
I_{FSM}	t_p = 5 µs sine	460	A
V_F	3 Apk, T_J = 25 °C	0.73	V
T_J		- 40 to 150	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-MBR350	VS-MBR350-M3	VS-MBR360	VS-MBR360-M3	UNITS
Maximum DC reverse voltage	V_R	50	50	60	60	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_L = 50 °C, rectangular waveform		3.0	A
Maximum peak one cycle non-repetitive surge current See fig. 6	I_{FSM}	5 µs sine or 3 µs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	460	
		10 ms sine or 6 ms rect. pulse		80	
Non-repetitive avalanche energy	E_{AS}	T_J = 25 °C, I_{AS} = 1 A, L = 10 mH		5.0	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		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 °C	0.58	V
		3.0 A		0.73	
		9.4 A		1.06	
		1.0 A	T_J = 125 °C	0.49	
		3.0 A		0.64	
		9.4 A		0.89	
Maximum reverse leakage current See fig. 2	I_{RM} (1)	T_J = 25 °C	V_R = Rated V_R	0.6	mA
		T_J = 100 °C		8	
		T_J = 125 °C		15	
Typical junction capacitance	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz) 25 °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/µs

Note

(1) Pulse width < 300 µs, 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	°C
Maximum thermal resistance, junction to lead	R_{thJL} (2)	DC operation See fig. 4	30	°C/W
Approximate weight			1.2	g
			0.042	oz.
Marking device		Case style C-16	MBR350	
			MBR360	

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

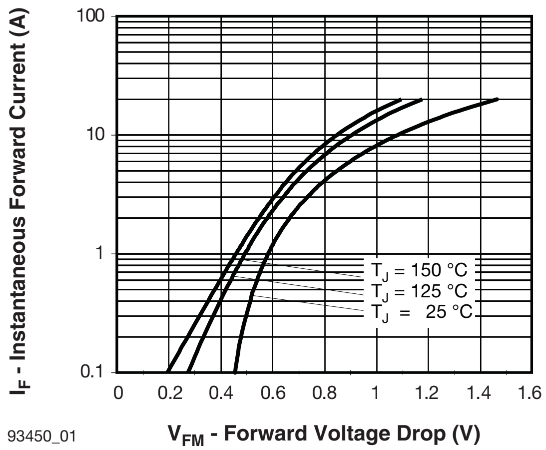


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Fig. 1 - Maximum Forward Voltage Drop Characteristics

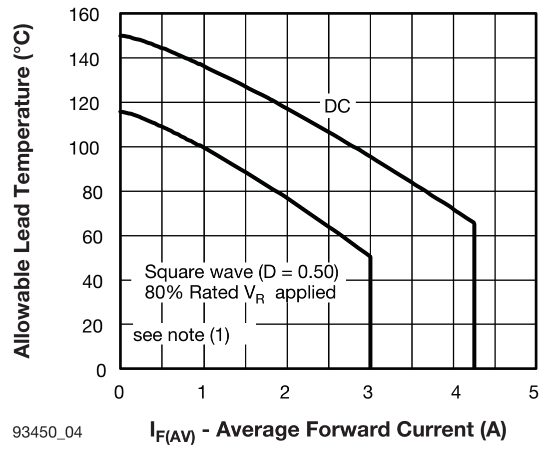

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Fig. 4 - Maximum Allowable Lead Temperature vs. Average Forward Current

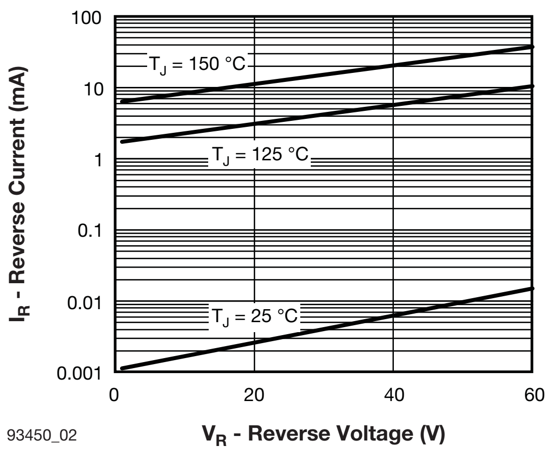

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Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

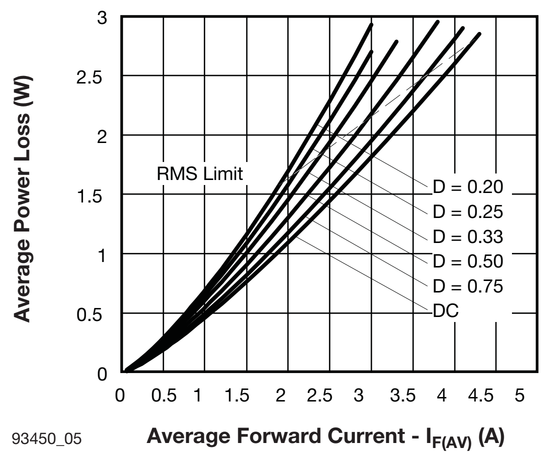

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Fig. 5 - Forward Power Loss Characteristics

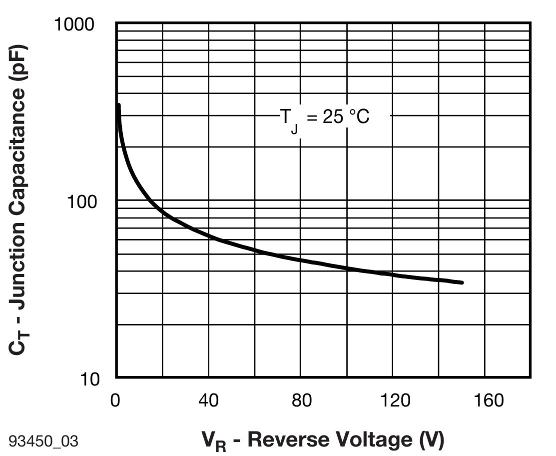

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Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

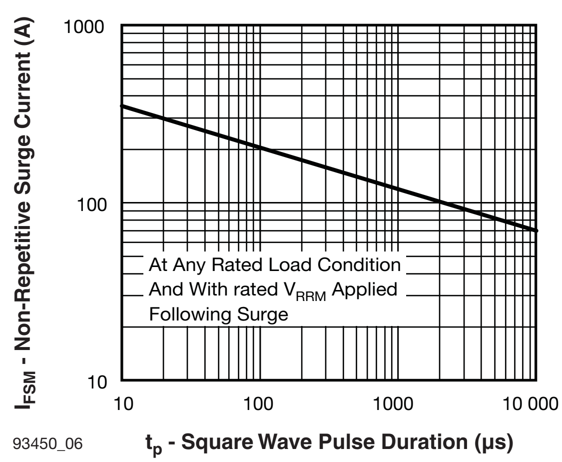

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Fig. 6 - Maximum Non-Repetitive Surge Current

Note

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

ORDERING INFORMATION TABLE

Device code	VS-	MBR	3	60	TR	-M3
	1	2	3	4	5	6

1 - Vishay Semiconductors product

2 - Schottky MBR series

3 - Current rating: 3 = 3 A

4 - Voltage rating: 50 = 50 V; 60 = 60 V

5 - TR = Tape and reel package
None = Bulk package

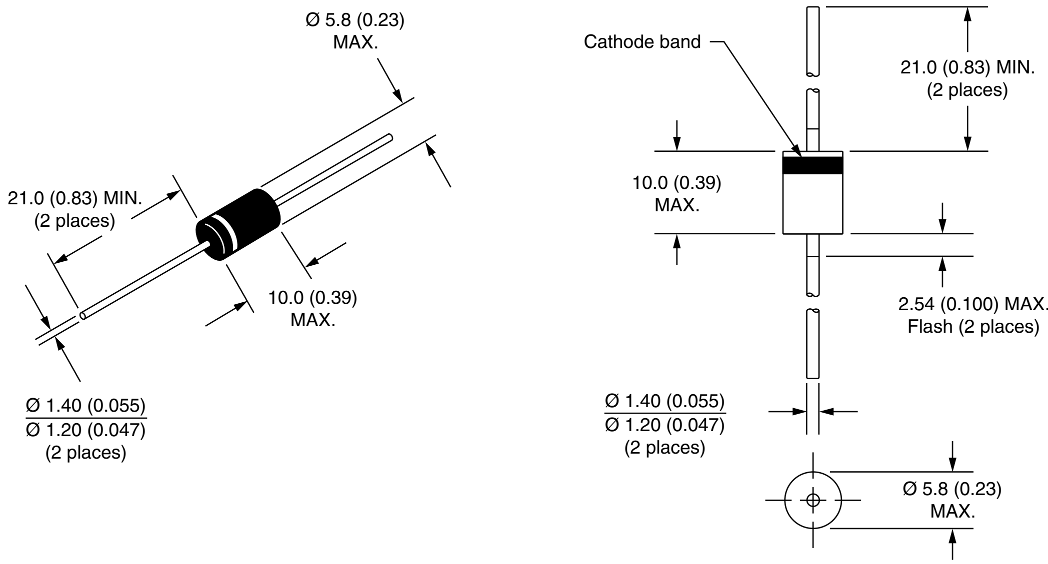
6 - Environmental digit
- None = Lead (Pb)-free and RoHS compliant
- -M3 = Halogen-free, RoHS compliant, and terminations lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	**QUANTITY PER T/R**	**MINIMUM ORDER QUANTITY**	**PACKAGING DESCRIPTION**
VS-MBR350	500	500	Bulk
VS-MBR350TR	1200	1200	Tape and reel
VS-MBR350-M3	500	500	Bulk
VS-MBR350TR-M3	1200	1200	Tape and reel
VS-MBR360	500	500	Bulk
VS-MBR360TR	1200	1200	Tape and reel
VS-MBR360-M3	500	500	Bulk
VS-MBR360TR-M3	1200	1200	Tape and reel

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95242
Part marking information	www.vishay.com/doc?95304
Packaging information	www.vishay.com/doc?95338

Axial DO-201AD (C-16)

DIMENSIONS in millimeters (inches)



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