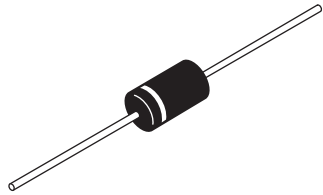


## Schottky Rectifier, 1 A



DO-204AL



### 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-204AL (DO-41)
$I_{F(AV)}$	1 A
$V_R$	100 V
$V_F$ at $I_F$	0.68 V
$I_{RM}$ max.	1.0 mA at 125 °C
$T_J$ max.	150 °C
Diode variation	Single die
$E_{AS}$	1.0 mJ

### DESCRIPTION

The VS-MBR1100... 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	1.0	A
$V_{RRM}$		100	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	200	A
$V_F$	1 Apk, $T_J = 125 \text{ }^\circ\text{C}$	0.68	V
$T_J$	Range	- 40 to 150	°C

VOLTAGE RATINGS				
PARAMETER	SYMBOL	VS-MBR1100	VS-MBR1100-M3	UNITS
Maximum DC reverse voltage	$V_R$	100	100	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 $T_C = 85 \text{ }^\circ\text{C}$ , rectangular waveform		10	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	200	
		10 ms sine or 6 ms rect. pulse		50	
Non-repetitive avalanche energy	$E_{AS}$	$T_J = 25 \text{ }^\circ\text{C}$ , $I_{AS} = 0.5 \text{ A}$ , $L = 8 \text{ mH}$		1.0	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		0.5	A



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	V <sub>FM</sub> <sup>(1)</sup>	1 A	T <sub>J</sub> = 25 °C	0.85	V
		2 A		0.96	
		1 A	T <sub>J</sub> = 125 °C	0.68	
		2 A		0.78	
Maximum reverse leakage current See fig. 2	I <sub>RM</sub> <sup>(1)</sup>	T <sub>J</sub> = 25 °C	V <sub>R</sub> = Rated V <sub>R</sub>	0.5	mA
		T <sub>J</sub> = 125 °C		1.0	
Typical junction capacitance	C <sub>T</sub>	V <sub>R</sub> = 5 V <sub>DC</sub> , (test signal range 100 kHz to 1 MHz) 25 °C		35	pF
Typical series inductance	L <sub>S</sub>	Measured lead to lead 5 mm from package body		8.0	nH
Maximum voltage rate of change	dV/dt	Rated V <sub>R</sub>		10 000	V/μs

Note

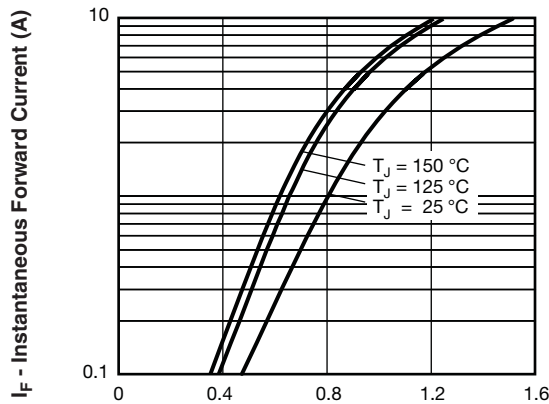
(1) Pulse width < 300 μs, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction and storage temperature range	T <sub>J</sub> <sup>(1)</sup> , T <sub>Stg</sub>			- 40 to 150	°C
Maximum thermal resistance, junction to lead	R <sub>thJL</sub> <sup>(2)</sup>	DC operation See fig. 4		80	°C/W
Approximate weight				0.33	g
				0.012	oz.
Marking device		Case style DO-204AL (DO-41) (JEDEC)		MBR1100	

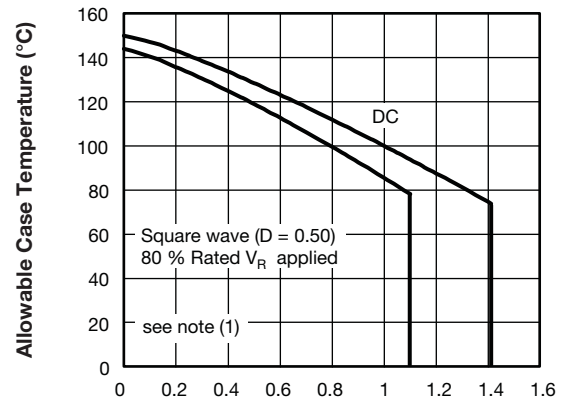
Notes

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

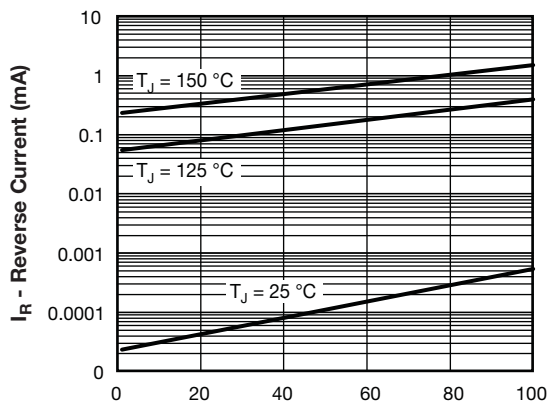
(2) Mounted 1" square PCB, thermal probe connected to lead 2 mm from package



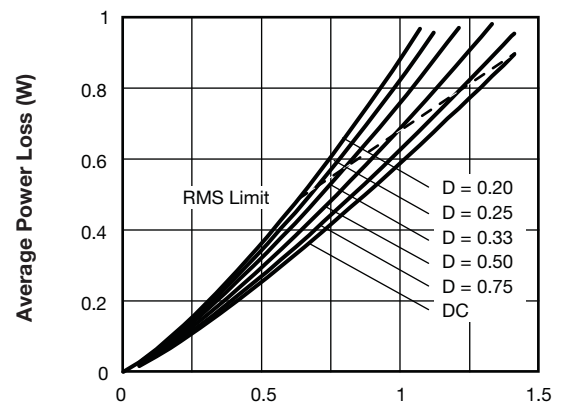
93438\_01 **V<sub>FM</sub> - Forward Voltage Drop (V)**  
Fig. 1 - Maximum Forward Voltage Drop Characteristics



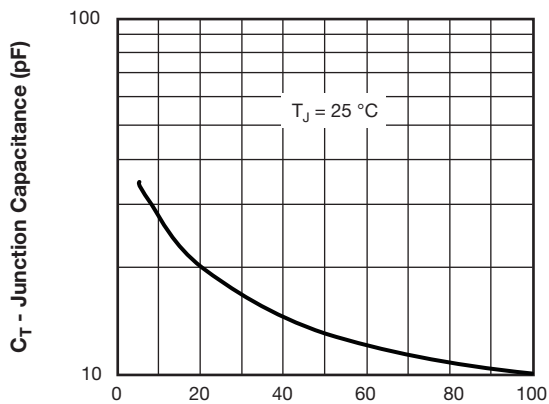
93438\_04 **I<sub>F(AV)</sub> - Average Forward Current (A)**  
Fig. 4 - Maximum Allowable Case Temperature vs. Average Forward Current



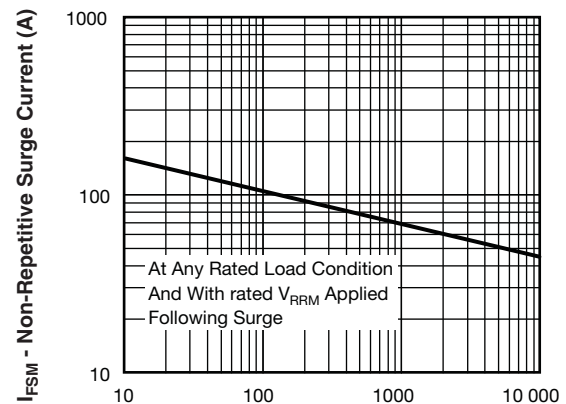
93438\_02 **V<sub>R</sub> - Reverse Voltage (V)**  
Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage



93438\_05 **Average Forward Current - I<sub>F(AV)</sub> (A)**  
Fig. 5 - Forward Power Loss Characteristics



93438\_03 **V<sub>R</sub> - Reverse Voltage (V)**  
Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage



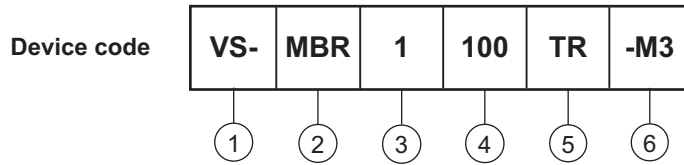
93438\_06 **t<sub>p</sub> - Square Wave Pulse Duration (µs)**  
Fig. 6 - Maximum Non-Repetitive Surge Current

**Note**

(1) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;  
 $P_d$  = Forward power loss =  $I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);  $P_{d_{REV}}$  = 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: 1 = 1 A
- 4** - Voltage rating: 100 = 100 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

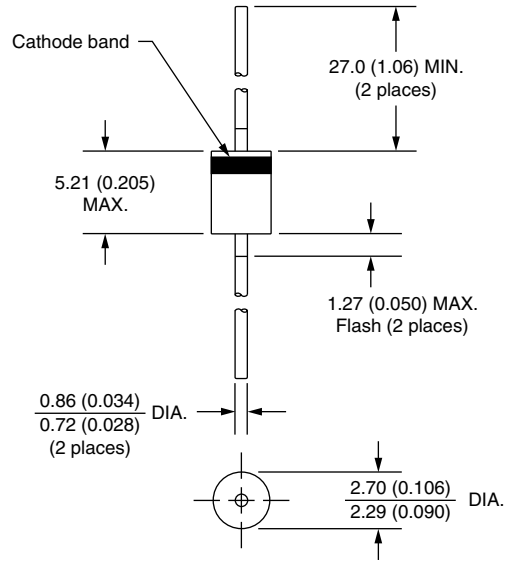
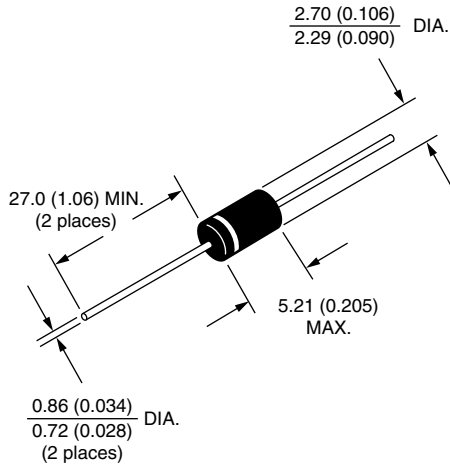
ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-MBR1100	1000	1000	Bulk
VS-MBR1100TR	5000	5000	Tape and reel
VS-MBR1100-M3	1000	1000	Bulk
VS-MBR1100TR-M3	5000	5000	Tape and reel

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95241">www.vishay.com/doc?95241</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-204AL (DO-41)

**DIMENSIONS** in millimeters (inches)





## Disclaimer

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**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**