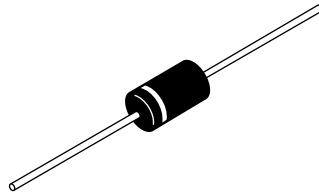


## Schottky Rectifier, 1 A



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
- Lead (Pb)-free plating
- Designed and qualified for industrial level


**RoHS**  
COMPLIANT

### PRODUCT SUMMARY

$I_{F(AV)}$	1 A
$V_R$	50/60 V
$I_{RM}$	10 mA at 125 °C

### DESCRIPTION

The MBR150, MBR160 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
$V_{RRM}$		50/60	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	150	A
$V_F$	1 Apk, $T_J = 125 \text{ }^\circ\text{C}$	0.65	V
$T_J$	Range	- 40 to 150	$^\circ\text{C}$

### VOLTAGE RATINGS

PARAMETER	SYMBOL	MBR150	MBR160	UNITS
Maximum DC reverse voltage	$V_R$	50	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 $T_C = 75 \text{ }^\circ\text{C}$ , rectangular waveform	1.0	A
Maximum peak one cycle non-repetitive surge current See fig. 6	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	150	
		10 ms sine or 6 ms rect. pulse	25	
Non-repetitive avalanche energy	$E_{AS}$	$T_J = 25 \text{ }^\circ\text{C}$ , $I_{AS} = 1 \text{ A}$ , $L = 4 \text{ mH}$	2.0	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 A	$T_J = 25\text{ }^\circ\text{C}$	0.75	V
		2 A		0.9	
		3 A		1.0	
		1 A	$T_J = 125\text{ }^\circ\text{C}$	0.65	
		2 A		0.75	
		3 A		0.82	
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	0.5	mA
		$T_J = 100\text{ }^\circ\text{C}$		5	
		$T_J = 125\text{ }^\circ\text{C}$		10	
Typical junction capacitance	$C_T$	$V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C		55	pF
Typical series inductance	$L_S$	Measured lead to lead 5 mm from package body		8.0	nH
Maximum voltage rate of change	dV/dt	Rated $V_R$		10 000	V/ $\mu$ s

**Note**

(1) Pulse width < 300  $\mu$ 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		80	$^\circ\text{C}/\text{W}$
Approximate weight				0.33	g
				0.012	oz.
Marking device		Case style DO-204AL (DO-41)		MBR150	
				MBR160	

**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

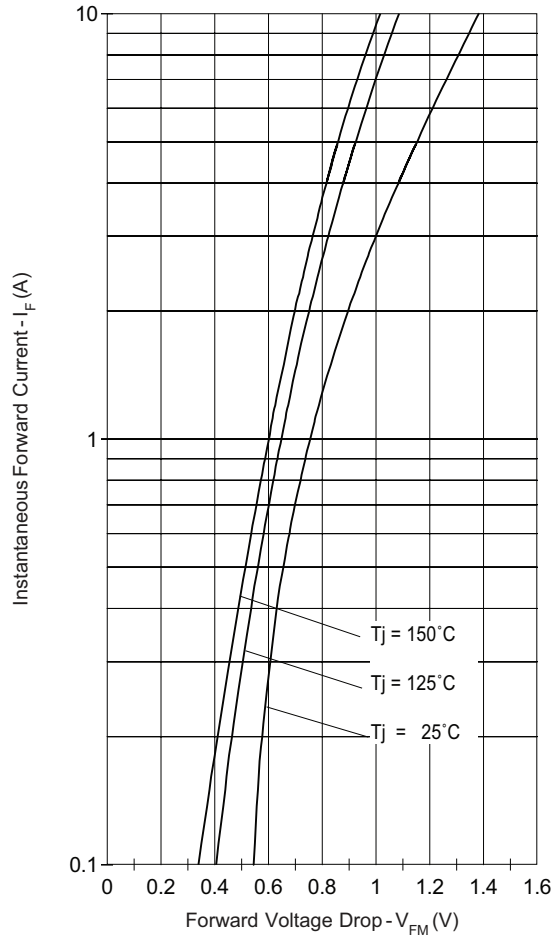


Fig. 1 - Maximum Forward Voltage Drop Characteristics

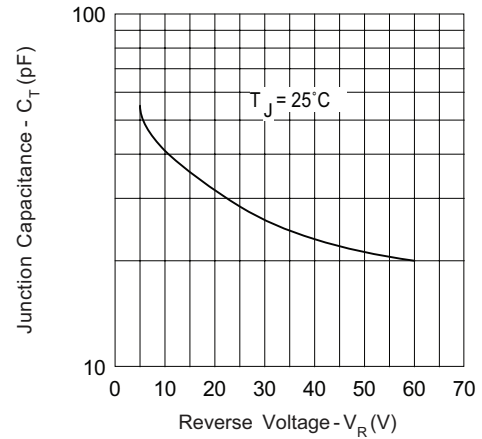


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

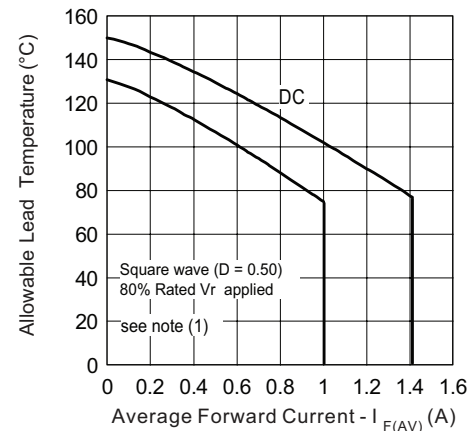


Fig. 4 - Maximum Ambient Temperature vs. Average Forward Current, Printed Circuit Board Mounted

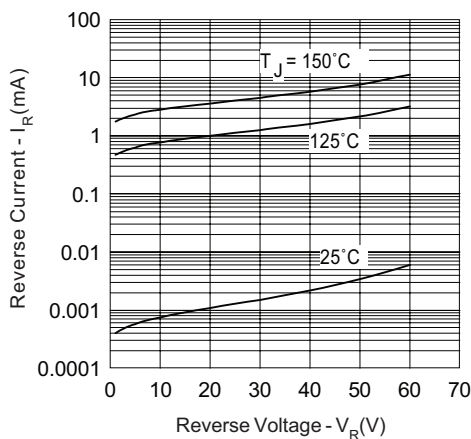


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

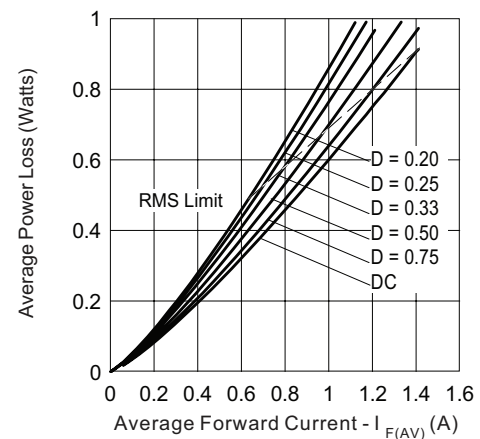


Fig. 5 - Forward Power Loss Characteristics

**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  $V_R$

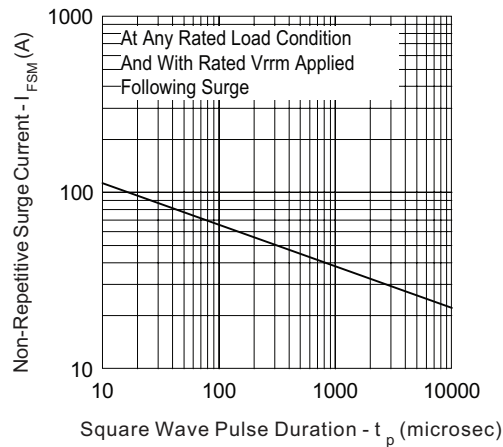


Fig. 6 - Maximum Non-Repetitive Surge Current

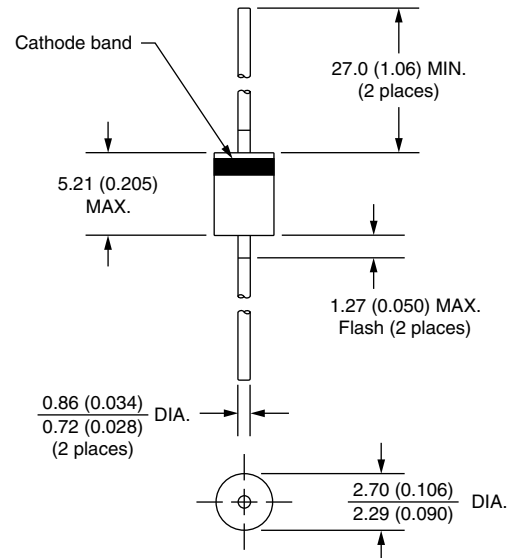
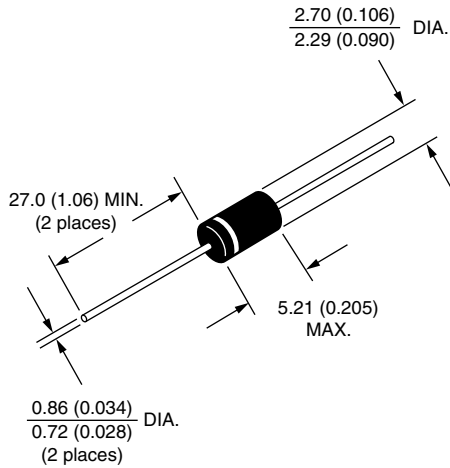
## ORDERING INFORMATION TABLE

Device code	<b>MBR</b>	<b>1</b>	<b>60</b>	<b>TR</b>
	①	②	③	④
	<b>1</b>	-	Schottky MBR series	
	<b>2</b>	-	Current rating: 1 = 1 A	
	<b>3</b>	-	Voltage rating	50 = 50 V 60 = 60 V
	<b>4</b>	-	TR = Tape and reel package (5000 pcs) None = Box package (1000 pcs)	

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95241">http://www.vishay.com/doc?95241</a>
Part marking information	<a href="http://www.vishay.com/doc?95304">http://www.vishay.com/doc?95304</a>
Packaging information	<a href="http://www.vishay.com/doc?95308">http://www.vishay.com/doc?95308</a>

## Axial DO-204AL (DO-41)

**DIMENSIONS** in millimeters (inches)





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