

## Schottky Diode, 0.5 A



SOD-123



### FEATURES

- Surface mountable
- Very low forward voltage drop
- Extremely fast switching
- Negligible switching losses
- Guard ring for enhanced ruggedness and long term reliability
- Designed and qualified for industrial level

### DESCRIPTION

This Schottky diode is ideally suited for low voltage, high frequency operation, as freewheeling and polarity protection. Small size of the package allows proper use in applications where compact size is critical, fitting also the GSM and PCMCIA requirement.

### PRODUCT SUMMARY

$I_{F(AV)}$	0.5 A
$V_R$	40 V
$V_F$ at 0.5 A at 25 °C	0.560 V
$I_{RM}$	13 mA at 100 °C

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	DC	0.5	A
$V_{RRM}$		40	V
$I_{FSM}$	$t_p = 10$ ms sine	6.0	A
$V_F$	0.5 Apk, $T_J = 100$ °C	0.42	V
$T_J$	Range	- 65 to 150	°C

### VOLTAGE RATINGS

PARAMETER	SYMBOL	MBR0540	UNITS
Maximum DC reverse voltage	$V_R$	40	V
Maximum working peak reverse voltage	$V_{RWM}$		

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Forward current	$I_F$	DC, $T_L = 122$ °C	0.5	A
Maximum peak one cycle non-repetitive surge current at $T_J = 25$ °C	$I_{FSM}$	5 $\mu$ s sine or 3 $\mu$ s rect. pulse	50	
		10 ms sine or 6 ms rect. pulse	6.0	



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}^{(1)}$	0.5 A	$T_J = 25\text{ }^\circ\text{C}$	0.480	V
		1 A		0.560	
		0.5 A	$T_J = 100\text{ }^\circ\text{C}$	0.420	
		1 A		0.520	
Maximum reverse leakage current	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = 20\text{ V}$	10	$\mu\text{A}$
		$T_J = 100\text{ }^\circ\text{C}$		5	mA
		$T_J = 25\text{ }^\circ\text{C}$	$V_R = 40\text{ V}$	20	$\mu\text{A}$
		$T_J = 100\text{ }^\circ\text{C}$		13	mA
Maximum junction capacitance	$C_T$	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $T_J = 25\text{ }^\circ\text{C}$		60	pF
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	$T_J^{(1)}, T_{Stg}$			- 65 to 150	$^\circ\text{C}$
Maximum thermal resistance, junction to lead	$R_{thJL}$	Mounted on PC board FR4 with minimum pad size		150	$^\circ\text{C/W}$
Maximum thermal resistance, junction to ambient	$R_{thJA}$	1" square pad size (1 x 0.5" for each lead) on FR4 board		200	
Approximate weight				0.012	g
Marking device		Case style SOD-123		CYWLC	

**Note**

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

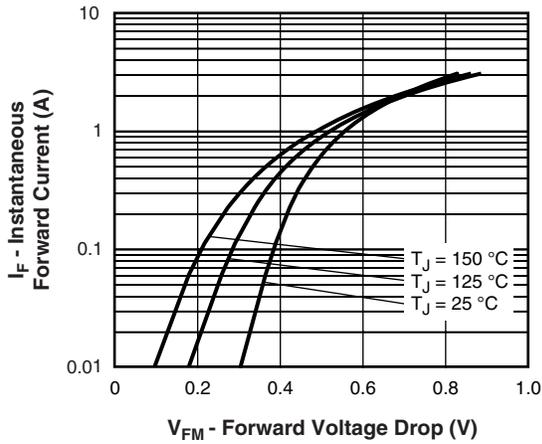


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

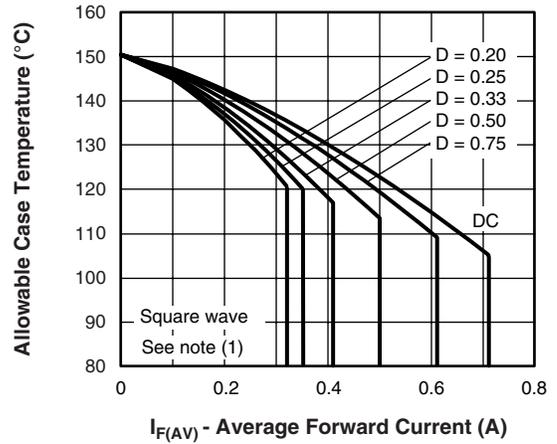


Fig. 4 - Maximum Allowable Case Temperature vs. Average Forward Current

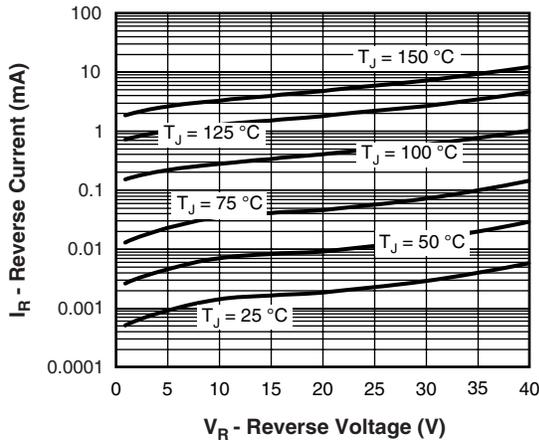


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

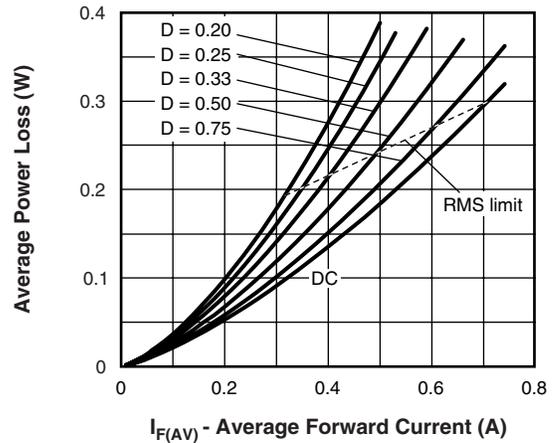


Fig. 5 - Forward Power Loss Characteristics

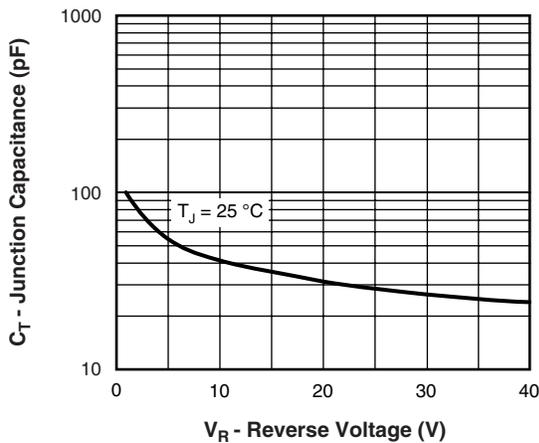


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

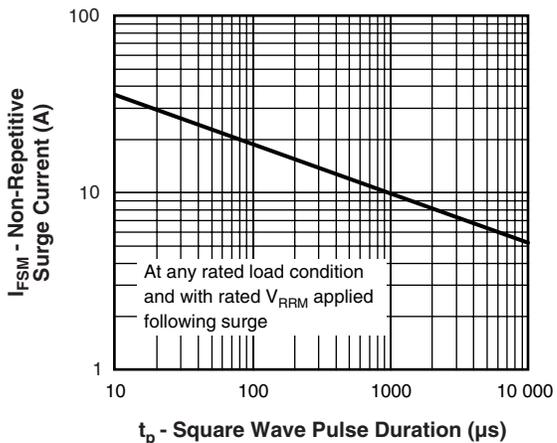


Fig. 6 - Maximum Non-Repetitive Surge Current

**Note**

(1) Formula used:  $T_C = T_J - P_d \times R_{thJC}$ ;  
 $P_d$  = Forward power loss =  $I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 4)

# MBR0540

Vishay High Power Products Schottky Diode, 0.5 A



## ORDERING INFORMATION TABLE

DEVICE	PACKAGE	MARKING	BASE QUANTITY	DELIVERY MODE
MBR0540	SOD-123	CY $\overline{W}$ LC	3000	Tape and reel

## LINKS TO RELATED DOCUMENTS

Dimensions	<a href="http://www.vishay.com/doc?95053">http://www.vishay.com/doc?95053</a>
Packaging information	<a href="http://www.vishay.com/doc?95061">http://www.vishay.com/doc?95061</a>



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