

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
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level


 RoHS*
COMPLIANT

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

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.

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	MBR0540PbF	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 μ s sine or 3 μ s rect. pulse	50	
		10 ms sine or 6 ms rect. pulse	6.0	

* Pb containing terminations are not RoHS compliant, exemptions may apply

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	μA
		$T_J = 100\text{ }^\circ\text{C}$		5	mA
		$T_J = 25\text{ }^\circ\text{C}$	$V_R = 40\text{ V}$	20	μA
		$T_J = 100\text{ }^\circ\text{C}$		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/ 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	$T_J^{(1)}, T_{Stg}$			- 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

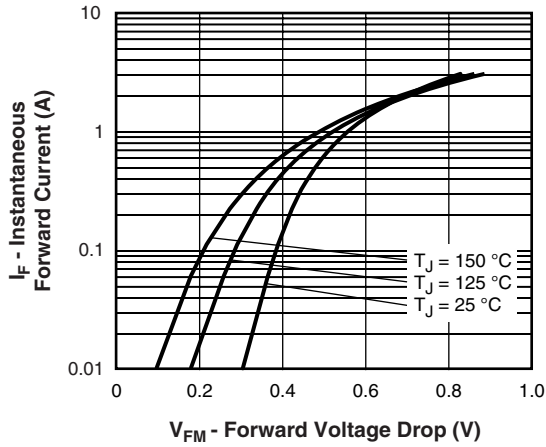


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

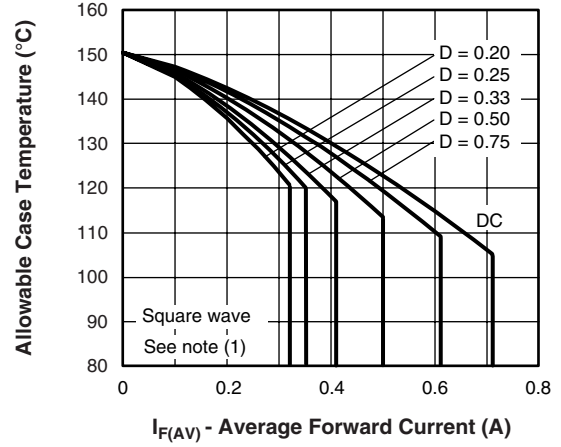


Fig. 4 - Maximum Allowable Case Temperature vs. Average Forward Current

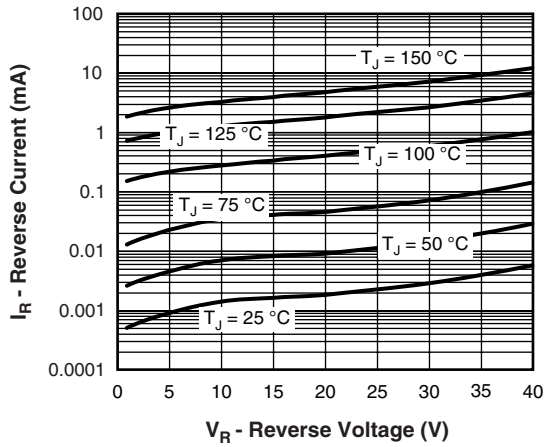


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

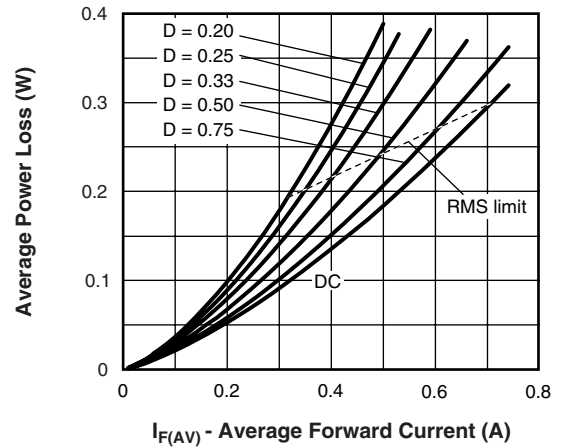


Fig. 5 - Forward Power Loss Characteristics

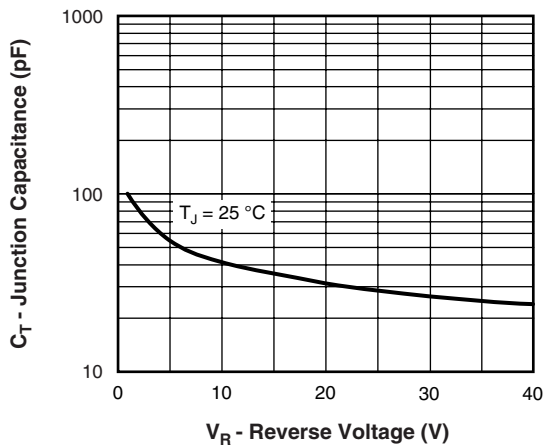


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

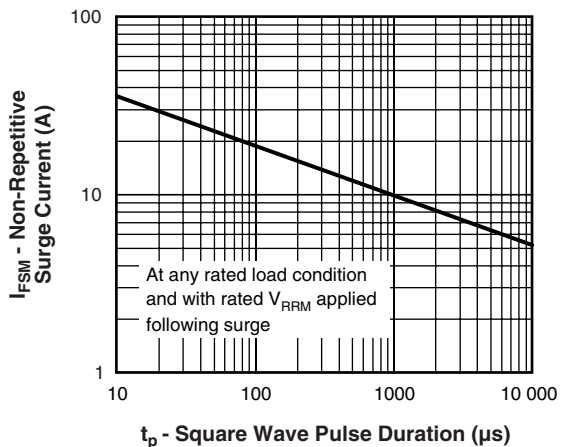


Fig. 6 - Maximum Non-Repetitive Surge Current

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)

MBR0540PbF

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	http://www.vishay.com/doc?95053
Part marking information	http://www.vishay.com/doc?95338
Packaging information	http://www.vishay.com/doc?95061



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