

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
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level


RoHS
COMPLIANT

PRODUCT SUMMARY

$I_{F(AV)}$	0.5 A
V_R	20 V
V_F at 0.5 A at 25 °C	0.440 V
I_{RM}	7 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 application where compact size is critical, fitting also the GSM and PCMCIA requirement.

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
I_F	DC	0.5	A
V_{RRM}		20	V
I_{FSM}	$t_p = 10$ ms sine	6.5	A
V_F	0.5 Apk, $T_J = 100$ °C	0.36	V
T_J	Range	- 65 to 150	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	MBR0520PbF	UNITS
Maximum DC reverse voltage	V_R	20	V
Maximum working peak reverse voltage	V_{RWM}		

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	I_F	DC, $T_L = 129$ °C		0.5	A
Maximum peak one cycle non-repetitive surge current at 25 °C	I_{FSM}	5 μ s sine or 3 μ s rect. pulse	Following any rated load condition and with rated V_{RRM} applied	5.5	
		10 ms sine or 6 ms rect. pulse		6.5	

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}^{(1)}$	0.1 A	$T_J = 25\text{ }^{\circ}\text{C}$	0.373	V
		0.5 A		0.440	
		0.1 A	$T_J = 100\text{ }^{\circ}\text{C}$	0.260	
		0.5 A		0.360	
Maximum reverse leakage current	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = 10\text{ V}$	40	μA
		$T_J = 100\text{ }^{\circ}\text{C}$		3	mA
		$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = 20\text{ V}$	150	μA
		$T_J = 100\text{ }^{\circ}\text{C}$		7	mA
Maximum junction capacitance	C_T	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $T_J = 25\text{ }^{\circ}\text{C}$		110	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	AYWLC	

Note

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

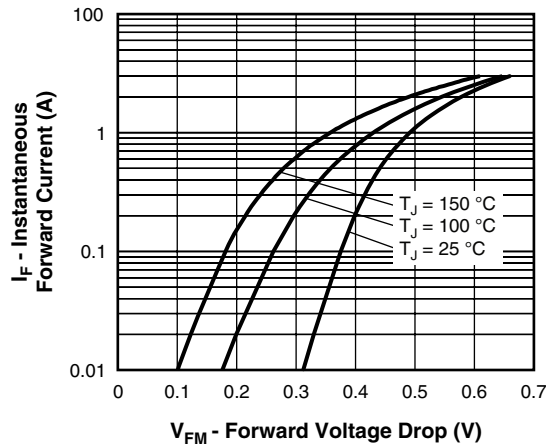


Fig. 1 - Maximum Forward Voltage Drop Characteristics

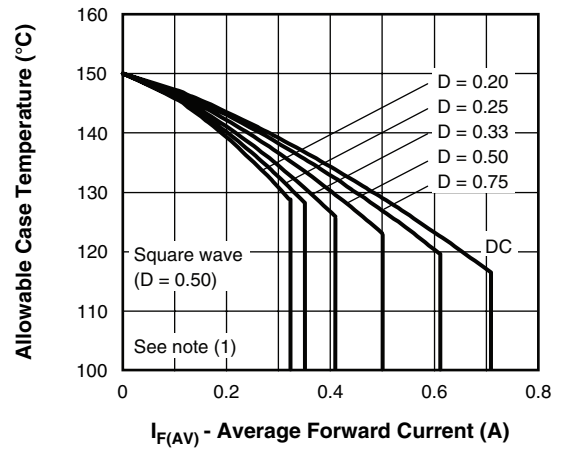


Fig. 4 - Maximum Allowable Case Temperature vs. Average Forward Current

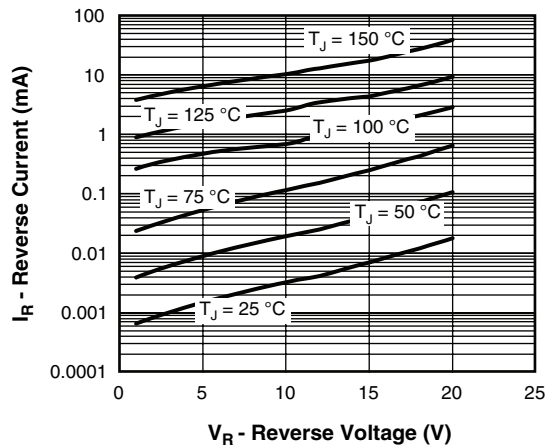


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

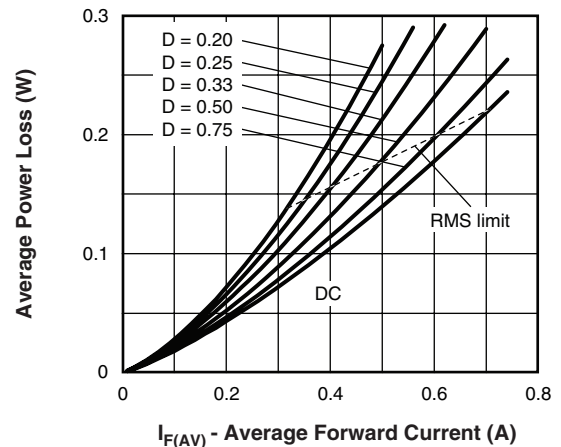


Fig. 5 - Forward Power Loss Characteristics

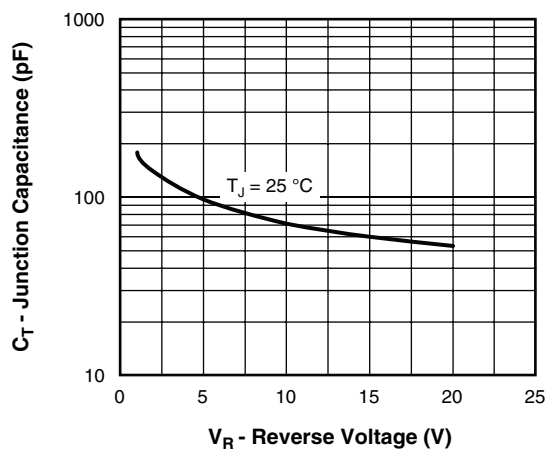


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

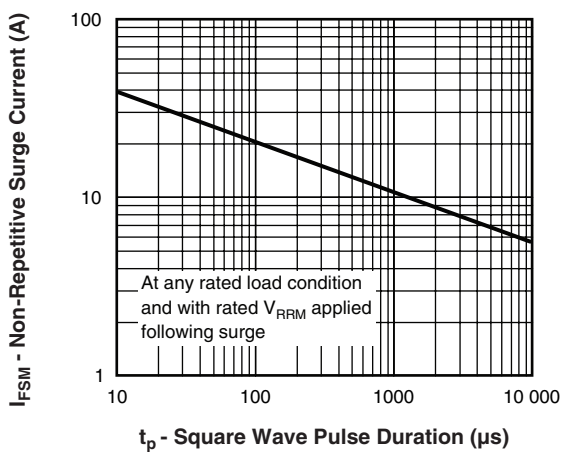


Fig. 6 - Maximum Non-Repetitive Surge Current

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 = $V_{R1} \times I_R (1 - D)$; $I_R (1 - D)$



ORDERING INFORMATION TABLE

DEVICE	PACKAGE	MARKING	BASE QUANTITY	DELIVERY MODE
MBR0520	SOD-123	A \overline{Y} WLC	3000	Tape and reel

LINKS TO RELATED DOCUMENTS

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



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