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 application where compact size is critical, fitting also the GSM and PCMCIA requirement.

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

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	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	MBR0520	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 µs sine or 3 µs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	55	
		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 °C	0.375	V
		0.5 A		0.440	
		0.1 A	T_J = 100 °C	0.260	
		0.5 A		0.360	
Maximum reverse leakage current	I_{RM} (1)	T_J = 25 °C	V_R = 10 V	40	µA
		T_J = 100 °C		3	mA
		T_J = 25 °C	V_R = 20 V	150	µA
		T_J = 100 °C		7	mA
Maximum junction capacitance	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz) T_J = 25 °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	°C
Maximum thermal resistance, junction to lead	R_{thJL}	Mounted on PC board FR4 with minimum pad size	150	°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	AY$\overline{W}$LC	

Note

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

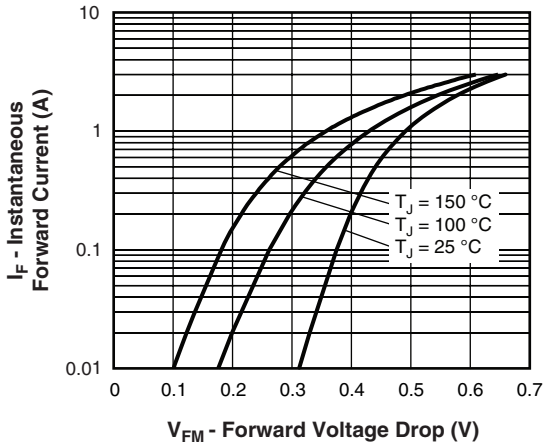

Fig. 1 - Maximum Forward Voltage Drop Characteristics

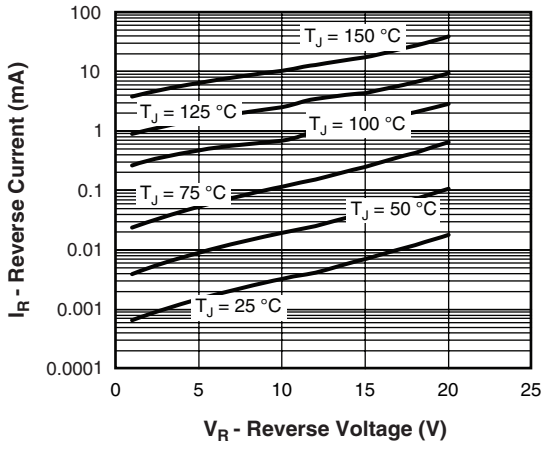

Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

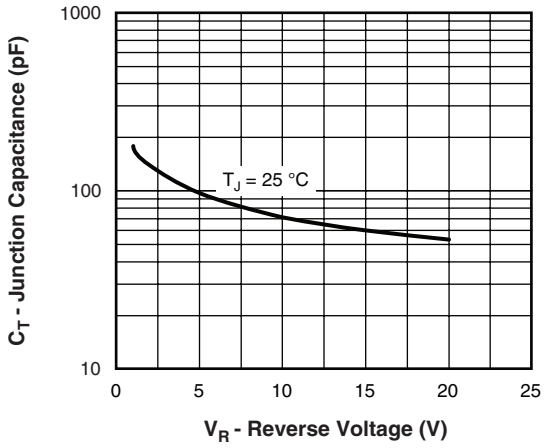

Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

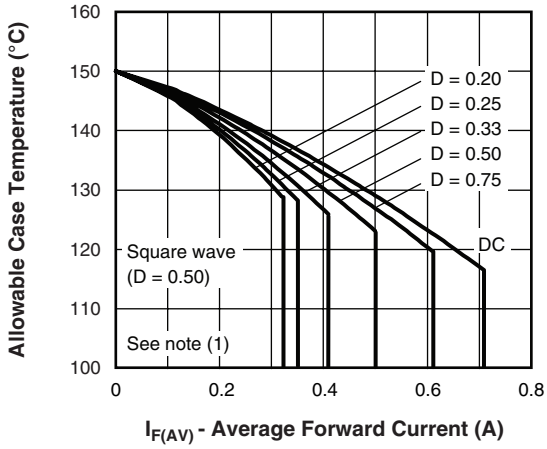

Fig. 4 - Maximum Allowable Case Temperature vs. Average Forward Current

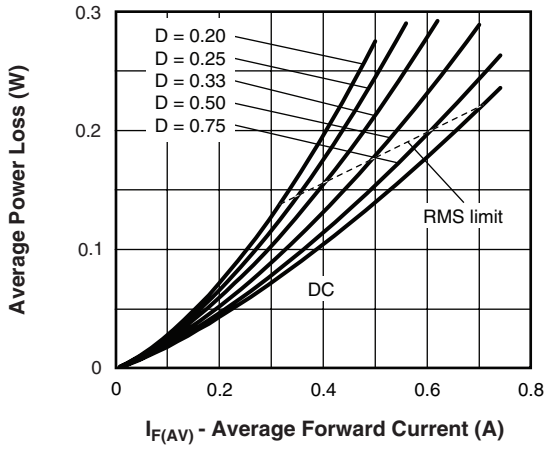

Fig. 5 - Forward Power Loss Characteristics

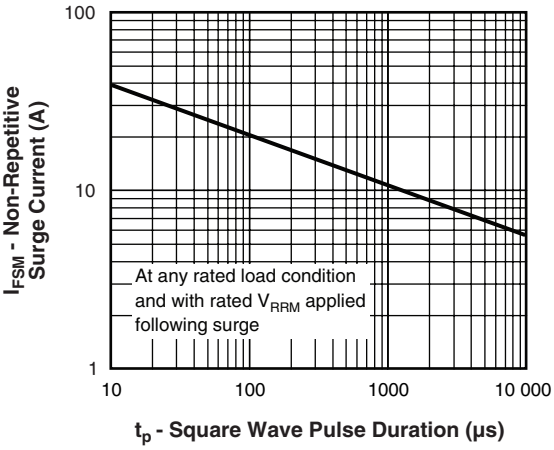

Fig. 6 - Maximum Non-Repetitive Surge Current

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 (1 - D)

ORDERING INFORMATION TABLE				
DEVICE	**PACKAGE**	**MARKING**	**BASE QUANTITY**	**DELIVERY MODE**
MBR0520	SOD-123	AY$\overline{W}$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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