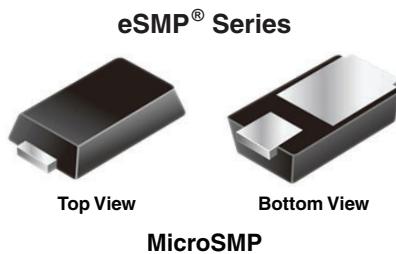


Surface Mount ESD Capability Rectifier



FEATURES

- Very low profile - typical height of 0.65 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop, low leakage current
- ESD capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
 - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



TYPICAL APPLICATIONS

General purpose, polarity protection, and rail-to-rail protection in commercial, industrial, and automotive applications.

MECHANICAL DATA

Case: MicroSMP

Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, and RoHS-compliant
Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V, 200 V, 400 V, 600 V
I_{FSM}	18 A
V_F at $I_F = 1.0$ A (125 °C)	0.9 V
T_J max.	175 °C
Package	MicroSMP
Diode variations	Single

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)						
PARAMETER	SYMBOL	MSX1PB	MSX1PD	MSX1PG	MSX1PJ	UNIT
Device marking code		XB	XD	XG	XJ	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Maximum average forward rectified current	$I_{F(AV)}$			1.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}			18		A
Operating junction and storage temperature range	T_J, T_{STG}			-55 to +175		°C

ELECTRICAL CHARACTERISTICS ($T_A = 25$ °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Maximum instantaneous forward voltage	$I_F = 0.5$ A	$T_A = 25$ °C	V_F ⁽¹⁾	0.93	-	V	
	$I_F = 1.0$ A			1.0	1.1		
	$I_F = 0.5$ A	$T_A = 125$ °C		0.81	-		
	$I_F = 1.0$ A			0.9	0.98		
Maximum reverse current	Rated V_R	$T_A = 25$ °C	I_R ⁽²⁾	-	1.0	μ A	
		$T_A = 125$ °C		4.1	50		
Typical reverse recovery time	$I_F = 0.5$ A, $I_R = 1.0$ A, $I_{rr} = 0.25$ A		t_{rr}	960	-	ns	
Typical junction capacitance	4.0 V, 1 MHz		C_J	5	-	pF	

Notes

(1) Pulse test: 300 μ s pulse width, 1 % duty cycle

(2) Pulse test: pulse width \leq 40 ms

THERMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	MSX1PB	MSX1PD	MSX1PG	MSX1PJ	UNIT
Typical thermal resistance	$R_{\theta JA}$ ⁽¹⁾	110			30	°C/W
	$R_{\theta JL}$ ⁽¹⁾					

Note

⁽¹⁾ Thermal resistance from junction to ambient and junction to lead mounted on PCB with 5.0 mm x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band.

IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS
 $(T_A = 25^\circ\text{C}$, unless otherwise noted)

STANDARD	TEST TYPE	TEST CONDITIONS	SYMBOL	CLASS	VALUE
AEC-Q101-001	Human body model (contact mode)	$C = 100 \text{ pF}, R = 1.5 \text{ k}\Omega$	V_C	H3B	$> 8 \text{ kV}$
AEC-Q101-002	Machine model (contact mode)	$C = 200 \text{ pF}, R = 0 \Omega$		M4	$> 400 \text{ V}$
JESD 22-A114	Human body model (contact mode)	$C = 100 \text{ pF}, R = 1.5 \text{ k}\Omega$		3B	$> 8 \text{ kV}$
JESD 22-A115	Machine model (contact mode)	$C = 200 \text{ pF}, R = 0 \Omega$		C	$> 400 \text{ V}$
IEC 61000-4-2 ⁽²⁾	Human body model (contact mode)	$C = 150 \text{ pF}, R = 330 \Omega$		4	$> 8 \text{ kV}$
	Human body model (air-discharge mode) ⁽¹⁾	$C = 150 \text{ pF}, R = 330 \Omega$		4	$> 15 \text{ kV}$
ISO 10605	Contact mode	$C = 330 \text{ pF}, R = 2 \text{ k}\Omega$		-	20 kV typ.

Notes

⁽¹⁾ Immunity to IEC 61000-4-2 air discharge mode has a typical performance $> 30 \text{ kV}$

⁽²⁾ System ESD standard

ORDERING INFORMATION (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
MSX1PJ-M3/89A	0.006	89A	4500	7" diameter plastic tape and reel
MSX1PJHM3/89A ⁽¹⁾	0.006	89A	4500	7" diameter plastic tape and reel

Note

⁽¹⁾ Automotive Grade

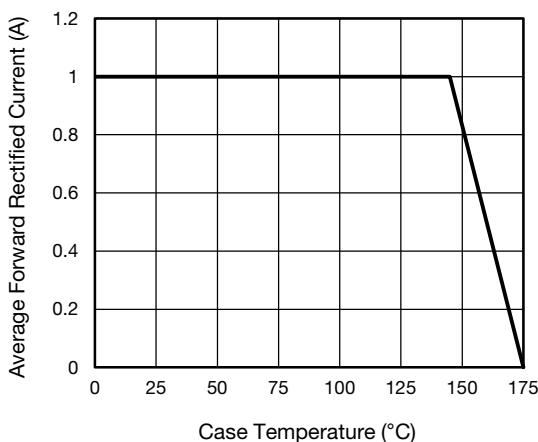
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

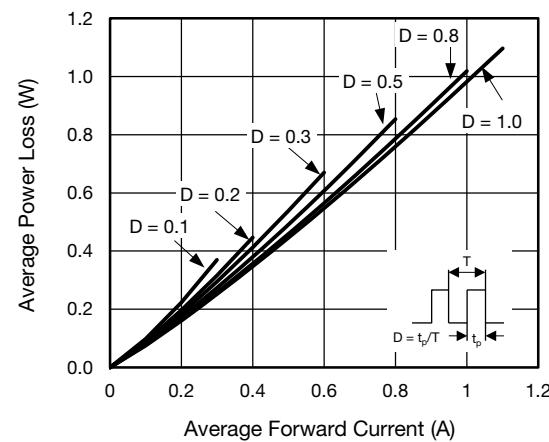


Fig. 2 - Average Power Loss Characteristics

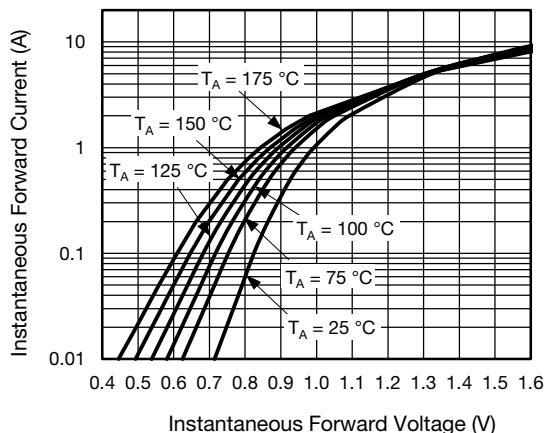


Fig. 3 - Typical Instantaneous Forward Characteristics

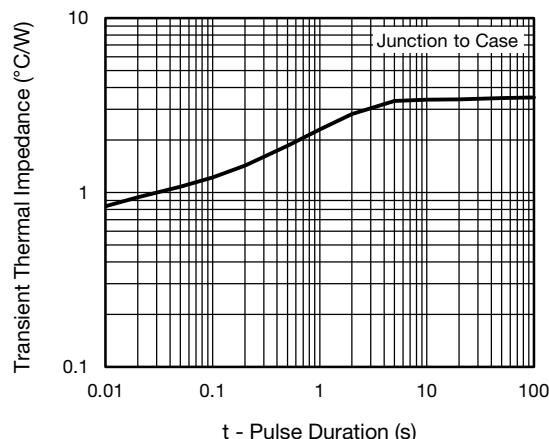


Fig. 6 - Typical Transient Thermal Impedance

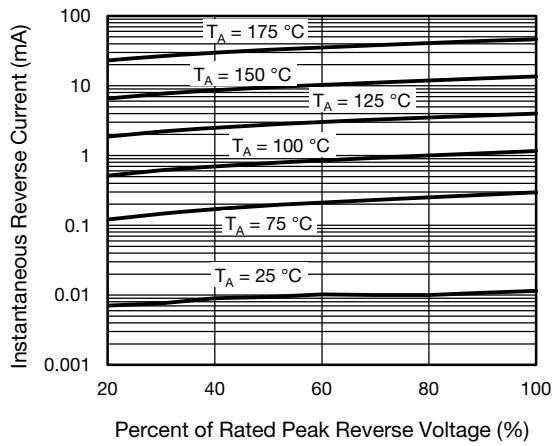


Fig. 4 - Typical Reverse Leakage Characteristics

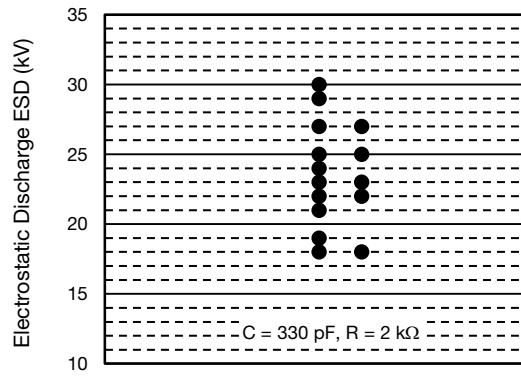


Fig. 7 - ESD Dispersion Map

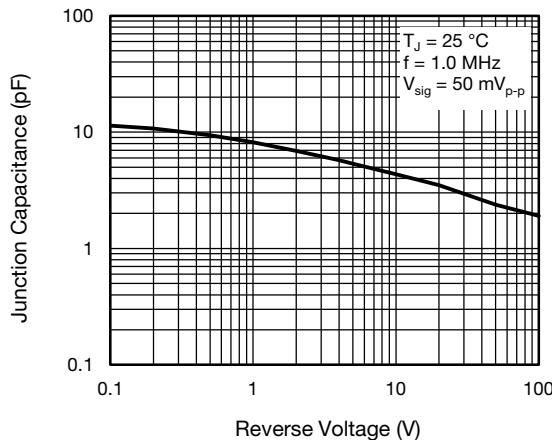
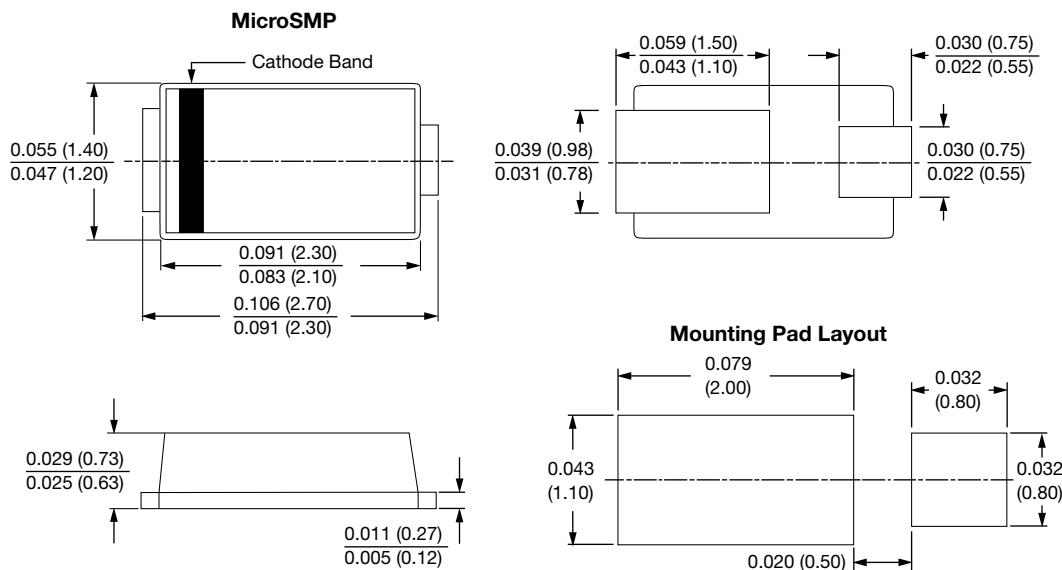


Fig. 5 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)


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