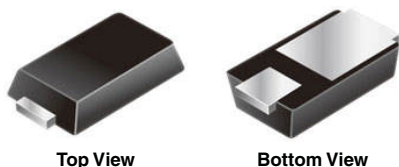


Surface-Mount ESD Capability Rectifier

eSMP® Series



Top View

Bottom View

MicroSMP (DO-219AD)

Anode  Cathode

DESIGN SUPPORT TOOLS

[click logo to get started](#)


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/doc299912



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: MicroSMP (DO-219AD)

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 (DO-219AD)
Circuit configuration	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	μA
		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 μs pulse width, 1 % duty cycle
 (2) Pulse test: pulse width $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	MSX1PB	MSX1PD	MSX1PG	MSX1PJ	UNIT
Typical thermal resistance	R _{θJA} ⁽¹⁾	110				°C/W
	R _{θJL} ⁽¹⁾	30				

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 ($T_A = 25\text{ }^{\circ}\text{C}$, 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)	$C = 200\text{ pF}$, $R = 0\text{ }\Omega$		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)	$C = 200\text{ pF}$, $R = 0\text{ }\Omega$		C	$> 400\text{ V}$
IEC 61000-4-2 ⁽²⁾	Human body model (contact mode)	$C = 150\text{ pF}$, $R = 330\text{ }\Omega$		4	$> 8\text{ kV}$
	Human body model (air-discharge mode) ⁽¹⁾	$C = 150\text{ pF}$, $R = 330\text{ }\Omega$		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) AEC-Q101 qualified



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

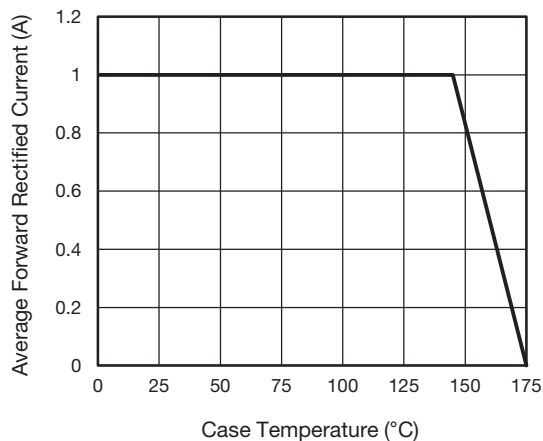


Fig. 1 - Maximum Forward Current Derating Curve

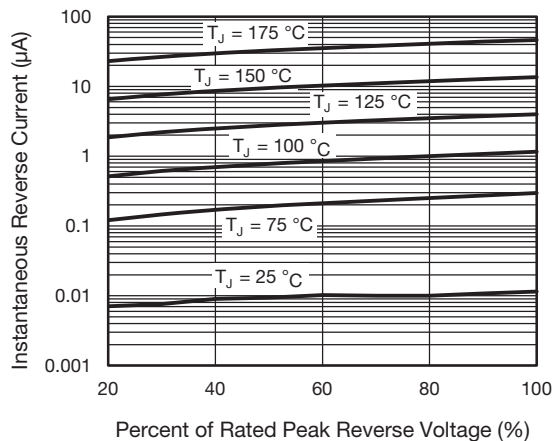


Fig. 4 - Typical Reverse Leakage Characteristics

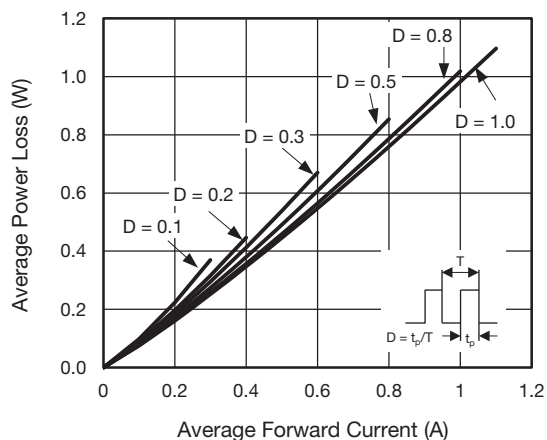


Fig. 2 - Average Power Loss Characteristics

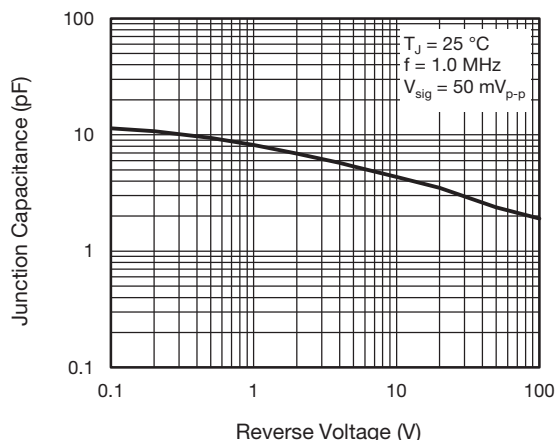


Fig. 5 - Typical Junction Capacitance

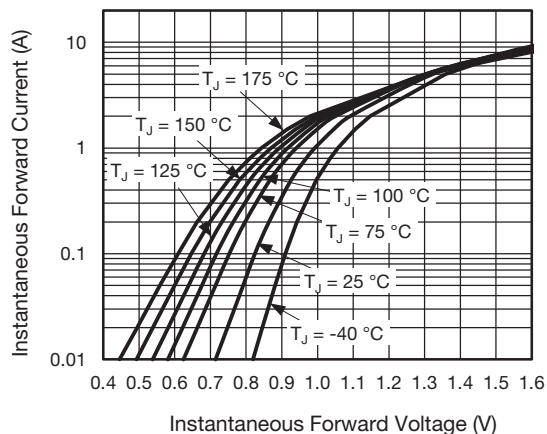


Fig. 3 - Typical Instantaneous Forward Characteristics

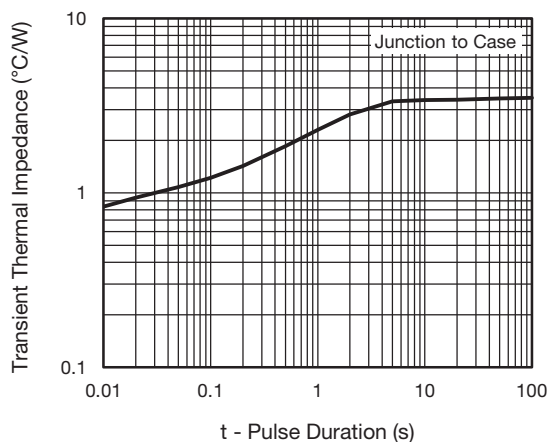


Fig. 6 - Typical Transient Thermal Impedance

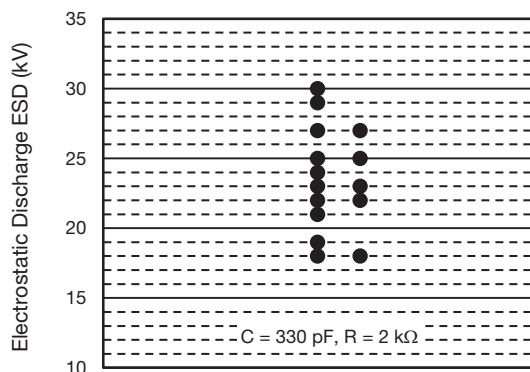
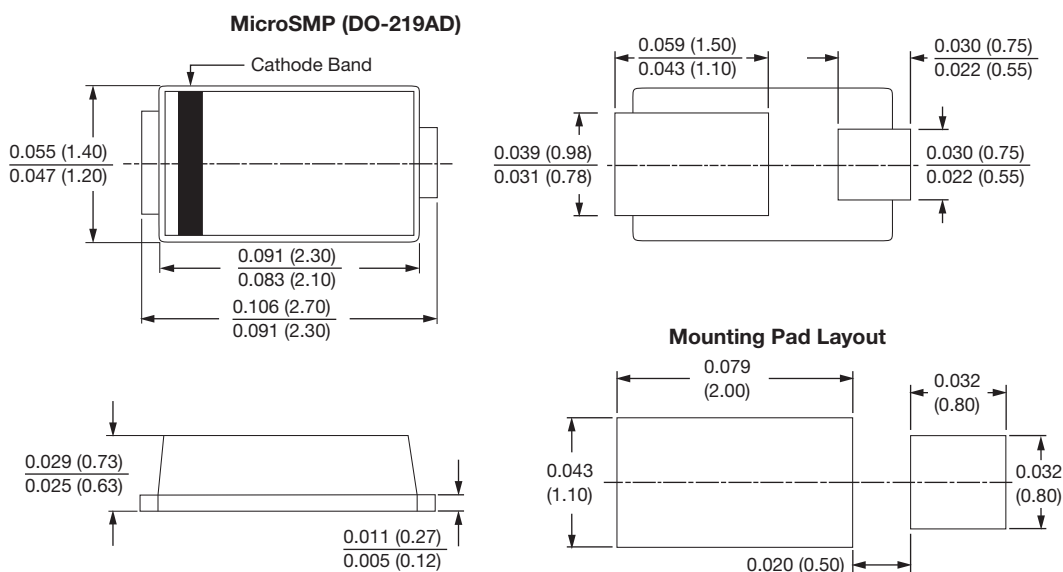


Fig. 7 - ESD Dispersion Map

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)




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