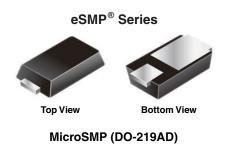
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MSE1PB, MSE1PD, MSE1PG, MSE1PJ

Vishay General Semiconductor

Surface Mount ESD Capability Rectifier



Anode O Cathode

click logo to get started

DESIGN SUPPORT TOOLS



PRIMARY CHARACTERISTICS					
I _{F(AV)} 1.0 A					
V _{RRM}	100 V, 200 V, 400 V, 600 V				
I _{FSM}	20 A				
V_F at I_F = 1.0 A	0.925 V				
I _R	1 µA				
T _J max.	175 °C				
Package	MicroSMP (DO-219AD)				
Circuit configuration	Single				

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 <u>www.vishay.com/doc?99912</u>

TYPICAL APPLICATIONS

General purpose, polarity protection, and rail-to-rail protection in both consumer and automotive applications.

MECHANICAL DATA

Case: MicroSMP (DO-219AD)

Molding compound meets UL 94 V-0 flammability rating Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

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

MAXIMUM RATINGS (T _A = 25 °C, unless otherwise noted)							
PARAMETER	SYMBOL	MSE1PB	MSE1PD	MSE1PG	MSE1PJ	UNIT	
Device marking code		SB	SD	SG	SJ		
Max. repetitive peak reverse voltage	V _{RRM}	100 200 400 600			600	V	
Max. average forward rectified current (fig. 1)	I _{F(AV)}	1.0				А	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I _{FSM}	20			А		
Operating junction and storage temperature range	T _J , T _{STG}	-55 to +175				°C	

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COMPLIANT

HALOGEN

FREE



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ELECTRICAL CHARACTERISTICS (T _A = 25 °C, unless otherwise noted)							
PARAMETER	TEST C	TEST CONDITIONS		TYP.	MAX.	UNIT	
Max. instantaneous forward voltage	I _F = 0.5 A	T _ 25 °C	V _F ⁽¹⁾	0.940	-		
	I _F = 1.0 A	T _A = 25 °C		1.016	1.1	v	
	I _F = 0.5 A	T _A = 125 °C		0.834	-	v	
	I _F = 1.0 A			0.925	0.98		
Max. reverse current	Rated V _B	T _A = 25 °C	I _R ⁽²⁾	-	1.0		
Max. reverse current	naleu v _R	T _A = 125 °C		3.7	50	μA	
Typical reverse recovery time	I _F = 0.5 A, I _R	$I_F = 0.5 \text{ A}, I_R = 1.0 \text{ A}, I_{rr} = 0.25 \text{ A}$		780	-	ns	
Typical junction capacitance	4.0 V, 1 MHz	4.0 V, 1 MHz		5	-	pF	

Notes

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

 $^{(2)}$ Pulse test: Pulse width $\leq 40\mbox{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25 \text{ °C}$, unless otherwise noted)							
PARAMETER SYMBOL MSE1PB MSE1PD MSE1PG MSE1PJ				UNIT			
	R _{0JA} ⁽¹⁾	110				°C/W	
Typical thermal resistance	R _{0JL} ⁽¹⁾						
	R _{0JC} ⁽¹⁾		4	0			

Note

(1) Thermal resistance from junction to ambient and junction to lead mounted on PCB with 6.0 mm x 6.0 mm copper pad areas. R_{θJL} is measured at the terminal of cathode band.

IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS ($T_A = 25$ °C, unless otherwise noted)						
STANDARD	TEST TYPE	TEST CONDITIONS	SYMBOL	CLASS	VALUE	
AEC-Q101-001	Human body model (contact mode)	C = 100 pF, R = 1.5 k Ω		H3B	> 8 kV	
AEC-Q101-002	Machine model (contact mode)	C = 200 pF, R = 0 Ω		M4	> 400 V	
JESD22-A114	Human body model (contact mode)	C = 100 pF, R = 1.5 k Ω	V _C	3B	> 8 kV	
JESD22-A115	Machine model (contact mode)	C = 200 pF, R = 0 Ω	٧C	С	> 400 V	
IEC 61000-4-2 ⁽²⁾	Human body model (contact mode)	C = 150 pF, R = 330 Ω		4	> 8 kV	
120 01000-4-2 ()	Human body model (air-discharge mode) ⁽¹⁾	C = 150 pF, R = 330 Ω		4	> 15 kV	

Notes

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

(2) System ESD standard

ORDERING INFORMATION (Example)							
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE			
MSE1PJ-M3/89A	0.006	89A	4500	7" diameter plastic tape and reel			
MSE1PJHM3/89A ⁽¹⁾	0.006	89A	4500	7" diameter plastic tape and reel			

Note

(1) AEC-Q101 qualified



MSE1PB, MSE1PD, MSE1PG, MSE1PJ

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RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

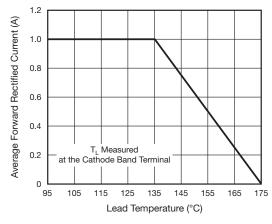


Fig. 1 - Forward Current Derating Curve

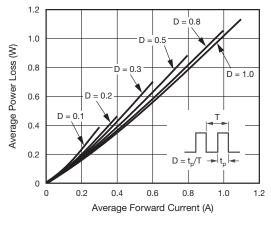
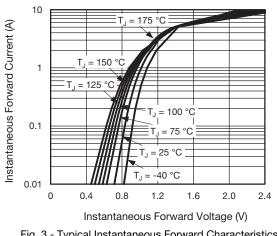
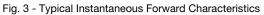


Fig. 2 - Forward Power Loss Characteristics





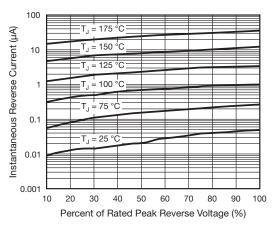


Fig. 4 - Typical Reverse Leakage Characteristics

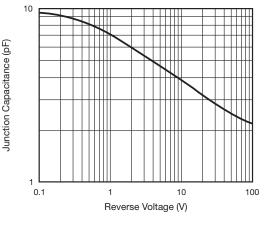


Fig. 5 - Typical Junction Capacitance

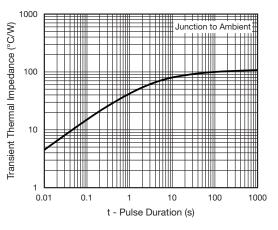


Fig. 6 - Typical Transient Thermal Impedance

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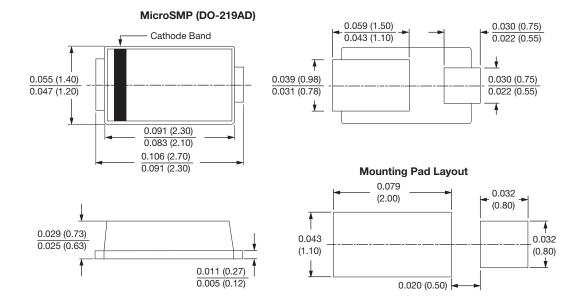
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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



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