AUTOMOTIVE

ROHS

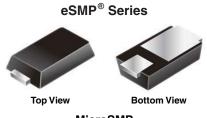
HALOGEN

FREE



Vishay General Semiconductor

Surface Mount ESD Capability Rectifier



IVI	cr	O	S	IV	P

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 IF = 1.0 A	0.925 V				
I _R	1 μΑ				
T _J max.	175 °C				

TYPICAL APPLICATIONS

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

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
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

MECHANICAL DATA

Case: MicroSMP

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

automotive grade **Terminals:** Matte tin plated leads, solderable per

J-STD-002 and JESD 22-B102 M3 suffix meets JESD 201 class 1A whisker test, HM3 suffix

Polarity: Color band denotes the cathode end

meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T _A = 25 °C, unless otherwise noted)							
PARAMETER	SYMBOL	MSE1PB	MSE1PD	MSE1PG	MSE1PJ	UNIT	
Device marking code		SB	SD	SG	SJ		
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V	
Maximum average forward rectified current (fig. 1)	I _{F(AV)}	1.0				Α	
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	

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

Notes

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

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



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THERMAL CHARACTERISTICS (T _A = 25 °C, unless otherwise noted)							
PARAMETER	SYMBOL	MSE1PB	MSE1PD	MSE1PG	MSE1PJ	UNIT	
	R _{0JA} (1)		°C/W				
Typical thermal resistance	R _{0JL} (1)						
	R ₀ JC (1)	40					

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 kΩ		НЗВ	> 8 kV		
AEC-Q101-002	Machine model (contact mode) $C = 200 \text{ pF}, R = 0 \Omega$		M4	> 400 V			
JESD22-A114	Human body model (contact mode)	C = 150 pF, $R = 1.5$ kΩ	V _C	3B	> 8 kV		
JESD22-A115	5 Machine model (contact mode) $C = 200 \text{ pF}, R = 0 \Omega$		• • • • • • • • • • • • • • • • • • • •	С	> 400 V		
IEC 61000-4-2 (2)	Human body model (contact mode)	C = 150 pF, R = 150 Ω		4	> 8 kV		
120 01000-4-2 ()	Human body model (air-discharge mode) (1)	C = 150 pF, R = 150 Ω		4	> 15 kV		

Notes

⁽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

RATINGS AND CHARACTERISTICS CURVES

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

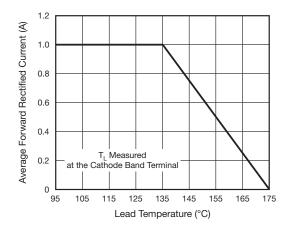


Fig. 1 - Forward Current Derating Curve

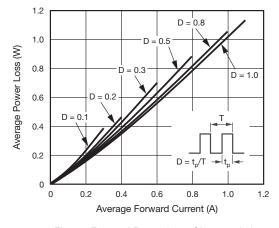


Fig. 2 - Forward Power Loss Characteristics

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

⁽¹⁾ Automotive grade



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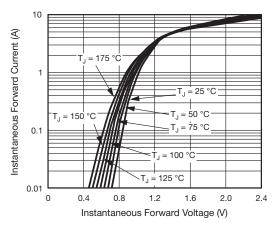


Fig. 3 - Typical Instantaneous Forward Characteristics

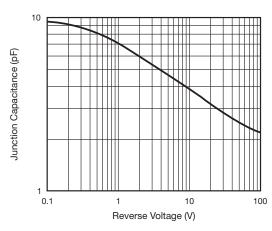


Fig. 5 - Typical Junction Capacitance

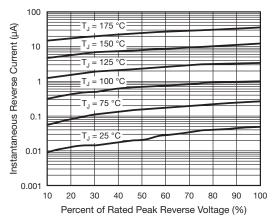


Fig. 4 - Typical Reverse Leakage Characteristics

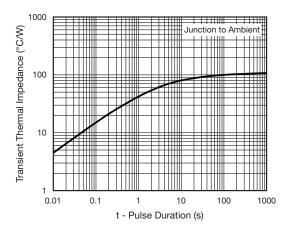
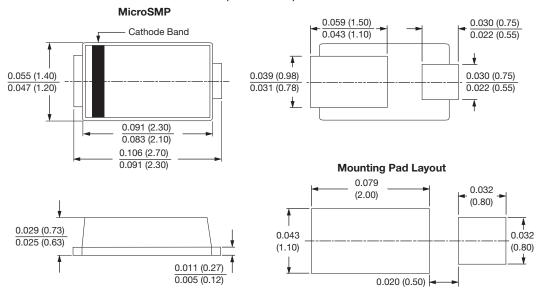


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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