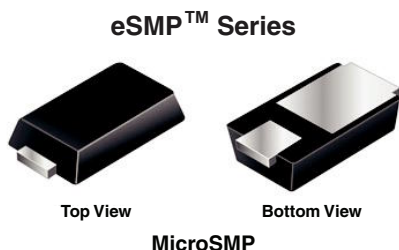




Surface Mount ESD Capability Rectifiers



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 μ A
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
- Solder dip 265 °C max. 10 s, per JESD 22-A111
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**
- Find out more about Vishay's Automotive Grade Product requirements at: www.vishay.com/applications



MECHANICAL DATA

Case: MicroSMP

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, 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 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	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	1.0				A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	20				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175				°C

MSE1PB thru MSE1PJ

Vishay General Semiconductor



ELECTRICAL CHARACTERISTICS (T _A = 25 °C, unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage ⁽¹⁾	I _F = 0.5 A I _F = 1.0 A	T _A = 25 °C	V _F	0.940 1.016	- 1.1	V
	I _F = 0.5 A I _F = 1.0 A	T _A = 125 °C		0.834 0.925	- 0.98	
Maximum reverse current ⁽²⁾	Rated V _R	T _A = 25 °C T _A = 125 °C	I _R	- 3.7	1.0 50	μA
Typical reverse recovery time	I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A		t _{rr}	780	-	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 ≤ 40 ms

THERMAL CHARACTERISTICS (T _A = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	MSE1PB	MSE1PD	MSE1PG	MSE1PJ	UNIT
Typical thermal resistance ⁽¹⁾	R _{θJA}	110				°C/W
	R _{θJL}	30				
	R _{θJC}	40				

Note

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

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	V _C	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 = 150 pF, R = 1.5 kΩ		3B	> 8 kV
JESD22-A115	Machine model (contact mode)	C = 200 pF, R = 0 Ω		C	> 400 V
IEC 61000-4-2 ⁽²⁾	Human body model (contact mode)	C = 150 pF, R = 150 Ω		4	> 8 kV
	Human body model (air-discharge mode) ⁽¹⁾	C = 150 pF, R = 150 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⁾ Automotive grade



RATINGS AND CHARACTERISTICS CURVES

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

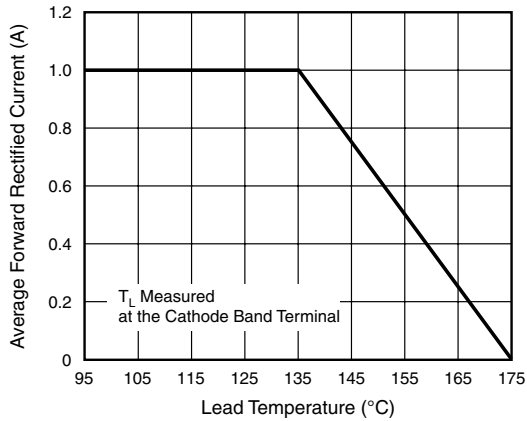


Figure 1. Forward Current Derating Curve

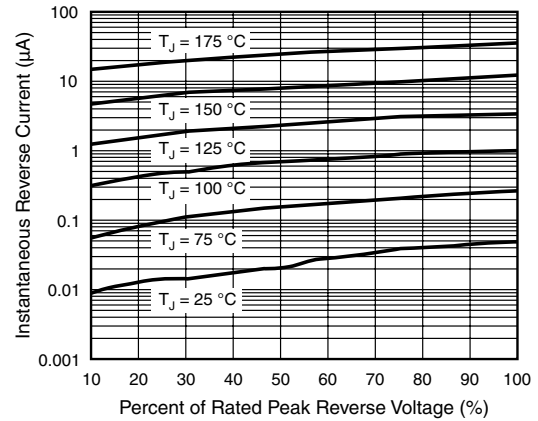


Figure 4. Typical Reverse Leakage Characteristics

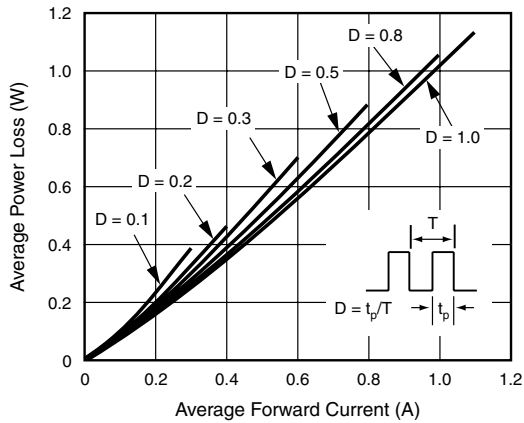


Figure 2. Forward Power Loss Characteristics

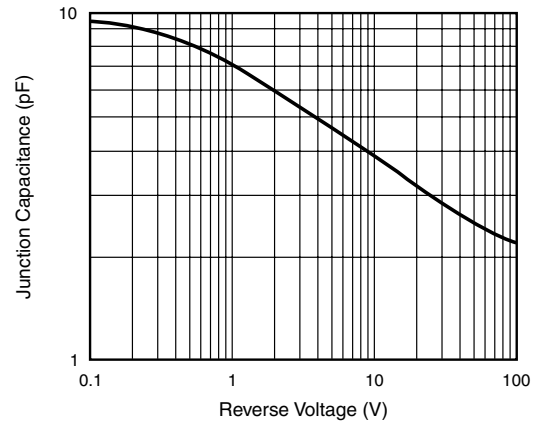


Figure 5. Typical Junction Capacitance

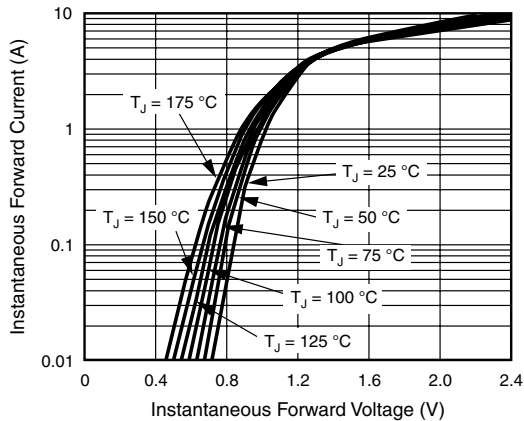


Figure 3. Typical Instantaneous Forward Characteristics

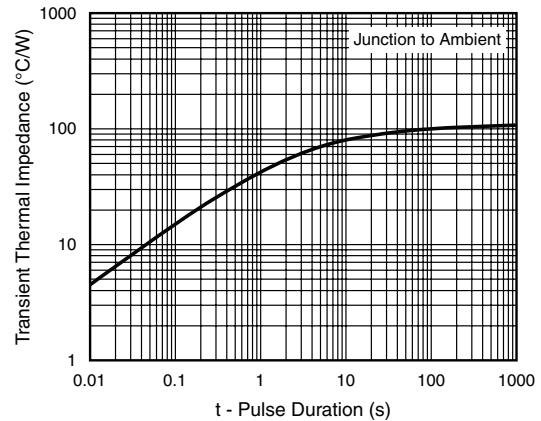


Figure 6. Typical Transient Thermal Impedance

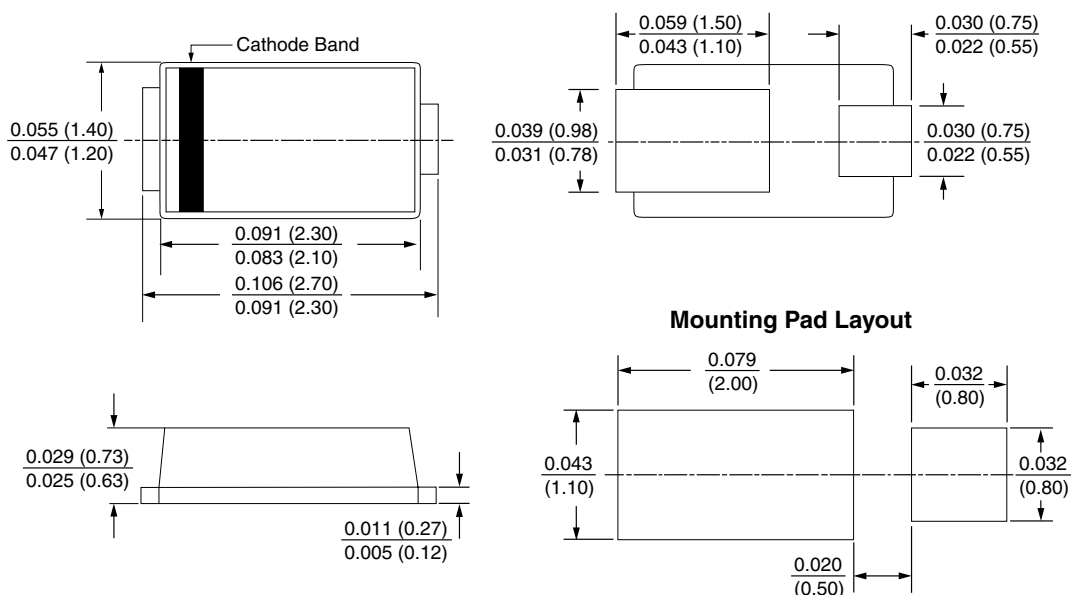
MSE1PB thru MSE1PJ

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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

MicroSMP





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