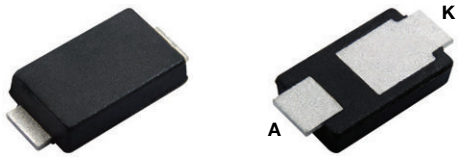
Surface-Mount ESD Capability Rectifiers

eSMP® Series



Top View Bottom View

SMPA (DO-221BC)

Anode ○—▶|—○ Cathode

LINKS TO ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	100 V, 200 V, 400 V, 600 V
I_{FSM}	42 A
V_F at I_F = 5.0 A (T_A = 125 °C)	0.95 V
I_R	10 µA
T_J max.	175 °C
Package	SMPA (DO-221BC)
Circuit configuration	Single

FEATURES

AUTOMOTIVE GRADE Available

RoHS COMPLIANT HALOGEN FREE

- Very low profile - typical height of 0.95 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
- Not recommended for PCB bottom side wave mounting
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

General purpose, power line polarity protection, in both consumer and automotive applications.

MECHANICAL DATA

Case: SMPA (DO-221BC)
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 suffix meets JESD 201 class 2 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	SE50PAB	SE50PAD	SE50PAG	SE50PAJ	UNIT
Device marking code		50B	50D	50G	50J	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Maximum DC forward current	I_F (1)	5.0				A
	I_F (2)	1.6				
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	42				A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175				°C

Notes
(1) Mounted on 30 mm x 30 mm pad areas, aluminum PCB
(2) Free air, mounted on recommended copper pad area

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 2.5 A	T_A = 25 °C	V_F (1)	0.94	-	V
	I_F = 5.0 A			1.03	1.16	
	I_F = 2.5 A	T_A = 125 °C		0.84	-	
	I_F = 5.0 A			0.95	1.10	
Reverse current	Rated V_R	T_A = 25 °C	I_R (2)	-	10	μA
		T_A = 125 °C		13	150	
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.0	-	μs
Typical junction capacitance	4.0 V, 1 MHz		C_J	32	-	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**	**SE50PAB**	**SE50PAD**	**SE50PAG**	**SE50PAJ**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	115				°C/W
	$R_{\theta JM}$ (2)	7				

Notes

(1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance $R_{\theta JA}$ - junction to ambient

(2) Mounted on 30 mm x 30 mm pad areas aluminum PCB; $R_{\theta JM}$ - junction to mount

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

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SE50PAJ-M3/I	0.033	I	14 000	13" diameter plastic tape and reel
SE50PAJHM3/H (1)	0.033	H	3500	7" diameter plastic tape and reel
SE50PAJHM3/I (1)	0.033	I	14 000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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

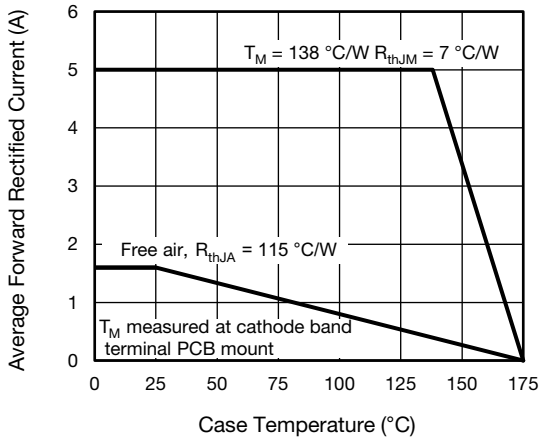

Fig. 1 - Maximum Forward Current Derating Curve

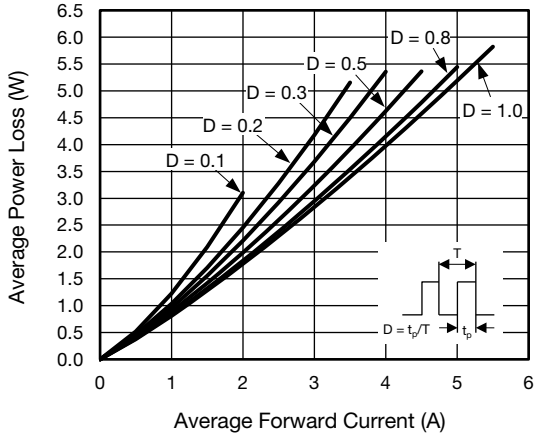

Fig. 2 - Forward Power Loss Characteristics

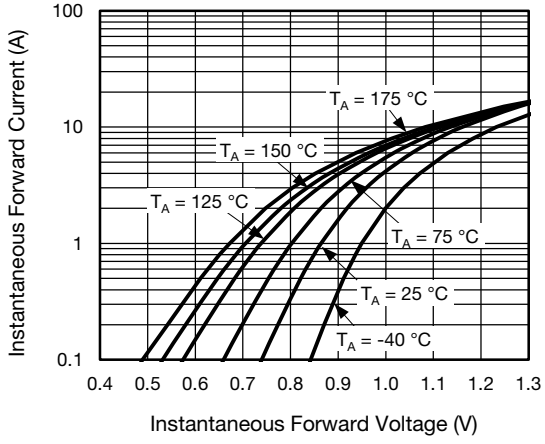

Fig. 3 - Typical Instantaneous Forward Characteristics

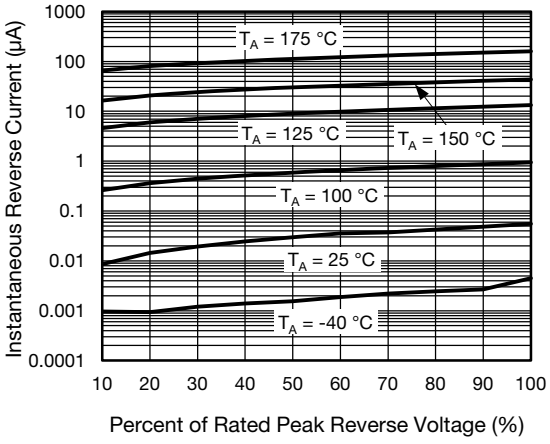

Fig. 4 - Typical Reverse Leakage Characteristics

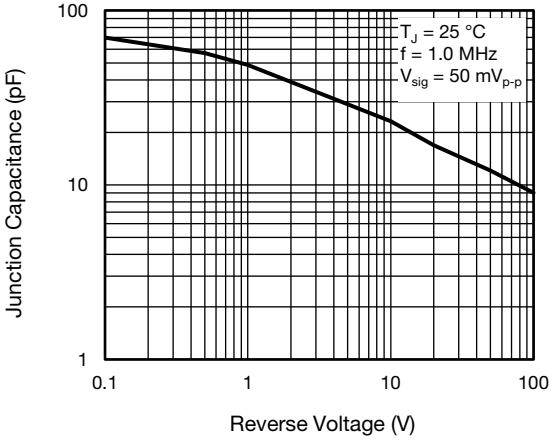

Fig. 5 - Typical Junction Capacitance

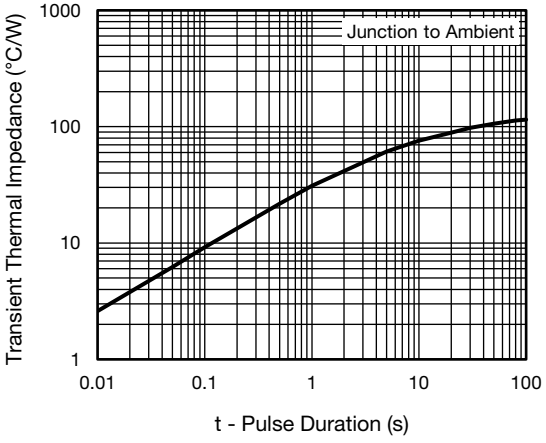

Fig. 6 - Typical Transient Thermal Impedances

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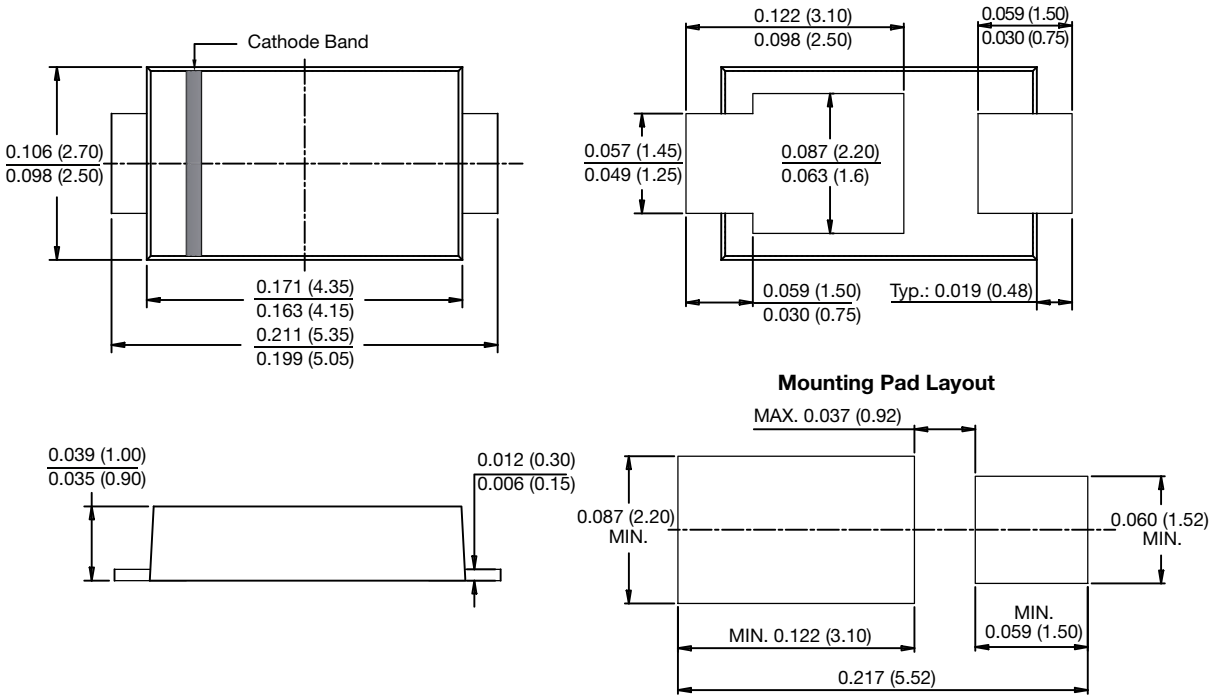
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPA (DO-221BC)



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