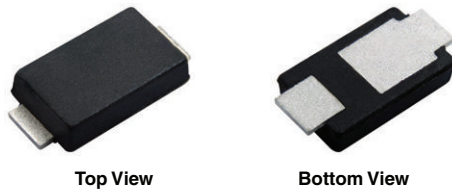


Surface-Mount ESD Capability Rectifiers

eSMP® Series



Top View

Bottom View

SMPA (DO-221BC)

Anode Cathode

FEATURES

- 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

 AUTOMOTIVE
GRADE
Available

RoHS
COMPLIANT
HALOGEN
FREE

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 μ A
T_J max.	175 °C
Package	SMPA (DO-221BC)
Circuit configuration	Single

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



ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 2.5\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.94	-	V
	$I_F = 5.0\text{ A}$			1.03	1.16	
	$I_F = 2.5\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.84	-	
	$I_F = 5.0\text{ A}$			0.95	1.10	
Reverse current	Rated V_R	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	-	10	μA
		$T_A = 125\text{ }^\circ\text{C}$		13	150	
Typical reverse recovery time	$I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$		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 $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	SYMBOL	SE50PAB	SE50PAD	SE50PAG	SE50PAJ	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	115				$^\circ\text{C/W}$
	$R_{\theta JM}^{(2)}$	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 ($T_A = 25\text{ }^\circ\text{C}$ 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	$> 8\text{ kV}$

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



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

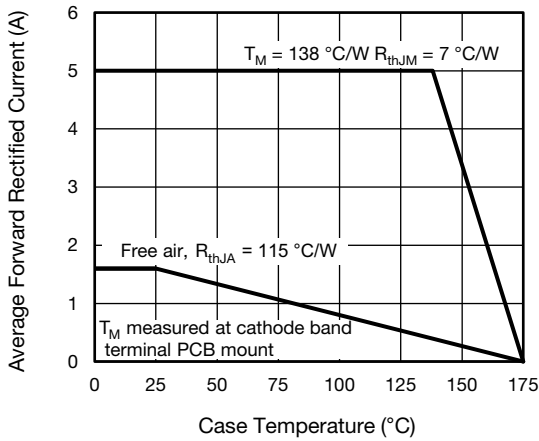


Fig. 1 - Maximum Forward Current Derating Curve

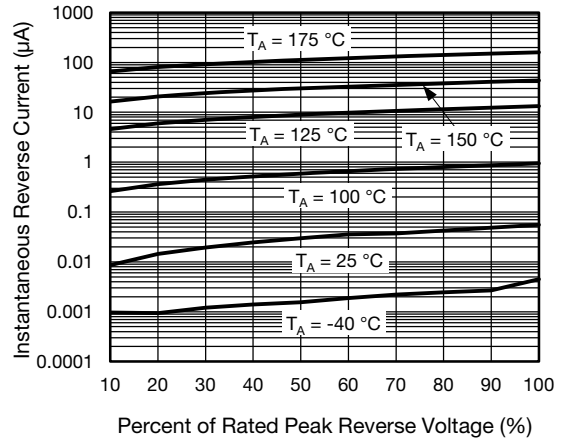


Fig. 4 - Typical Reverse Leakage Characteristics

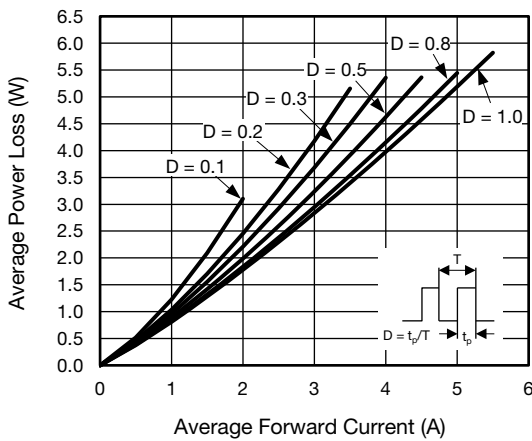


Fig. 2 - Forward Power Loss Characteristics

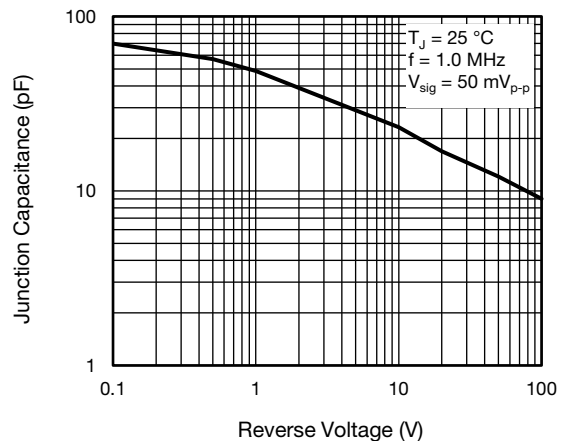


Fig. 5 - Typical Junction Capacitance

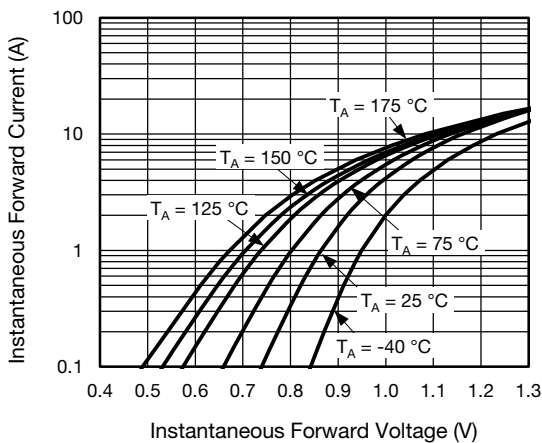


Fig. 3 - Typical Instantaneous Forward Characteristics

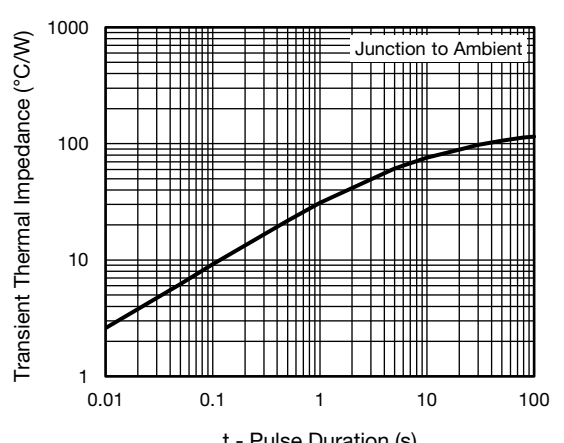
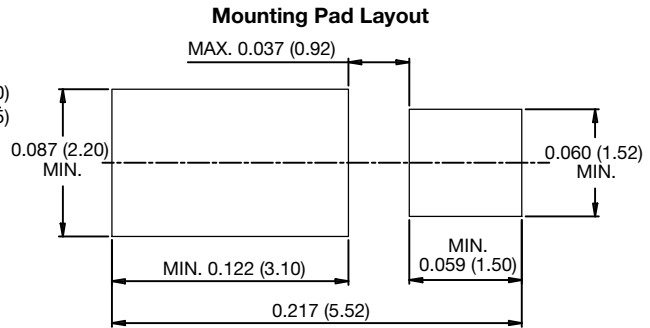
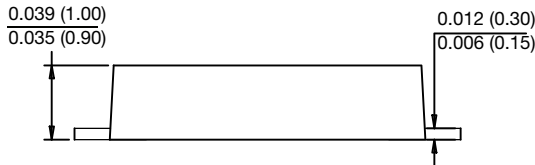
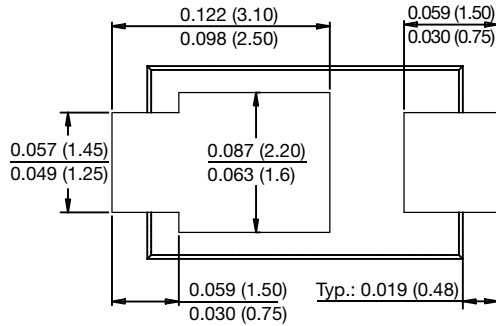
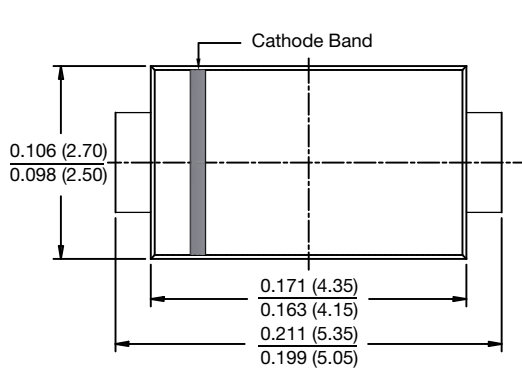


Fig. 6 - Typical Transient Thermal Impedances



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPA (DO-221BC)





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