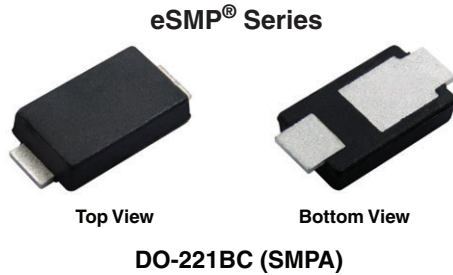


## Surface Mount ESD Capability Rectifiers



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### 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](http://www.vishay.com/doc?99912)

### MECHANICAL DATA

**Case:** DO-221BC (SMPA)

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

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 $\mu$ A
$T_J$ max.	175 °C
Package	DO-221BC (SMPA)
Diode variations	Single die

### TYPICAL APPLICATIONS

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

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, 2 oz. FR4 PCB

(2) Free air, mounted on recommended copper pad area



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 2.5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.94	-	V
	I <sub>F</sub> = 5.0 A			1.03	1.16	
	I <sub>F</sub> = 2.5 A	T <sub>A</sub> = 125 °C		0.84	-	
	I <sub>F</sub> = 5.0 A			0.95	1.10	
Reverse current	Rated V <sub>R</sub>	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	10	µA
		T <sub>A</sub> = 125 °C		13	150	
Typical reverse recovery time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A		t <sub>rr</sub>	2.0	-	µs
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	32	-	pF

Notes

- (1) Pulse test: 300 µs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °c unless otherwise noted)						
PARAMETER	SYMBOL	SE50PAB	SE50PAD	SE50PAG	SE50PAJ	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	115				°C/W
	R <sub>θJM</sub> <sup>(2)</sup>	7				

Notes

- (1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance R<sub>θJA</sub> - junction to ambient
- (2) Mounted on 30 mm x 30 mm pad areas, 2 oz. FR4 PCB; R<sub>θJM</sub> - junction to mount

IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS (T <sub>A</sub> = 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 <sub>C</sub>	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/I <sup>(1)</sup>	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)

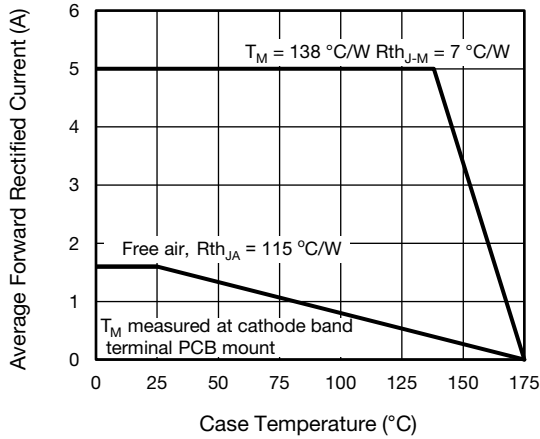


Fig. 1 - Maximum Forward Current Derating Curve

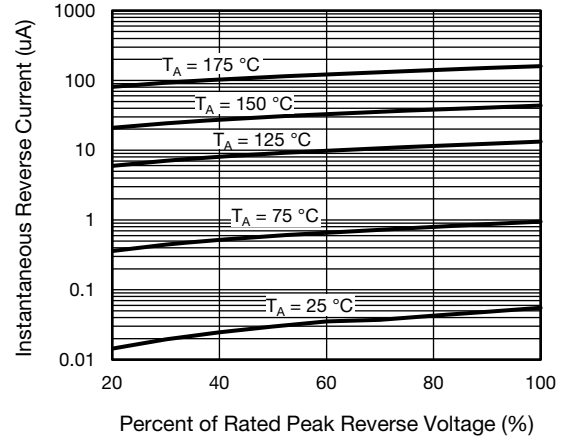


Fig. 4 - Typical Reverse Leakage Characteristics

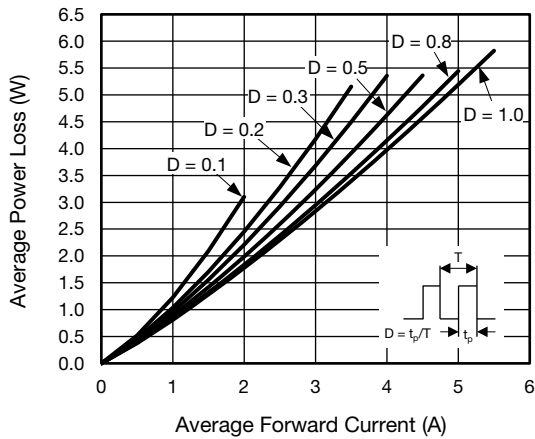


Fig. 2 - Forward Power Loss Characteristics

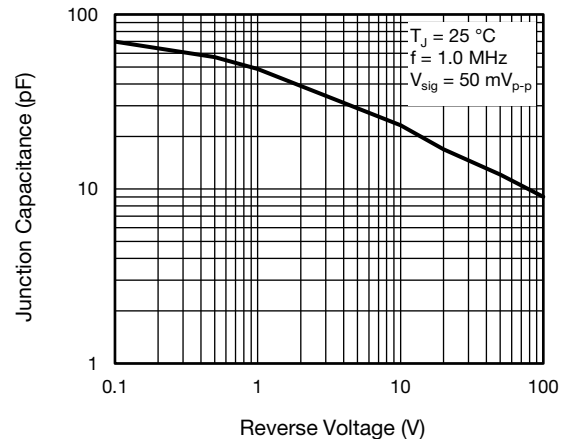


Fig. 5 - Typical Junction Capacitance

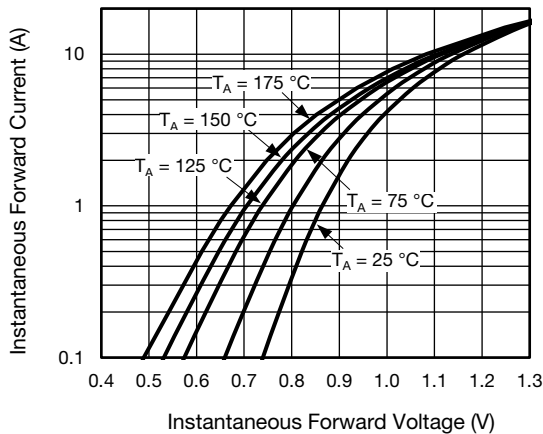


Fig. 3 - Typical Instantaneous Forward Characteristics

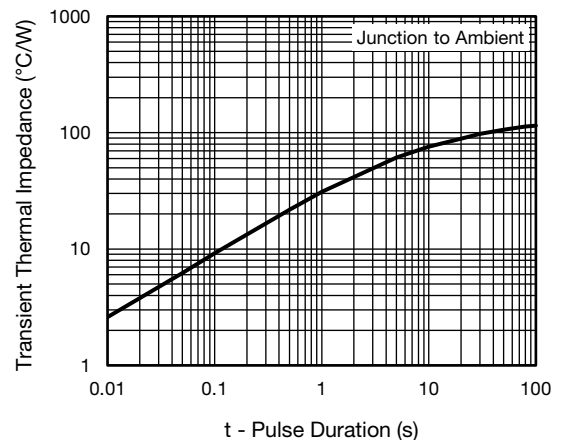
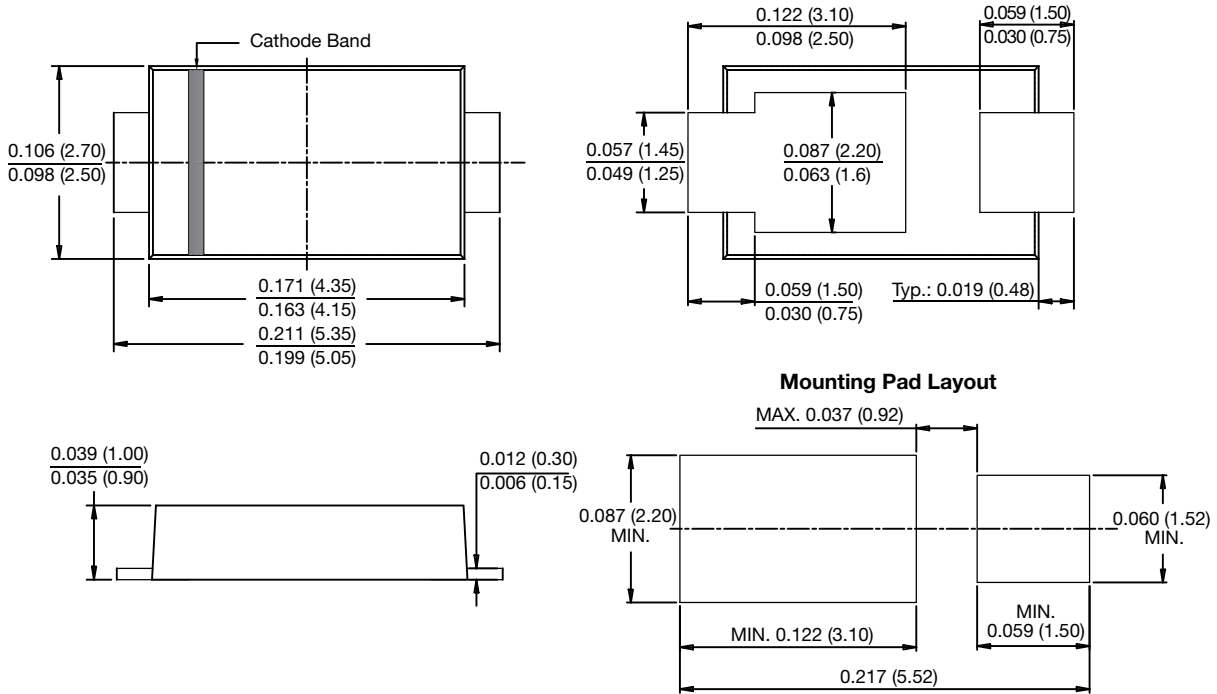


Fig. 6 - Typical Transient Thermal Impedances



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-221BC (SMPA)





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