

Surface Mount ESD Capability Rectifiers

eSMP® Series



DO-220AA (SMP)

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	1.0 A
V_{RRM}	100 V, 200 V, 400 V, 600 V
I_R	5 μ A
V_F at $I_F = 1.0$ A	0.86 V
T_J max.	175 °C
Package	DO-220AA (SMP)
Diode variations	Single die

TYPICAL APPLICATIONS

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

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop
- Typical I_R less than 0.1 μ A
- 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

AUTOMOTIVE
GRADE



RoHS
COMPLIANT
HALOGEN
FREE

MECHANICAL DATA

Case: DO-220AA (SMP)

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 meets JESD 201 class 2 whisker test

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)

PARAMETER	SYMBOL	SE10PB	SE10PD	SE10PG	SE10PJ	UNIT
Device marking code		10B	10D	10G	10J	
Max. repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Average forward current	$I_{F(AV)}$	1.0				A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	25				A
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
Max. instantaneous forward voltage	$I_F = 1.0$ A	V_F (1)	0.960	1.05	V
			0.860	0.95	
Max. reverse current	Rated V_R	I_R (2)	-	5.0	μ A
			4.8	50	
Max. 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	7.0	-	pF

Notes

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

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

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

PARAMETER	SYMBOL	SE10PB	SE10PD	SE10PG	SE10PJ	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	105				$^{\circ}\text{C/W}$
	$R_{\theta JL}^{(1)}$	25				
	$R_{\theta JC}^{(1)}$	30				

Note

(1) Thermal resistance from junction to ambient and junction to lead mounted on PCB with 5.0 mm x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top center of the body.

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	$> 8\text{ kV}$
AEC-Q101-002	Machine model (contact mode)	$C = 200\text{ pF}$, $R = 0\text{ }\Omega$		M4	$> 400\text{ V}$
JESD22-A114	Human body model (contact mode)	$C = 100\text{ pF}$, $R = 1.5\text{ k}\Omega$		3B	$> 8\text{ kV}$
JESD22-A115	Machine model (contact mode)	$C = 200\text{ pF}$, $R = 0\text{ }\Omega$		C	$> 400\text{ V}$
IEC 61000-4-2 ⁽²⁾	Human body model (contact mode)	$C = 150\text{ pF}$, $R = 330\text{ }\Omega$		4	$> 8\text{ kV}$
	Human body model (air-discharge mode) ⁽¹⁾	$C = 150\text{ pF}$, $R = 330\text{ }\Omega$		4	$> 15\text{ kV}$

Notes

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

(2) System ESD standard

ORDERING INFORMATION (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SE10PJ-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SE10PJ-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SE10PJHM3/84A ⁽¹⁾	0.024	84A	3000	7" diameter plastic tape and reel
SE10PJHM3/85A ⁽¹⁾	0.024	85A	10 000	13" diameter plastic tape and reel

Note

(1) Automotive grade

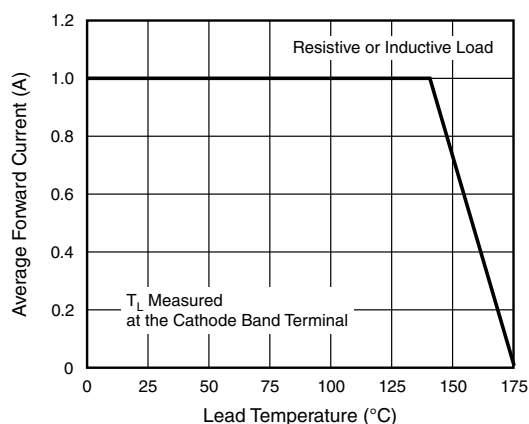
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Fig. 1 - Max. Forward Current Derating Curve

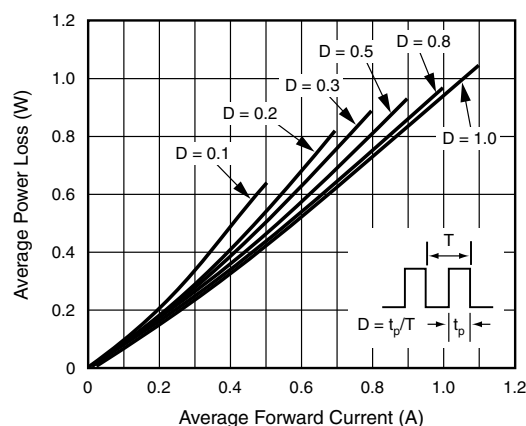


Fig. 2 - Forward Power Loss Characteristics

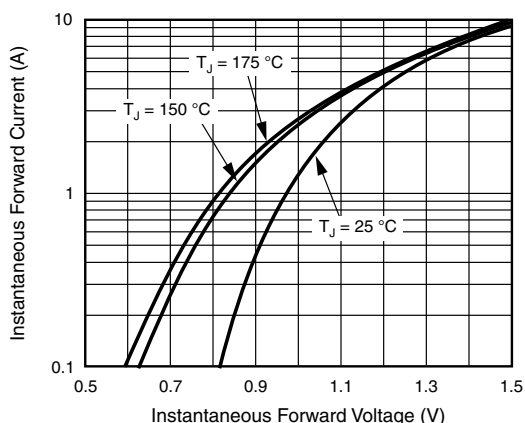


Fig. 3 - Forward Power Loss Characteristics

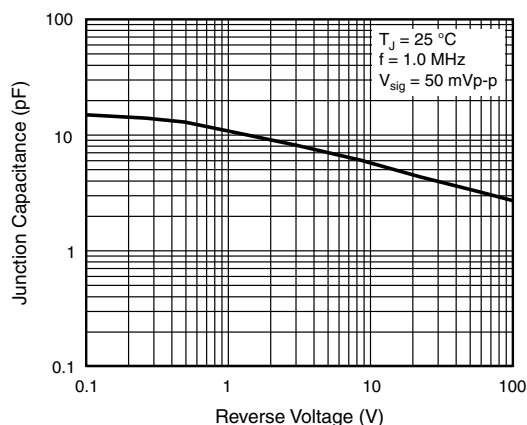


Fig. 5 - Typical Instantaneous Forward Characteristics

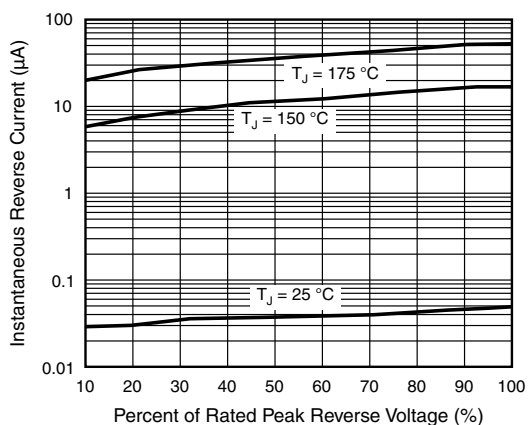
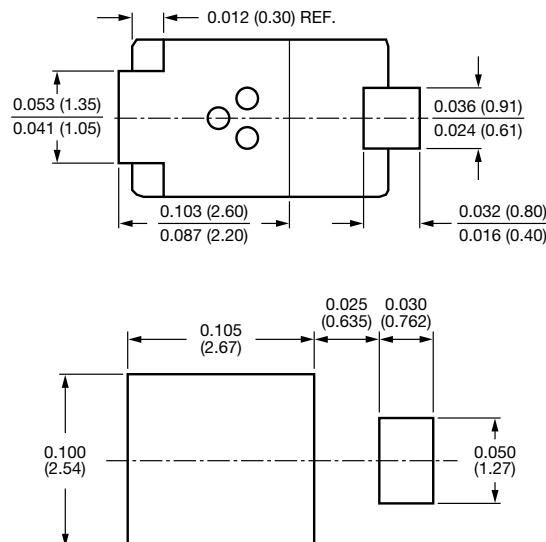
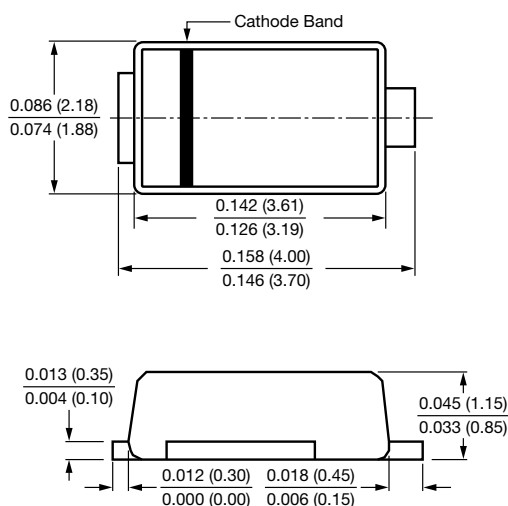


Fig. 4 - Typical Instantaneous Forward Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)





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