

Surface Mount ESD Capability Rectifiers

eSMP™ Series



DO-220AA (SMP)

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
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	1.0 A
V_{RRM}	100 V to 600 V
I_R	5 μ A
V_F at $I_F = 1.0$ A	0.86 V
T_J max.	175 °C

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

PARAMETER	SYMBOL	SE10PB	SE10PD	SE10PG	SE10PJ	UNIT
Device marking code		10B	10D	10G	10J	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Average forward 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}	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
Maximum instantaneous forward voltage ⁽¹⁾	$I_F = 1.0$ A, $I_F = 1.0$ A,	$T_J = 25$ °C $T_J = 125$ °C	V_F	0.960 0.860	1.05 0.95	V
Maximum reverse current ⁽¹⁾	rated V_R	$T_J = 25$ °C $T_J = 125$ °C	I_R	- 4.8	5.0 50	μ A
Typical reverse recovery time	$I_F = 0.5$ A, $I_R = 1.0$ A, $I_{rr} = 0.25$ A		t_{rr}	780	-	-
Typical junction capacitance time	4.0 V, 1 MHz		C_J	7.0	-	pF

Note:

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

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	SE10PB	SE10PD	SE10PG	SE10PJ	UNIT
Typical thermal resistance ⁽¹⁾	$R_{\theta JA}$		105			$^{\circ}\text{C/W}$
	$R_{\theta JL}$		25			
	$R_{\theta JC}$		30			

Note:

- (1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 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 kV
AEC Q101-002	Machine model (contact mode)	$C = 200\text{ pF}$, $R = 0\text{ }\Omega$		M4	> 400 V
JESD22-A114	Human body model (contact mode)	$C = 150\text{ pF}$, $R = 1.5\text{ k}\Omega$		3B	> 8 kV
JESD22-A115	Machine model (contact mode)	$C = 200\text{ pF}$, $R = 0\text{ }\Omega$		C	> 400 V
IEC-61000-4-2 ⁽²⁾	Human body model (contact mode)	$C = 150\text{ pF}$, $R = 150\text{ }\Omega$		4	> 8 kV
	Human body model (air-discharge mode) ⁽¹⁾	$C = 150\text{ pF}$, $R = 150\text{ }\Omega$		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
SE10PJ-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SE10PJ-E3/85A	0.024	85A	10000	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

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

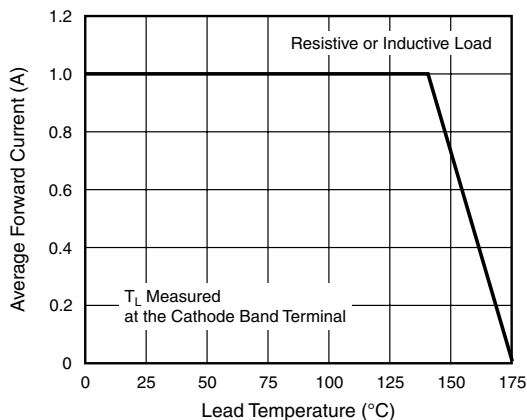


Figure 1. Maximum Forward Current Derating Curve

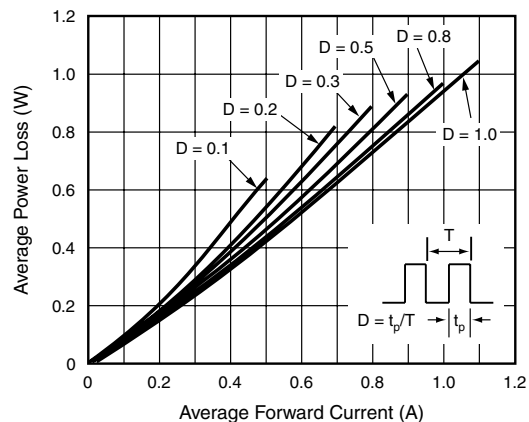


Figure 2. Forward Power Loss Characteristics

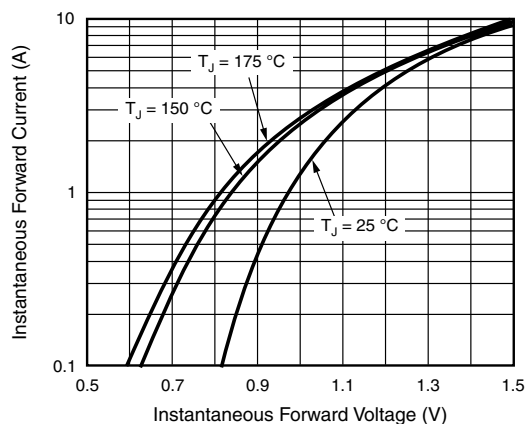


Figure 3. Typical Instantaneous Forward Characteristics

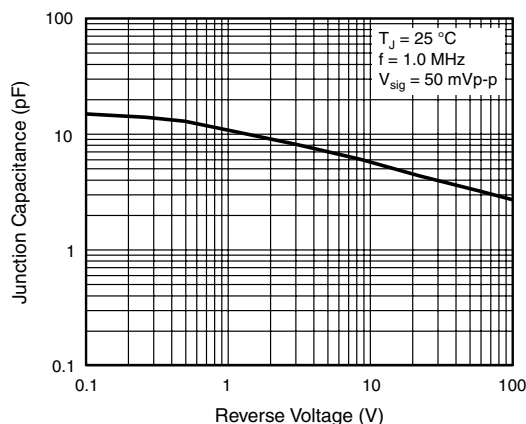


Figure 5. Typical Junction Capacitance

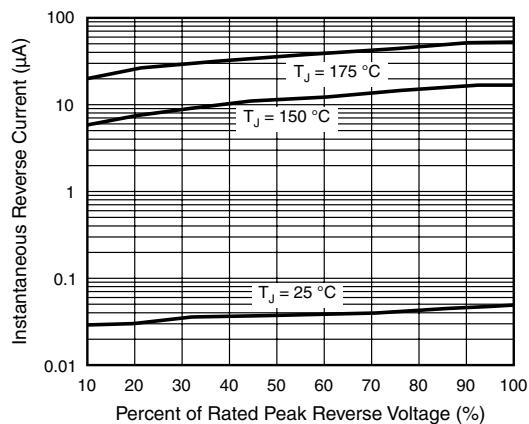
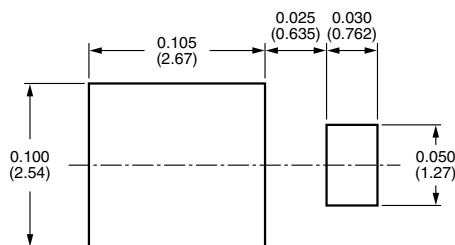
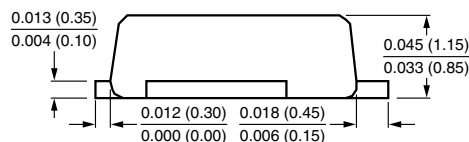
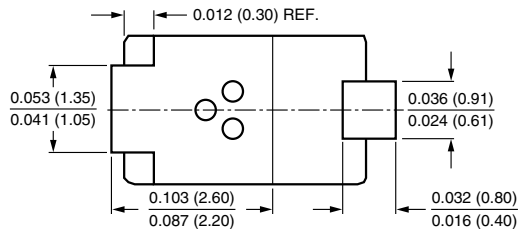
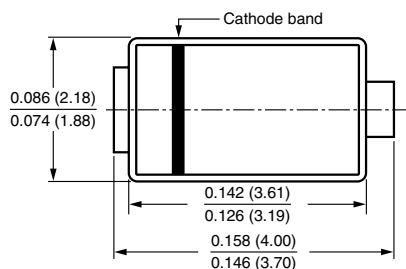


Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)





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