Surface Mount ESD Capability Rectifiers

eSMP® Series

SMP (DO-220AA)

Cathode ○—▷|—○ Anode

ADDITIONAL RESOURCES

3D Models

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 µA
- 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

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: SMP (DO-220AA)
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

PRIMARY CHARACTERISTICS

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

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	T_A = 25 °C	V_F [1]	0.960	1.05	V
		T_A = 125 °C		0.860	0.95	
Max. reverse current	Rated V_R	T_A = 25 °C	I_R [2]	-	5.0	µA
		T_A = 125 °C		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 µs pulse width, 1 % duty cycle

[2] Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SE10PB	SE10PD	SE10PG	SE10PJ	UNIT
Typical thermal resistance	$R_{\theta JA}$ [1]	105				°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 °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
AEC-Q101-002	Machine model (contact mode)	C = 200 pF, R = 0 Ω		M4	> 400 V
JESD22-A114	Human body model (contact mode)	C = 100 pF, R = 1.5 kΩ		3B	> 8 kV
JESD22-A115	Machine model (contact mode)	C = 200 pF, R = 0 Ω		C	> 400 V
IEC 61000-4-2 [2]	Human body model (contact mode)	C = 150 pF, R = 330 Ω		4	> 8 kV
	Human body model (air-discharge mode) [1]	C = 150 pF, R = 330 Ω		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-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 °C unless otherwise noted)
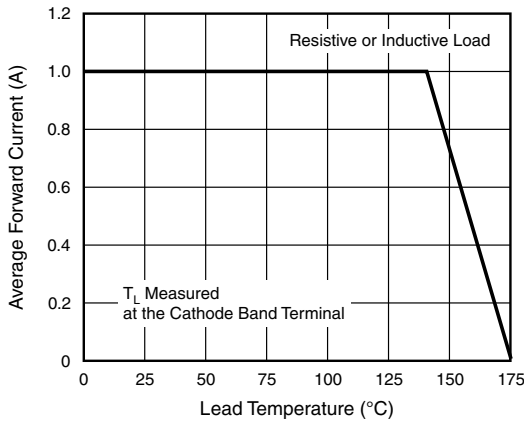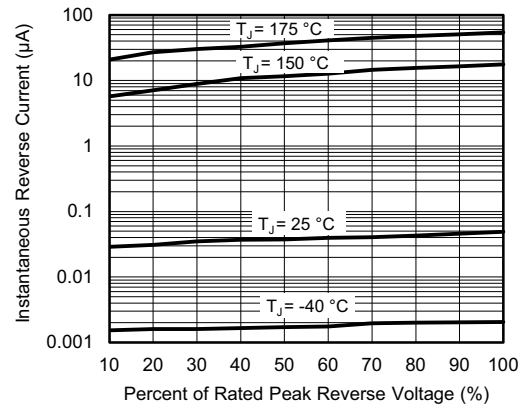

Fig. 1 - Max. Forward Current Derating Curve

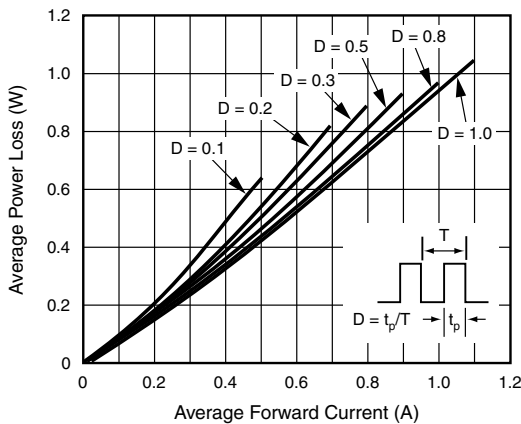Fig. 4 - Typical Instantaneous Forward Characteristics
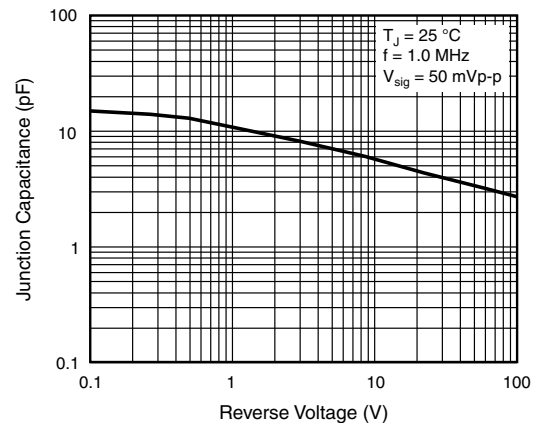

Fig. 2 - Forward Power Loss Characteristics

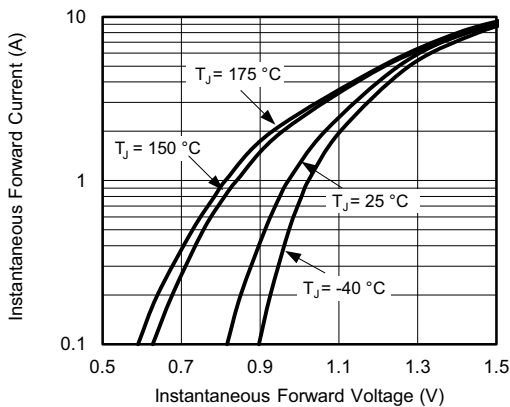

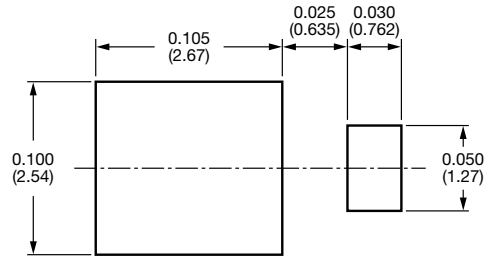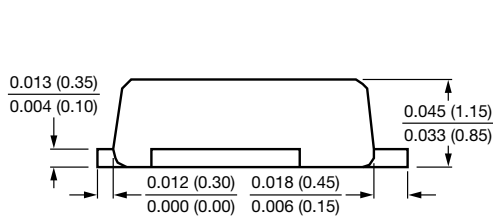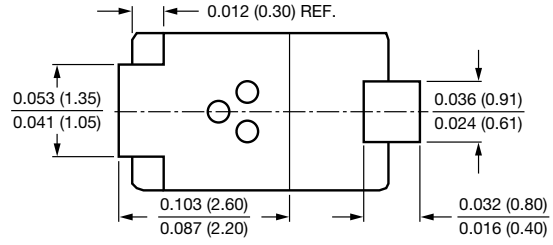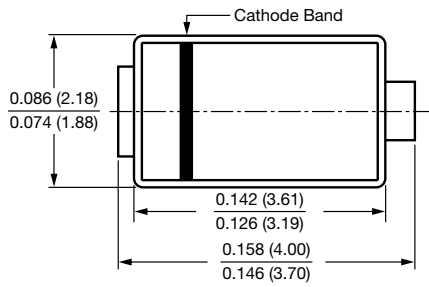Fig. 5 - Typical Instantaneous Forward Characteristics

Fig. 3 - Forward Power Loss Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)

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