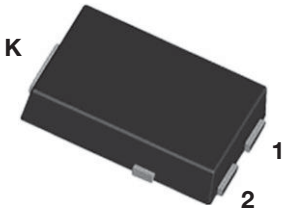
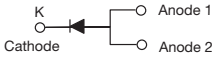
Surface-Mount ESD Capability Rectifiers

eSMP® Series



SMPC (TO-277A)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Oxid planar chip junction
- Low forward voltage drop
- ESD capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

RoHS COMPLIANT
HALOGEN FREE

DESIGN SUPPORT TOOLS

click logo to get started

3D Models Available

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	100 V, 200 V, 400 V, 600 V
I_{FSM}	60 A
I_R	10 µA
V_F at I_F = 4.0 A, (125 °C)	0.91 V
T_J max.	175 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: SMPC (TO-277A)

Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade
Base P/NHM3_X - halogen-free, RoHS-compliant and AEC-Q101 qualified
("_X" denotes revision code e.g. A, B,.....)

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	SE40PB	SE40PD	SE40PG	SE40PJ	UNIT
Device marking code		40B	40D	40G	40J	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Maximum DC forward current	I_F (1)	4.0				A
	I_F (2)	2.4				
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	60				A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175				°C

Notes

(1) Mounted on 14 mm x 14 mm pad areas, 2 oz. FR4 PCB
(2) Free air, mounted on recommended copper pad area

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 2.0 A	T_A = 25 °C	V_F (1)	0.92	-	V
	I_F = 4.0 A			1.00	1.05	
	I_F = 2.0 A	T_A = 125 °C		0.82	-	
	I_F = 4.0 A			0.91	0.96	
Reverse current	rated V_R	T_A = 25 °C	I_R (2)	0.1	10	μA
		T_A = 125 °C		19	150	
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.2	-	μs
Typical junction capacitance	4.0 V, 1 MHz		C_J	28	-	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**	**SE40PB**	**SE40PD**	**SE40PG**	**SE40PJ**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	70				°C/W
	$R_{\theta JM}$ (2)	6.6				

Notes

(1) Free air, mounted on recommended PCB 1 oz. pad area; thermal resistance $R_{\theta JA}$ - junction to ambient

(2) Units mounted on PCB with 14 mm x 14 mm pad areas, 2 oz. FR4 PCB; $R_{\theta JM}$ - junction to mount

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

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SE40PJ-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SE40PJ-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SE40PJHM3_A/H (1)	0.10	H	1500	7" diameter plastic tape and reel
SE40PJHM3_A/I (1)	0.10	I	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

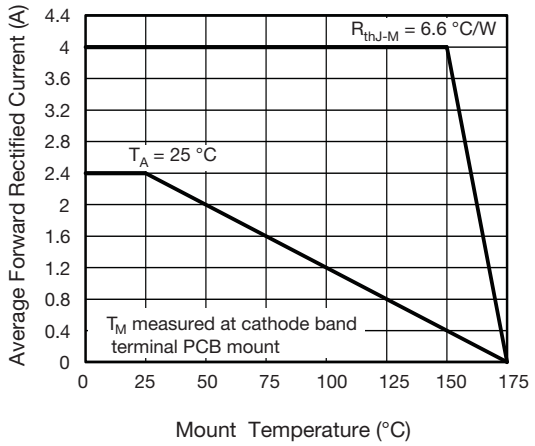

Fig. 1 - Maximum Forward Current Derating Curve

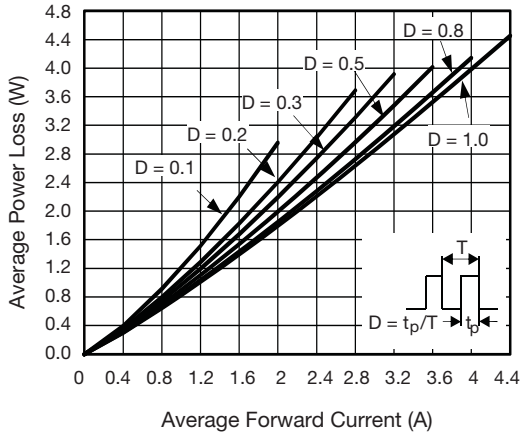

Fig. 2 - Forward Power Loss Characteristics

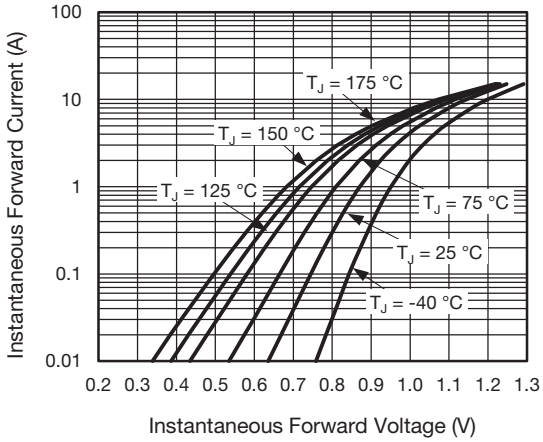

Fig. 3 - Typical Instantaneous Forward Characteristics

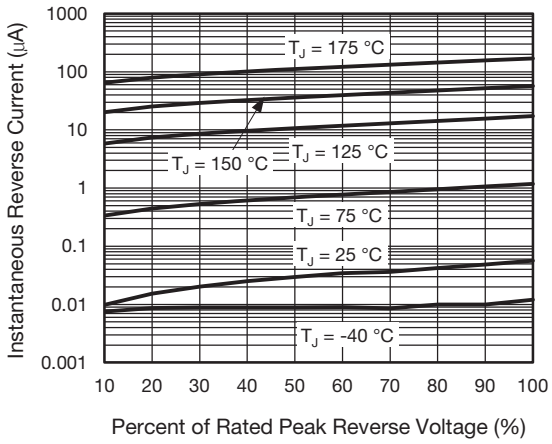

Fig. 4 - Typical Reverse Leakage Characteristics

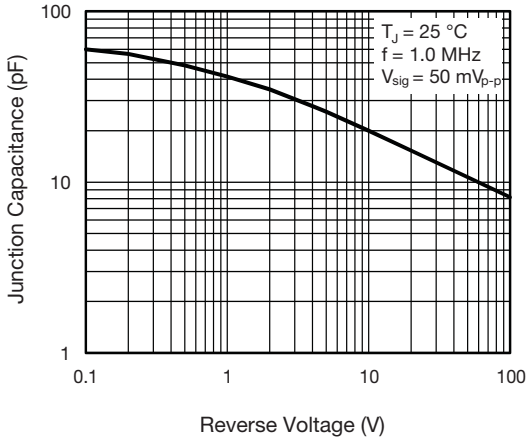

Fig. 5 - Typical Junction Capacitance

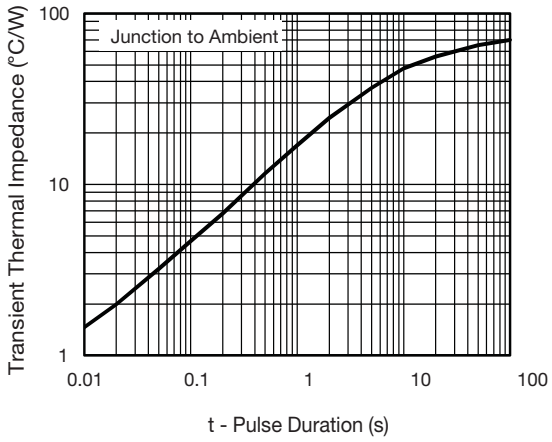

Fig. 6 - Typical Transient Thermal Impedance

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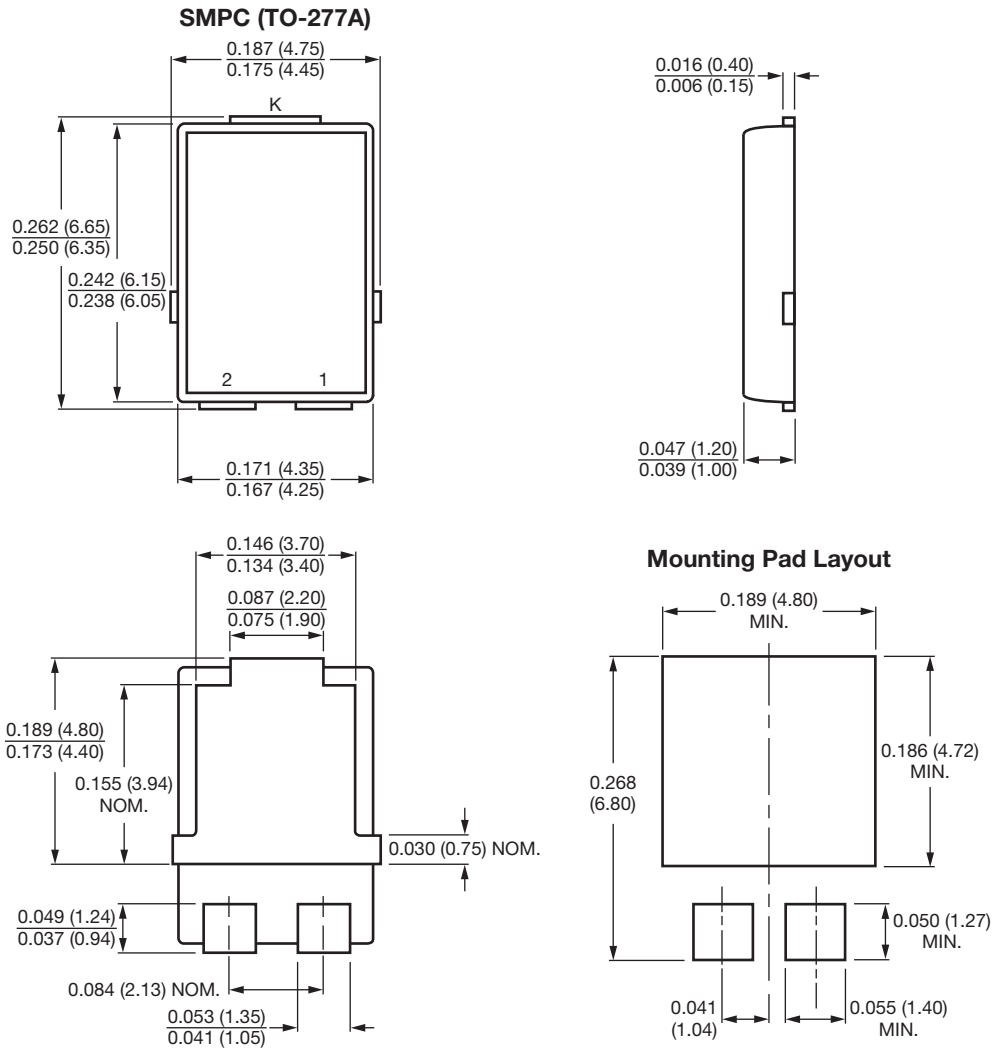
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A

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