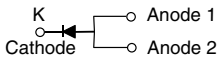
High Current Density Standard Avalanche Surface-Mount Rectifiers

eSMP® Series

SMPC (TO-277A)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Glass passivated pellet chip junction
- Controlled avalanche characteristics
- Low leakage current
- High forward surge 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

LINKS TO ADDITIONAL RESOURCES

3D Models

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	200 V, 400 V, 600 V, 800 V, 1000 V
I_{FSM}	70 A
E_{AS}	20 mJ
V_F at I_F = 3 A	0.90 V
T_J max.	175 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

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

PARAMETER		SYMBOL	AS3PD	AS3PG	AS3PJ	AS3PK	AS3PM	UNIT
Device marking code			AS3D	AS3G	AS3J	AS3K	AS3M	
Max. repetitive peak reverse voltage		V_{RRM}	200	400	600	800	1000	V
Max. DC forward current (fig. 1)		I_F (1)	3.0					A
		I_F (2)	2.1					
Peak forward surge current 10 ms single half sine-wave superimposed on rated load		I_{FSM}	70					A
Non-repetitive avalanche energy at T_J = 25 °C	I_{AS} = 2.5 A max.	E_{AS}	20					mJ
	I_{AS} = 1.0 A typical		30					
Operating junction and storage temperature range		T_J, T_{STG}	-55 to +175					°C

Notes

(1) Mounted on 10 mm x 10 mm pad areas, 1 oz. FR4 PCB

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

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 1.5 A	T_A = 25 °C	V_F (1)	0.92	-	V
	I_F = 3.0 A			1.00	1.10	
	I_F = 1.5 A	T_A = 125 °C		0.81	-	
	I_F = 3.0 A			0.90	0.95	
Reverse current	rated V_R	T_A = 25 °C	I_R (2)	0.28	10	µA
		T_A = 125 °C		62	150	
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	1.2	-	µs
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	37	-	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**	**AS3PD**	**AS3PG**	**AS3PJ**	**AS3PK**	**AS3PM**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	80					°C/W
	$R_{\theta JM}$ (2)	5					

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 10 mm x 10 mm copper pad areas, 1 oz. FR4 PCB; $R_{\theta JM}$ - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
AS3PJ-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
AS3PJ-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
AS3PJHM3_A/H (1)	0.10	H	1500	7" diameter plastic tape and reel
AS3PJHM3_A/I (1)	0.10	I	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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

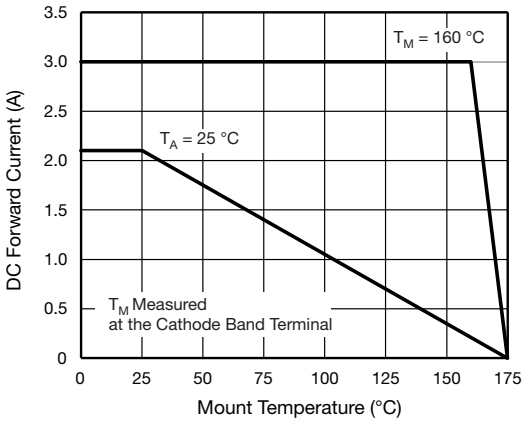


Fig. 1 - Maximum Forward Current Derating Curve

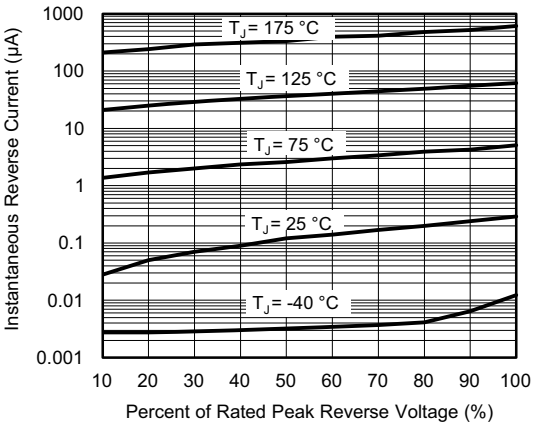


Fig. 4 - Typical Reverse Leakage Characteristics

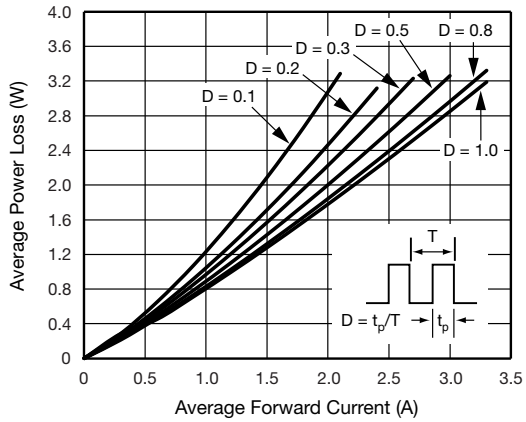


Fig. 2 - Forward Power Loss Characteristics

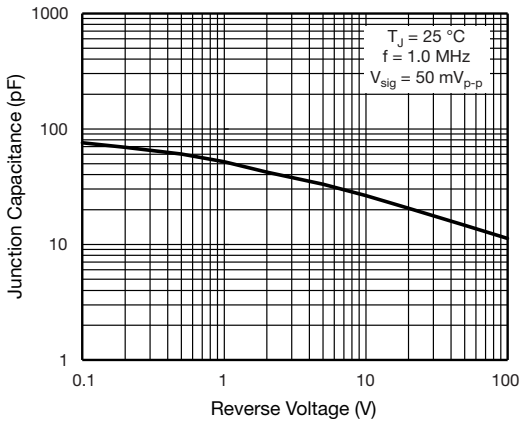


Fig. 5 - Typical Junction Capacitance

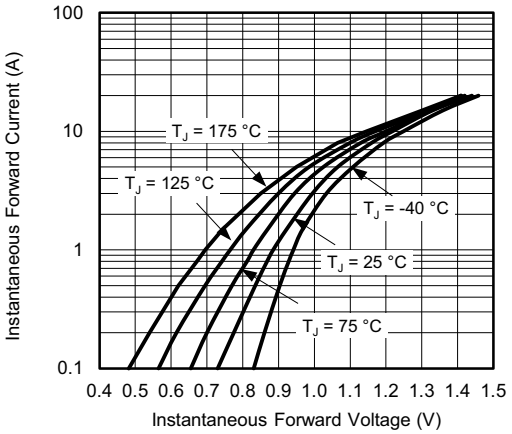


Fig. 3 - Typical Instantaneous Forward Characteristics

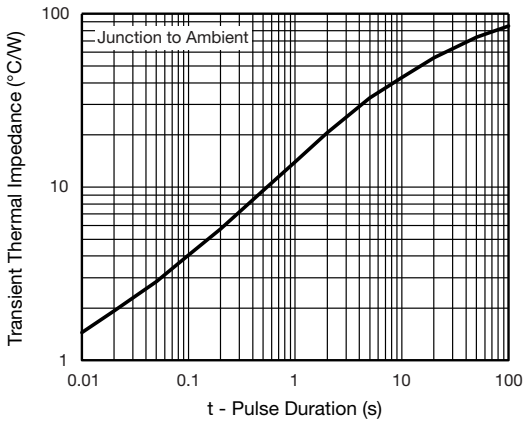
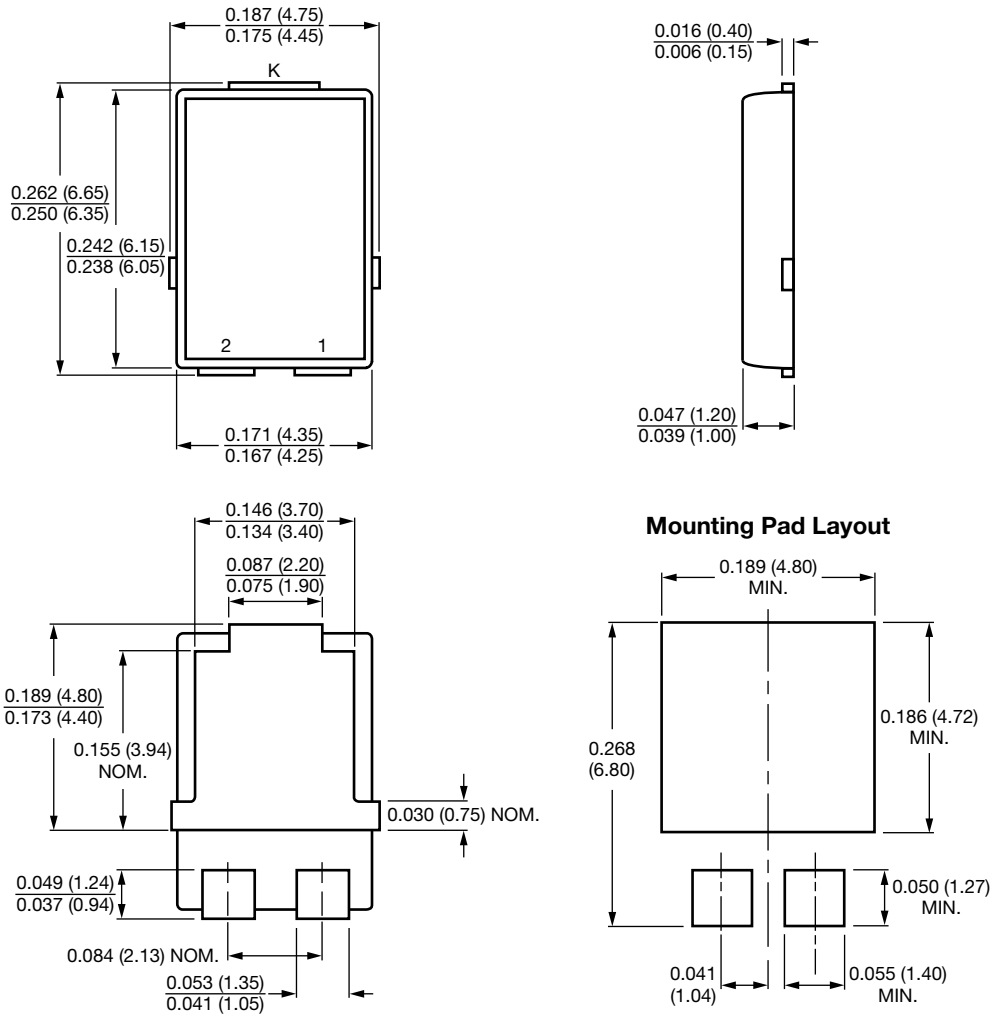


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPC (TO-277A)



Conform to JEDEC® TO-277A

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