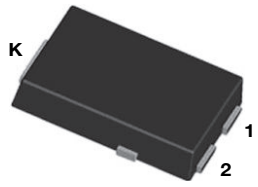
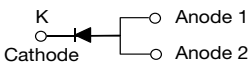
Fast Switching Avalanche Surface-Mount Rectifiers

eSMP® Series



SMPC (TO-277A)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Glass passivated pellet chip junction
- Fast reverse recovery time
- 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

ADDITIONAL RESOURCES

3D Models

TYPICAL APPLICATIONS

For use in lighting, fast switching 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 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	800 V, 1000 V
I_{FSM}	50 A
t_{rr}	120 ns
E_{AS}	20 mJ
V_F at I_F = 3.0 A	1.26 V
T_J max.	175 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

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

PARAMETER		SYMBOL	AR3PK	AR3PM	UNIT
Device marking code			AR3K	AR3M	
Maximum repetitive peak reverse voltage		V_{RRM}	800	1000	V
Maximum DC forward current (fig. 1)		I_F (1)	3.0		A
		I_F (2)	1.6		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load		I_{FSM}	50		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 typ.		30		
Operating junction and storage temperature range		T_J, T_{STG}	-55 to +175		°C

Notes
(1) Mounted on 20 mm x 20 mm pad areas, 1 oz. FR4 PCB
(2) Free air, mounted on recommended pad area

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 3.0 A	T_A = 25 °C	V_F (1)	1.55	1.9	V
		T_A = 125 °C		1.26	1.6	
Reverse current	Rated V_R	T_A = 25 °C	I_R (2)	0.34	10	µA
		T_A = 125 °C		110	500	
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	95	120	ns
Typical junction capacitance per diode	Rated V_R = 4.0 V, 1 MHz		C_J	34	-	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**	**AR3PK**	**AR3PM**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	85		°C/W
	$R_{\theta JM}$ (2)	5		

Notes

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

(2) Units mounted on PCB with 20 mm x 20 mm copper pad areas; $R_{\theta JM}$ - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
AR3PM-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
AR3PM-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
AR3PMHM3_A/H (1)	0.10	H	1500	7" diameter plastic tape and reel
AR3PMHM3_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)

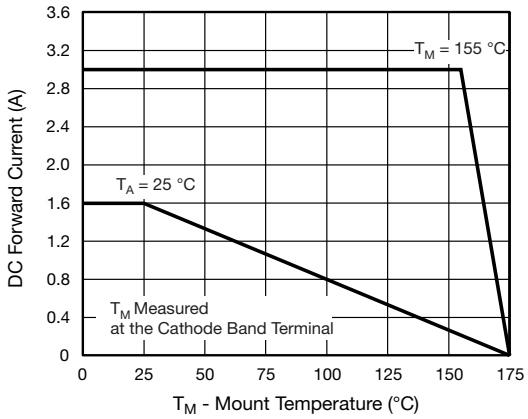


Fig. 1 - Maximum Forward Current Derating Curve

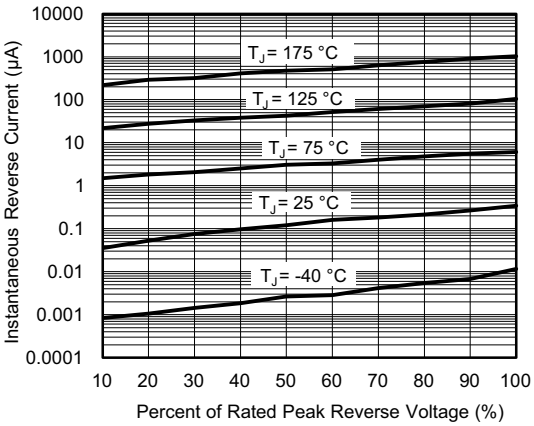


Fig. 4 - Typical Reverse Leakage Characteristics

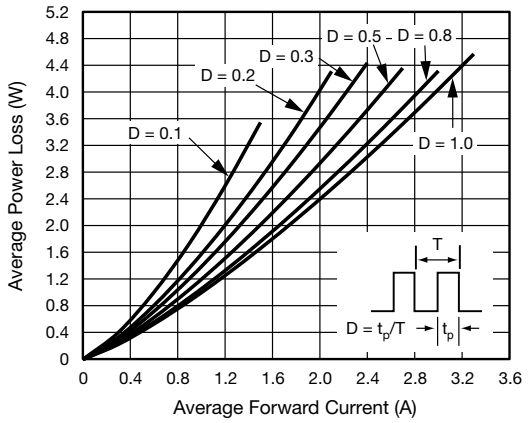


Fig. 2 - Average Power Loss Characteristics

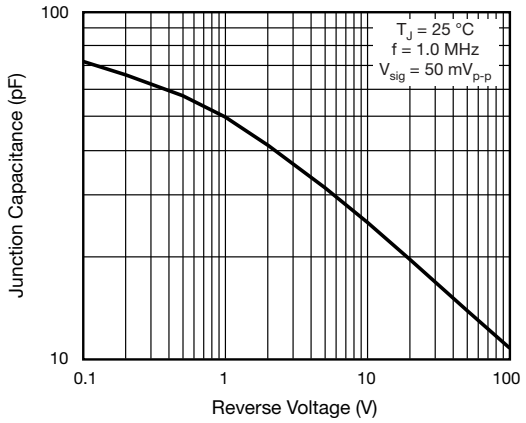


Fig. 5 - Typical Junction Capacitance

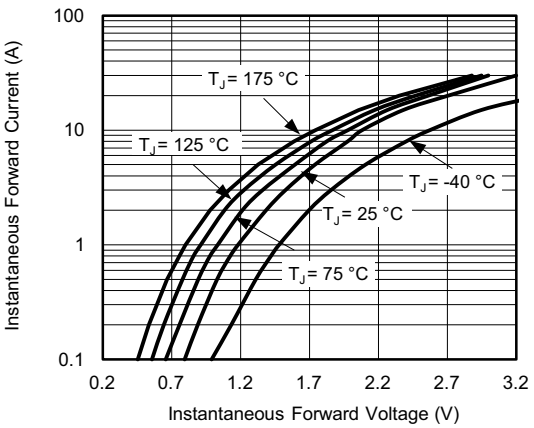


Fig. 3 - Typical Instantaneous Forward Characteristics

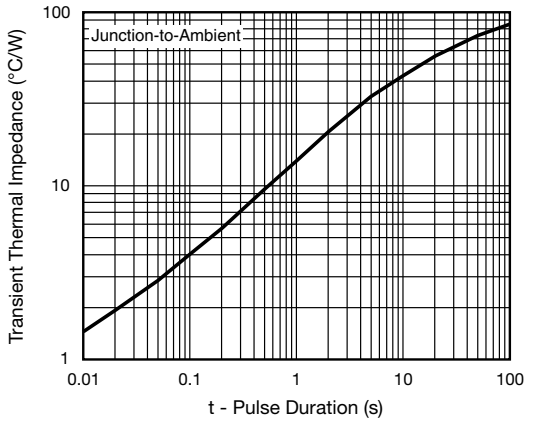
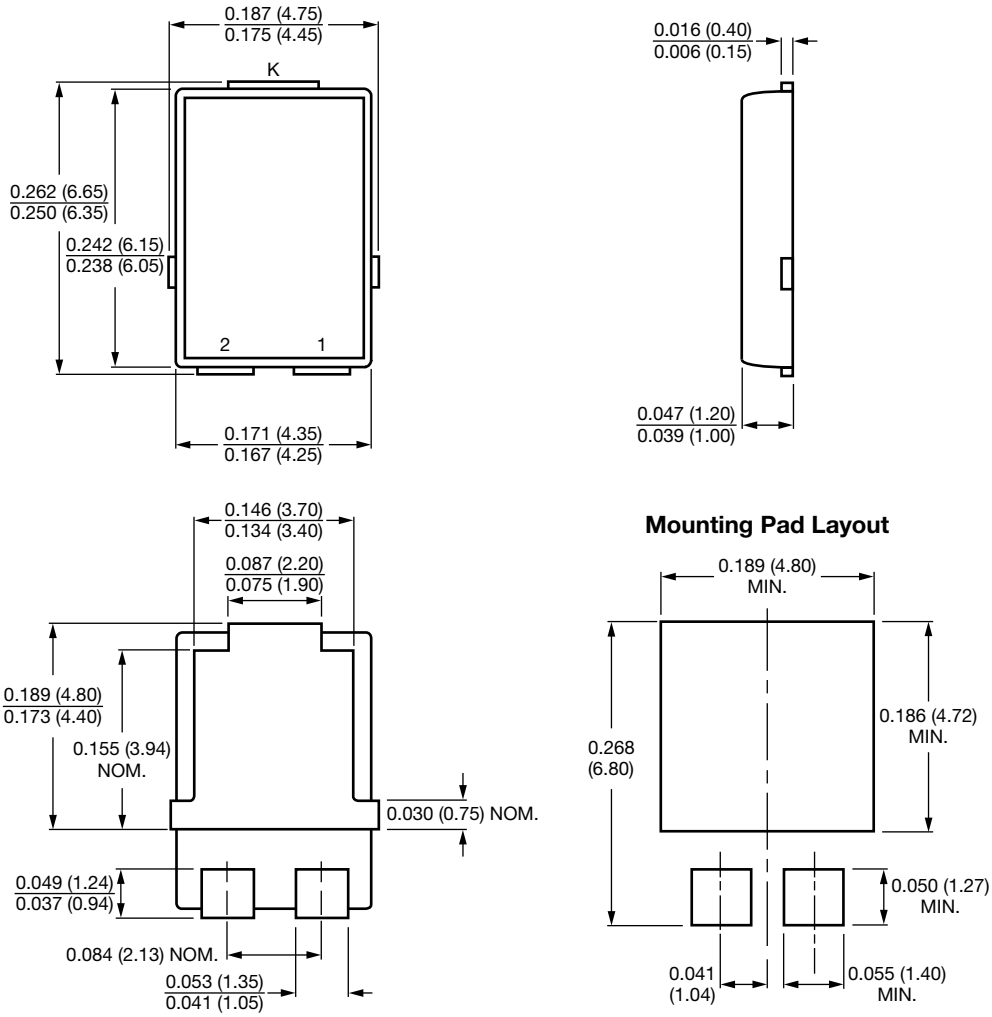


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPC (TO-277A)



Conform to JEDEC® TO-277A

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