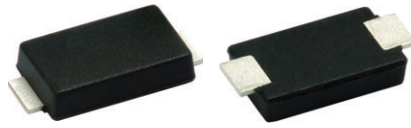


# Surface-Mount PAR<sup>®</sup> Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions

## eSMP<sup>®</sup> Series



Top View

Bottom View

### SlimSMA (DO-221AC)

Cathode Anode

## LINKS TO ADDITIONAL RESOURCES


[3D Models](#)

### PRIMARY CHARACTERISTICS

$V_{BR}$	6.8 V to 51 V
$V_{WM}$	5.8 V to 43.6 V
$P_{PPM}$ (10 x 1000 $\mu$ s)	600 W
$P_D$ at $T_M = 65^\circ\text{C}$	6 W
$T_J$ max.	185 $^\circ\text{C}$
Polarity	Unidirectional
Package	SlimSMA (DO-221AC)

## FEATURES

- Very low profile - typical height of 0.95 mm
- Junction passivation optimized design passivated anisotropic rectifier technology
- $T_J = 185^\circ\text{C}$  capability suitable for high reliability and automotive requirement
- Ideal for automated placement
- Unidirectional only
- Excellent clamping capability
- Peak pulse power: 600 W (10/1000  $\mu$ s)
- AEC-Q101 qualified
- ESD capability: IEC 61000-4-2 level 4
  - 15 kV (air)
  - 8 kV (contact)
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260  $^\circ\text{C}$
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

AUTOMOTIVE GRADE


**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, and telecommunication.

## MECHANICAL DATA

**Case:** SlimSMA (DO-221AC)

Molding compound meets UL 94 V-0 flammability rating  
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 JESD22-B102

HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** color band denotes cathode end

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

PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform	$P_{PPM}^{(1)}$	600	W
Peak pulse current with a 10/1000 $\mu$ s waveform	$I_{PPM}^{(1)}$	See next table	A
Power dissipation on infinite heat sink, $T_M = 65^\circ\text{C}$	$P_D^{(2)}$	6	W
Power dissipation, $T_M = 25^\circ\text{C}$	$P_D^{(3)}$	1.1	
Operating junction and storage temperature range	$T_J, T_{STG}$	-65 to +185	$^\circ\text{C}$

#### Notes

(1) Non-repetitive current pulse, per fig. 3 and derated above  $T_A = 25^\circ\text{C}$  per fig. 2.

(2) Power dissipation mounted on infinite heat sink

(3) Power dissipation mounted on minimum recommended pad layout



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)											
DEVICE TYPE	DEVICE MARKING CODE	BREAKDOWN VOLTAGE V <sub>BR</sub> <sup>(1)</sup> AT I <sub>T</sub> (V)			TEST CURRENT I <sub>T</sub> (mA)	STAND-OFF VOLTAGE V <sub>WM</sub> (V)	MAXIMUM REVERSE LEAKAGE AT V <sub>WM</sub> I <sub>R</sub> (μA)	T <sub>J</sub> = 150 °C MAXIMUM REVERSE LEAKAGE AT V <sub>WM</sub> I <sub>R</sub> (μA)	MAXIMUM PEAK PULSE SURGE CURRENT I <sub>PPM</sub> (A)	MAXIMUM CLAMPING VOLTAGE AT I <sub>PPM</sub> V <sub>C</sub> (V)	TYPICAL TEMP. COEFFICIENT OF V <sub>BR</sub> <sup>(2)</sup> α <sub>T</sub> (%/°C)
		MIN.	NOM.	MAX.							
TA6F6.8A	AEP	6.45	6.80	7.14	10	5.80	500	1000	57.1	10.5	0.047
TA6F7.5A	AGP	7.13	7.50	7.88	10	6.40	250	500	53.1	11.3	0.052
TA6F8.2A	AKP	7.79	8.20	8.61	10	7.02	100	200	49.6	12.1	0.056
TA6F9.1A	AMP	8.65	9.10	9.55	1.0	7.78	25	50	44.8	13.4	0.060
TA6F10A	APP	9.5	10.0	10.5	1.0	8.55	5.0	20	41.4	14.5	0.064
TA6F11A	ARP	10.5	11.0	11.6	1.0	9.40	2.0	5.0	38.5	15.6	0.067
TA6F12A	ATP	11.4	12.0	12.6	1.0	10.2	2.0	5.0	35.9	16.7	0.070
TA6F13A	AVP	12.4	13.0	13.7	1.0	11.1	2.0	5.0	33.0	18.2	0.072
TA6F15A	AXP	14.3	15.0	15.8	1.0	12.8	1.0	5.0	28.3	21.2	0.076
TA6F16A	AZP	15.2	16.0	16.8	1.0	13.6	1.0	5.0	26.7	22.5	0.078
TA6F18A	BEP	17.1	18.0	18.9	1.0	15.3	1.0	5.0	23.5	25.5	0.080
TA6F20A	BGP	19.0	20.0	21.0	1.0	17.1	1.0	5.0	21.7	27.7	0.082
TA6F22A	BKP	20.9	22.0	23.1	1.0	18.8	1.0	5.0	19.6	30.6	0.084
TA6F24A	BMP	22.8	24.0	25.2	1.0	20.5	1.0	5.0	18.1	33.2	0.085
TA6F27A	BPP	25.7	27.0	28.4	1.0	23.1	1.0	5.0	16.0	37.5	0.087
TA6F30A	BRP	28.5	30.0	31.5	1.0	25.6	1.0	5.0	14.5	41.4	0.088
TA6F33A	BTP	31.4	33.0	34.7	1.0	28.2	1.0	5.0	13.1	45.7	0.089
TA6F36A	BVP	34.2	36.0	37.8	1.0	30.8	1.0	5.0	12.0	49.9	0.090
TA6F39A	BXP	37.1	39.0	41.0	1.0	33.3	1.0	5.0	11.1	53.9	0.091
TA6F43A	BZP	40.9	43.0	45.2	1.0	36.8	1.0	10.0	10.1	59.3	0.092
TA6F47A	CEP	44.7	47.0	49.4	1.0	40.2	1.0	10.0	9.3	64.8	0.092
TA6F51A	CGP	48.5	51.0	53.6	1.0	43.6	1.0	10.0	8.6	70.1	0.093

Notes

(1) Pulse test: t<sub>p</sub> ≤ 50 ms

(2) To calculate V<sub>BR</sub> vs. junction temperature, use the following formula: V<sub>BR</sub> at T<sub>J</sub> = V<sub>BR</sub> at 25 °C x (1 + α<sub>T</sub> x (T<sub>J</sub> - 25))

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance, junction to ambient	R <sub>θJA</sub> <sup>(1)</sup>	145	°C/W
Typical thermal resistance, junction to mount	R <sub>θJM</sub> <sup>(2)</sup>	20	°C/W

Notes

(1) Mounted on minimum recommended pad layout

(2) Mounted on infinite heat sink

IMMUNITY TO STATIC ELECTRICAL DISCHARGE TO THE FOLLOWING STANDARDS (T <sub>A</sub> = 25 °C unless otherwise noted)					
STANDARD	TEST TYPE	TEST CONDITIONS	SYMBOL	CLASS	VALUE
IEC 61000-4-2	Human body model (contact mode)	C = 150 pF, R = 330 Ω	V <sub>C</sub>	4	> 8 kV
	Human body model (air discharge mode)				> 15 kV

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TA6F6.8AHM3_A/H <sup>(1)</sup>	0.032	H	3500	7" diameter plastic tape and reel
TA6F6.8AHM3_A/I <sup>(1)</sup>	0.032	I	14 000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified



**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

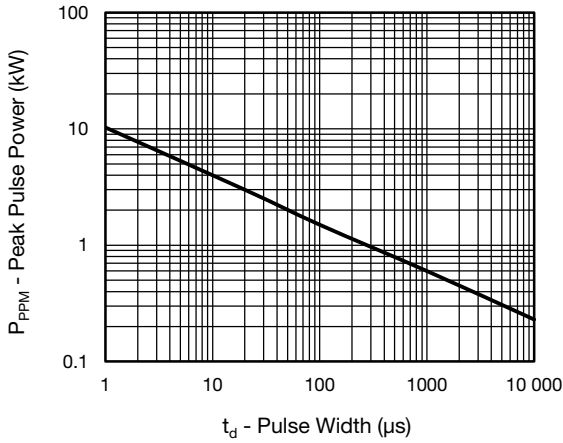


Fig. 1 - Peak Pulse Power Rating Curve

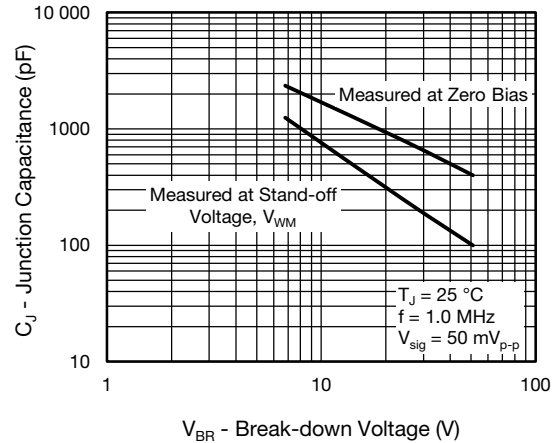


Fig. 4 - Typical Junction Capacitance

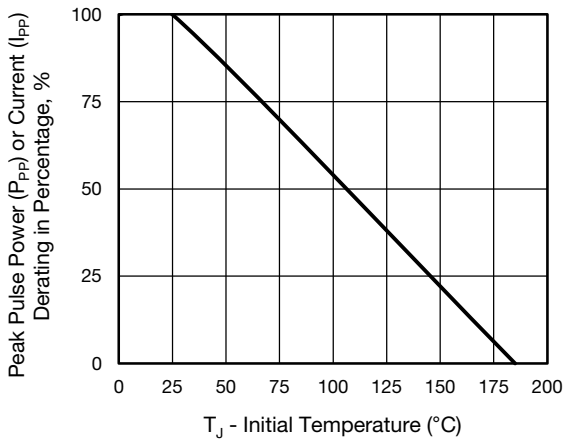


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

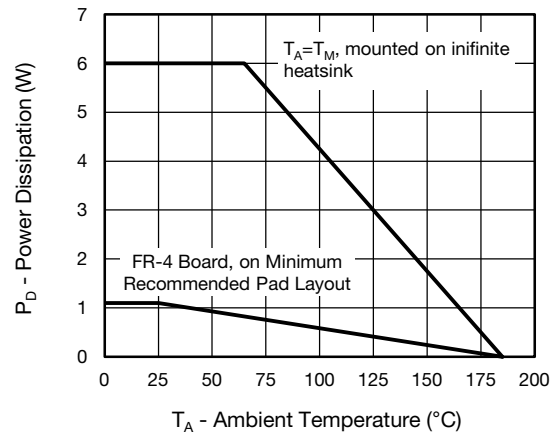


Fig. 5 - Power Dissipation Derating Curve

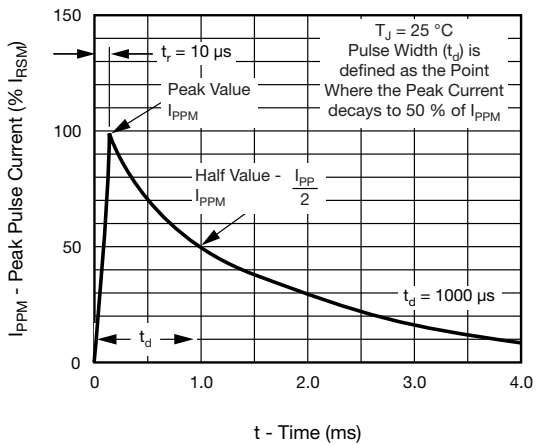


Fig. 3 - Pulse Waveform

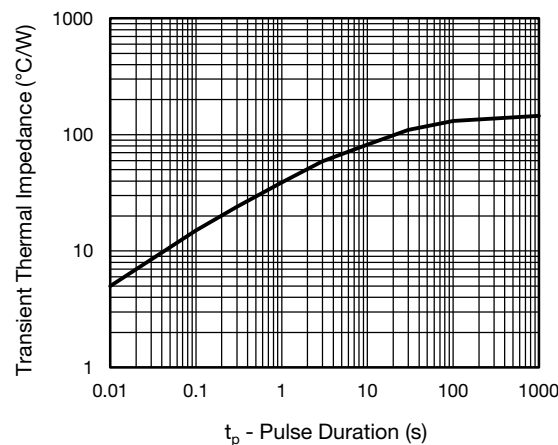
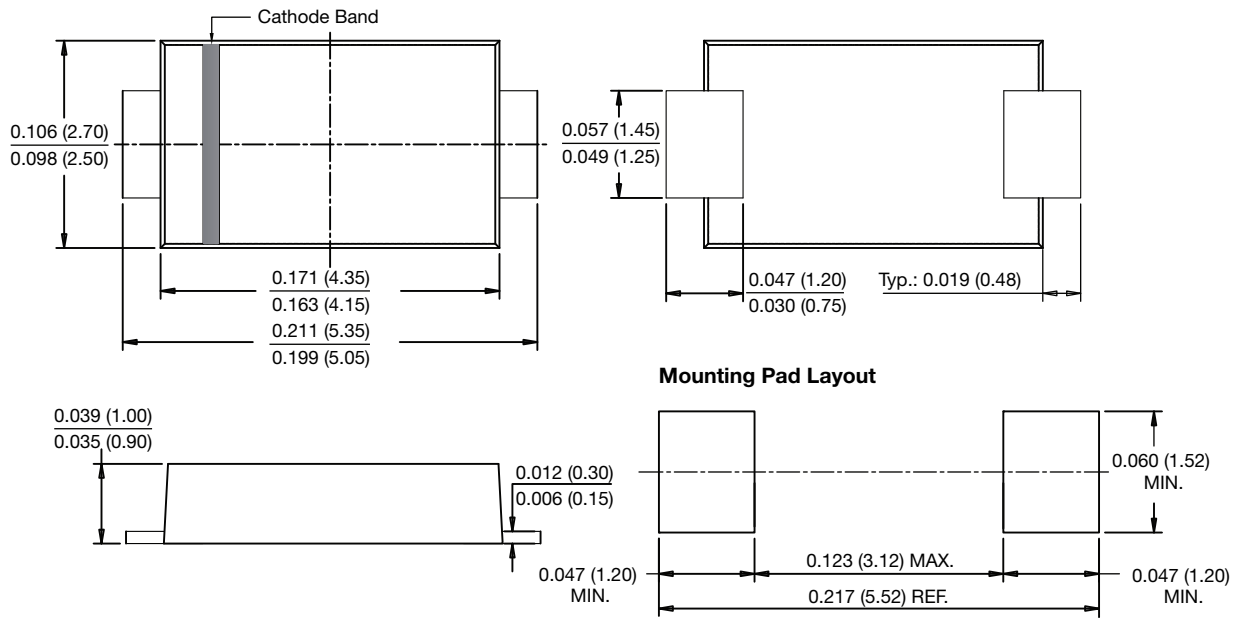


Fig. 6 - Typical Transient Thermal Impedance



**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**SlimSMA (DO-221AC)**





## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.