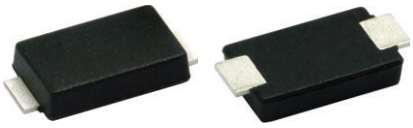
Surface-Mount PAR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions

eSMP® Series



Top View Bottom View

SlimSMA (DO-221AC)



LINKS TO ADDITIONAL RESOURCES

3D Models | Related Documents | Packages | Marking

PRIMARY CHARACTERISTICS	
V_{BR}	12 V to 100 V
V_{WM}	10.2 V to 85.5 V
P_{PPM} (10 x 1000 µs)	600 W
P_D at T_M = 65 °C	8 W
T_J max.	185 °C
Polarity	Bidirectional
Package	SlimSMA (DO-221AC)

FEATURES

AUTOMOTIVE GRADE

RoHS COMPLIANT

HALOGEN FREE

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

TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lightning on ICs, MOSFET, signal lines of sensor units for automotive.

MECHANICAL DATA

Case: SlimSMA (DO-221AC)

Molding compound meets UL 94 V-0 flammability rating

Base P/NHM3 - halogen-free, RoHS-compliant and AEC-Q101 qualified

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD22-B102

HM3 suffix meets JESD 201 class 2 whisker test

Polarity: no cathode band for bidirectional types

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

PARAMETER		SYMBOL	VALUE	UNIT
Peak pulse power dissipation	with a 10/1000 µs waveform	P_{PPM} (1)	600	W
Peak pulse current	with a 10/1000 µs waveform	I_{PPM} (1)	See next table	A
Power dissipation	T_M = 65 °C	P_D (2)	8	W
	T_A = 25 °C	P_D (3)	1.1	
Operating junction and storage temperature range		T_J , T_{STG}	-65 to +185	°C

Notes

(1) Non-repetitive current pulse, per fig. 3 and derated above T_A = 25 °C per fig. 2.

(2) Power dissipation mounted on infinite heat sink

(3) Power dissipation mounted on minimum recommended pad layout

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

DEVICE TYPE	DEVICE MARKING CODE	BREAKDOWN VOLTAGE V_{BR} (1) AT I_T (V)			TEST CURRENT I_T (mA)	STAND-OFF VOLTAGE V_{WM} (V)	MAXIMUM REVERSE LEAKAGE AT V_{WM} I_R (µA)	T_J = 150 °C MAXIMUM REVERSE LEAKAGE AT V_{WM} I_R (µA)	MAXIMUM PEAK PULSE SURGE CURRENT I_{PPM} (A)	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)	TYPICAL TEMP. COEFFICIENT OF V_{BR} (2) αT (%/°C)
		MIN.	NOM.	MAX.							
TA6F12CA	ATP	11.4	12.0	12.6	1.0	10.2	2.0	6.0	35.9	16.7	0.070
TA6F13CA	AVP	12.4	13.0	13.7	1.0	11.1	2.0	5.0	33.0	18.2	0.072
TA6F15CA	AXP	14.3	15.0	15.8	1.0	12.8	1.0	5.0	28.3	21.2	0.076
TA6F16CA	AZP	15.2	16.0	16.8	1.0	13.6	1.0	5.0	26.7	22.5	0.078
TA6F18CA	BEP	17.1	18.0	18.9	1.0	15.3	1.0	5.0	23.8	25.2	0.080
TA6F20CA	BGP	19.0	20.0	21.0	1.0	17.1	1.0	5.0	21.7	27.7	0.082
TA6F22CA	BKP	20.9	22.0	23.1	1.0	18.8	1.0	5.0	19.6	30.6	0.084
TA6F24CA	BMP	22.8	24.0	25.2	1.0	20.5	1.0	5.0	18.1	33.2	0.085
TA6F27CA	BPP	25.7	27.0	28.4	1.0	23.1	1.0	5.0	16.0	37.5	0.087
TA6F30CA	BRP	28.5	30.0	31.5	1.0	25.6	1.0	5.0	14.5	41.4	0.088
TA6F33CA	BTP	31.4	33.0	34.7	1.0	28.2	1.0	5.0	13.1	45.7	0.089
TA6F36CA	BVP	34.2	36.0	37.8	1.0	30.8	1.0	5.0	12.0	49.9	0.090
TA6F39CA	BXP	37.1	39.0	41.0	1.0	33.3	1.0	5.0	11.1	53.9	0.091
TA6F43CA	BZP	40.9	43.0	45.2	1.0	36.8	1.0	5.0	10.1	59.3	0.092
TA6F47CA	CEP	44.7	47.0	49.4	1.0	40.2	1.0	10.0	9.3	64.8	0.092
TA6F51CA	CGP	48.5	51.0	53.6	1.0	43.6	1.0	10.0	8.6	70.1	0.093
TA6F56CA	CKP	53.2	56.0	58.8	1.0	47.8	1.0	10.0	7.8	77.0	0.093
TA6F62CA	CMP	58.9	62.0	65.1	1.0	53.0	1.0	10.0	7.1	85.0	0.094
TA6F68CA	CPP	64.6	68.0	71.4	1.0	58.1	1.0	10.0	6.5	92.0	0.095
TA6F75CA	CRP	71.3	75.0	78.8	1.0	64.1	1.0	10.0	5.8	104	0.095
TA6F82CA	CTP	77.9	82.0	86.1	1.0	70.1	1.0	10.0	5.3	113	0.095
TA6F91CA	CVP	86.5	91.0	95.5	1.0	77.8	1.0	10.0	4.8	125	0.096
TA6F100CA	CXP	95.0	100	105	1.0	85.5	1.0	10.0	4.4	137	0.096

Notes

(1) Pulse test: $t_p \leq 50$ ms

(2) To calculate V_{BR} vs. junction temperature, use the following formula: V_{BR} at T_J = V_{BR} at 25 °C x (1 + αT x (T_J - 25))

(3) All terms and symbols are consistent with ANSI / IEEE C62.35

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

PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Thermal resistance	$R_{\theta JA}$ (1)	120	150	°C/W
	$R_{\theta JM}$ (2)	12	15	°C/W

Notes

(1) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz. standard footprint

(2) Thermal resistance junction-to-mount to follow JEDEC® 51-14, using TDIM (transient dual interface test method)

IMMUNITY TO STATIC ELECTRICAL DISCHARGE TO THE FOLLOWING STANDARDS (T_A = 25 °C unless otherwise noted)

STANDARD	TEST TYPE	TEST CONDITIONS	SYMBOL	VALUE
IEC 61000-4-2	Contact discharge	C = 150 pF, R = 330 Ω	ESD	30 kV
	Air discharge			30 kV

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ORDERING INFORMATION TABLE

Device code

T	A	6	F	xxx	CA	H	M3
1	2	3	4	5	6	7	8

1 - Vishay PAR® TVS product

2 - Automotive TVS designator

3 - Peak pulse power rating (6 = 600 W)

4 - Package type (F = flat package)

5 - Nominal breakdown voltage

6 - Breakdown voltage tolerance and polarity (CA ± 5 %, bidirectional)

7 - Quality grade (H = AEC-Q101 qualified, - = industry grade)

8 - Material / environment category (M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free

ORDERING INFORMATION (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TA6F12CAHM3/H (1)	0.032	H	3500	7" diameter plastic tape and reel
TA6F12CAHM3/I (1)	0.032	I	14 000	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)

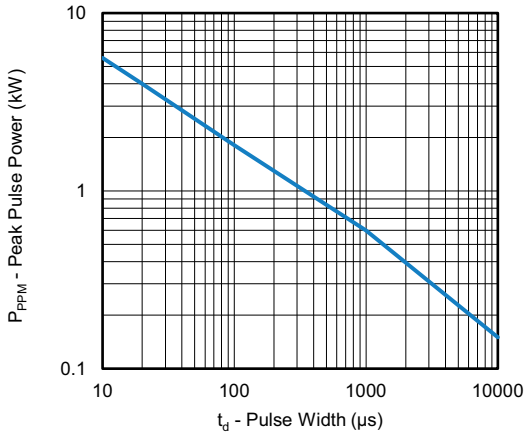

Fig. 1 - Peak Pulse Power Rating Curve

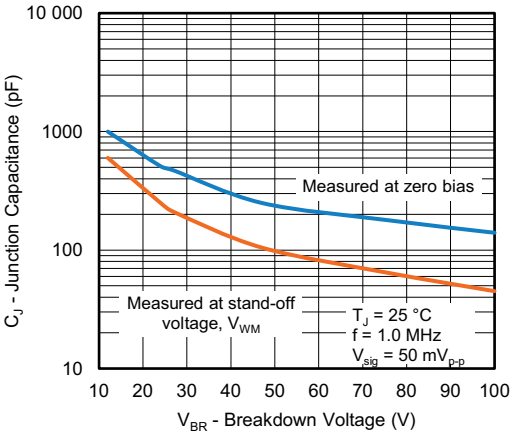

Fig. 4 - Typical Junction Capacitance

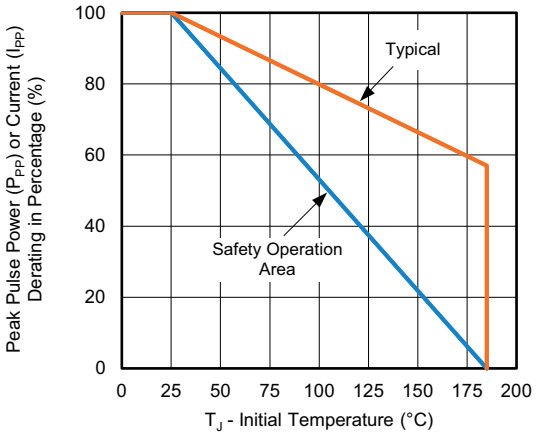

Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

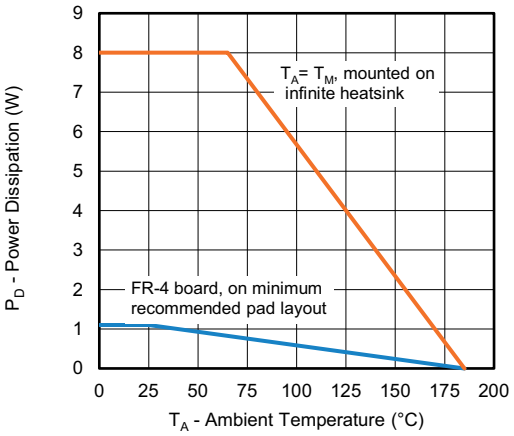

Fig. 5 - Power Dissipation Derating Curve

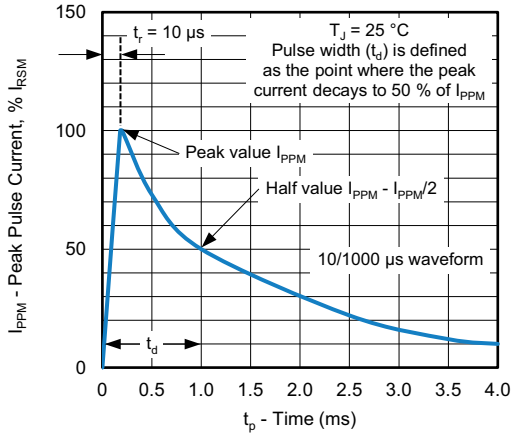

Fig. 3 - Pulse Waveform

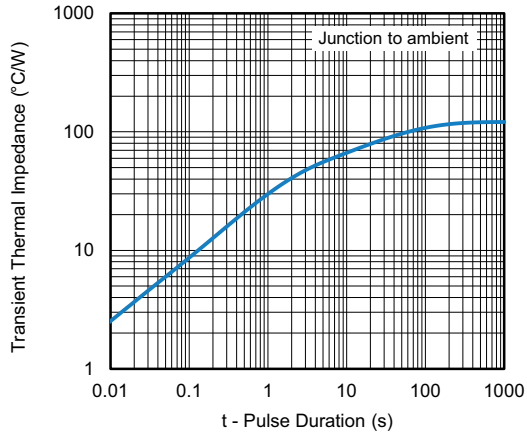

Fig. 6 - Typical Transient Thermal Impedance

Note

- Fig. 1, power calculations is based on IPPM times defined maximum clamping voltage by pulse width

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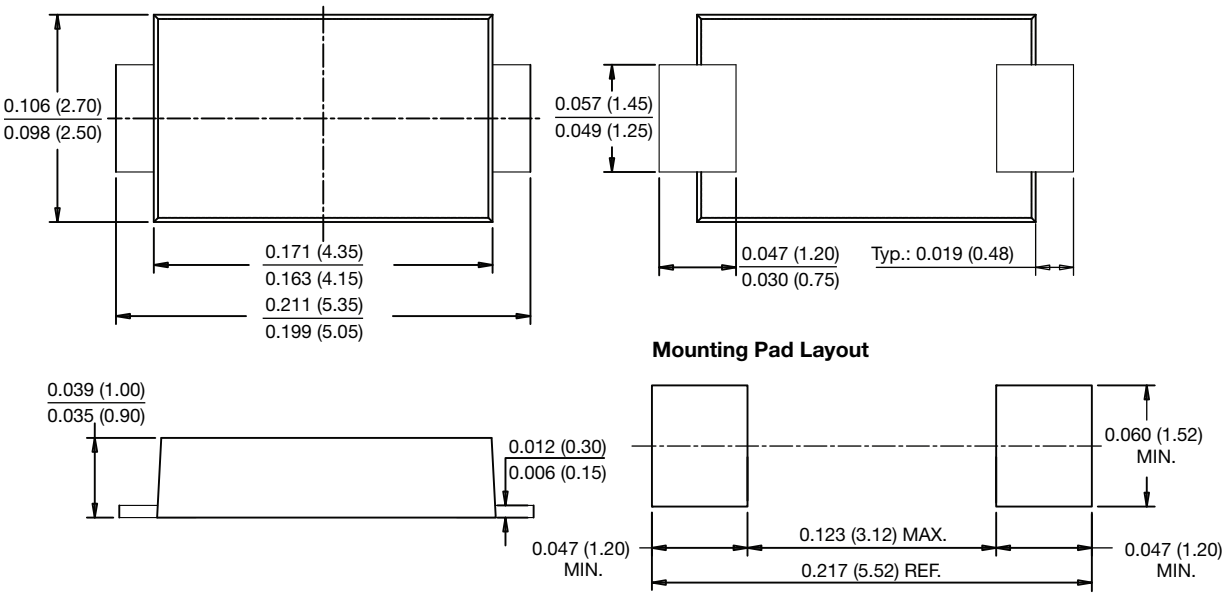
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SlimSMA (DO-221AC)



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