Surface-Mount PAR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions

eSMP® Series

Top View Bottom View

SlimSMAW (DO-221AD)

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	SlimSMAW (DO-221AD)

FEATURES

AUTOMOTIVE GRADE

RoHS COMPLIANT HALOGEN FREE

- Low profile package
- 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: SlimSMAW (DO-221AD)

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

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

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.							
TA6L12CA	ATL	11.4	12.0	12.6	1.0	10.2	2.0	6.0	35.9	16.7	0.070
TA6L13CA	AVL	12.4	13.0	13.7	1.0	11.1	2.0	5.0	33.0	18.2	0.072
TA6L15CA	AXL	14.3	15.0	15.8	1.0	12.8	1.0	5.0	28.3	21.2	0.076
TA6L16CA	AZL	15.2	16.0	16.8	1.0	13.6	1.0	5.0	26.7	22.5	0.078
TA6L18CA	BEL	17.1	18.0	18.9	1.0	15.3	1.0	5.0	23.8	25.2	0.080
TA6L20CA	BGL	19.0	20.0	21.0	1.0	17.1	1.0	5.0	21.7	27.7	0.082
TA6L22CA	BKL	20.9	22.0	23.1	1.0	18.8	1.0	5.0	19.6	30.6	0.084
TA6L24CA	BML	22.8	24.0	25.2	1.0	20.5	1.0	5.0	18.1	33.2	0.085
TA6L27CA	BPL	25.7	27.0	28.4	1.0	23.1	1.0	5.0	16.0	37.5	0.087
TA6L30CA	BRL	28.5	30.0	31.5	1.0	25.6	1.0	5.0	14.5	41.4	0.088
TA6L33CA	BTL	31.4	33.0	34.7	1.0	28.2	1.0	5.0	13.1	45.7	0.089
TA6L36CA	BVL	34.2	36.0	37.8	1.0	30.8	1.0	5.0	12.0	49.9	0.090
TA6L39CA	BXL	37.1	39.0	41.0	1.0	33.3	1.0	5.0	11.1	53.9	0.091
TA6L43CA	BZL	40.9	43.0	45.2	1.0	36.8	1.0	5.0	10.1	59.3	0.092
TA6L47CA	CEL	44.7	47.0	49.4	1.0	40.2	1.0	10.0	9.3	64.8	0.092
TA6L51CA	CGL	48.5	51.0	53.6	1.0	43.6	1.0	10.0	8.6	70.1	0.093
TA6L56CA	CKL	53.2	56.0	58.8	1.0	47.8	1.0	10.0	7.8	77.0	0.093
TA6L62CA	CML	58.9	62.0	65.1	1.0	53.0	1.0	10.0	7.1	85.0	0.094
TA6L68CA	CPL	64.6	68.0	71.4	1.0	58.1	1.0	10.0	6.5	92.0	0.095
TA6L75CA	CRL	71.3	75.0	78.8	1.0	64.1	1.0	10.0	5.8	104	0.095
TA6L82CA	CTL	77.9	82.0	86.1	1.0	70.1	1.0	10.0	5.3	113	0.095
TA6L91CA	CVL	86.5	91.0	95.5	1.0	77.8	1.0	10.0	4.8	125	0.096
TA6L100CA	CXL	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

ORDERING INFORMATION

Device code

T	A	6	L	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

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
TA6L12CAHM3/H[1]	0.033	H	3500	7" diameter plastic tape and reel
TA6L12CAHM3/I[1]	0.033	I	14 000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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

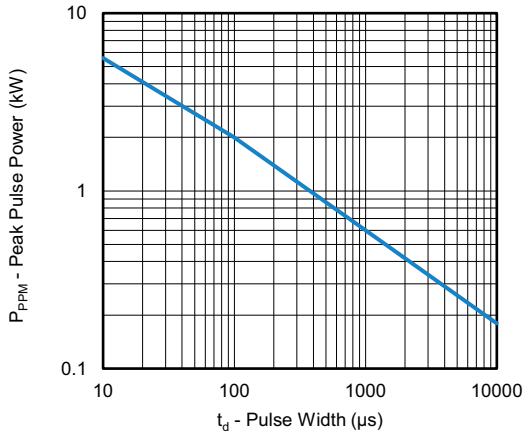


Fig. 1 - Peak Pulse Power Rating Curve

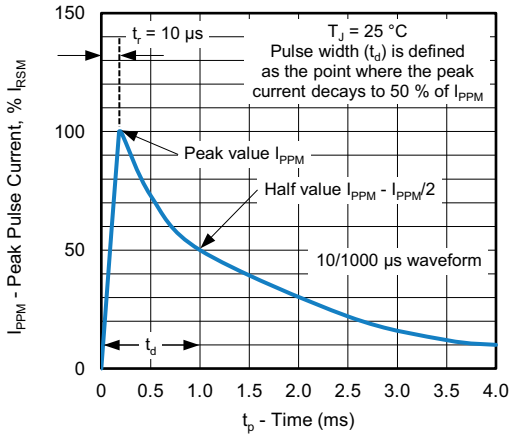


Fig. 3 - Pulse Waveform

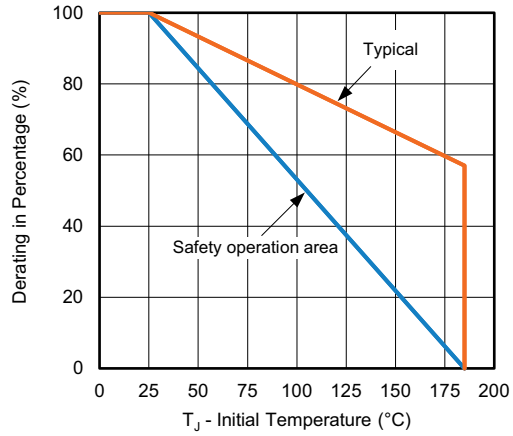


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

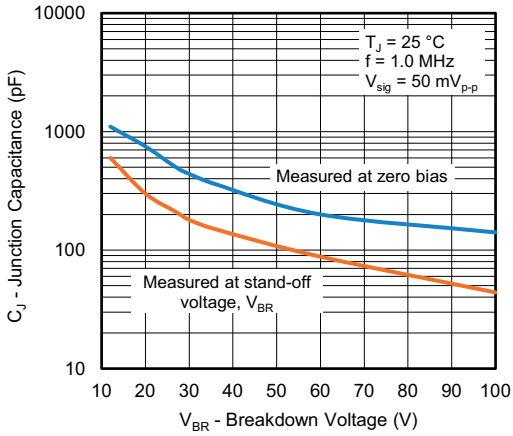


Fig. 4 - Typical Junction Capacitance

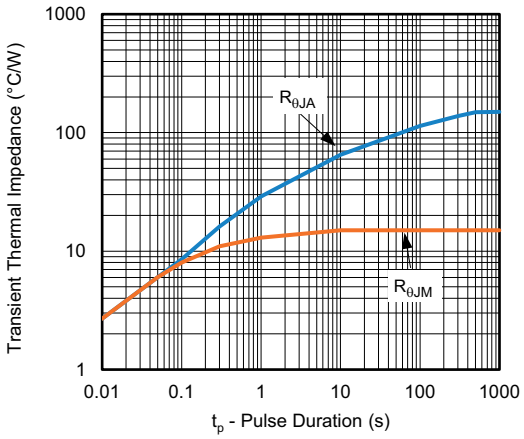


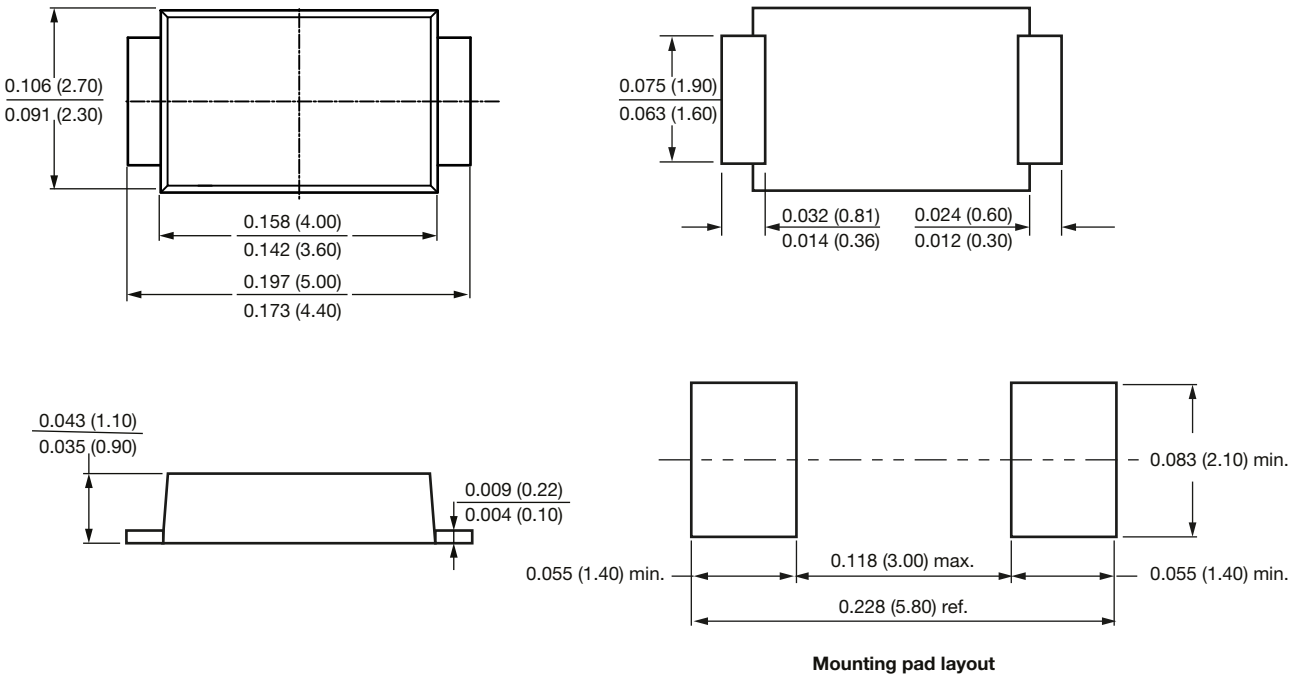
Fig. 5 - Typical Transient Thermal Impedance

Note

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

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SlimSMAW (DO-221AD)



Mounting pad layout

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