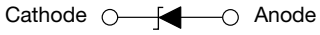
Surface Mount PAR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions

eSMP® Series

Top view Bottom view

SMF (DO-219AB)



PRIMARY CHARACTERISTICS	
V_{WM}	8.55 V to 43.6 V
V_{BR}	10 V to 51 V
P_{PPM}	400 W
P_D	1.0 W
T_J max.	185 °C
Polarity	Unidirectional
Package	SMF (DO-219AB)

FEATURES

- Low profile package
- Junction passivation optimized design passivated anisotropic rectifier technology
- T_J = 185 °C capability suitable for high reliability and automotive requirement
- Unidirectional only
- 400 W peak pulse power capability with a 10/1000 µs waveform
- Excellent clamping capability
- AEC-Q101 qualified
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Wave and reflow solderable
- Compatible to SOD-123W package case outline
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

HALOGEN FREE

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: SMF (DO-219AB)
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 JESD 22-B102
HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Peak power dissipation with a 10/1000 µs waveform (fig. 3)	P_{PPM} (1)	400	W
Peak power pulse current with a 10/1000 µs waveform (fig. 1)	I_{PPM} (1)	See next table	A
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

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_D (µA)	T_J = 150 °C MAXIMUM REVERSE LEAKAGE AT V_{WM} I_D (µA)	MAXIMUM PEAK PULSE SURGE CURRENT I_{PPM} (2) (A)	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)	TYPICAL TEMP. COEFFICIENT OF V_{BR} (3) αT (%/°C)
		MIN.	NOM.	MAX.							
T4F10A	APP	9.5	10.0	10.5	1.0	8.55	5.0	20	27.6	14.5	0.064
T4F11A	ARP	10.5	11.0	11.6	1.0	9.40	1.0	5.0	25.6	15.6	0.067
T4F12A	ATP	11.4	12.0	12.6	1.0	10.2	1.0	5.0	24.0	16.7	0.070
T4F13A	AVP	12.4	13.0	13.7	1.0	11.1	1.0	5.0	22.0	18.2	0.072
T4F15A	AXP	14.3	15.0	15.8	1.0	12.8	1.0	5.0	18.9	21.2	0.076
T4F16A	AZP	15.2	16.0	16.8	1.0	13.6	1.0	5.0	17.8	22.0	0.078
T4F18A	BEP	17.1	18.0	18.9	1.0	15.3	1.0	5.0	15.9	25.5	0.080
T4F20A	BGP	19.0	20.0	21.0	1.0	17.1	1.0	5.0	14.4	27.7	0.082
T4F22A	BKP	20.9	22.0	23.1	1.0	18.8	1.0	5.0	13.1	30.6	0.084
T4F24A	BMP	22.8	24.0	25.2	1.0	20.5	1.0	5.0	12.0	33.2	0.085
T4F27A	BPP	25.7	27.0	28.4	1.0	23.1	1.0	5.0	10.7	37.5	0.087
T4F30A	BRP	28.5	30.0	31.5	1.0	25.6	1.0	5.0	9.7	41.4	0.088
T4F33A	BTP	31.4	33.0	34.7	1.0	28.2	1.0	5.0	8.8	45.7	0.089
T4F36A	BVP	34.2	36.0	37.8	1.0	30.8	1.0	5.0	8.0	49.9	0.090
T4F39A	BXP	37.1	39.0	41.0	1.0	33.3	1.0	5.0	7.4	53.9	0.091
T4F43A	BZP	40.9	43.0	45.2	1.0	36.8	1.0	5.0	6.7	59.3	0.092
T4F47A	CEP	44.7	47.0	49.4	1.0	40.2	1.0	5.0	6.2	64.8	0.092
T4F51A	CGP	48.5	51.0	53.6	1.0	43.6	1.0	5.0	5.7	70.1	0.093

Notes

(1) V_{BR} measured after I_T applied for 300µs, I_T = square wave pulse or equivalent

(2) Surge current waveform per fig. 3 and derated per fig. 2

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

(4) 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_{thJA} (1)	135	160	°C/W
	R_{thJM} (2)	15	18	°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 Transient Dual Interface Test Method (TDIM)

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
T4F10AHM3/H (1)	0.015	H	3000	7" diameter plastic tape and reel
T4F10AHM3/I (1)	0.015	I	10 000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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

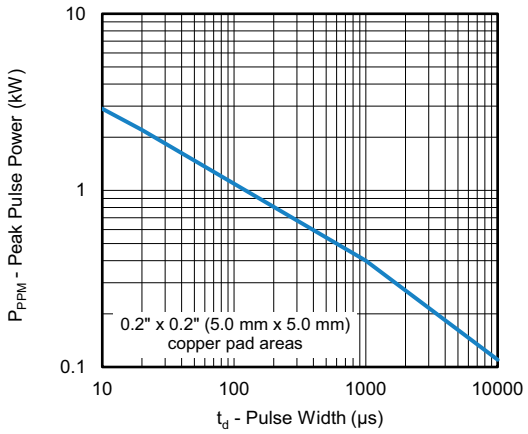


Fig. 1 - Peak Pulse Power Rating Curve

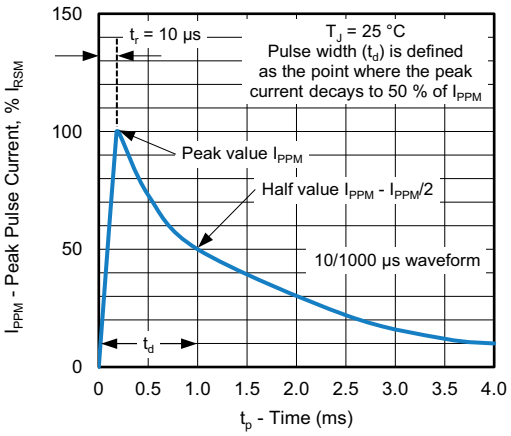


Fig. 3 - Pulse Waveform

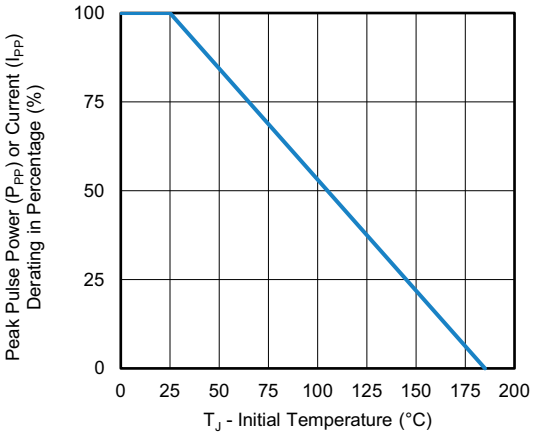


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

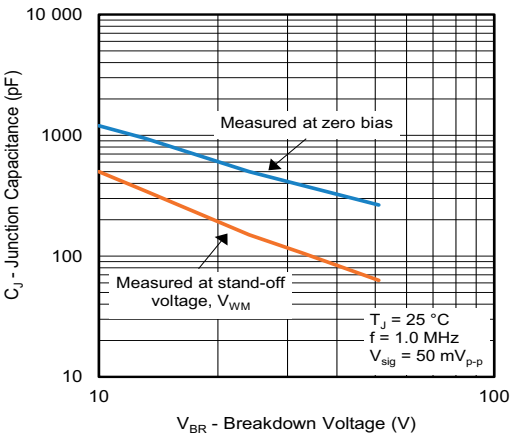
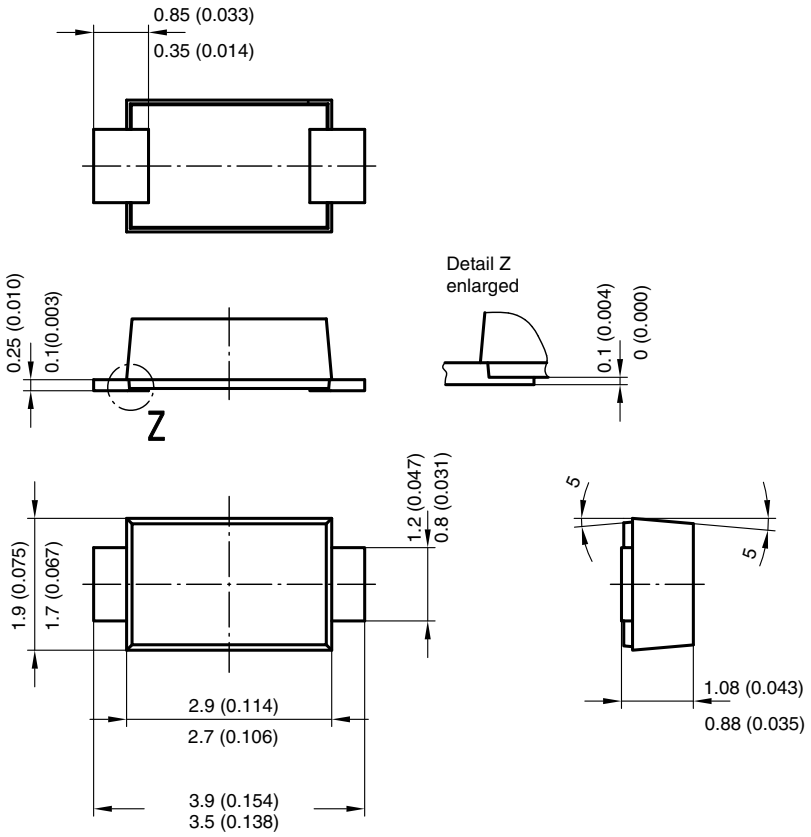


Fig. 4 - Typical Junction Capacitance

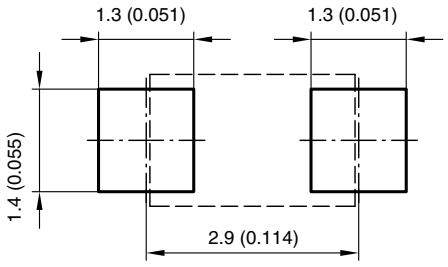
Note

- Fig.1 power calculation is based on I_{PPM} times defined maximum clamping voltage by pulse width

PACKAGE OUTLINE DIMENSIONS in millimeters (inches)



Foot print recommendation:



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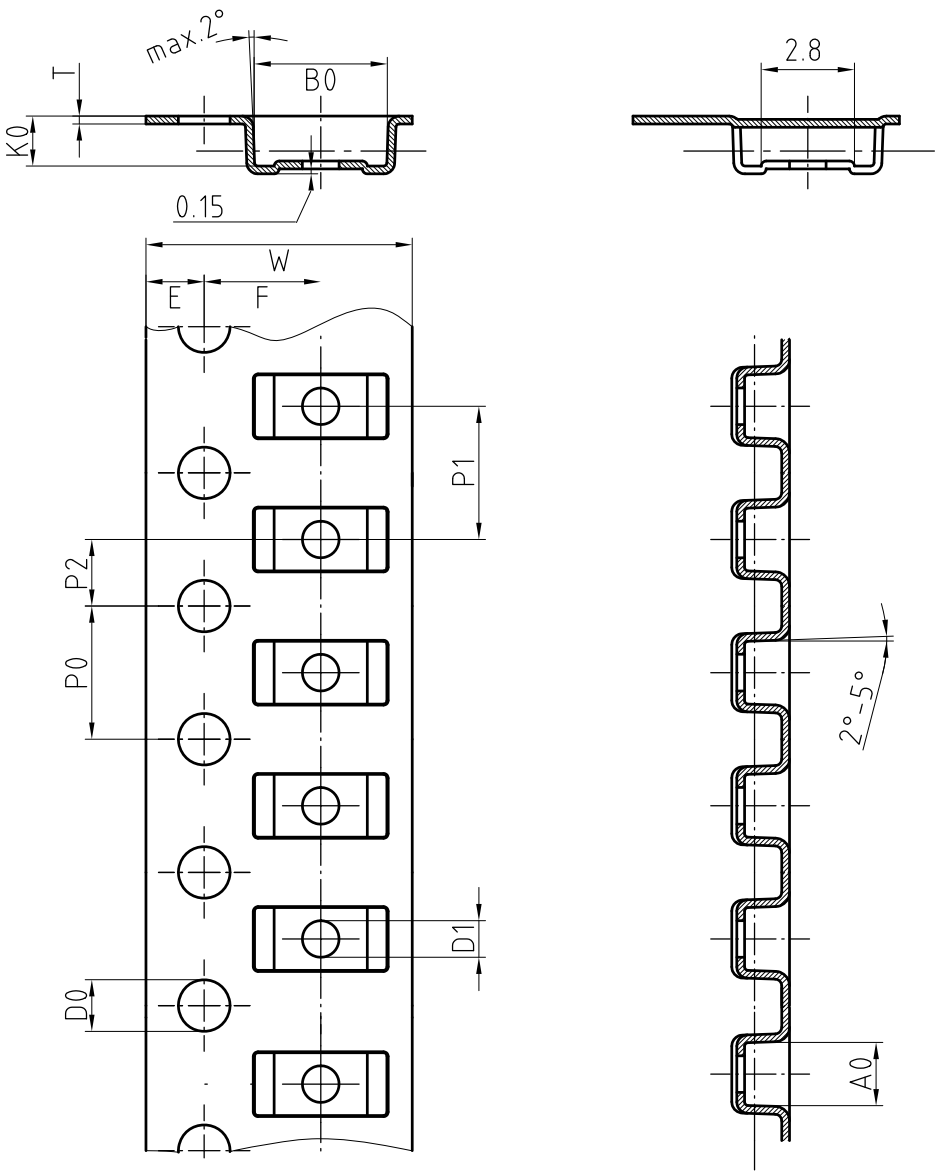
BLISTERTAPE DIMENSIONS in millimeters: **SMF (DO-219AB)**



Mat:	A0	B0	K0	W	T	P0	P2	P1	D0	D1	E	F
PS	1.9	4.0	1.5	8.0	0.235	4.0	2.0	4.0	1.5	1	1.75	3.5

Document-No.: S8-V-3717.02-001 (3)

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