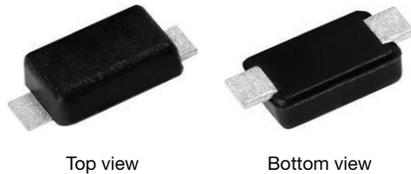


Surface Mount TRANSZORB[®] Transient Voltage Suppressors

eSMP[®] Series



Top view

Bottom view

SMF (DO-219AB)



PRIMARY CHARACTERISTICS	
V_{WM}	10 V to 85 V
V_{BR}	11.1 V to 104 V
P_{PPM}	400 W, 350 W
P_D	1.0 W
T_J max.	175 °C
Polarity	Bidirectional
Package	SMF (DO-219AB)

FEATURES

- Low profile package
- Junction passivation optimized design passivated anisotropic rectifier technology
- Bidirectional
- 400 W peak pulse power capability with a 10/1000 μ s waveform (350 W above 48 V)
- 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

 AUTOMOTIVE
GRADE
Available

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 consumer, computer, industrial, automotive, and telecommunication.

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

Base P/N-M3 - halogen-free, RoHS-compliant, and industrial grade

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 and 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 power dissipation with a 10/1000 μ s waveform (fig. 3)	$P_{PPM}^{(1)}$	400	W
Peak power pulse current with a 10/1000 μ s waveform (fig. 1)	$I_{PPM}^{(1)}$	See next table	A
Operating junction and storage temperature range	T_J, T_{STG}	-65 to +175	°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⁾ α _T (%/°C)
		MIN.	MAX.							
4SMF10CA	4AX	11.1	12.3	1.0	10	1.0	5.0	25.5	15.7	0.070
4SMF11CA	4AZ	12.2	13.5	1.0	11	1.0	5.0	23.3	17.2	0.072
4SMF12CA	4BE	13.3	14.7	1.0	12	1.0	5.0	21.3	18.8	0.076
4SMF13CA	4BG	14.4	15.9	1.0	13	1.0	5.0	19.6	20.4	0.076
4SMF14CA	4BK	15.6	17.2	1.0	14	1.0	5.0	18.2	22.0	0.078
4SMF15CA	4BM	16.7	18.5	1.0	15	1.0	5.0	16.9	23.6	0.080
4SMF16CA	4BP	17.8	19.7	1.0	16	1.0	5.0	15.9	25.2	0.082
4SMF17CA	4BR	18.9	20.9	1.0	17	1.0	5.0	15.0	26.7	0.082
4SMF18CA	4BT	20.0	22.1	1.0	18	1.0	5.0	14.1	28.3	0.084
4SMF20CA	4BV	22.2	24.5	1.0	20	1.0	5.0	12.7	31.4	0.085
4SMF22CA	4BX	24.4	26.9	1.0	22	1.0	5.0	11.3	35.5	0.087
4SMF24CA	4BZ	26.7	29.5	1.0	24	1.0	5.0	10.3	39.0	0.087
4SMF26CA	4CE	28.9	31.9	1.0	26	1.0	5.0	9.5	42.0	0.088
4SMF28CA	4CG	31.1	34.4	1.0	28	1.0	5.0	8.8	45.5	0.089
4SMF30CA	4CK	33.3	36.8	1.0	30	1.0	5.0	8.3	48.4	0.090
4SMF33CA	4CM	36.7	40.6	1.0	33	1.0	5.0	7.5	53.1	0.091
4SMF36CA	4CP	40.0	44.2	1.0	36	1.0	5.0	6.9	58.3	0.092
4SMF40CA	4CR	44.4	49.1	1.0	40	1.0	5.0	6.2	64.5	0.092
4SMF43CA	4CT	47.8	52.8	1.0	43	1.0	5.0	5.7	69.8	0.093
4SMF45CA	4CV	50.0	55.3	1.0	45	1.0	5.0	5.5	72.3	0.093
4SMF48CA	4CX	53.3	58.9	1.0	48	1.0	5.0	4.6	76.9	0.093
4SMF51CA	4CZ	56.7	62.7	1.0	51	1.0	5.0	4.3	82.2	0.094
4SMF54CA	4RE	60.0	66.3	1.0	54	1.0	5.0	4.0	87.0	0.094
4SMF58CA	4RG	64.4	71.2	1.0	58	1.0	5.0	3.7	93.8	0.095
4SMF60CA	4RK	66.7	73.7	1.0	60	1.0	5.0	3.6	96.8	0.095
4SMF64CA	4RM	71.1	78.6	1.0	64	1.0	5.0	3.4	103	0.095
4SMF70CA	4RP	77.8	86.0	1.0	70	1.0	5.0	3.1	113	0.095
4SMF75CA	4RR	83.3	92.1	1.0	75	1.0	5.0	2.9	120	0.096
4SMF78CA	4RT	86.7	95.8	1.0	78	1.0	5.0	2.8	125	0.096
4SMF85CA	4RV	94.4	104	1.0	85	1.0	5.0	2.6	136	0.096

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+α_T 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
4SMF10CA-M3/H	0.015	H	3000	7" diameter plastic tape and reel
4SMF10CA-M3/I	0.015	I	10 000	13" diameter plastic tape and reel
4SMF10CAHM3/H ⁽¹⁾	0.015	H	3000	7" diameter plastic tape and reel
4SMF10CAHM3/I ⁽¹⁾	0.015	I	10 000	13" diameter plastic tape and reel

Note

- (1) AEC-Q101 qualified



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

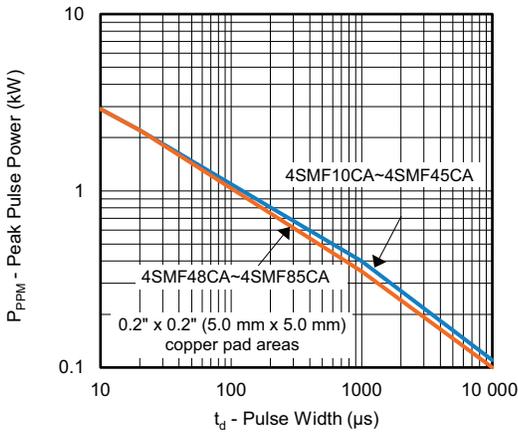


Fig. 1 - Peak Pulse Power Rating Curve

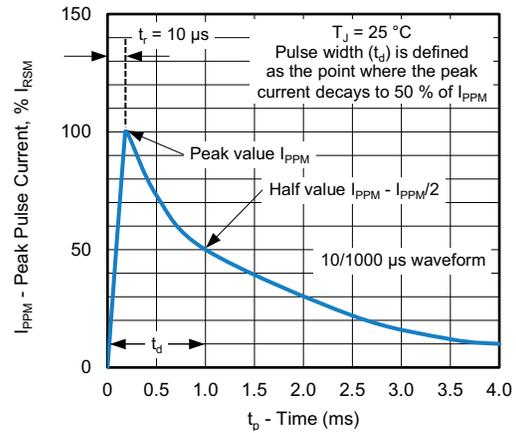


Fig. 3 - Pulse Waveform

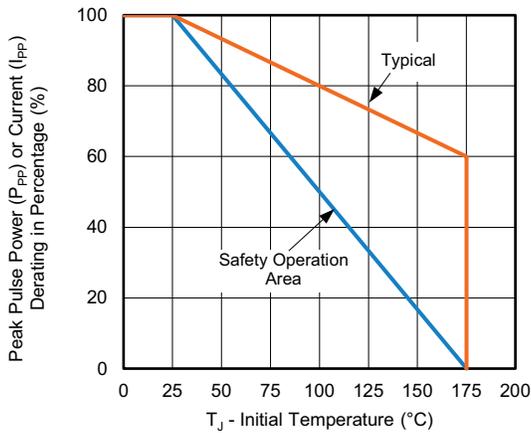


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

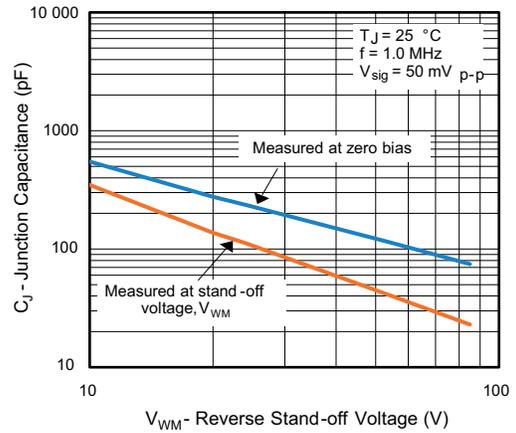


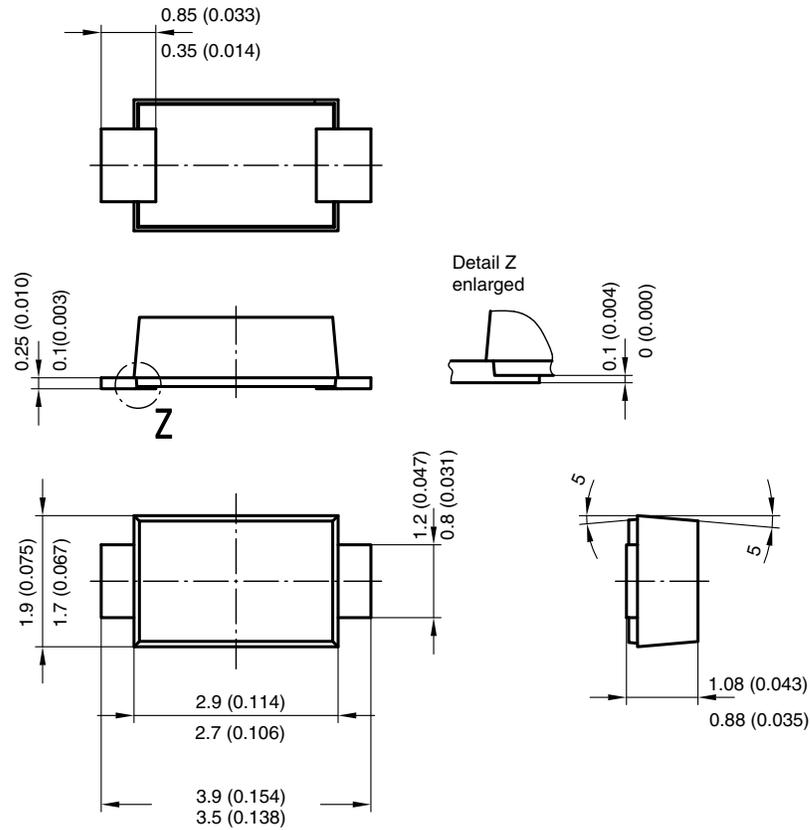
Fig. 4 - Typical Junction Capacitance

Note

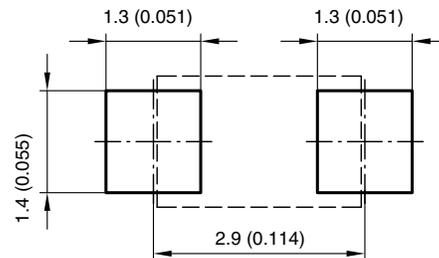
- Fig.1 power calculation is based on I_{PPM} times defined maximum clamping voltage by pulse width



PACKAGE OUTLINE DIMENSIONS in millimeters (inches)



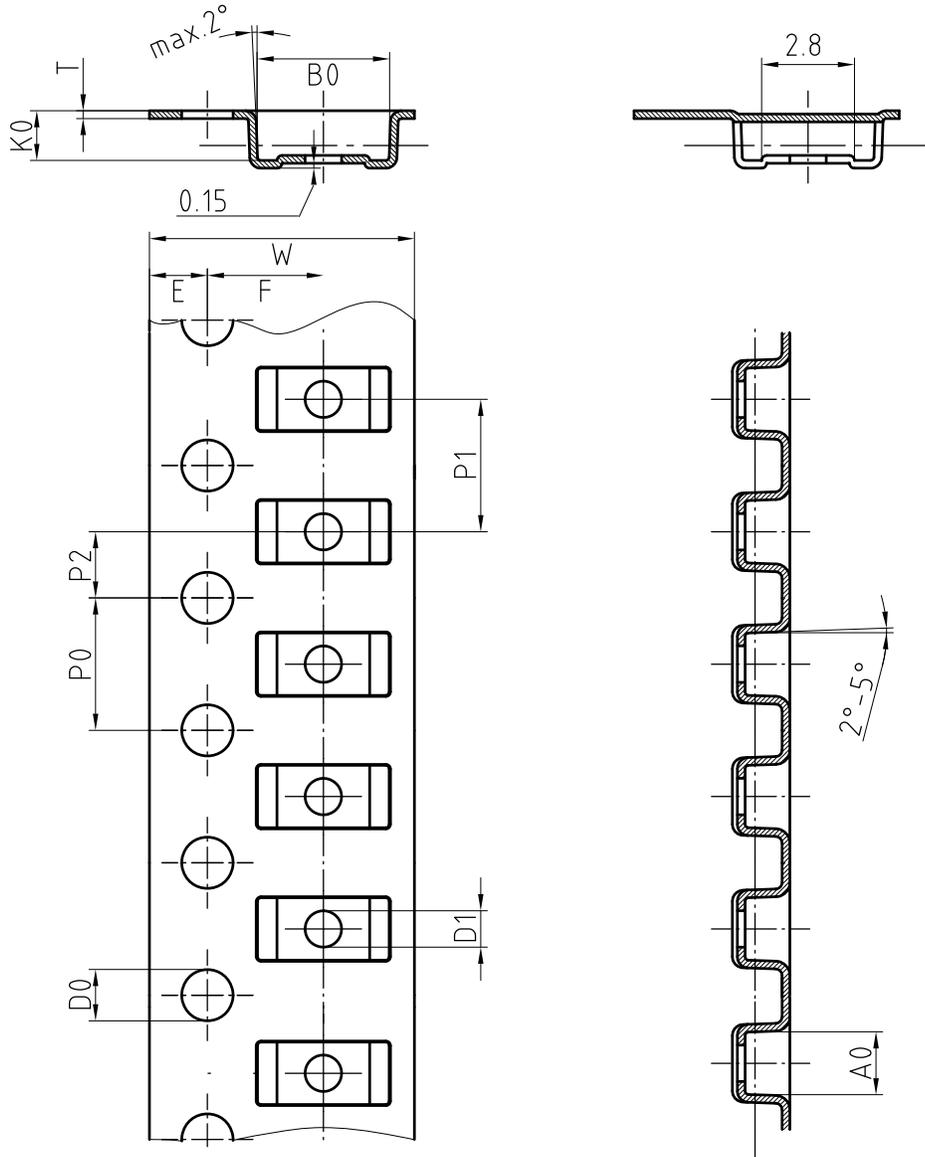
Foot print recommendation:



Created - Date: 15. February 2005
Rev. 3 - Date: 13. March 2007
Document no.: S8-V-3915.01-001 (4)
17247



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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