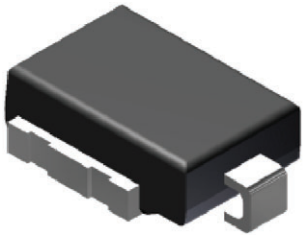
Surface Mount PAR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218 Compatible

Anode ○—▶|—○ Cathode

LINKS TO ADDITIONAL RESOURCES

Related Documents | Packages | Marking

PRIMARY CHARACTERISTICS	
V_{WM}	10 V to 43 V
V_{BR}	11.1 V to 52.8 V
P_{PPM} (10 x 1000 µs)	4600 W
P_{PPM} (10 x 10 000 µs)	3600 W
P_D	6 W
I_{FSM}	600 A
T_J max.	175 °C
Polarity	Unidirectional
Package	DO-218AC

FEATURES

- Junction passivation optimized design passivated anisotropic rectifier technology
- T_J = 175 °C capability suitable for high reliability and automotive requirement
- Unidirectional
- Low leakage current
- Low forward voltage drop
- High surge capability
- Meets ISO7637-2 surge specification (varied by test condition)
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- 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, especially for automotive load dump protection application.

MECHANICAL DATA

Case: DO-218AC
Molding compound meets UL 94 V-0 flammability rating
Base P/NHM3 - RoHS-compliant, 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: heatsink is anode

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

PARAMETER		SYMBOL	VALUE	UNIT
Peak pulse power dissipation	with 10/1000 µs waveform	P_{PPM}	4600	W
	with 10/10 000 µs waveform		3600	
Power dissipation on infinite heatsink at T_A = 25 °C (fig. 1)		P_D	6.0	W
Peak pulse current with 10/1000 µs waveform		I_{PPM} (1)	See next table	A
Peak forward surge current 8.3 ms single half sine-wave		I_{FSM}	600	A
Operating junction and storage temperature range		T_J, T_{STG}	-55 to +175	°C

Note

(1) Non-repetitive current pulse at T_A = 25 °C

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)										
DEVICE TYPE	BREAKDOWN VOLTAGE V_{BR} (V)			TEST CURRENT I_T (mA)	STAND-OFF VOLTAGE V_{WM} (V)	MAXIMUM REVERSE LEAKAGE AT V_{WM} I_D (µA)	MAXIMUM REVERSE LEAKAGE AT V_{WM} T_J = 175 °C I_D (µA)	MAX. PEAK PULSE CURRENT AT 10/1000 µs WAVEFORM (A)	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)	TYPICAL TEMP. COEFFICIENT OF V_{BR} (1) αT (%/°C)
	MIN.	NOM.	MAX.							
SM6S10AHM3	11.1	11.7	12.3	5.0	10.0	15	250	271	17.0	0.069
SM6S11AHM3	12.2	12.9	13.5	5.0	11.0	10	150	253	18.2	0.072
SM6S12AHM3	13.3	14.0	14.7	5.0	12.0	10	150	231	19.9	0.074
SM6S13AHM3	14.4	15.2	15.9	5.0	13.0	10	150	214	21.5	0.076
SM6S14AHM3	15.6	16.4	17.2	5.0	14.0	10	150	198	23.2	0.078
SM6S15AHM3	16.7	17.6	18.5	5.0	15.0	10	150	189	24.4	0.080
SM6S16AHM3	17.8	18.8	19.7	5.0	16.0	10	150	177	26.0	0.081
SM6S17AHM3	18.9	19.9	20.9	5.0	17.0	10	150	167	27.6	0.082
SM6S18AHM3	20.0	21.1	22.1	5.0	18.0	10	150	158	29.2	0.083
SM6S20AHM3	22.2	23.4	24.5	5.0	20.0	10	150	142	32.4	0.085
SM6S22AHM3	24.4	25.7	26.9	5.0	22.0	10	150	130	35.5	0.086
SM6S24AHM3	26.7	28.1	29.5	5.0	24.0	10	150	118	38.9	0.087
SM6S26AHM3	28.9	30.4	31.9	5.0	26.0	10	150	109	42.1	0.088
SM6S28AHM3	31.1	32.8	34.4	5.0	28.0	10	150	101	45.4	0.089
SM6S30AHM3	33.3	35.1	36.8	5.0	30.0	10	150	95	48.4	0.090
SM6S33AHM3	36.7	38.7	40.6	5.0	33.0	10	150	86	53.3	0.091
SM6S36AHM3	40.0	42.1	44.2	5.0	36.0	10	150	79	58.1	0.091
SM6S40AHM3	44.4	46.8	49.1	5.0	40.0	10	150	71	64.5	0.092
SM6S43AHM3	47.8	50.3	52.8	5.0	43.0	10	150	66	69.4	0.093

Notes

- For all types maximum V_F = 1.9 V at I_F = 100 A measured on 300 µs square pulse width

(1) 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))

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	55	°C/W
	$R_{\theta JM}$ (2)	0.45	°C/W

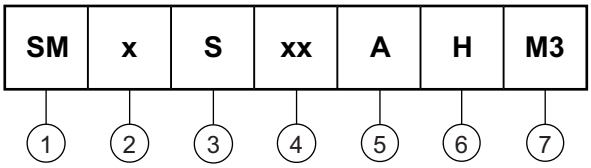
Notes

(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 TABLE

Device code



1 - Surface mount

2 - Power dissipation P_D (5 = 5 W, 6 = 6 W, 8 = 8 W)

3 - Standard V_F type

4 - Stand-off voltage

5 - Breakdown voltage tolerance and polarity (A ± 5 %, unidirectional)

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

7 - 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**
SM6S10AHM3/I [1]	2.550	I	750	13" diameter plastic tape and reel, anode towards the sprocket hole

Note

[1] AEC-Q101 qualified

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

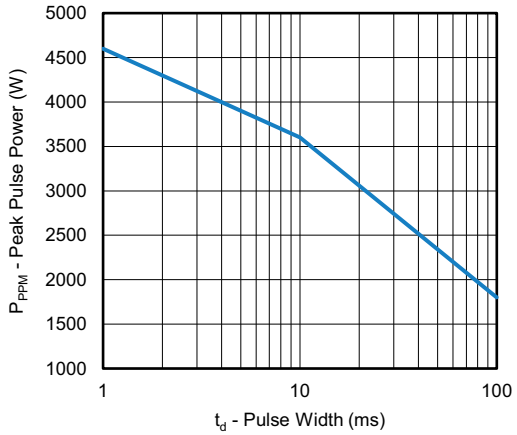


Fig. 1 - Peak Pulse Power Derating Curve

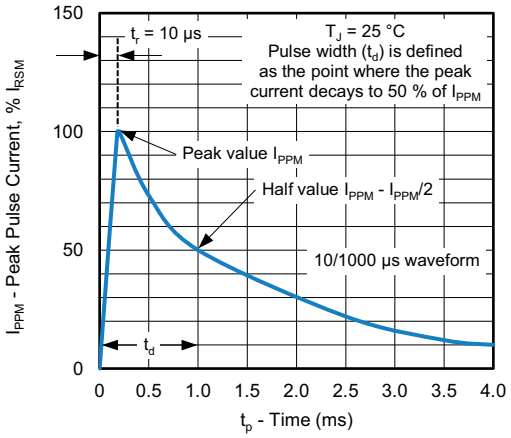


Fig. 4 - Pulse waveform

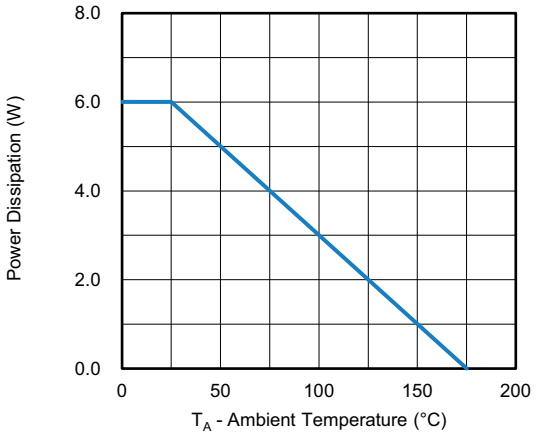


Fig. 2 - Power Derating Curve

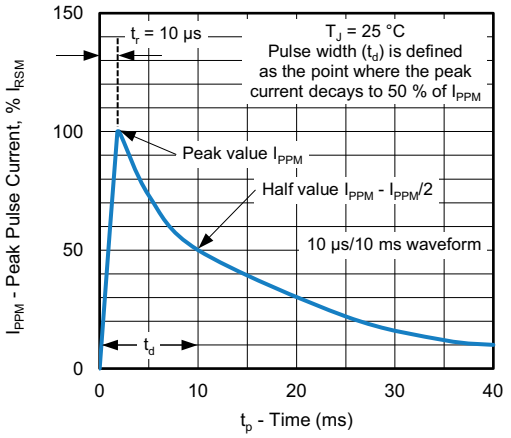


Fig. 5 - Pulse Waveform

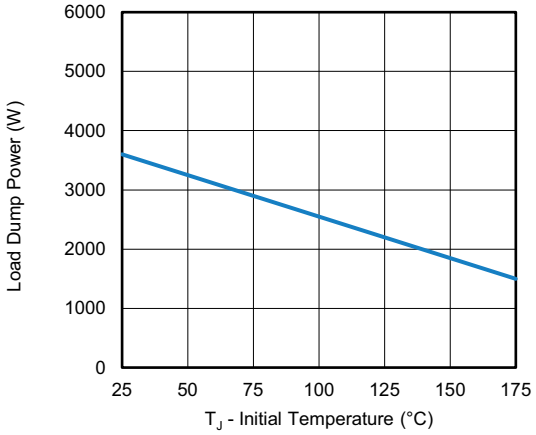


Fig. 3 - Load Dump Power Characteristics
(10 ms Exponential Waveform)

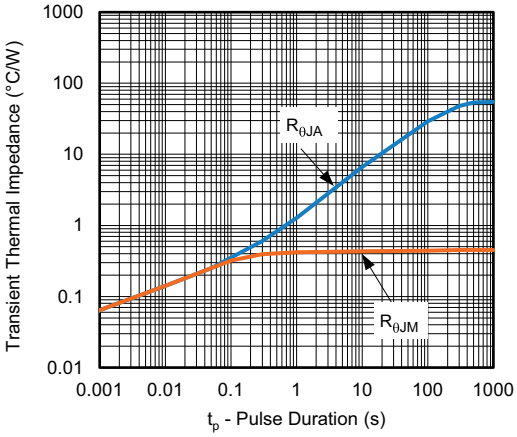
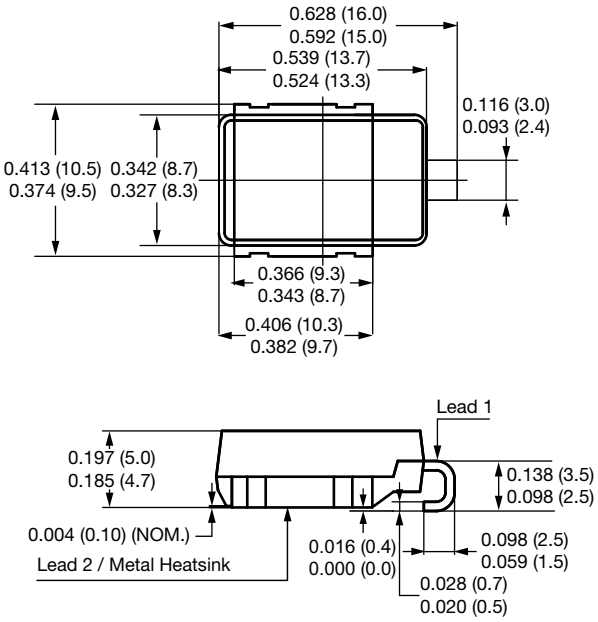


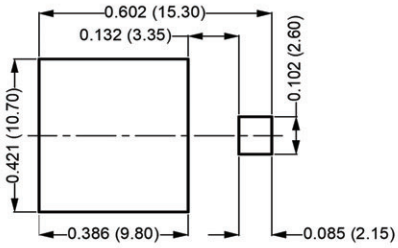
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-218AC



Mounting Pad Layout



Note

- Footprint in accordance with IPC 7351 standard

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