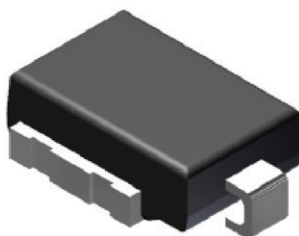


Surface Mount PAR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218 Compatible

Anode  Cathode

LINKS TO ADDITIONAL RESOURCES



RoHS
COMPLIANT
HALOGEN
FREE

FEATURES

- Junction passivation optimized design passivated anisotropic rectifier technology
- $T_J = 175\text{ }^{\circ}\text{C}$ capability suitable for high reliability and automotive requirement
- Low leakage current
- Low forward voltage drop
- High surge capability
- Meets ISO 7637-2 surge specification
- Meets MSL level 1, per J-STD-020, LF maximum peak of $245\text{ }^{\circ}\text{C}$
- AEC-Q101 qualified
- 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, 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

PRIMARY CHARACTERISTICS	
V_{BR}	27 V
P_{PPM} (10 x 1000 μs)	4600 W
P_{PPM} (10 x 10 000 μs)	3600 W
P_D	6 W
V_{WM}	22 V
I_{PPM}	90 A
I_{FSM}	600 A
T_J max.	$175\text{ }^{\circ}\text{C}$
Polarity	Unidirectional
Package	DO-218AC

MAXIMUM RATINGS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation	P_{PPM}	4600	W
		3600	
Power dissipation on infinite heatsink at $T_A = 25\text{ }^{\circ}\text{C}$ (fig. 1)	P_D	6.0	W
Non-repetitive peak reverse surge current for 10 μs /10 ms exponentially decaying waveform	I_{PPM}	90	A
Maximum working stand-off voltage	V_{WM}	22.0	V
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	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)			
DEVICE TYPE	BREAKDOWN VOLTAGE V_{BR} AT I_T (V)		STAND-OFF VOLTAGE V_{WM} (V)
	MIN.	MAX.	
SM6A27HM3	24	30	22

ADDITIONAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	MIN.	TYP.	MAX.	UNIT
Temperature coefficient of V _{BR}	I _T = 10 mA		αT	-	-	36	mV/°C
Clamping voltage for 10 μs/10 ms exponentially decaying waveform	I _{PP} = 65 A		V _C	-	-	40.0	V
Instantaneous forward voltage	I _F = 6.0 A		V _F ⁽¹⁾	-	-	0.99	V
	I _F = 100 A			-	0.94	-	
Reverse leakage current	Rated V _{WM}	T _J = 25 °C	I _R	-	-	0.5	μA
		T _J = 175 °C		-	-	20.0	

Note

(1) Measured on a 300 μ s square pulse width

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance	R _{θJA} ⁽¹⁾	55	°C/W
	R _{θJM} ⁽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

SM	x	A	27	H	M3
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1

2

3

4

5

6

- 1 - Surface mount
- 2 - Power dissipation P_D (5 = 5 W, 6 = 6 W, 8 = 8 W)
- 3 - Automotive TVS designator (low V_F type)
- 4 - 27 V breakdown voltage
- 5 - Quality grade (H = AEC-Q101 qualified, otherwise = industry grade)
- 6 - Material / Environmental 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
SM6A27HM3/I ⁽¹⁾	2.550	I	750	13" diameter plastic tape and reel, anode towards the sprocket hole

Note

(1) AEC-Q101 qualified

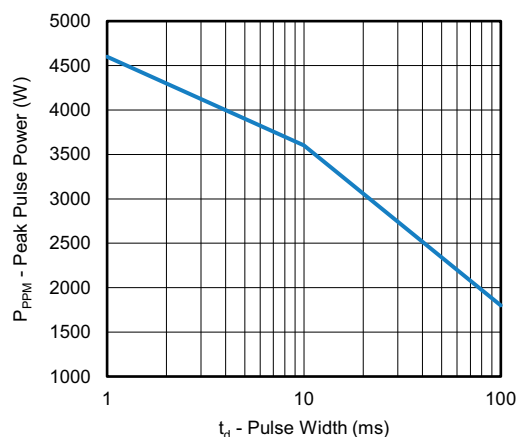
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Peak Pulse Power Derating Curve

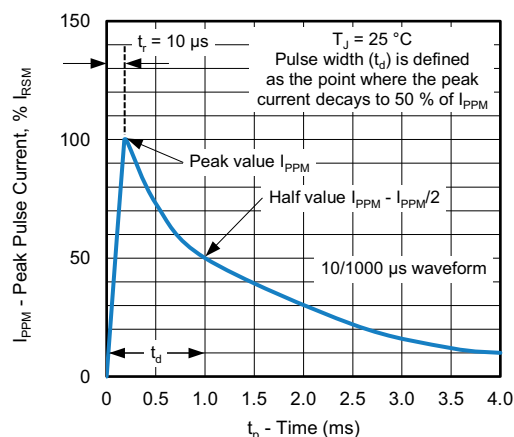


Fig. 4 - Pulse Waveform

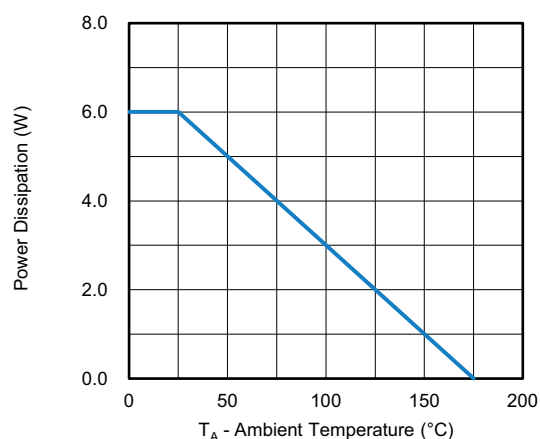


Fig. 2 - Power Derating Curve

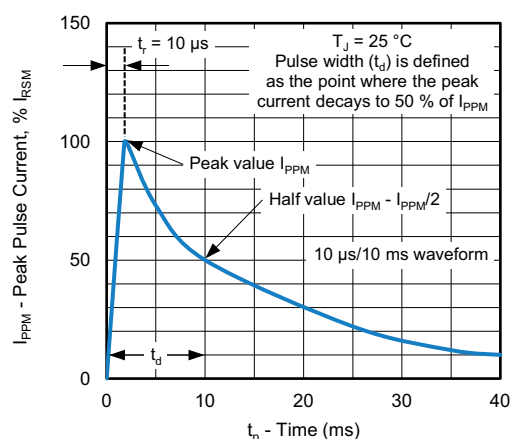


Fig. 5 - Pulse Waveform

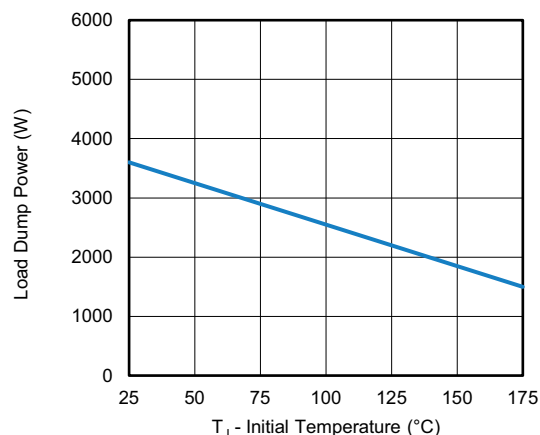


Fig. 3 - Load dump Power Characteristics (10 ms Exponential Waveform)

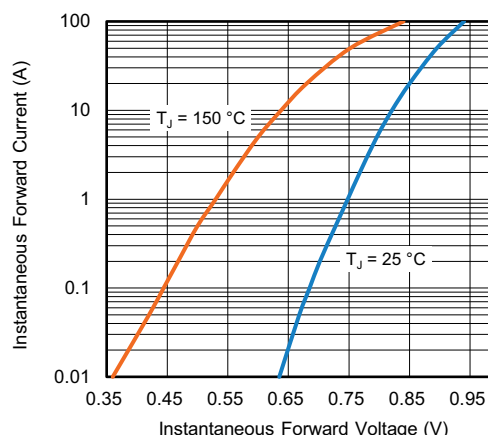


Fig. 6 - Typical Instantaneous Forward Characteristics

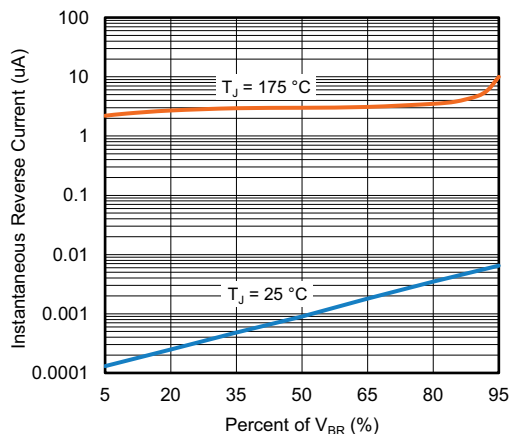


Fig. 7 - Typical Reverse Characteristics

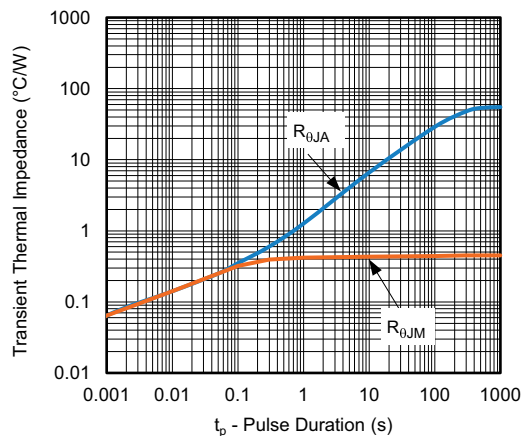
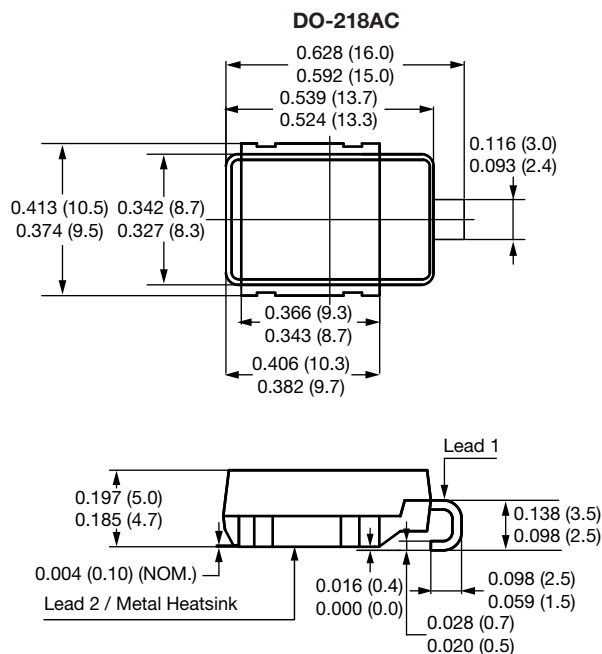
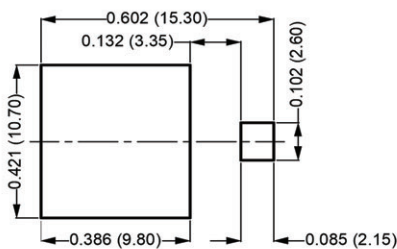


Fig. 8 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Mounting Pad Layout

Note

- Footprint in accordance with IPC 7351 standard



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