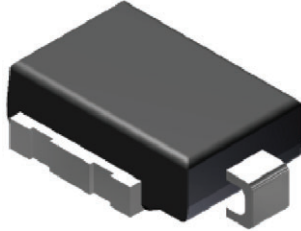


# Surface Mount PAR<sup>®</sup> Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218 Compatible



## LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$V_{BR}$	27 V
$P_{PPM}$ (10 x 1000 $\mu$ s)	6600 W
$P_{PPM}$ (10 x 10 000 $\mu$ s)	5200 W
$P_D$	8 W
$V_{WM}$	22 V
$I_{PPM}$	130 A
$I_{FSM}$	700 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
- 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 °C
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://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	$P_{PPM}$	with 10/1000 $\mu$ s waveform	6600
		with 10/10 000 $\mu$ s waveform	5200
Power dissipation on infinite heatsink at $T_A = 25$ °C (fig. 1)	$P_D$	8.0	W
Non-repetitive peak reverse surge current for 10 $\mu$ s/10 ms exponentially decaying waveform	$I_{PPM}$	130	A
Maximum working stand-off voltage	$V_{WM}$	22.0	V
Peak forward surge current 8.3 ms single half sine-wave	$I_{FSM}$	700	A
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +175	°C

ELECTRICAL CHARACTERISTICS ( $T_A = 25$ °C unless otherwise noted)				
DEVICE TYPE	BREAKDOWN VOLTAGE $V_{BR}$ AT $I_T$ (V)		TEST CURRENT $I_T$ (mA)	STAND-OFF VOLTAGE $V_{WM}$ (V)
	MIN.	MAX.		
SM8A27HM3	24	30	10	22



ADDITIONAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Temperature coefficient of V <sub>BR</sub>	I <sub>T</sub> = 10 mA	αT	-	-	36	mV/°C
Clamping voltage for 10 μs/10 ms exponentially decaying waveform	I <sub>PP</sub> = 75 A	V <sub>C</sub>	-	-	40.0	V
Instantaneous forward voltage	I <sub>F</sub> = 6.0 A	V <sub>F</sub> <sup>(1)</sup>	-	-	0.98	V
	I <sub>F</sub> = 100 A		-	0.93	-	
Reverse leakage current	Rated V <sub>WM</sub>	I <sub>R</sub>	T <sub>J</sub> = 25 °C	-	-	1.0
			T <sub>J</sub> = 175 °C	-	-	50.0

Note

(1) Measured on a 300 μs square pulse width

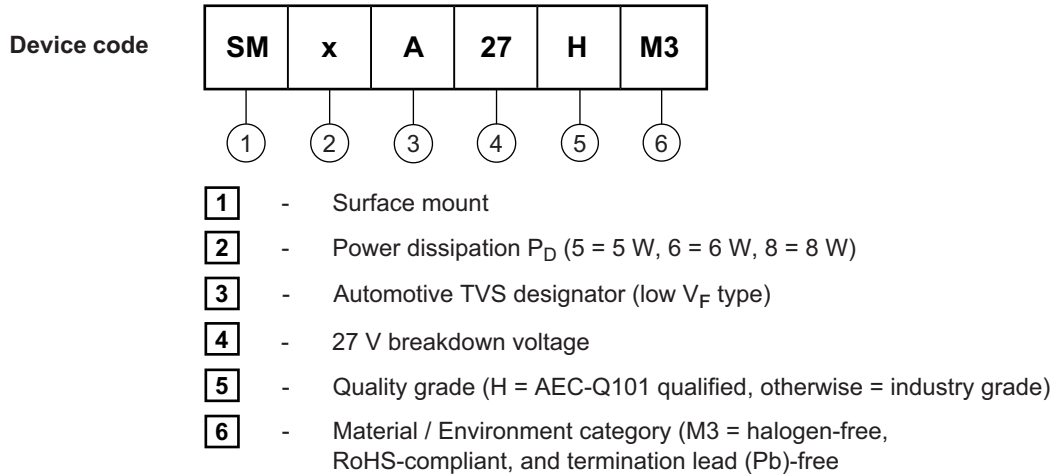
THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	55	°C/W
	R <sub>θJM</sub> <sup>(2)</sup>	0.35	°C/W

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



ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SM8A27HM3/I <sup>(1)</sup>	2.605	I	750	13" diameter plastic tape and reel, anode towards the sprocket hole

Note

(1) AEC-Q101 qualified



RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)

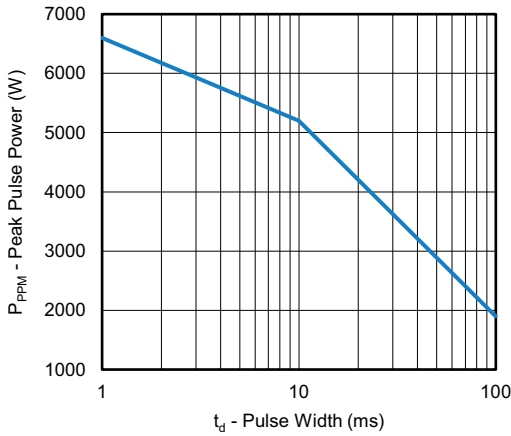


Fig. 1 - Peak Pulse Power Derating Curve

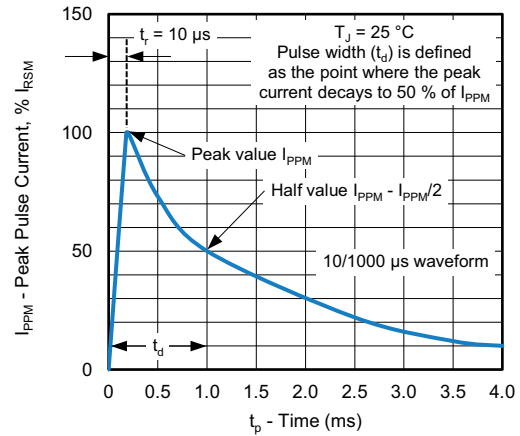


Fig. 4 - Pulse Waveform

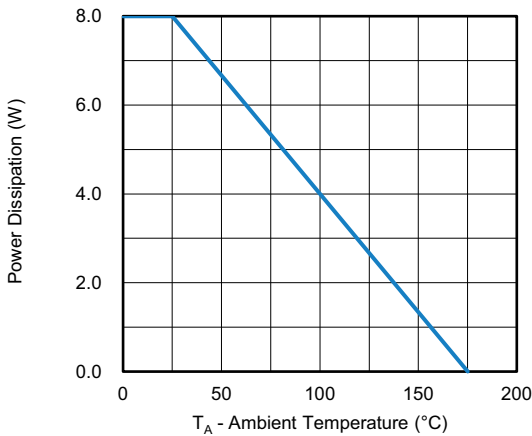


Fig. 2 - Power Derating Curve

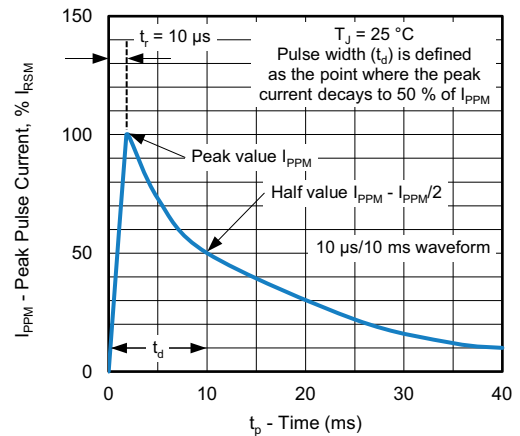


Fig. 5 - Pulse Waveform

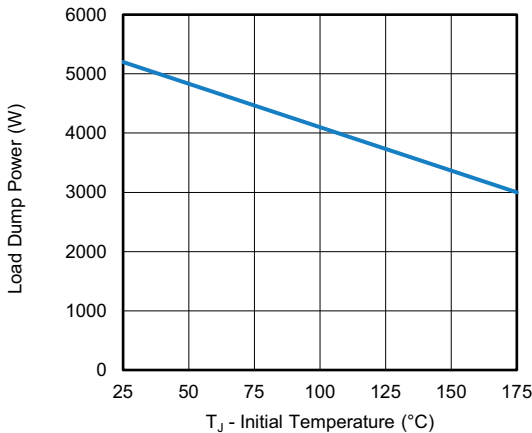


Fig. 3 - Load dump Power Characteristics (10 ms Exponential Waveform)

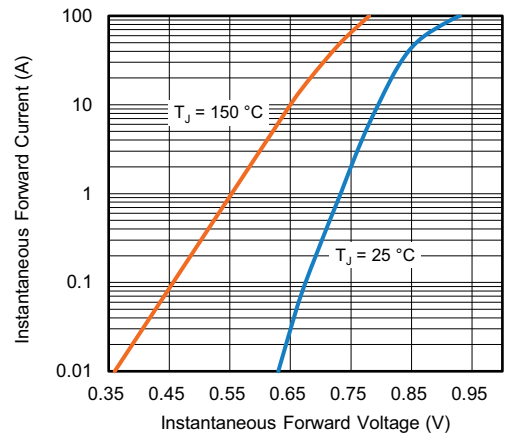


Fig. 6 - Typical Instantaneous Forward Characteristics

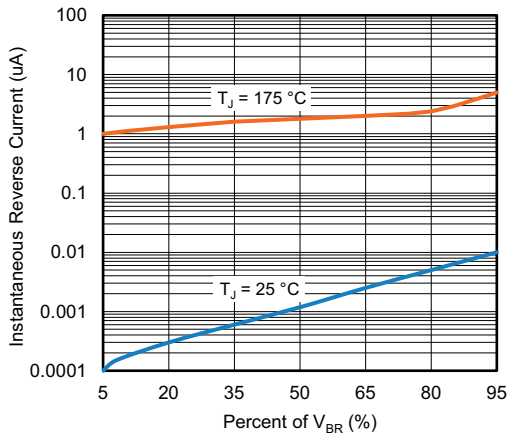


Fig. 7 - Typical Reverse Characteristics

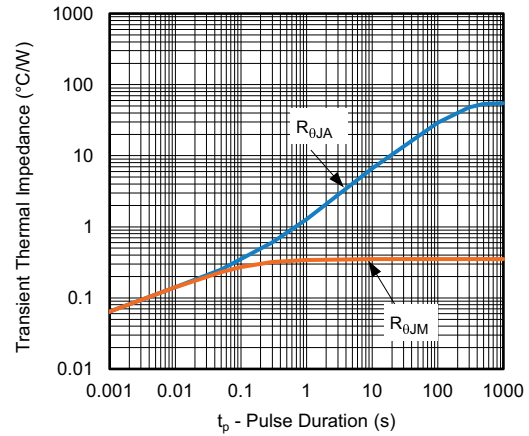
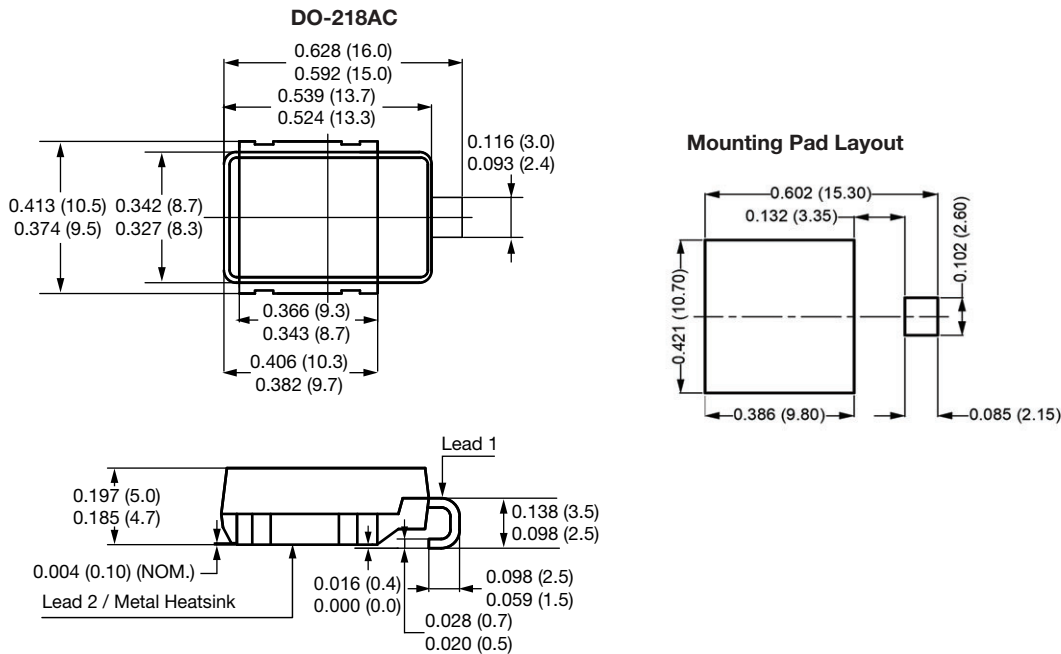


Fig. 8 - Typical Transient Thermal Impedance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)



**Note**

- Footprint in accordance with IPC 7351 standard



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