

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

High Temperature Stability and High Reliability Conditions



DO-218 Compatible

PRIMARY CHARACTERISTICS	
$V_{BR}$	27 V
$P_{PPM}$ (10 x 1000 $\mu$ s)	3600 W
$P_D$	5 W
$V_{WM}$	22 V
$I_{RSM}$	70 A
$I_{FSM}$	500 A
$T_J$ max.	175 °C
Polarity	Uni-directional
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 ISO7637-2 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

## TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting, especially for automotive load dump protection application.

## MECHANICAL DATA

**Case:** DO-218AC

Molding compound meets UL 94 V-0 flammability rating Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified

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

HE3 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 $\mu$ s waveform	$P_{PPM}$	3600	W
Power dissipation on infinite heatsink at $T_C = 25$ °C (fig. 1)	$P_D$	5.0	W
Non-repetitive peak reverse surge current for 10 $\mu$ s/10 ms exponentially decaying waveform	$I_{RSM}$	70	A
Maximum working stand-off voltage	$V_{WM}$	22.0	V
Peak forward surge current 8.3 ms single half sine-wave	$I_{FSM}$	500	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.		
SM5A27T	24	30	10	22



ADDITIONAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNIT	
Zener voltage temperature coefficient	I <sub>Z</sub> = 10 mA	V <sub>ZTC</sub>	-	-	36	mV/°C	
Clamping voltage for 10 μs/10 ms exponentially decaying waveform	I <sub>PP</sub> = 55 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>	-	-	1.0	V	
	I <sub>F</sub> = 100 A		-	0.95	-		
Reverse leakage current	Rated V <sub>WM</sub>	I <sub>R</sub>	T <sub>J</sub> = 25 °C	-	-	0.2	μA
			T <sub>J</sub> = 175 °C	-	-	10.0	

**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, junction to case	R <sub>θJC</sub>	1.0	°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SM5A27THE3/I <sup>(1)</sup>	2.505	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)**

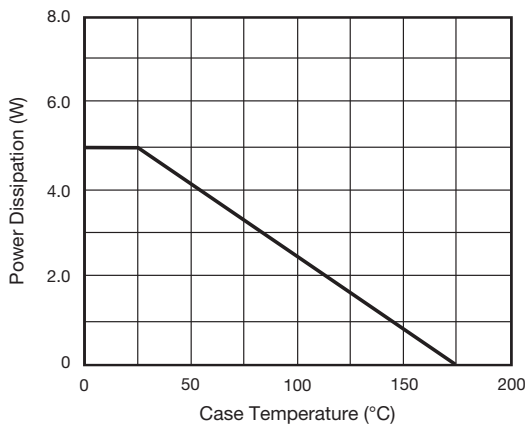


Fig. 1 - Power Derating Curve

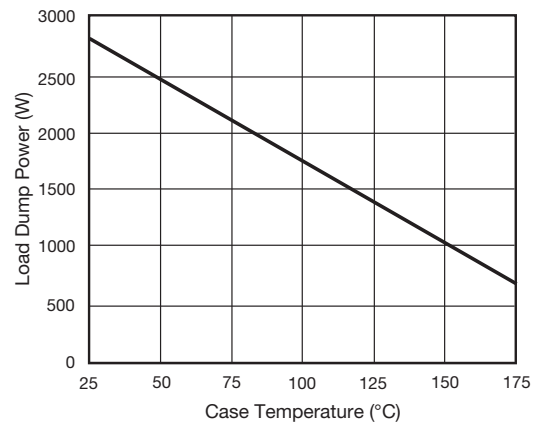


Fig. 2 - Load Dump Power Characteristics (10 ms Exponential Waveform)

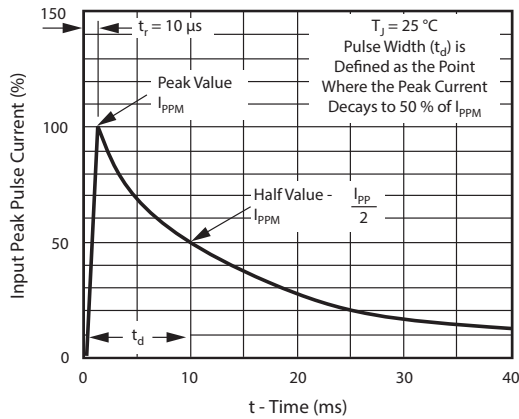


Fig. 3 - Pulse Waveform

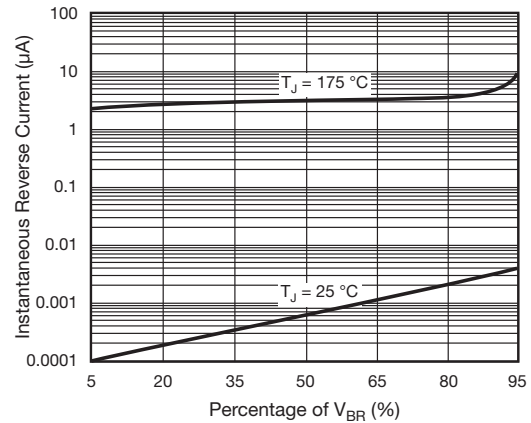


Fig. 6 - Typical Reverse Characteristics

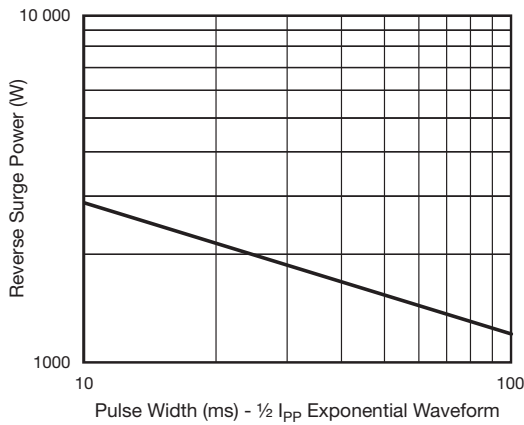


Fig. 4 - Reverse Power Capability

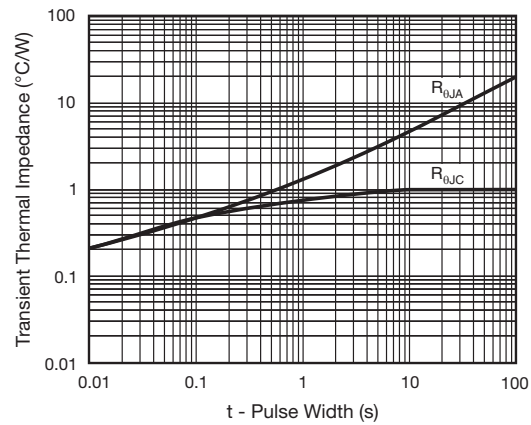


Fig. 7 - Typical Transient Thermal Impedance

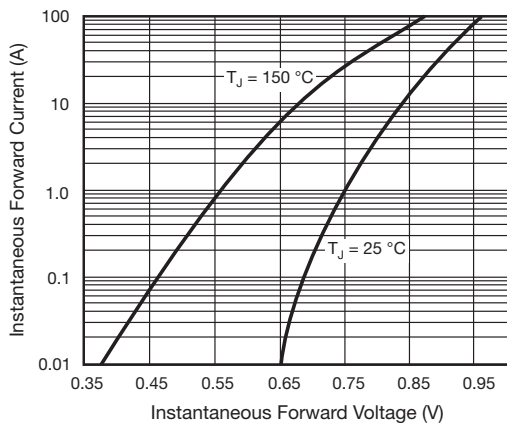
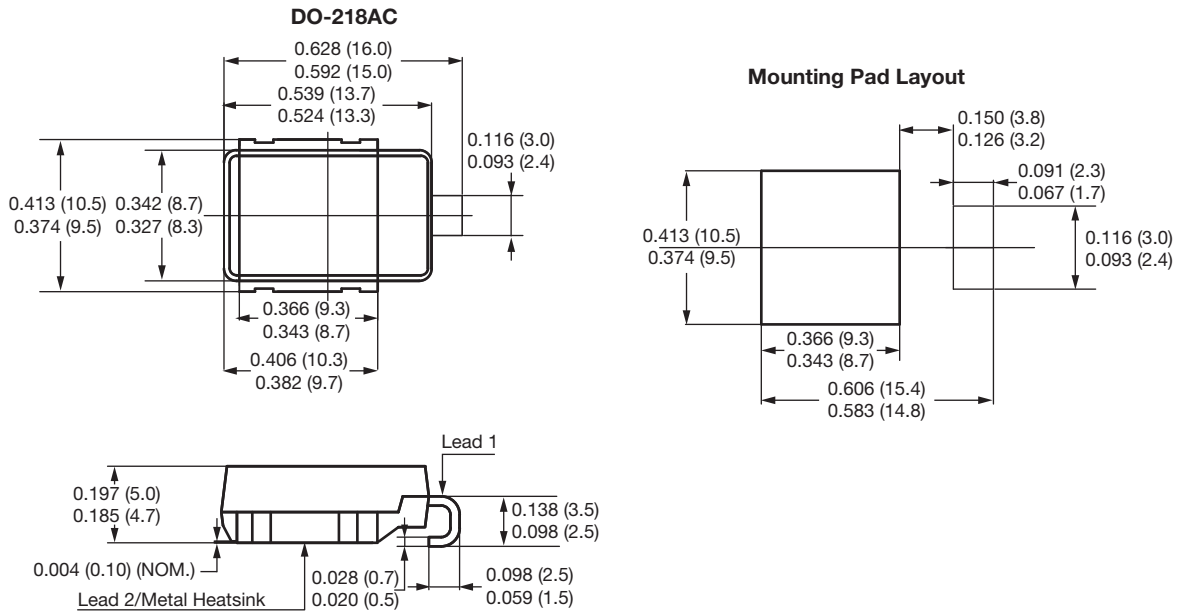


Fig. 5 - Typical Instantaneous Forward Characteristics



### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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