### Vishay General Semiconductor

# Surface Mount PAR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218 Compatible

PRIMARY CHARACTERISTICS					
$V_{BR}$	27 V				
P <sub>PPM</sub> (10 x 1000 μs)	3600 W				
$P_{D}$	5 W				
V <sub>WM</sub>	22 V				
I <sub>RSM</sub>	70 A				
I <sub>FSM</sub>	500 A				
T <sub>J</sub> max.	175 °C				
Polarity	Uni-directional				
Package	DO-218AC				

### **FEATURES**

- Junction passivation optimized design passivated anisotropic rectifier technology
- T<sub>J</sub> = 175 °C capability suitable for high reliability and automotive requirement



RoHS

- 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 <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### **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 <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	VALUE	UNIT		
Peak pulse power dissipation with 10/1000 µs waveform	P <sub>PPM</sub>	3600	W		
Power dissipation on infinite heatsink at T <sub>C</sub> = 25 °C (fig. 1)	P <sub>D</sub>	5.0	W		
Non-repetitive peak reverse surge current for 10 µs/10 ms exponentially decaying waveform	I <sub>RSM</sub>	70	А		
Maximum working stand-off voltage	V <sub>WM</sub>	22.0	V		
Peak forward surge current 8.3 ms single half sine-wave	I <sub>FSM</sub>	500	А		
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175	°C		

<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)					
DEVICE TYPE	BREAKDOWN VOLTAGE V <sub>BR</sub> AT I <sub>T</sub> (V)		TEST CURRENT	STAND-OFF VOLTAGE	
	MIN.	MAX.	(mA)	(V)	
SM5A27T	24	30	10	22	



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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 I <sub>F</sub> = 100 A		V <sub>F</sub> <sup>(1)</sup>	-	-	1.0	V
				-	0.95	-	
Reverse leakage current	Poted V	T <sub>J</sub> = 25 °C	I <sub>R</sub>	-	-	0.2	μΑ
	Rated V <sub>WM</sub>	T <sub>J</sub> = 175 °C		-	-	10.0	

#### Note

 $<sup>^{(1)}</sup>$  Measured on a 300  $\mu s$  square pulse width

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	ER SYMBOL		UNIT	
Typical thermal resistance, junction to case	$R_{ heta JC}$	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

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

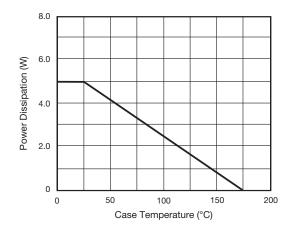


Fig. 1 - Power Derating Curve

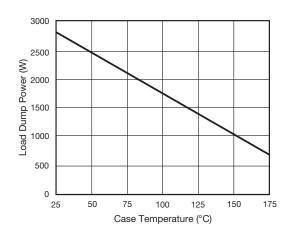


Fig. 2 - Load Dump Power Characteristics (10 ms Exponential Waveform)

<sup>(1)</sup> AEC-Q101 qualified



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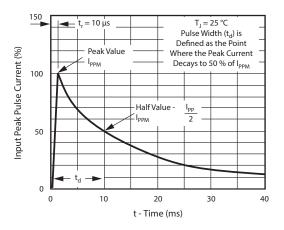


Fig. 3 - Pulse Waveform

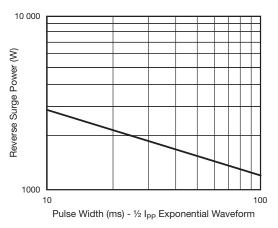


Fig. 4 - Reverse Power Capability

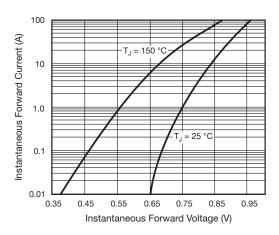


Fig. 5 - Typical Instantaneous Forward Characteristics

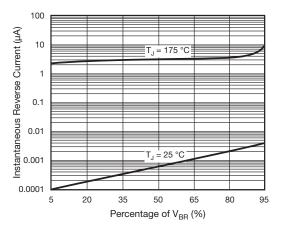


Fig. 6 - Typical Reverse Characteristics

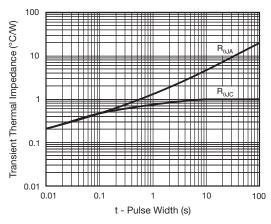
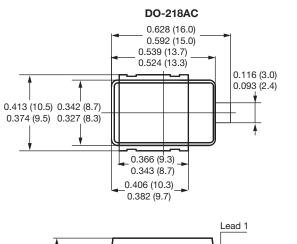


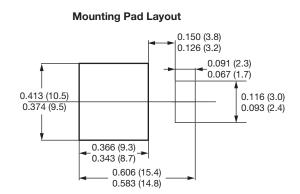
Fig. 7 - Typical Transient Thermal Impedance

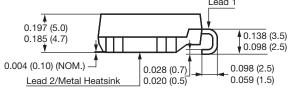


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### **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)









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