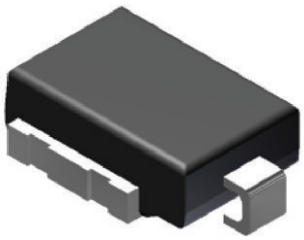
Surface Mount PAR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218 Compatible

Anode ○—▶|—○ Cathode

PRIMARY CHARACTERISTICS	
V_{WM}	22 V
V_{BR}	27 V
P_{PPM} (10 x 1000 µs)	4600 W
P_D	6 W
I_{RSM}	90 A
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
- 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

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_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation with 10/1000 µs waveform	P_{PPM}	4600	W
Power dissipation on infinite heatsink at T_C = 25 °C (fig. 1)	P_D	6.0	W
Non-repetitive peak reverse surge current for 10 µs/10 ms exponentially decaying waveform	I_{RSM}	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	°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.		
SM6A27T	24	30	10	22

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ADDITIONAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	MIN.	TYP.	MAX.	UNIT
Zener voltage temperature coefficient	I_Z = 10 mA		V_{ZTC}	-	-	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 µs square pulse width

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance, junction to case	$R_{\theta JC}$	0.95	°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SM6A27THE3/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)

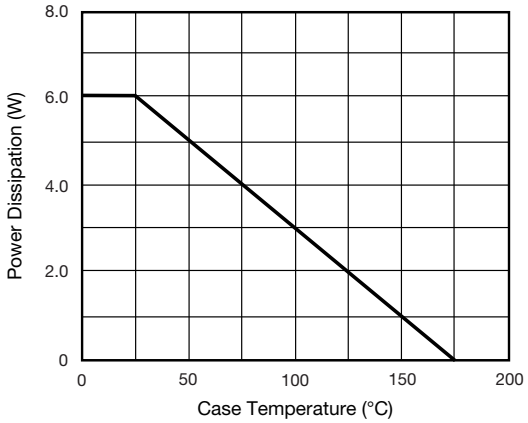

Fig. 1 - Power Derating Curve

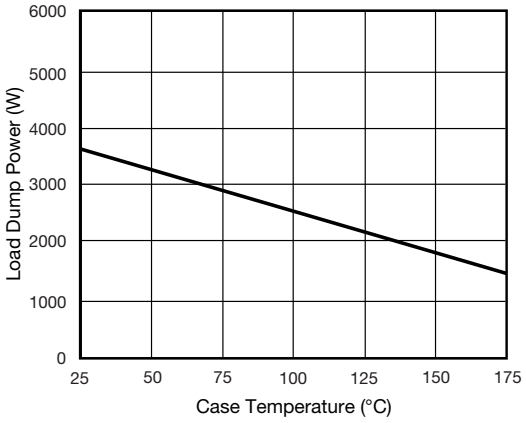

Fig. 2 - Load Dump Power Characteristics
(10 ms Exponential Waveform)

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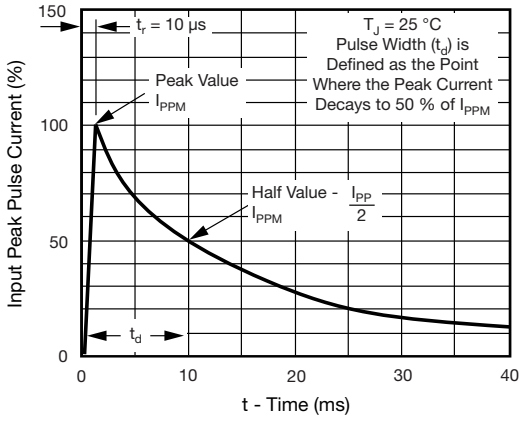

Fig. 3 - Pulse Waveform

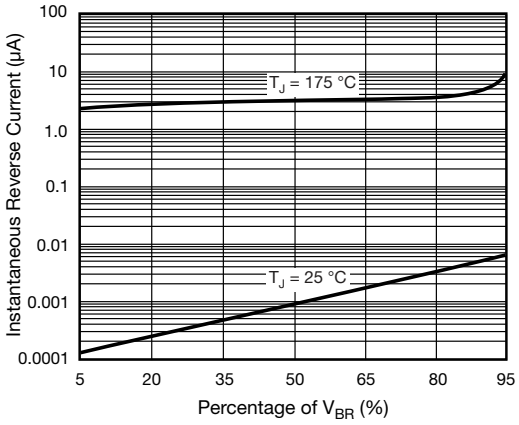

Fig. 6 - Typical Reverse Characteristics

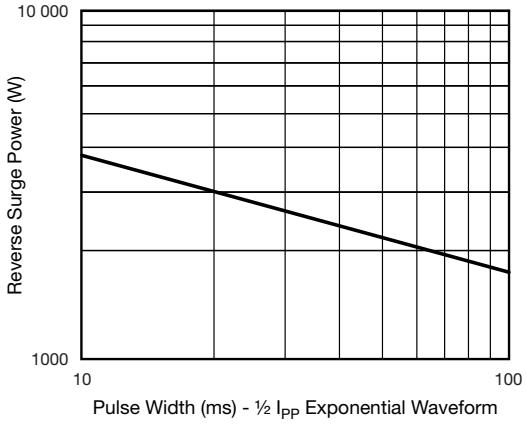

Fig. 4 - Reverse Power Capability

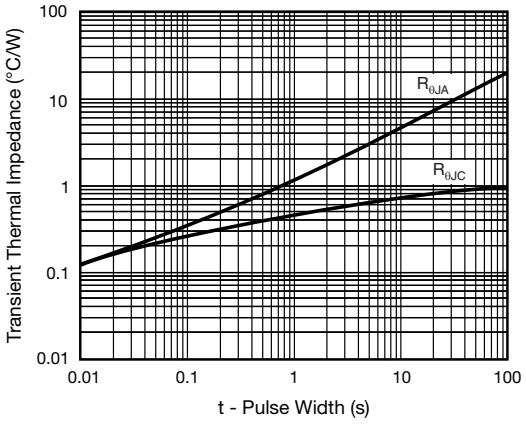

Fig. 7 - Typical Transient Thermal Impedance

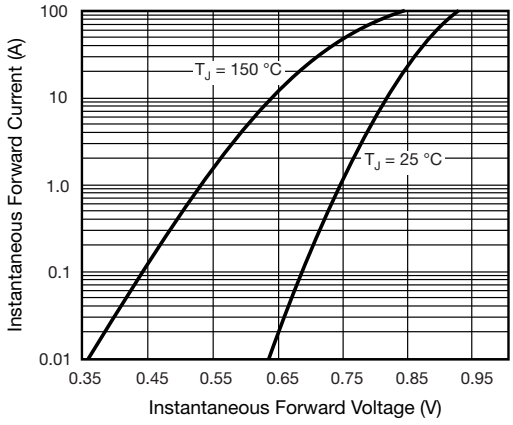

Fig. 5 - Typical Instantaneous Forward Characteristics

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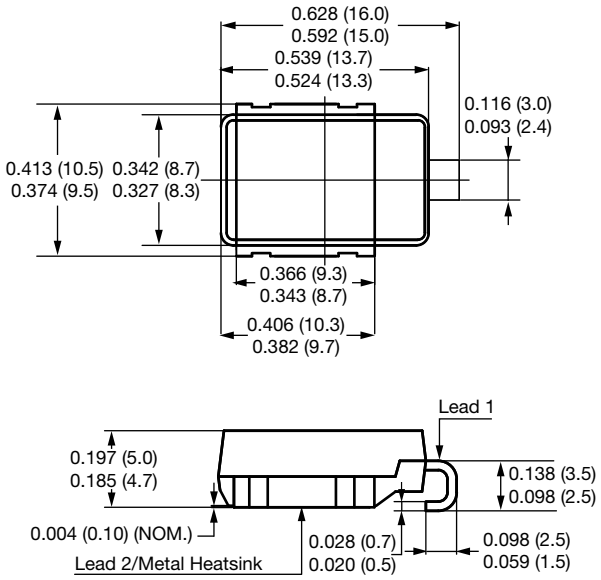
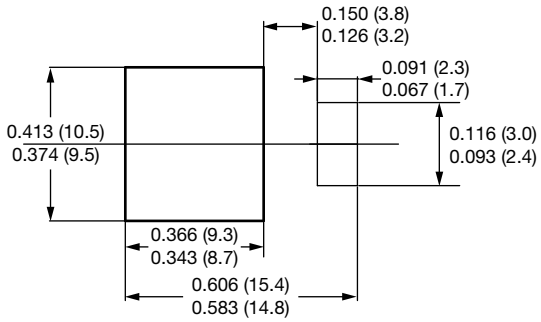
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-218AC



Mounting Pad Layout



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