

Surface Mount PAR[®] Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218AB

Cathode  Anode

LINKS TO ADDITIONAL RESOURCES



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 ISO7637-2 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



RoHS
COMPLIANT

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-218AB

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

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-218AB

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.	
SM6A27	24	30	22



ADDITIONAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Temperature coefficient of V_{BR}	$I_T = 10\text{ mA}$	αT	-	-	36	mV/ $^{\circ}\text{C}$
Clamping voltage for 10 μs /10 ms exponentially decaying waveform	$I_{PP} = 65\text{ A}$	V_C	-	-	40.0	V
Instantaneous forward voltage	$I_F = 6.0\text{ A}$	$V_F^{(1)}$	-	-	0.99	V
	$I_F = 100\text{ A}$		-	0.94	-	
Reverse leakage current	Rated V_{WM}	$T_J = 25\text{ }^{\circ}\text{C}$	-	-	0.5	μA
		$T_J = 175\text{ }^{\circ}\text{C}$	-	-	20.0	

Note

(1) Measured on a 300 μs square pulse width

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	55	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(2)}$	0.45	$^{\circ}\text{C/W}$

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	E3
	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 (E3 = non 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
SM6A27HE3/2D ⁽¹⁾	2.550	2D	750	13" diameter plastic tape and reel, anode towards the sprocket hole

Note

(1) AEC-Q101 qualified

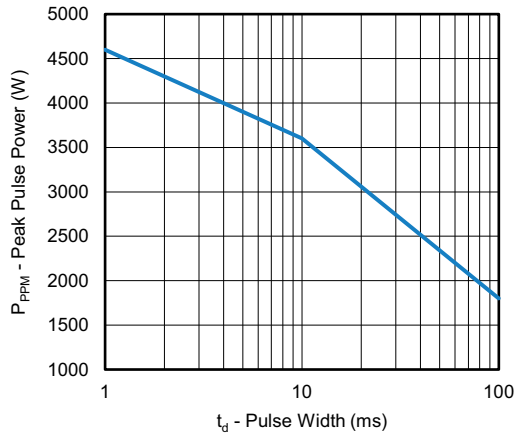
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Peak Pulse Power Derating Curve

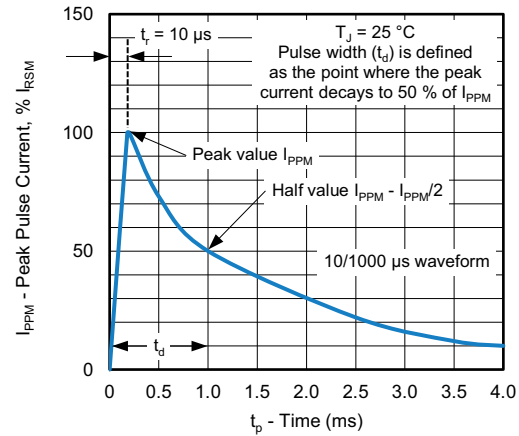


Fig. 4 - Pulse Waveform

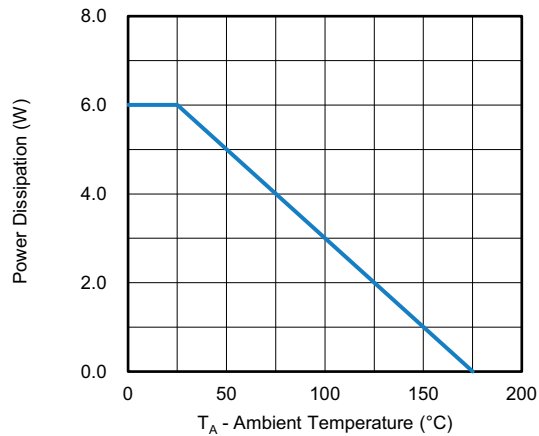


Fig. 2 - Power Derating Curve

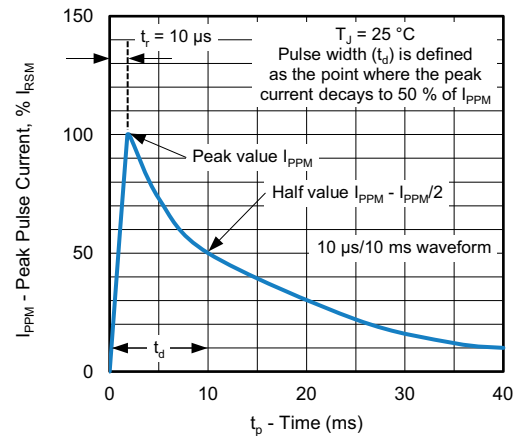


Fig. 5 - Pulse Waveform

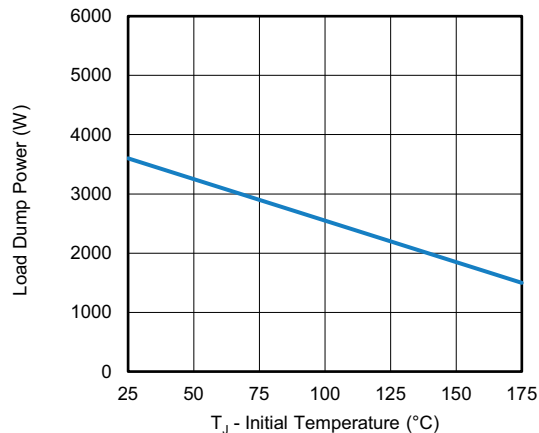


Fig. 3 - Load dump Power Characteristics (10 ms Exponential Waveform)

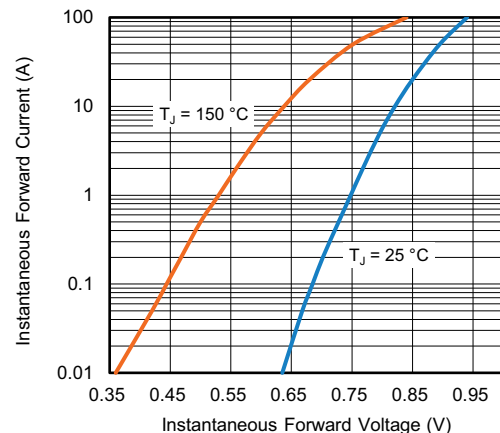


Fig. 6 - Typical Instantaneous Forward Characteristics

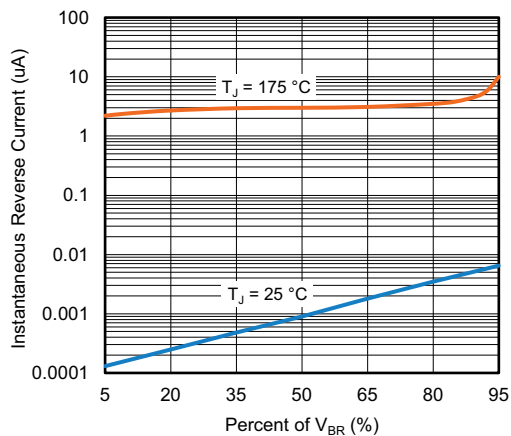


Fig. 7 - Typical Reverse Characteristics

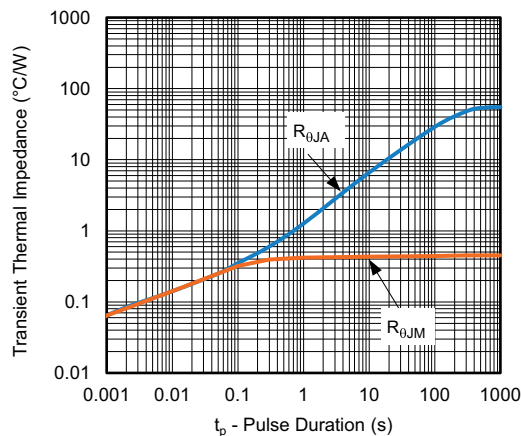
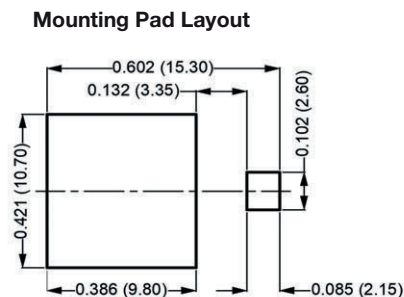
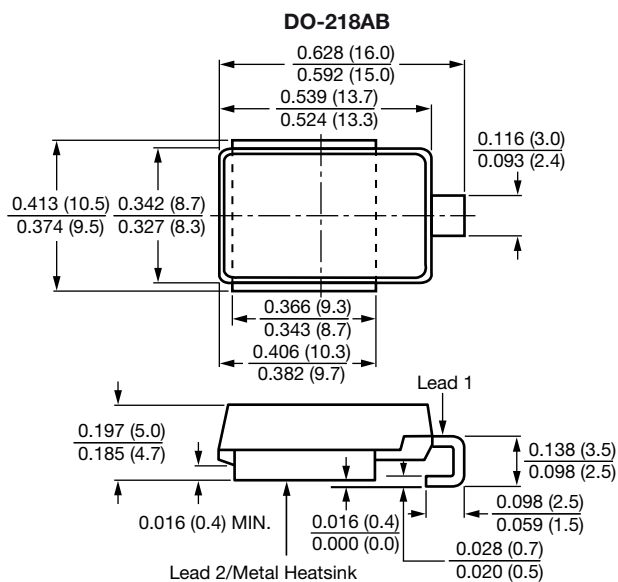


Fig. 8 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Note

- Footprint in accordance with IPC 7351 standard



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