

Surface Mount PAR[®] Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218AB

Anode Cathode



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

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-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)	3600 W
P_D	5 W
V_{WM}	22 V
I_{RSM}	70 A
I_{FSM}	500 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 with 10/1000 μs waveform	P_{PPM}	3600	W
Power dissipation on infinite heatsink at $T_C = 25\text{ }^\circ\text{C}$ (fig. 1)	P_D	5.0	W
Non-repetitive peak reverse surge current for 10 μs /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	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)				
DEVICE TYPE	BREAKDOWN VOLTAGE V_{BR} AT I_T (V)		TEST CURRENT I_T (mA)	STAND-OFF VOLTAGE V_{WM} (V)
	MIN.	MAX.		
SM5A27	24	30	10	22



ADDITIONAL CHARACTERISTICS (T _A = 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} = 55 A	V _C	-	-	40.0	V	
Instantaneous forward voltage	I _F = 6.0 A	V _F ⁽¹⁾	-	-	1.0	V	
	I _F = 100 A		-	0.95	-		
Reverse leakage current	Rated V _{WM}	I _R	T _J = 25 °C	-	-	0.2	μA
			T _J = 175 °C	-	-	10.0	

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 _{θJC}	1.0	°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SM5A27HE3/2D ⁽¹⁾	2.505	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 °C unless otherwise noted)

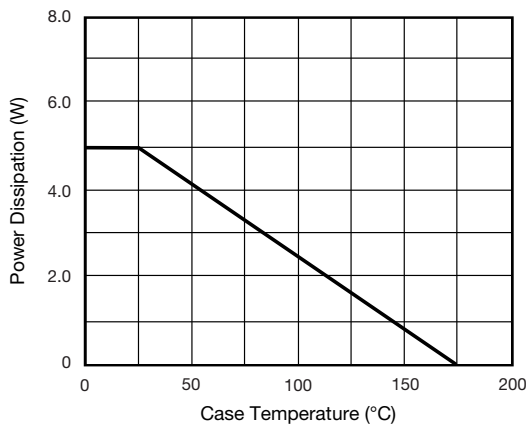


Fig. 1 - Power Derating Curve

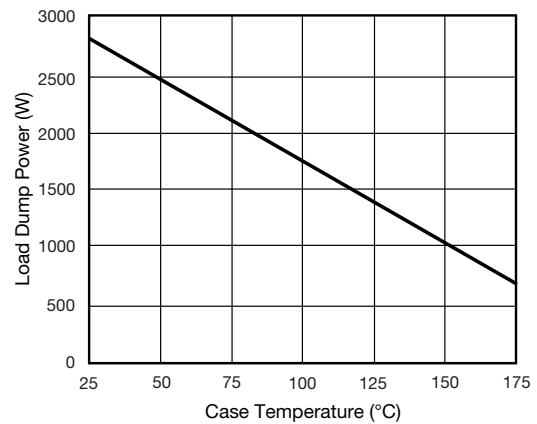


Fig. 2 - Load Dump Power Characteristics (10 ms Exponential Waveform)

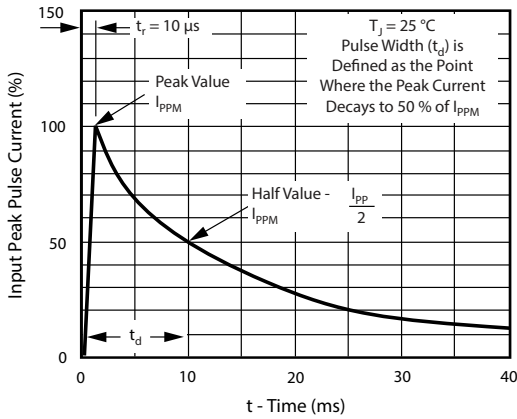


Fig. 3 - Pulse Waveform

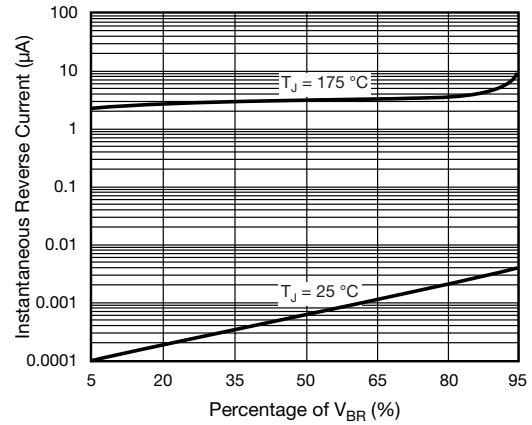


Fig. 6 - Typical Reverse Characteristics

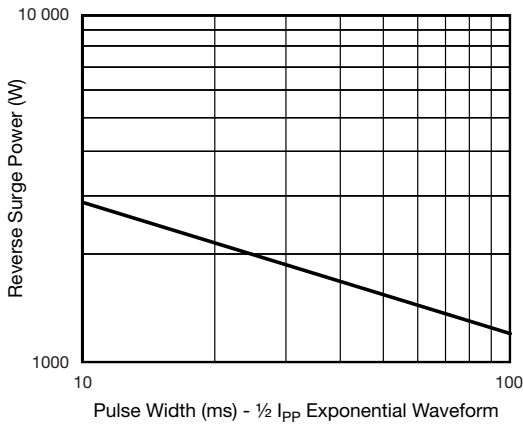


Fig. 4 - Reverse Power Capability

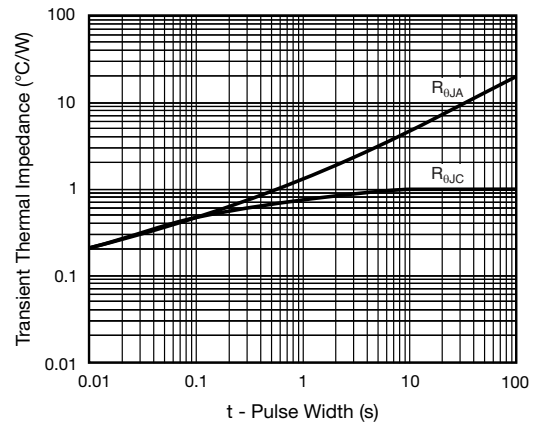


Fig. 7 - Typical Transient Thermal Impedance

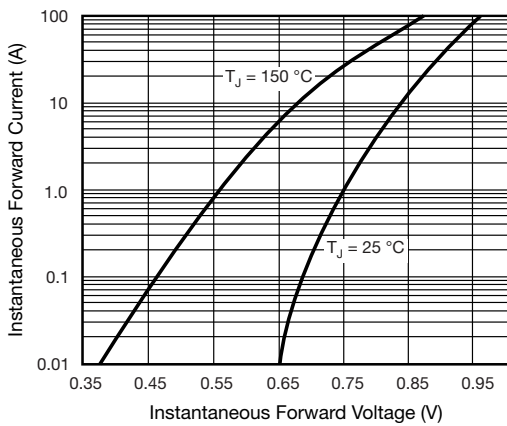
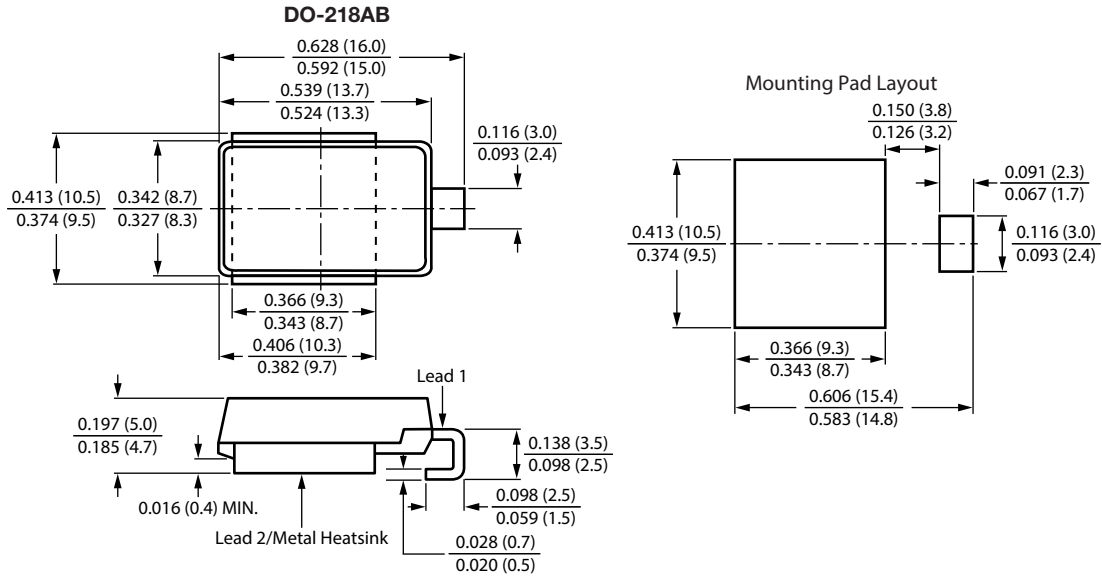


Fig. 5 - Typical Instantaneous Forward Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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