

Surface Mount PAR[®] Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218AB

Cathode  Anode

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 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 μ s)	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 μ s 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 μ 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	$^{\circ}\text{C}$

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 ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Zener voltage temperature coefficient	$I_Z = 10\text{ mA}$	V_{ZTC}	-	-	36	mV/ $^{\circ}\text{C}$
Clamping voltage for 10 μs /10 ms exponentially decaying waveform	$I_{PP} = 55\text{ A}$	V_C	-	-	40.0	V
Instantaneous forward voltage	$I_F = 6.0\text{ A}$	$V_F^{(1)}$	-	-	1.0	V
	$I_F = 100\text{ A}$		-	0.95	-	
Reverse leakage current	Rated V_{WM}	I_R	$T_J = 25\text{ }^{\circ}\text{C}$	-	0.2	μA
			$T_J = 175\text{ }^{\circ}\text{C}$	-	10.0	

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, junction to case	$R_{\theta JC}$	1.0	$^{\circ}\text{C}/\text{W}$

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

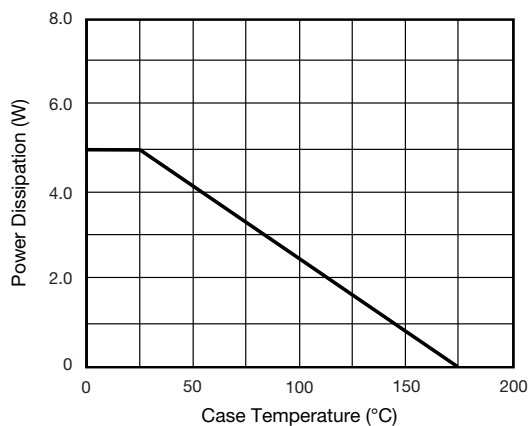
($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Power Derating Curve

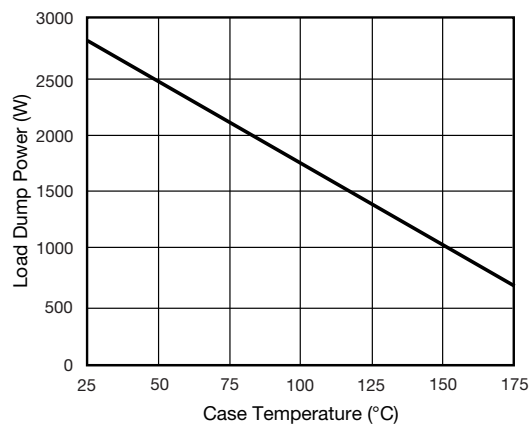


Fig. 2 - Load Dump Power Characteristics (10 ms Exponential Waveform)

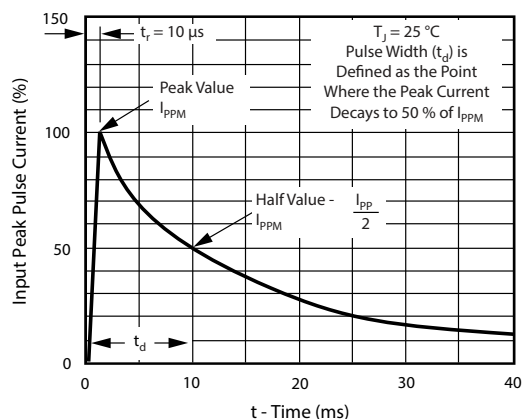


Fig. 3 - Pulse Waveform

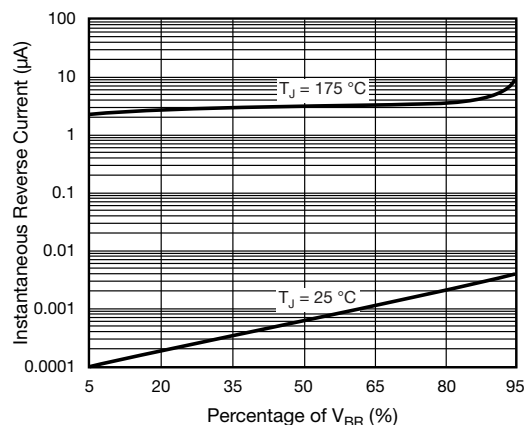


Fig. 6 - Typical Reverse Characteristics

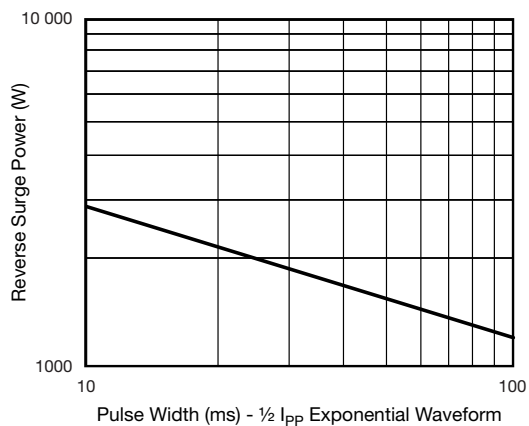


Fig. 4 - Reverse Power Capability

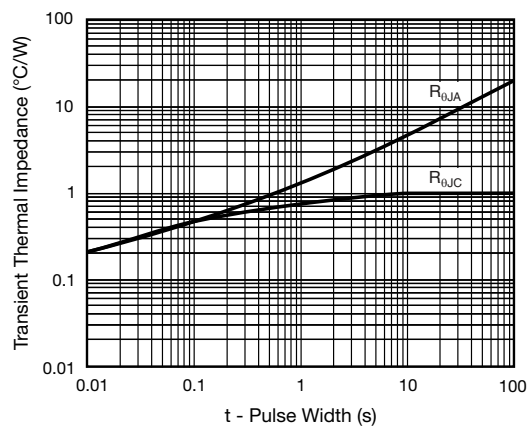


Fig. 7 - Typical Transient Thermal Impedance

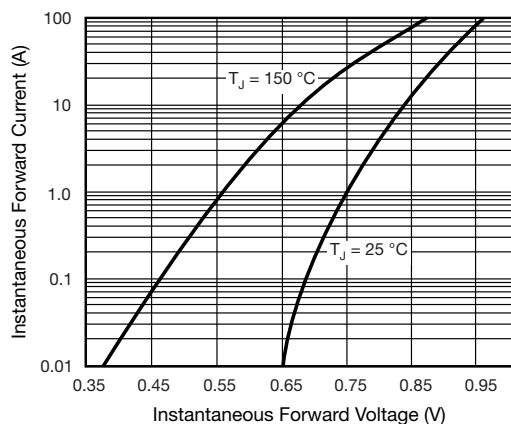
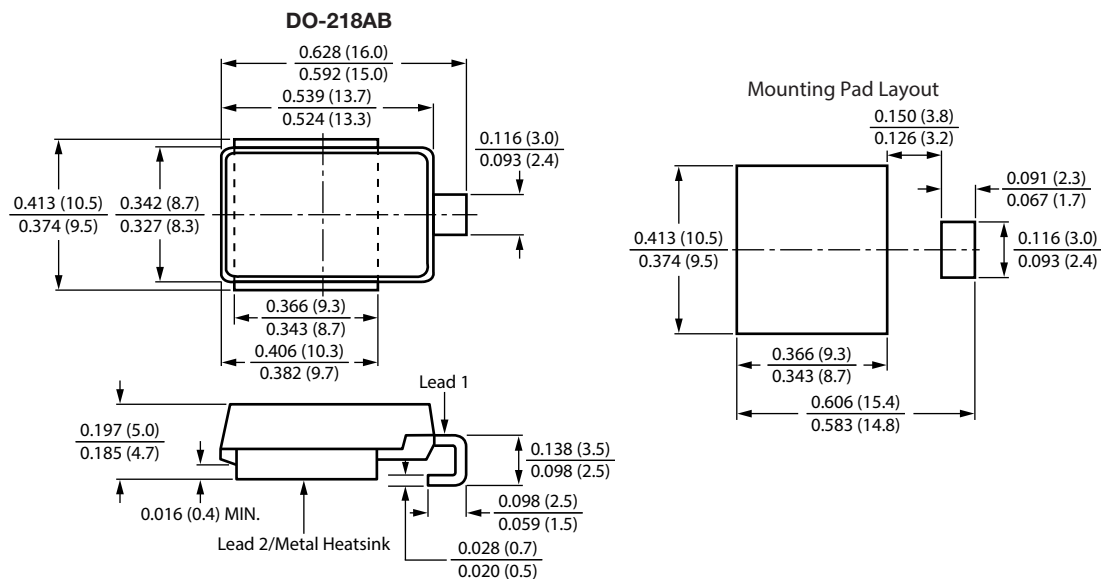


Fig. 5 - Typical Instantaneous Forward Characteristics



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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