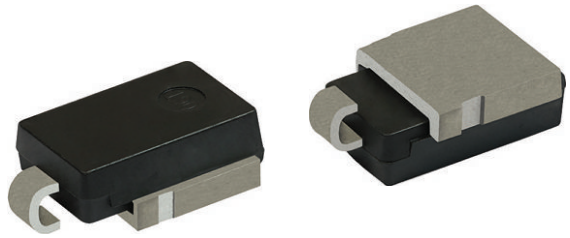
Not For New Designs - Alternative Device: SM5A27HM3

Surface-Mount PAR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218AB

Cathode ○—|◀—○ Anode

LINKS TO ADDITIONAL RESOURCES

Related Documents | Packages | Marking

PRIMARY CHARACTERISTICS	
V_{BR}	27 V
P_{PPM} (10 x 1000 µs)	3600 W
P_{PPM} (10 x 10 000 µs)	2800 W
P_D	5 W
V_{WM}	22 V
I_{PPM}	70 A
I_{FSM}	500 A
T_J max.	175 °C
Polarity	Unidirectional
Package	DO-218AB

FEATURES

RoHS COMPLIANT

- 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

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

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	VALUE	UNIT
Peak pulse power dissipation	with 10/1000 µs waveform	P_{PPM}	3600	W
	with 10/10 000 µs waveform		2800	
Power dissipation on infinite heatsink at T_A = 25 °C (fig. 1)		P_D	5.0	W
Non-repetitive peak reverse surge current for 10 µs/10 ms exponentially decaying waveform		I_{PPM}	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	°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.		
SM5A27	24	30	10	22

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ADDITIONAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	MIN.	TYP.	MAX.	UNIT
Temperature coefficient of V_{BR}	I_T = 10 mA		αT	-	-	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}	T_J = 25 °C	I_R	-	-	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	$R_{θJA}$ (1)	55	°C/W
	$R_{θJM}$ (2)	0.45	°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 / Environment 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
SM5A27HE3/2D (1)	2.505	2D	750	13" diameter plastic tape and reel, anode towards the sprocket hole

Note

(1) AEC-Q101 qualified

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RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

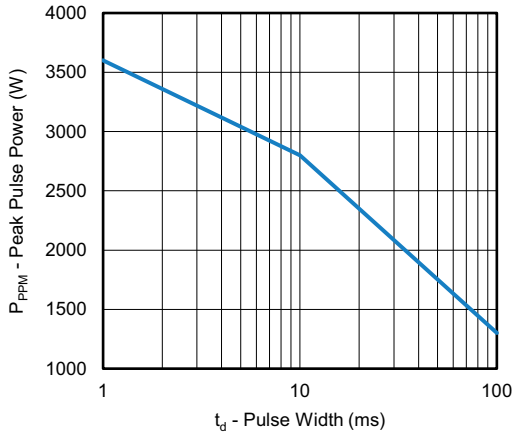

Fig. 1 - Peak Pulse Power Derating Curve

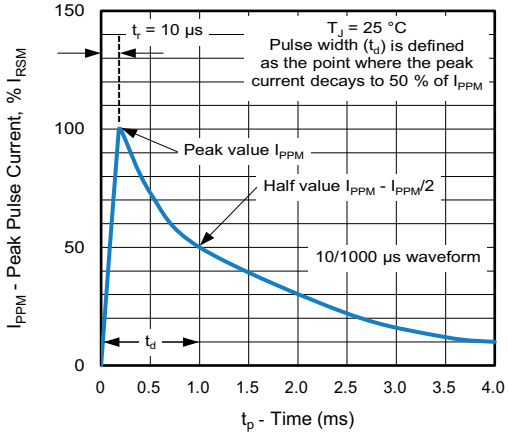

Fig. 4 - Pulse Waveform

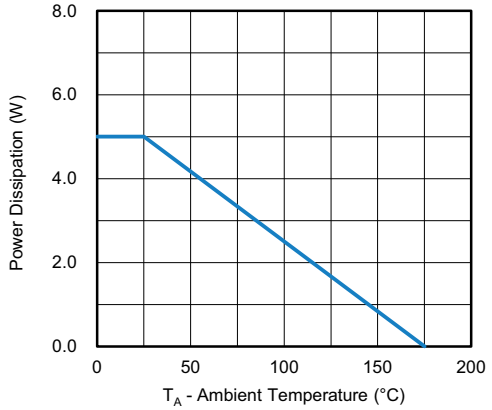

Fig. 2 - Power Derating Curve

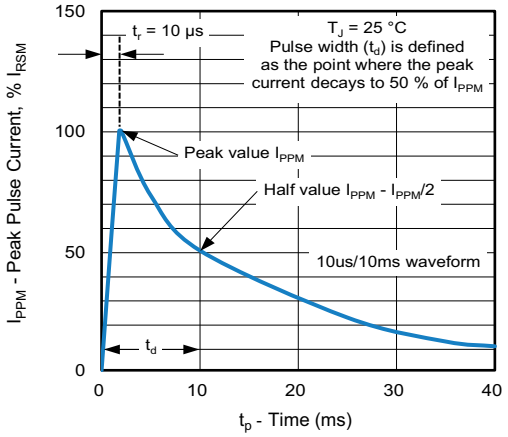

Fig. 5 - Pulse Waveform

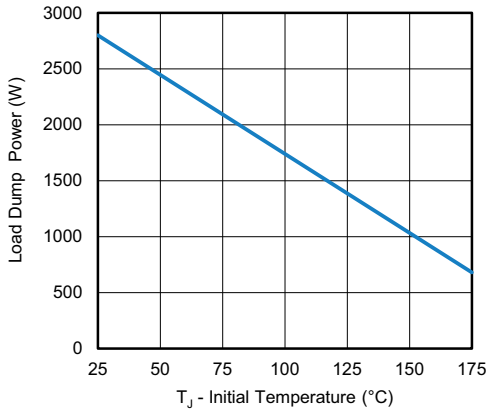

Fig. 3 - Load dump Power Characteristics
(10 ms Exponential Waveform)

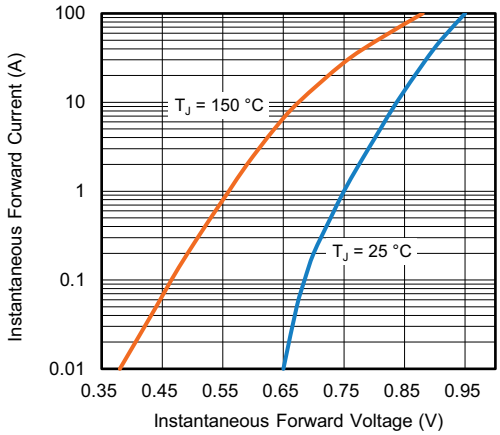

Fig. 6 - Typical Instantaneous Forward Characteristics

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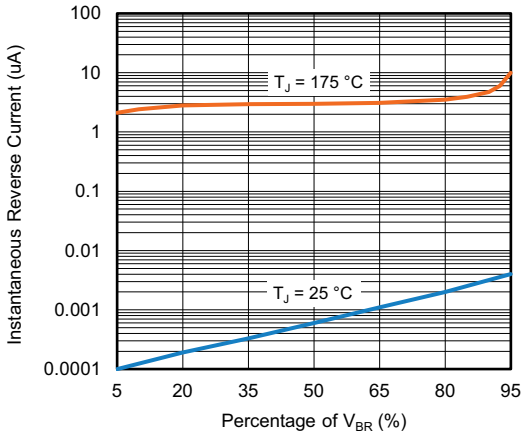


Fig. 7 - Typical Reverse Characteristics

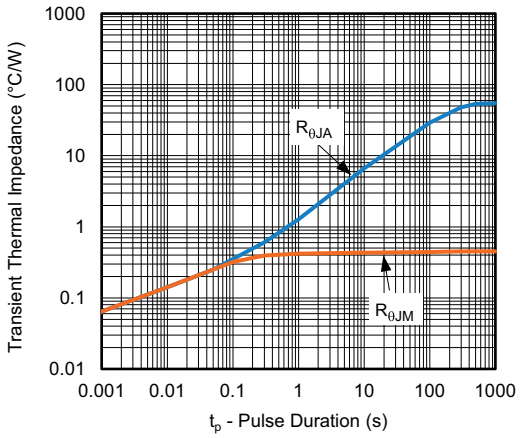
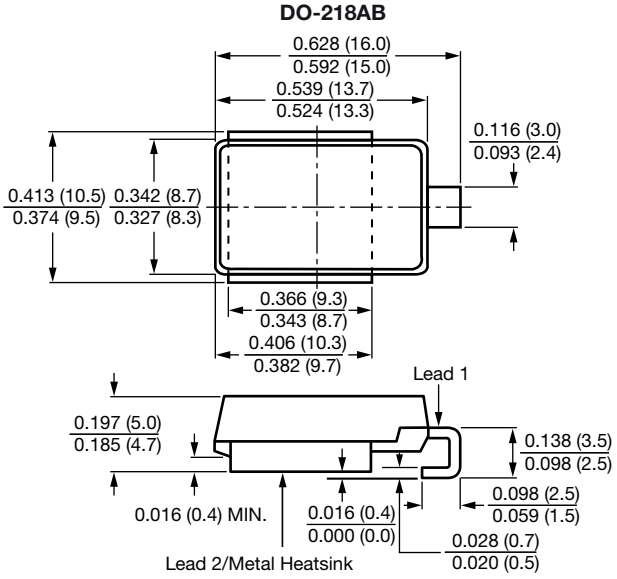
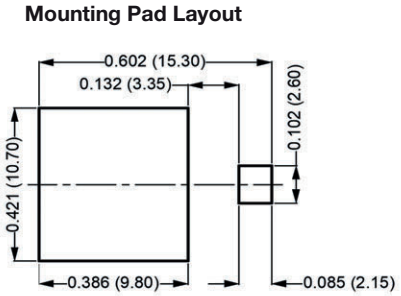


Fig. 8 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





Note

- Footprint in accordance with IPC 7351 standard

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