

Surface Mount PAR[®] Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218AB

PRIMARY CHARACTERISTICS	
V_{WM}	10 V to 36 V
P_{PPM} (10 x 1000 μ s)	4600 W
P_{PPM} (10 x 10 000 μ s)	3600 W
P_D	6 W
I_{FSM}	600 A
T_J max.	175 °C

FEATURES

- Junction passivation optimized design passivated anisotropic rectifier technology
- $T_J = 175$ °C capability suitable for high reliability and automotive requirement
- Available in uni-directional polarity only
- Low leakage current
- Low forward voltage drop
- High surge capability
- Meets ISO7637-2 surge specification (varied by test condition)
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



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

MAXIMUM RATINGS ($T_C = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation	P_{PPM}	with 10/1000 μ s waveform	4600
		with 10/10 000 μ s waveform	3600
Power dissipation on infinite heatsink at $T_C = 25$ °C (fig. 1)	P_D	6.0	W
Peak pulse current with 10/1000 μ s waveform	$I_{PPM}^{(1)}$	See next table	A
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

Note

⁽¹⁾ Non-repetitive current pulse at $T_A = 25$ °C



ELECTRICAL CHARACTERISTICS (T _C = 25 °C unless otherwise noted)								
DEVICE TYPE	BREAKDOWN VOLTAGE V _{BR} (V)		TEST CURRENT I _T (mA)	STAND-OFF VOLTAGE V _{WM} (V)	MAXIMUM REVERSE LEAKAGE AT V _{WM} I _D (µA)	MAXIMUM REVERSE LEAKAGE AT V _{WM} T _J = 175 °C I _D (µA)	MAX. PEAK PULSE CURRENT AT 10/1000 µs WAVEFORM (A)	MAXIMUM CLAMPING VOLTAGE AT I _{PPM} V _C (V)
	MIN.	MAX.						
SM6S10	11.1	13.6	5.0	10.0	15	250	245	18.8
SM6S10A	11.1	12.3	5.0	10.0	15	250	271	17.0
SM6S11	12.2	14.9	5.0	11.0	10	150	229	20.1
SM6S11A	12.2	13.5	5.0	11.0	10	150	253	18.2
SM6S12	13.3	16.3	5.0	12.0	10	150	209	22.0
SM6S12A	13.3	14.7	5.0	12.0	10	150	231	19.9
SM6S13	14.4	17.6	5.0	13.0	10	150	193	23.8
SM6S13A	14.4	15.9	5.0	13.0	10	150	214	21.5
SM6S14	15.6	19.1	5.0	14.0	10	150	178	25.8
SM6S14A	15.6	17.2	5.0	14.0	10	150	198	23.2
SM6S15	16.7	20.4	5.0	15.0	10	150	171	26.9
SM6S15A	16.7	18.5	5.0	15.0	10	150	189	24.4
SM6S16	17.8	21.8	5.0	16.0	10	150	160	28.8
SM6S16A	17.8	19.7	5.0	16.0	10	150	177	26.0
SM6S17	18.9	23.1	5.0	17.0	10	150	151	30.5
SM6S17A	18.9	20.9	5.0	17.0	10	150	167	27.6
SM6S18	20.0	24.4	5.0	18.0	10	150	143	32.2
SM6S18A	20.0	22.1	5.0	18.0	10	150	158	29.2
SM6S20	22.2	27.1	5.0	20.0	10	150	128	35.8
SM6S20A	22.2	24.5	5.0	20.0	10	150	142	32.4
SM6S22	24.4	29.8	5.0	22.0	10	150	117	39.4
SM6S22A	24.4	26.9	5.0	22.0	10	150	130	35.5
SM6S24	26.7	32.6	5.0	24.0	10	150	107	43.0
SM6S24A	26.7	29.5	5.0	24.0	10	150	118	38.9
SM6S26	28.9	35.3	5.0	26.0	10	150	99	46.6
SM6S26A	28.9	31.9	5.0	26.0	10	150	109	42.1
SM6S28	31.1	38.0	5.0	28.0	10	150	92	50.1
SM6S28A	31.1	34.4	5.0	28.0	10	150	101	45.4
SM6S30	33.3	40.7	5.0	30.0	10	150	86	53.5
SM6S30A	33.3	36.8	5.0	30.0	10	150	95	48.4
SM6S33	36.7	44.9	5.0	33.0	10	150	78	59.0
SM6S33A	36.7	40.6	5.0	33.0	10	150	86	53.3
SM6S36	40.0	48.9	5.0	36.0	10	150	72	64.3
SM6S36A	40.0	44.2	5.0	36.0	10	150	79	58.1

Note

- For all types maximum V_F = 1.9 V at I_F = 100 A measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum



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

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SM6S10AHE3/2D ⁽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)

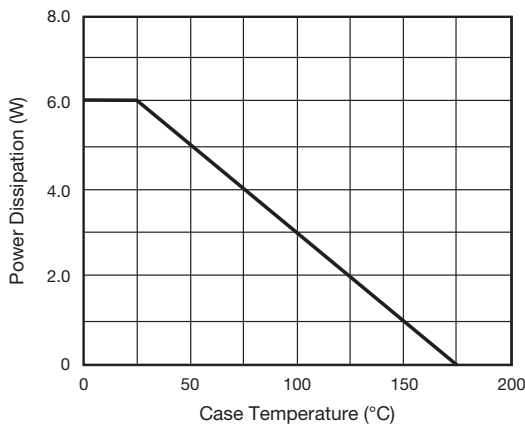


Fig. 1 - Power Derating Curve

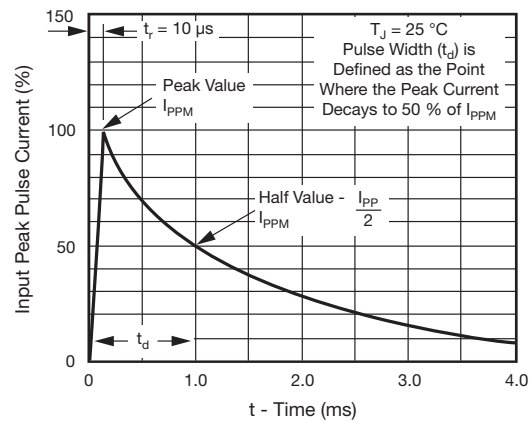


Fig. 3 - Pulse Waveform

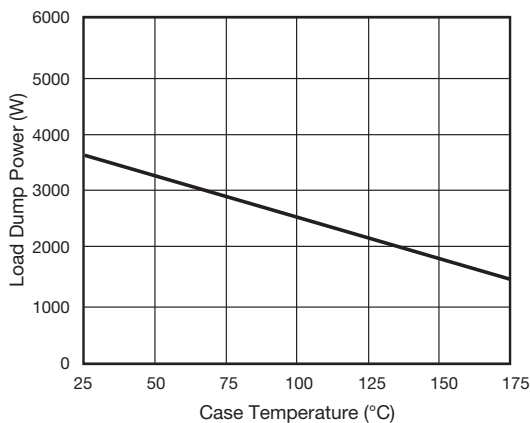


Fig. 2 - Load Dump Power Characteristics (10 ms Exponential Waveform)

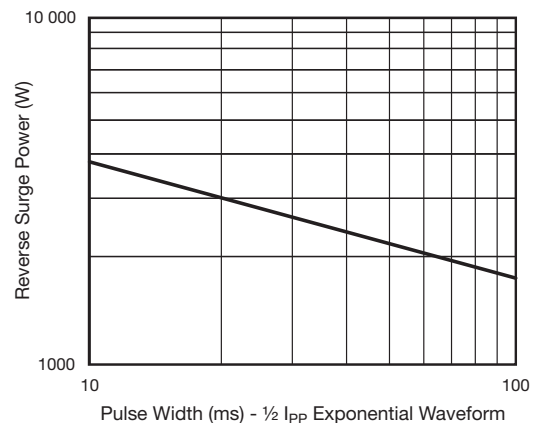


Fig. 4 - Reverse Power Capability

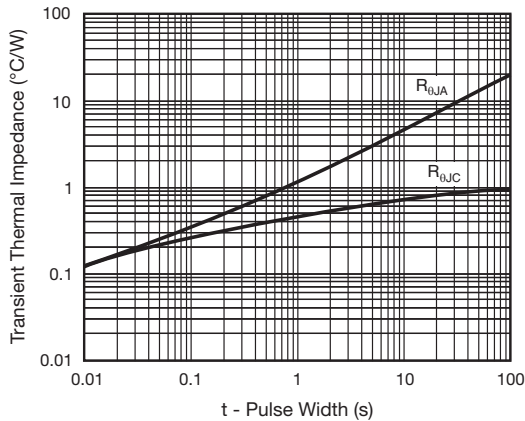
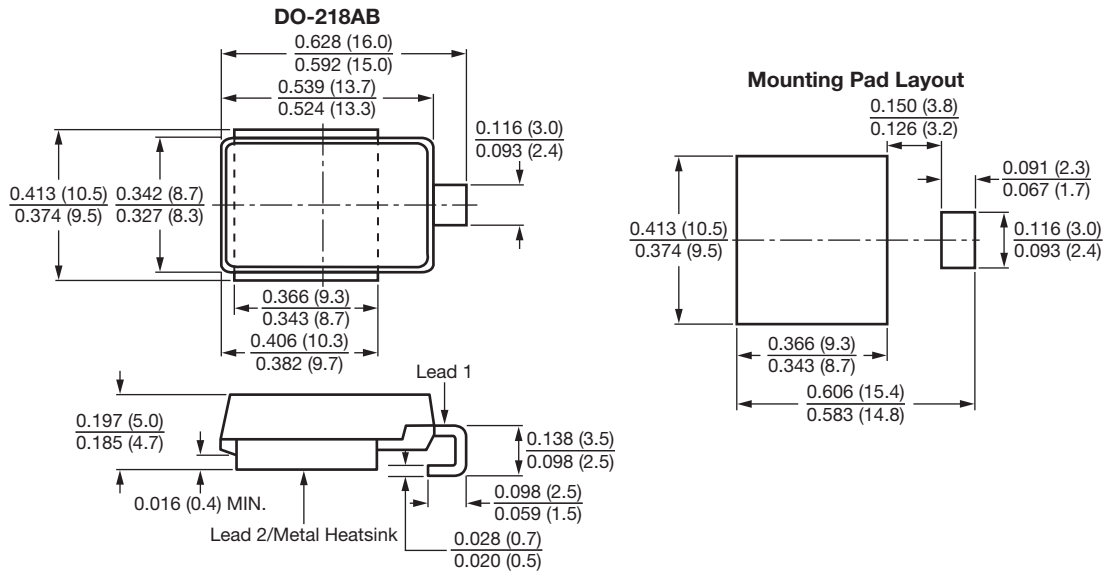


Fig. 5 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.