

Together We Make It Safe!



Transient Voltage Suppressor (TVS)





Transient Voltage Suppressor (TVS) SM6S

- DO218-AB
- 4600W
- Load Dump Application

Features

- Glass Passivated Chip
- Uni and Bidirectional Unit
- Low Leakage
- Excellent clamping capability
- Fast response time
- AEC-Q101 qualified
- Plastic material U/L 94V-0 recognized
- Reverse Voltage - 10 to 43 V
- Power Dissipation - 4600 W

Applications

- Automotive Electronics
- Telecom
- Lightning Protection Module
- Security
- Switching Power Supply
- Industrial Controller
- Inverter
- Renewable Energy Solar/Wind

Maximum Ratings and Thermal Characteristics

Parameter	Symbol	Value	Unit
Peak Power Dissipation At $T_A = 25^\circ\text{C}$ $T_p=10/1000\mu\text{s}$ Waveform	P_{PK}	4600	W
Peak Forward Surge Current 8.3ms single half sine-wave super imposed on rated load (Note 2)	I_{FSM}	600	A
Steady State Power Dissipation at $T_L = 122^\circ\text{C}$, lead lengths 0.375" (9.5mm) , see Fig.4	$P_{M(AV)}$	6.0	W
Maximum Instantaneous forward voltage at 100A for unidirectional devices only	V_F	3.5	V
Operating Temperature Range	T_J	-55~150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55~150	$^\circ\text{C}$

1. Non-repetitive current pulse, per fig. 5 and derated above $T_A = 25^\circ\text{C}$
2. 8.3ms single half sine-wave duty cycle= 4 pulses per minutes maximum (unidirectional units only).
3. Ratings at 25°C ambient temperature unless otherwise specified.
4. Single phase, half wave, 60Hz, resistive or inductive load.

Product Identification

SM6S XXX A or C
 (1) (2) (3) (4)

(1) Product Code (2) Reverse Standoff Voltage V_{RM} (3) Unidirectional (4) Bidirectional

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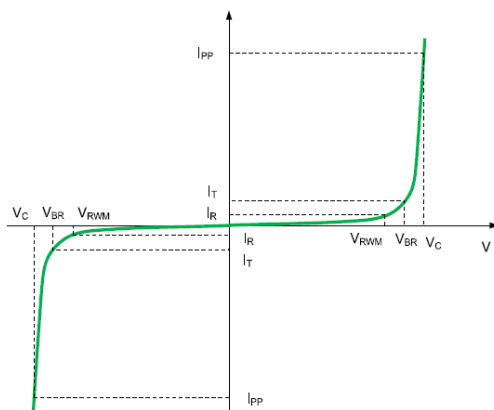
Electrical Characteristics

Part Number		$V_{BR}^{(1)}$ @ I_T		$I_T^{(2)}$	$V_{RM}^{(3)}$	$Max I_R^{(4)}$ @ V_{RM}	$Max V_C^{(5)}$	$Max I_{PP}^{(6)}$
Uni	Bi	MIN(V)	MAX(V)	mA	V	μA	V	A
SM6S10A	SM6S10C	11.1	12.3	5	10	15	17	270.6
SM6S11A	SM6S11C	12.2	13.5	5	11	10	18.2	252.7
SM6S12A	SM6S12C	13.3	14.7	5	12	10	19.9	231.2
SM6S13A	SM6S13C	14.4	15.9	5	13	10	21.5	214
SM6S14A	SM6S14C	15.6	17.2	5	14	10	23.2	198.3
SM6S15A	SM6S15C	16.7	18.5	5	15	10	24.4	188.5
SM6S16A	SM6S16C	17.8	19.7	5	16	10	26	176.9
SM6S17A	SM6S17C	18.9	20.9	5	17	10	27.6	166.7
SM6S18A	SM6S18C	20	22.1	5	18	10	29.2	157.5
SM6S20A	SM6S20C	22.2	24.5	5	20	10	32.4	142
SM6S22A	SM6S22C	24.4	26.9	5	22	10	35.5	129.6
SM6S24A	SM6S24C	26.7	29.5	5	24	10	38.9	118.3
SM6S26A	SM6S26C	28.9	31.9	5	26	10	42.1	109.3
SM6S27A	SM6S27C	24	30	5	22	10	39	116
SM6S28A	SM6S28C	31.1	34.4	5	28	10	45.4	101.3
SM6S30A	SM6S30C	33.3	36.8	5	30	10	48.4	95
SM6S33A	SM6S33C	36.7	40.6	5	33	10	53.3	86.3
SM6S36A	SM6S36C	40	44.2	5	36	10	58.1	79.2
SM6S40A	SM6S40C	44.4	49.1	5	40	10	64.5	71.3
SM6S43A	SM6S43C	47.8	52.8	5	43	10	69.4	66.3

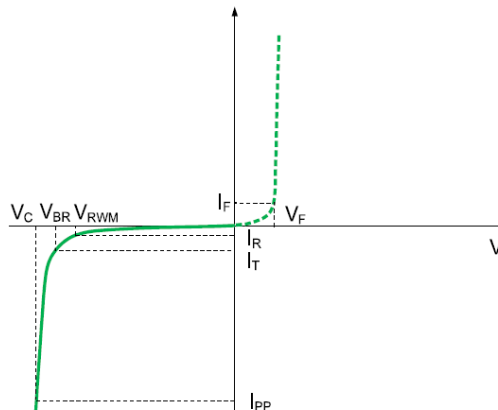
For bidirectional type having V_R of 10 volts and less, the I_R limit is double.

I-V Curve Characteristics

Bidirectional



Unidirectional

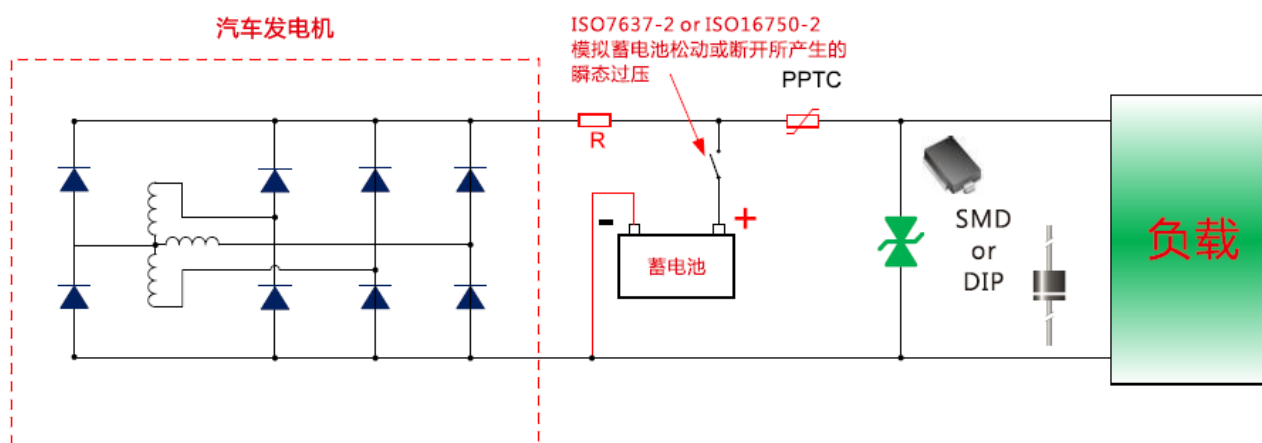


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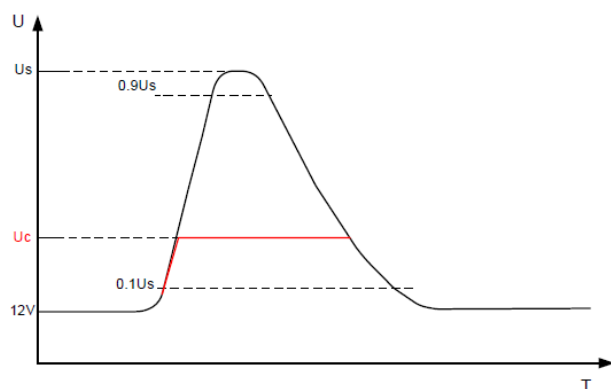
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Symbol	Parameter	Explanation
(1) V_{BR}	Breakdown voltage	The Voltage that flows though the TVS at a specified test current (I_T)
(2) I_T	Test current	A specified test current that flows though the TVS
(3) V_{RM}	Stand-off voltage	Maximum voltage that can be applied to the TVS without operation
(4) I_R	Leakage current @ V_R	Current measured at V_R
(5) V_C	Clamping voltage	Peak voltage measured across the suppressor at a specified I_{pp} (peak impulse current)
(6) I_{pp}	Peak pulse current	The maximum surge current that flows though the TVS

汽车电源系统模型:



ISO7637-2 P5A 波形及测试参数



参数	12V系统	24V系统
Us	65V ~ 87V	123V ~ 174V
Ri	0.5ohm ~ 4ohm	1ohm ~ 8ohm
Td	40ms ~ 400ms	100ms ~ 350ms
Tr	5 ~ 10ms	

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Fig1. Pulse Waveform

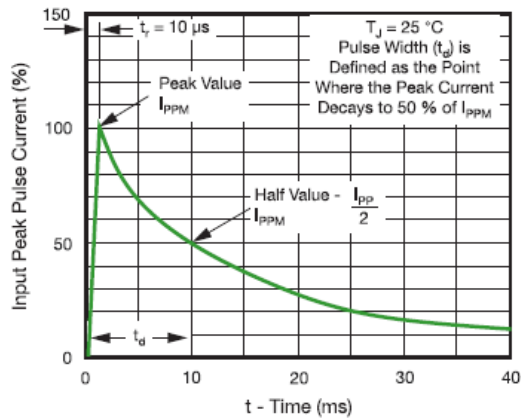


Fig2. Power Derating Curve

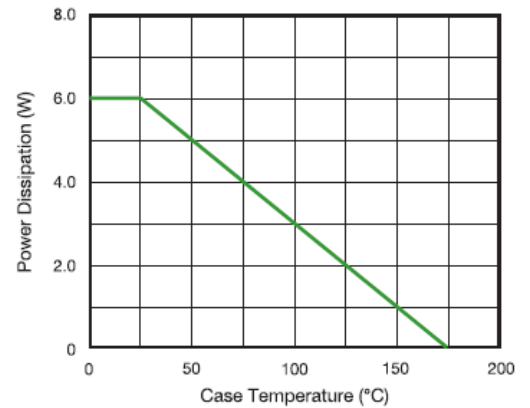


Figure 3. Peak Pulse Power Derating Curve

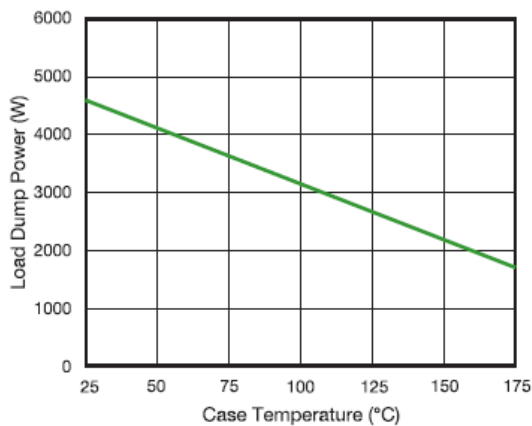
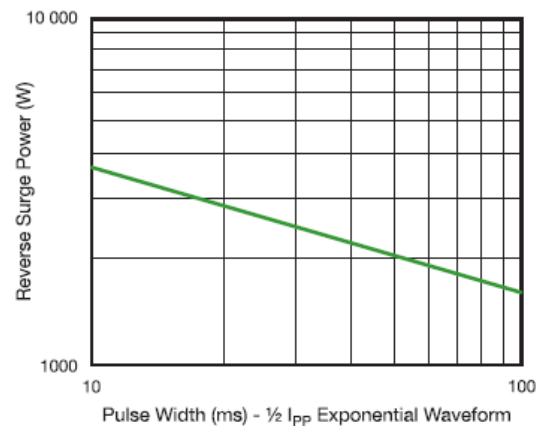


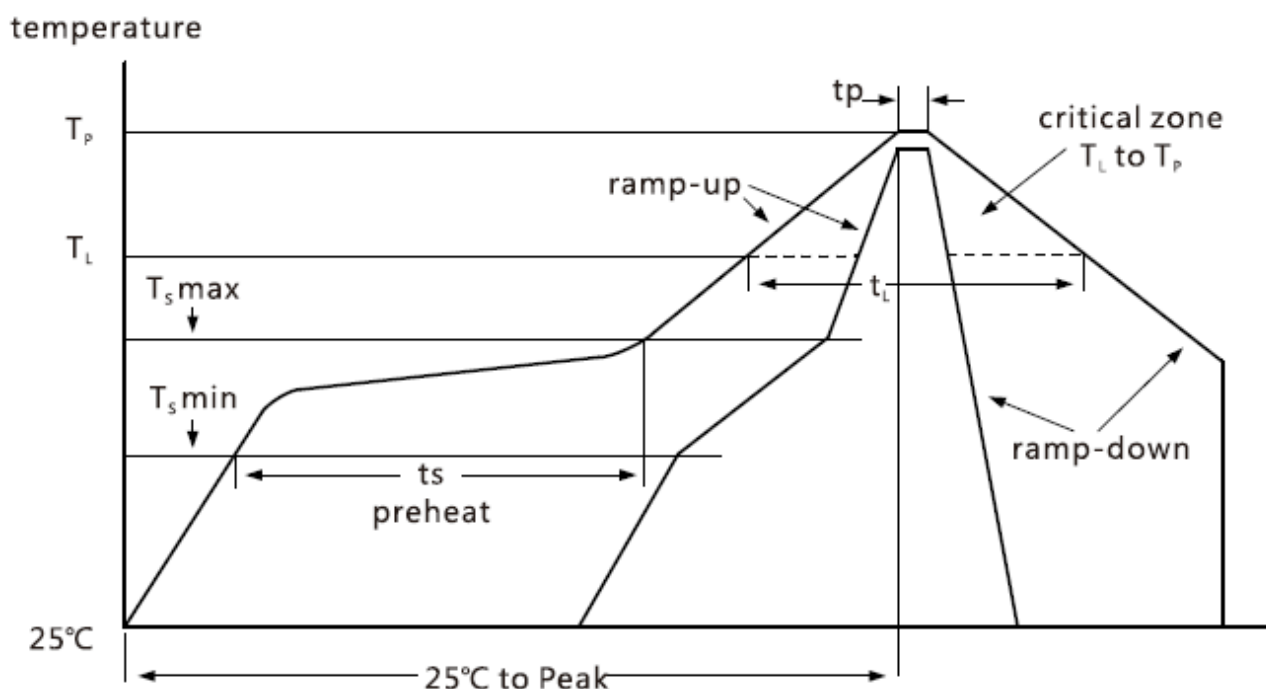
Figure 4. Reverse Power Capability



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Reflow Soldering Profile

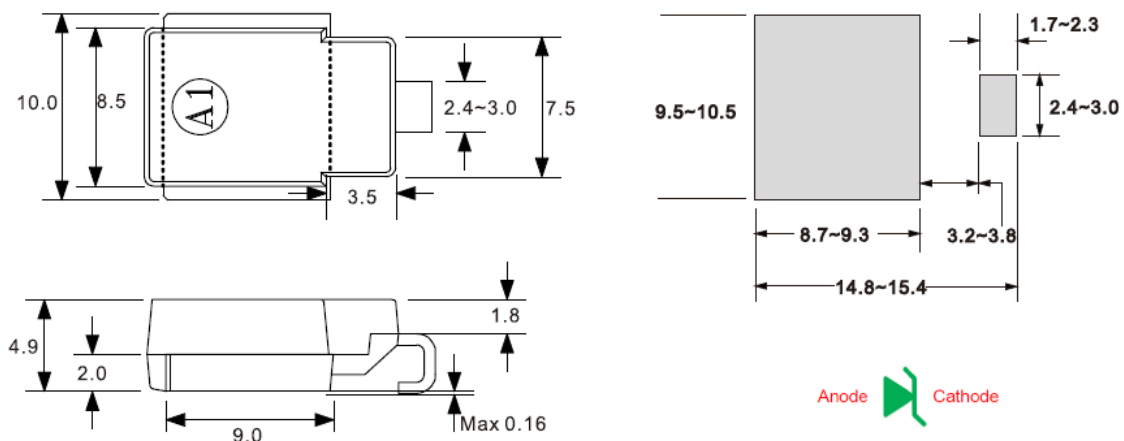


Reflow Profile Feature	SnPb eutectic assembly	Pb-free assembly
Average ramp-up rate ($T_s \text{ max}$ to T_p)	3°C/s maximum	3°C/s maximum
Preheat		
Temperature minimum ($T_s \text{ min}$)	100°C	150°C
Temperature maximum ($T_s \text{ max}$)	150°C	200°C
Time ($T_s \text{ min}$ to $T_s \text{ max}$)	60 s to 120 s	60 s to 180 s
Time maintained above		
Temperature (T_L)	183°C	217°C
Time (t_L)	60 s to 150 s	60 s to 150 s
Peak/classification temperature (T_p)	235°C	260°C
Number of allowed reflow cycles	3	3
Time within 5 °C of actual peak temperature (t_p)	10 s to 30 s	10 s to 30 s
Ramp-down rate	6°C/s maximum	6°C/s maximum
Time 25 °C to peak temperature	6 minutes maximum	8 minutes maximum

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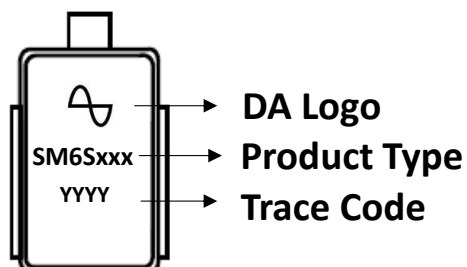
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Package and Layout Dimensions (DO-218AB) Unit: mm



Note : 未标注公差为±0.1

Product Marking



Packaging

Part	Component Package	Quantity	Packaging Option
SM6S-XXX-A/C	DO-218AB	750pcs	Tape & Reel 13" Reel