

## 200W, 5V - 100V Surface Mount Transient Voltage Suppressor

### FEATURES

- Photo Glass passivated junction
- Low power loss, high efficiency
- Ideal for automated placement
- Excellent clamping capability
- Typical  $I_R$  less than  $1\mu A$  above 10V
- 200 watts peak pulse power capability with a 10 / 1000  $\mu s$  waveform ( $V_{WM} \geq 60V$ ,  $P_{PPM} = 175W$ )
- Compliant to RoHS directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

| KEY PARAMETERS                |           |      |
|-------------------------------|-----------|------|
| PARAMETER                     | VALUE     | UNIT |
| $V_{WM}$                      | 5 - 100   | V    |
| $V_{BR}$<br>(uni-directional) | 6.8 - 117 | V    |
| $P_{PPM}$                     | 200       | W    |
| $T_{J\ MAX}$                  | 175       | °C   |
| Package                       | SOD-123W  |      |
| Configuration                 | Single    |      |

### APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- Lighting application
- On-board DC/DC converter



SOD-123W

### MECHANICAL DATA

- Case: SOD-123W
- Molding compound meets UL 94V-0 flammability rating
- Part no. with suffix "H" means AEC-Q101 qualified
- Packing code with suffix "G" means green compound (halogen-free)
- Moisture sensitivity level: level 1, per J-STD-020
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 16 mg (approximately)

| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ unless otherwise noted)                |           |             |      |
|--|-----------|-------------|------|
| PARAMETER  | SYMBOL    | VALUE       | UNIT |
| Non-repetitive peak impulse power dissipation with 10/1000us waveform <sup>(1)</sup> | $P_{PPM}$ | 200         | W    |
| Steady state power dissipation at $T_L = 25^\circ C$ <sup>(2)</sup>                  | $P_{tot}$ | 1           | W    |
| Forward Voltage @ $I_F = 12A$ for Uni-directional only <sup>(3)</sup>                | $V_F$     | 3.5         | V    |
| Junction temperature   | $T_J$     | -55 to +175 | °C   |
| Storage temperature  | $T_{STG}$ | -55 to +175 | °C   |

#### Notes:

1. Non-repetitive Current Pulse Per Fig. 3 and derated above  $T_A = 25^\circ C$  Per Fig. 2
2. Units mounted on recommended PCB (5mm x 5mm Cu pad test board)
3. Pulse test with  $PW = 0.3\ ms$

| <b>THERMAL PERFORMANCE</b>                       |                 |              |                      |
|--|-----------------|--------------|----------------------|
| <b>PARAMETER</b>                                 | <b>SYMBOL</b>   | <b>LIMIT</b> | <b>UNIT</b>          |
| Junction-to-lead thermal resistance per diode    | $R_{\theta JL}$ | 33           | $^{\circ}\text{C/W}$ |
| Junction-to-ambient thermal resistance per diode | $R_{\theta JA}$ | 100          | $^{\circ}\text{C/W}$ |
| Junction-to-case thermal resistance per diode    | $R_{\theta JC}$ | 34           | $^{\circ}\text{C/W}$ |

**Thermal Performance Note:** Units mounted on recommended PCB (5mm x 5mm Cu pad test board)

| <b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^{\circ}\text{C}$ unless otherwise noted) |              |  |      |                               |  |  |   |   |
|---|--------------|--|------|-------------------------------|--|--|---|---|
| Part number   | Marking code | Breakdown voltage<br>$V_{BR}@I_T$<br>(V)<br>(Note 1) |      | Test current<br>$I_T$<br>(mA) | Working stand-off voltage<br>$V_{WM}$<br>(V) | Maximum reverse leakage current<br>$I_R@V_{WM}$<br>( $\mu\text{A}$ )<br>(Note 1) | Maximum peak impulse current<br>$I_{PPM}$<br>(A)<br>$t_p = 10/1000 \mu\text{s}$ | Maximum clamping voltage<br>$V_C@I_{PPM}$<br>(V)<br>$t_p = 10/1000 \mu\text{s}$ |
|   |              | Min.   | Max. |                               |  |  |   |   |
| SMF5.0A   | 2W5P0        | 6.4  | 7.0  | 10                            | 5  | 800  | 21.7  | 9.2   |
| SMF6.0A   | 2W6P0        | 6.67   | 7.37 | 10                            | 6  | 800  | 19.4  | 10.3  |
| SMF6.5A   | 2W6P5        | 7.22   | 7.98 | 10                            | 6.5  | 500  | 17.9  | 11.2  |
| SMF7.0A   | 2W7P0        | 7.78   | 8.6  | 10                            | 7.0  | 200  | 16.7  | 12.0  |
| SMF7.5A   | 2W7P5        | 8.33   | 9.21 | 1                             | 7.5  | 100  | 15.5  | 12.9  |
| SMF8.0A   | 2W8P0        | 8.89   | 9.83 | 1                             | 8.0  | 50   | 14.7  | 13.6  |
| SMF8.5A   | 2W8P5        | 9.44   | 10.5 | 1                             | 8.5  | 10   | 13.9  | 14.4  |
| SMF9.0A   | 2W9P0        | 10.0   | 11.1 | 1                             | 9.0  | 5  | 13.0  | 15.4  |
| SMF10A  | 2W010        | 11.1   | 12.3 | 1                             | 10   | 5  | 11.8  | 17.0  |
| SMF11A  | 2W011        | 12.2   | 13.5 | 1                             | 11   | 1  | 11.0  | 18.2  |
| SMF12A  | 2W012        | 13.3   | 14.7 | 1                             | 12   | 1  | 10.1  | 19.9  |
| SMF13A  | 2W013        | 14.4   | 15.9 | 1                             | 13   | 1  | 9.3   | 21.5  |
| SMF14A  | 2W014        | 15.6   | 17.2 | 1                             | 14   | 1  | 8.6   | 23.2  |
| SMF15A  | 2W015        | 16.7   | 18.5 | 1                             | 15   | 1  | 8.2   | 24.4  |
| SMF16A  | 2W016        | 17.8   | 19.7 | 1                             | 16   | 1  | 7.7   | 26.0  |
| SMF17A  | 2W017        | 18.9   | 20.9 | 1                             | 17   | 1  | 7.2   | 27.6  |
| SMF18A  | 2W018        | 20.0   | 22.1 | 1                             | 18   | 1  | 6.8   | 29.2  |
| SMF20A  | 2W020        | 22.2   | 24.5 | 1                             | 20   | 1  | 6.2   | 32.4  |
| SMF22A  | 2W022        | 24.4   | 26.9 | 1                             | 22   | 1  | 5.6   | 35.5  |
| SMF24A  | 2W024        | 26.7   | 29.5 | 1                             | 24   | 1  | 5.1   | 38.9  |
| SMF26A  | 2W026        | 28.9   | 31.9 | 1                             | 26   | 1  | 4.8   | 42.1  |
| SMF28A  | 2W028        | 31.1   | 34.4 | 1                             | 28   | 1  | 4.4   | 45.4  |
| SMF30A  | 2W030        | 33.3   | 36.8 | 1                             | 30   | 1  | 4.1   | 48.4  |
| SMF33A  | 2W033        | 36.7   | 40.6 | 1                             | 33   | 1  | 3.8   | 53.3  |
| SMF36A  | 2W036        | 40.0   | 44.2 | 1                             | 36   | 1  | 3.4   | 58.1  |
| SMF40A  | 2W040        | 44.4   | 49.1 | 1                             | 40   | 1  | 3.1   | 64.5  |
| SMF43A  | 2W043        | 47.8   | 52.8 | 1                             | 43   | 1  | 2.9   | 69.4  |
| SMF45A  | 2W045        | 50.0   | 55.3 | 1                             | 45   | 1  | 2.8   | 72.7  |
| SMF48A  | 2W048        | 53.3   | 58.9 | 1                             | 48   | 1  | 2.6   | 77.4  |
| SMF51A  | 2W051        | 56.7   | 62.7 | 1                             | 51   | 1  | 2.4   | 82.4  |
| SMF54A  | 2W054        | 60.0   | 66.3 | 1                             | 54   | 1  | 2.3   | 87.1  |
| SMF58A  | 2W058        | 64.4   | 71.2 | 1                             | 58   | 1  | 2.1   | 95  |
| SMF60A  | 2W060        | 66.7   | 73.7 | 1                             | 60   | 1  | 1.8   | 96.8  |
| SMF64A  | 2W064        | 71.1   | 78.6 | 1                             | 64   | 1  | 1.7   | 103   |
| SMF70A  | 2W070        | 77.8   | 86   | 1                             | 70   | 1  | 1.55  | 113   |
| SMF75A  | 2W075        | 83.3   | 92.1 | 1                             | 75   | 1  | 1.45  | 121   |
| SMF78A  | 2W078        | 86.7   | 95.8 | 1                             | 78   | 1  | 1.4   | 126   |
| SMF85A  | 2W085        | 94.4   | 104  | 1                             | 85   | 1  | 1.3   | 137   |
| SMF90A  | 2W090        | 100  | 111  | 1                             | 90   | 1  | 1.05  | 146   |
| SMF100A   | 2W100        | 111  | 123  | 1                             | 100  | 1  | 1.08  | 162   |

**Note:**

1. Pulse test with  $PW=30 \text{ ms}$

**ORDERING INFORMATION**

| <b>PART NO.</b>       | <b>PART NO. SUFFIX(*)</b> | <b>PACKING CODE</b> | <b>PACKING CODE SUFFIX</b> | <b>PACKAGE</b> | <b>PACKING</b>    |
|-----------------------|---------------------------|---------------------|----------------------------|----------------|-------------------|
| SMFxxxA<br>(Note 1,2) | H                         | RV                  | G                          | SOD-123W       | 3,000 / 7" Reel   |
|                       |                           | RQ                  |                            | SOD-123W       | 10,000 / 13" Reel |

**Notes :**

1. "xxx" defines voltage from 5V (SMF5.0A) to 100V (SMF100A)
2. Whole series with green compound (halogen-free)

\*: Optional available

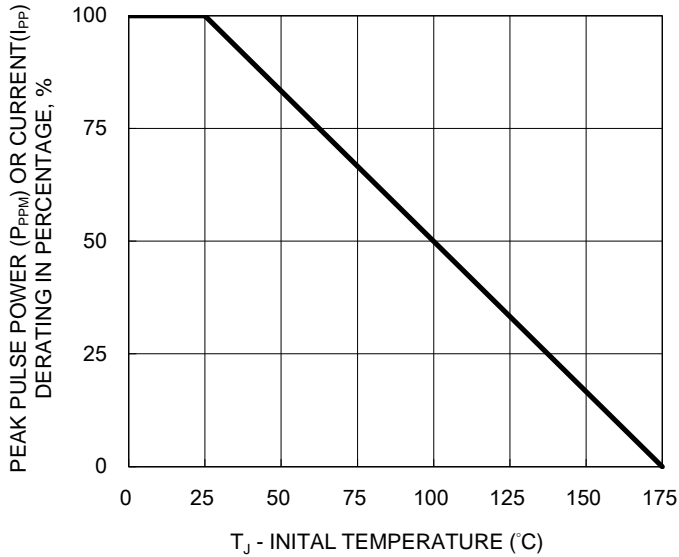
**EXAMPLE**

| <b>EXAMPLE P/N</b> | <b>PART NO.</b> | <b>PART NO. SUFFIX</b> | <b>PACKING CODE</b> | <b>PACKING CODE SUFFIX</b> | <b>DESCRIPTION</b>                   |
|--------------------|-----------------|------------------------|---------------------|----------------------------|--------------------------------------|
| SMF5.0AHRVG        | SMF5.0A         | H                      | RV                  | G                          | AEC-Q101 qualified<br>Green compound |

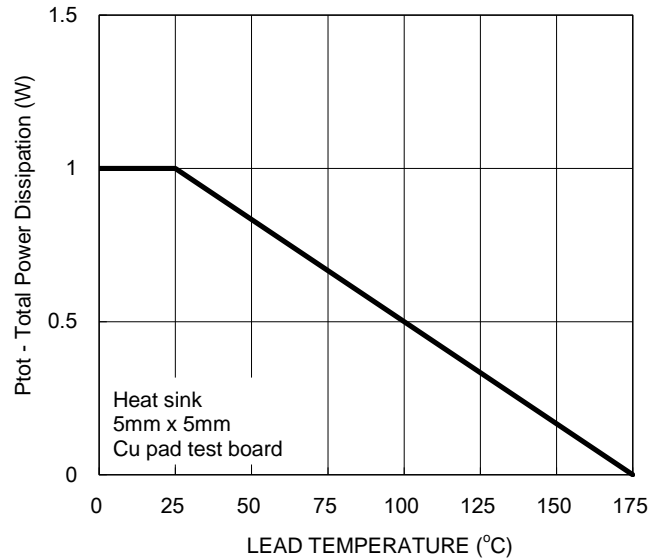
**CHARACTERISTICS CURVES**

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

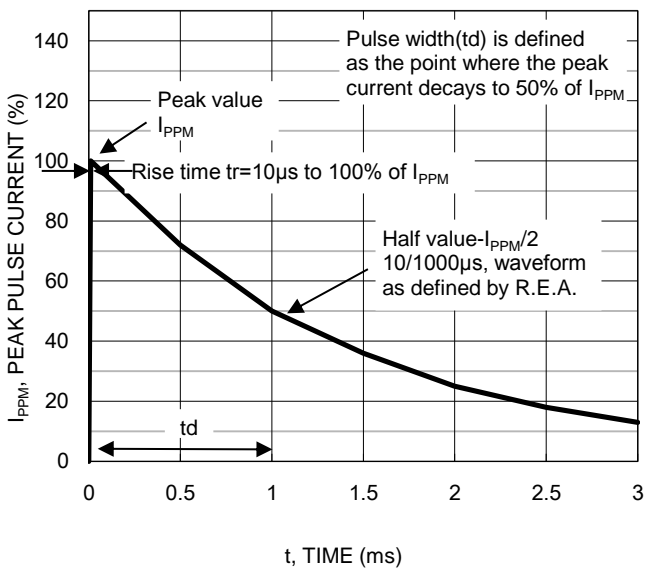
**Fig.1 Pulse Power or Current vs. Initial Junction Temperature**



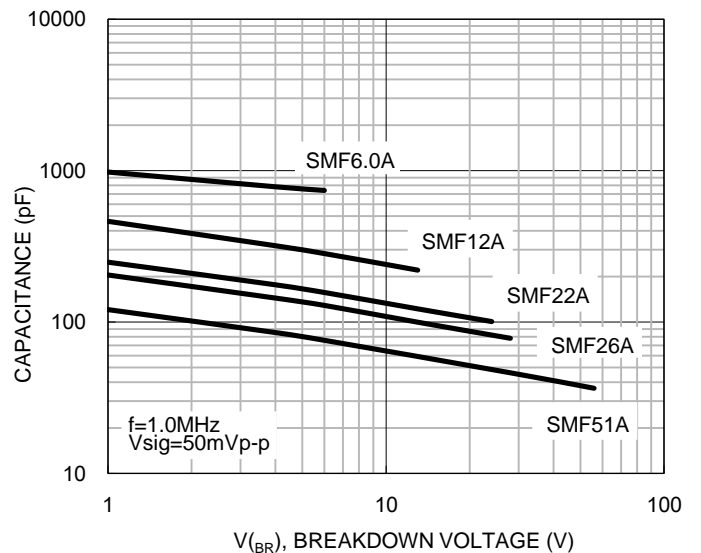
**Fig.2 Steady State Power Derating**



**Fig.3 Clamping Power Pulse Waveform**

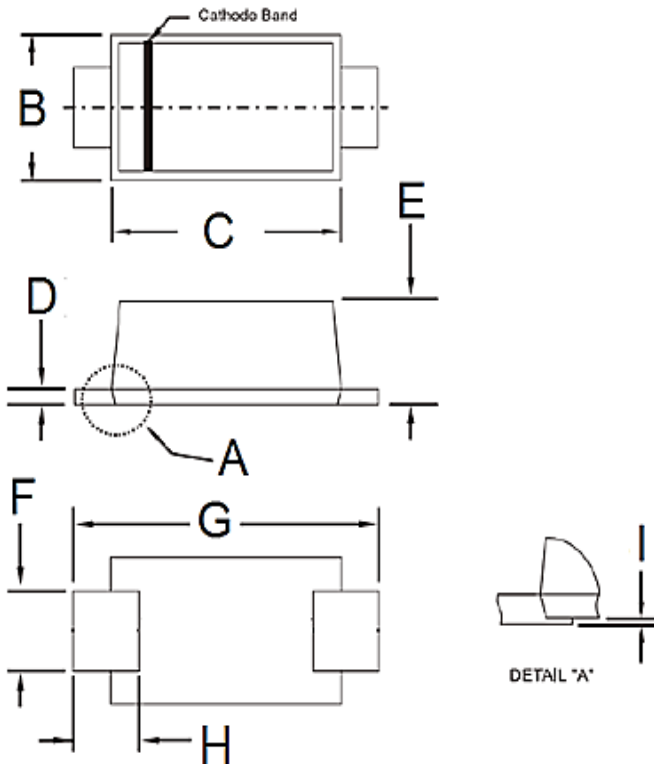


**Fig.4 Typical Junction Capacitance**



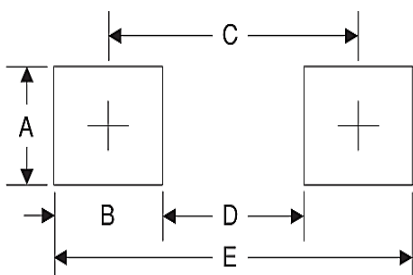
**PACKAGE OUTLINE DIMENSIONS**

SOD-123W



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min       | Max  | Min         | Max   |
| B    | 1.70      | 1.90 | 0.067       | 0.075 |
| C    | 2.60      | 2.90 | 0.102       | 0.114 |
| D    | 0.10      | 0.22 | 0.004       | 0.009 |
| E    | 0.90      | 1.02 | 0.035       | 0.040 |
| F    | 0.90      | 1.05 | 0.035       | 0.041 |
| G    | 3.60      | 3.80 | 0.142       | 0.150 |
| H    | 0.50      | 0.85 | 0.020       | 0.033 |
| I    | 0.00      | 0.10 | 0.000       | 0.004 |

**SUGGESTED PAD LAYOUT**



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 1.4       | 0.055       |
| B      | 1.2       | 0.047       |
| C      | 3.1       | 0.122       |
| D      | 1.9       | 0.075       |
| E      | 4.3       | 0.169       |

**MARKING DIAGRAM**



P/N =Marking Code  
 YW =Date Code  
 F =Factory Code

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