

## FEATURES

- ◆ Glass passivated chip
- ◆ Low leakage
- ◆ Uni and Bidirectional unit
- ◆ Excellent clamping capability
- ◆ The plastic material has U/L recognition 94V-0
- ◆ Fast response time
- ◆ AEC-Q101 qualified

## MECHANICAL DATA

- ◆ Case : Molded Plastic
- ◆ Marking : Unidirectional - type number and cathode band  
Bidirectional - type number only

## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Single phase, half wave, 60Hz, resistive or inductive load.

| Parameter  | Symbol             | Value   | Units |
|--|--------------------|---------|-------|
| Peak Pulse Power dissipation (NOTE 1)  | P <sub>PK</sub>    | 6600    | Watts |
| Storage Temperature Range  | T <sub>STG</sub>   | -55~150 | °C    |
| Operating Junction Temperature Range   | T <sub>J</sub>     | -55~150 | °C    |
| Power Dissipation on Infinite Heat Sink at T <sub>L</sub> =122°C (NOTE 2)              | P <sub>M(AV)</sub> | 8.0     | W     |
| Peak Forward Surge Current (NOTE 3)  | I <sub>F</sub>     | 700     | A     |
| Maximum Instantaneous forward voltage at 100A for unidirectional devices only (NOTE 4) | V <sub>F</sub>     | 3.5     | V     |

NOTE :

1. Non-repetitive current pulse@10/1000μs and derated above T<sub>A</sub>=25°C
2. Mounted on 5.0x5.0mm copper pad to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only.
4. V<sub>F</sub> < 3.5V for V<sub>BR</sub> ≤ 200V and V<sub>F</sub> < 6.5V for V<sub>BR</sub> ≥ 201V.

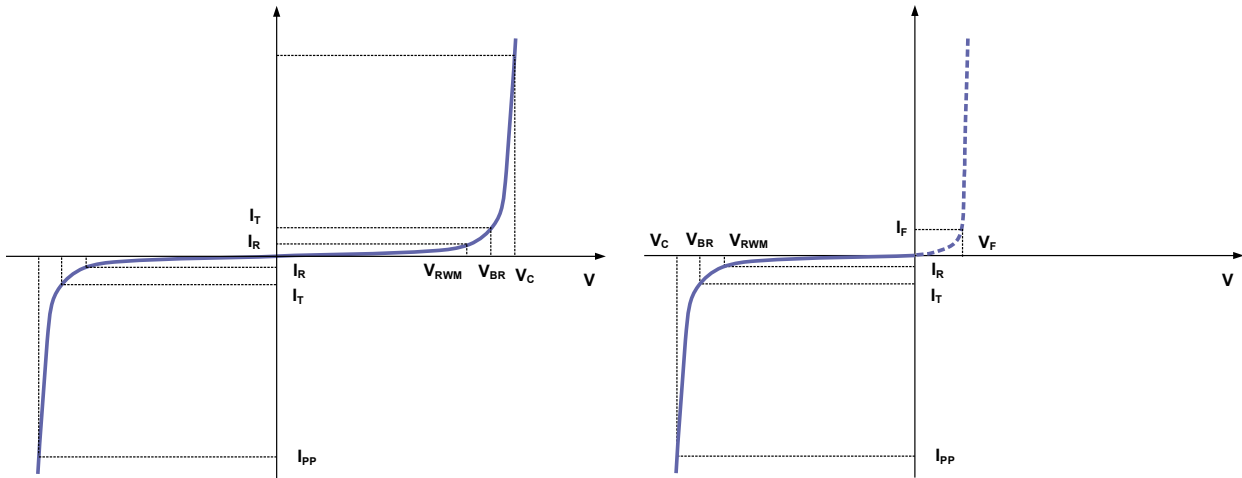
## ELECTRICAL CHARACTERISTICS

| Part Number |         | $V_{BR}^{(1)}@I_T$ |         | $I_T^{(2)}$ | $V_{RM}^{(3)}$ | Maxi.<br>$I_R^{(4)}@V_{RM}$ | Maxi.<br>$V_C^{(5)}@I_{PP}$ | Maxi. $I_{PP}^{(6)}$ |
|-------------|---------|--------------------|---------|-------------|----------------|-----------------------------|-----------------------------|----------------------|
| Uni         | Bi      | MIN (V)            | MAX (V) | mA          | V              | $\mu A$                     | V                           | A                    |
| SM8S10A     | SM8S10C | 11.1               | 12.3    | 5           | 10             | 15                          | 17                          | 388.0                |
| SM8S11A     | SM8S11C | 12.2               | 13.5    | 5           | 11             | 10                          | 18.2                        | 363.0                |
| SM8S12A     | SM8S12C | 13.3               | 14.7    | 5           | 12             | 10                          | 19.9                        | 332.0                |
| SM8S13A     | SM8S13C | 14.4               | 15.9    | 5           | 13             | 10                          | 21.5                        | 307.0                |
| SM8S14A     | SM8S14C | 15.6               | 17.2    | 5           | 14             | 10                          | 23.2                        | 284.0                |
| SM8S15A     | SM8S15C | 16.7               | 18.5    | 5           | 15             | 10                          | 24.4                        | 270.0                |
| SM8S16A     | SM8S16C | 17.8               | 19.7    | 5           | 16             | 10                          | 26                          | 254.0                |
| SM8S17A     | SM8S17C | 18.9               | 20.9    | 5           | 17             | 10                          | 27.6                        | 239.0                |
| SM8S18A     | SM8S18C | 20                 | 22.1    | 5           | 18             | 10                          | 29.2                        | 226.0                |
| SM8S20A     | SM8S20C | 22.2               | 24.5    | 5           | 20             | 10                          | 32.4                        | 204.0                |
| SM8S22A     | SM8S22C | 24.4               | 26.9    | 5           | 22             | 10                          | 35.5                        | 186.0                |
| SM8S24A     | SM8S24C | 26.7               | 29.5    | 5           | 24             | 10                          | 38.9                        | 170.0                |
| SM8S26A     | SM8S26C | 28.9               | 31.9    | 5           | 26             | 10                          | 42.1                        | 157.0                |
| SM8A27A     | SM8A27C | 24                 | 30      | 5           | 22             | 10                          | 39                          | 168.0                |
| SM8S28A     | SM8S28C | 31.1               | 34.4    | 5           | 28             | 10                          | 45.4                        | 145.0                |
| SM8S30A     | SM8S30C | 33.3               | 36.8    | 5           | 30             | 10                          | 48.4                        | 136.0                |
| SM8S33A     | SM8S33C | 36.7               | 40.6    | 5           | 33             | 10                          | 53.3                        | 124.0                |
| SM8S36A     | SM8S36C | 40                 | 44.2    | 5           | 36             | 10                          | 58.1                        | 114.0                |
| SM8S40A     | SM8S40C | 44.4               | 49.1    | 5           | 40             | 10                          | 64.5                        | 102.0                |
| SM8S43A     | SM8S43C | 47.8               | 52.8    | 5           | 43             | 10                          | 69.4                        | 95.1                 |

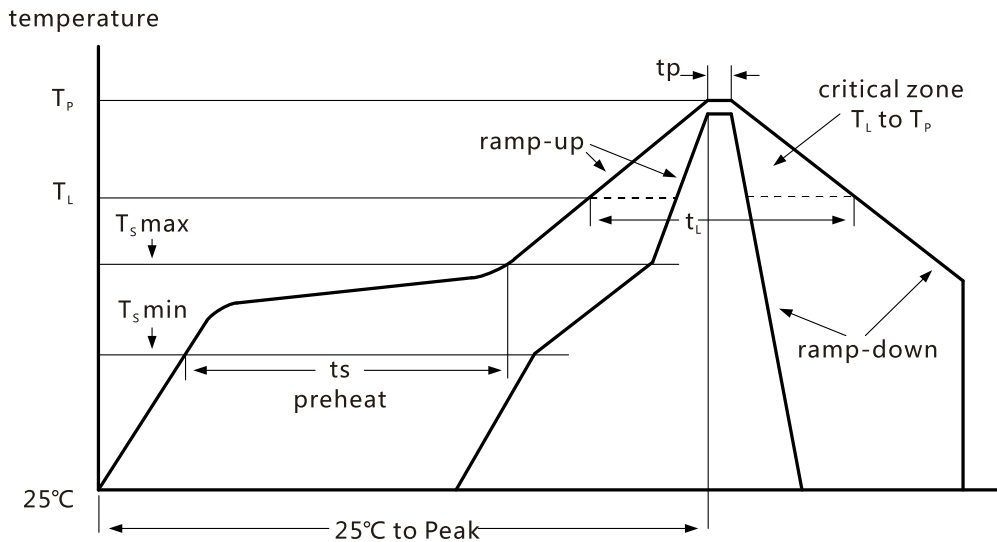
NOTE :

| Symbol       | Parameter                  | Description  |
|--------------|----------------------------|--|
| (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 @ $V_{RM}$ | Current measured at $V_{RM}$   |
| (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  |

## I-V CURVE CHARACTERISTICS



## REFLOW SOLDERING PROFILE



| Profile Feature                                       | SnPb eutectic assembly | Pb-free assembly  |
|---|------------------------|-------------------|
| Average ramp-up rate ( $T_s$ max to $T_p$ )           | 3°C/s maximum          | 3°C/s maximum     |
| Preheat   |                        |                   |
| Temperature minimum ( $T_s$ min)                      | 100°C                  | 150°C             |
| Temperature maximum ( $T_s$ max)                      | 150°C                  | 200°C             |
| Time ( $T_s$ min to $T_s$ 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           | 20 s to 40 s      |
| Ramp-down rate  | 6°C/s maximum          | 6°C/s maximum     |
| Time 25 °C to peak temperature                        | 6 minutes maximum      | 8 minutes maximum |

Figure 1. Pulse Waveform

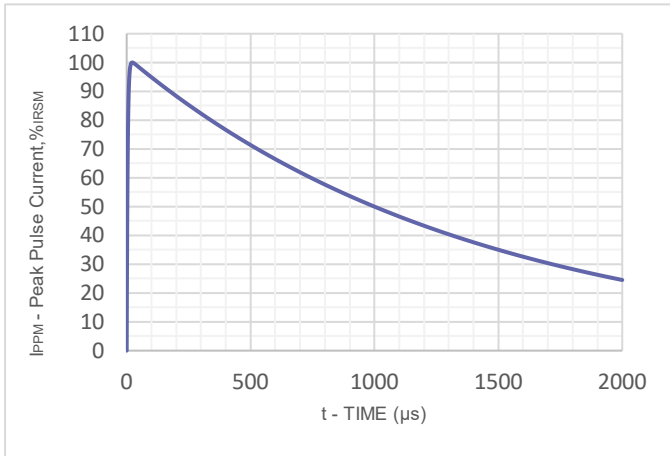


Figure 2. Power Derating Curve

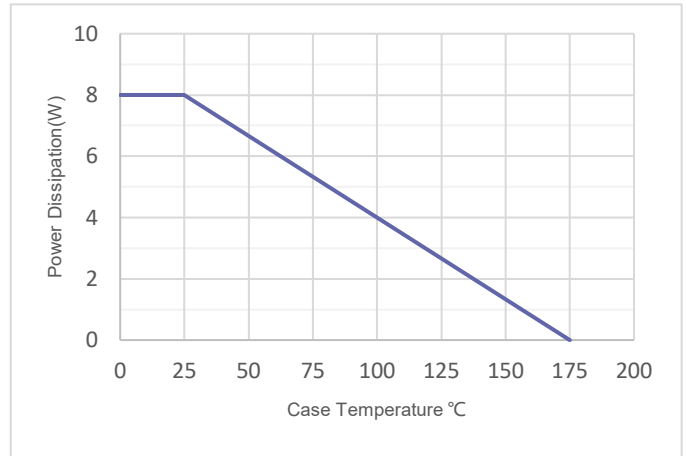


Figure 3. Peak Pulse Power Derting

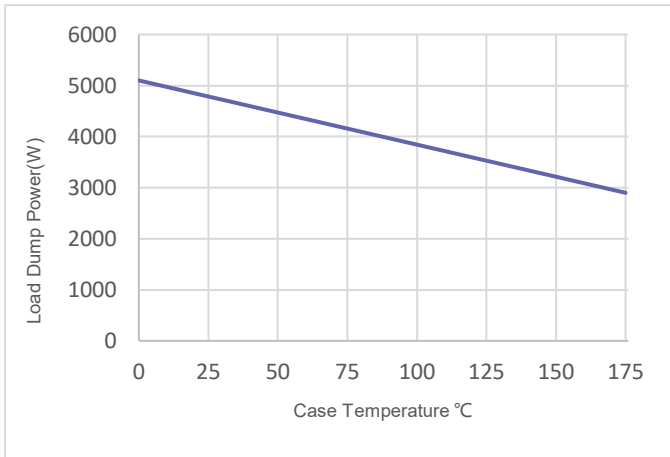
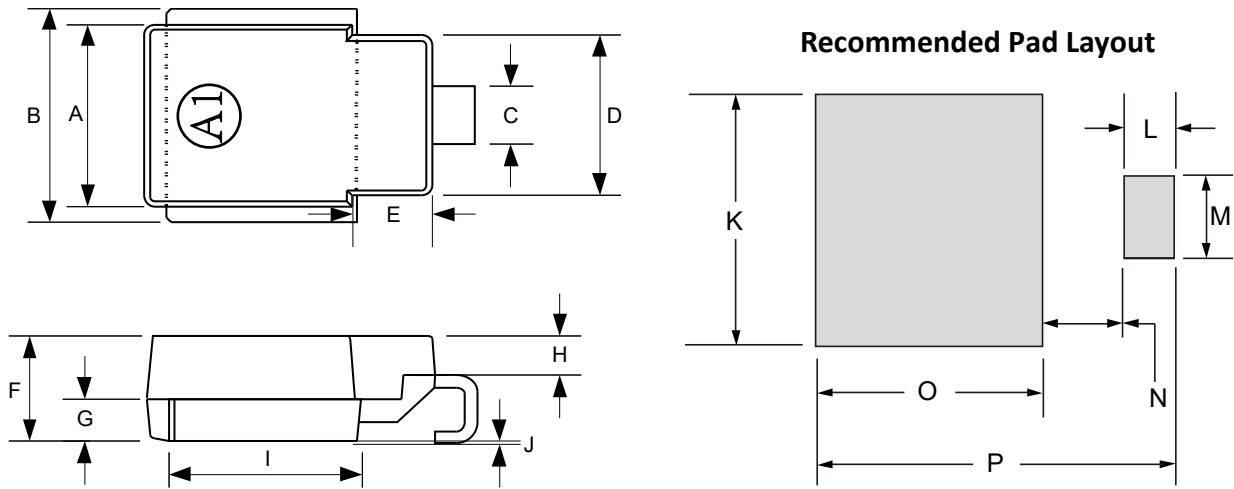


Figure 4. Power Derating Curve



**DIMENSIONS**

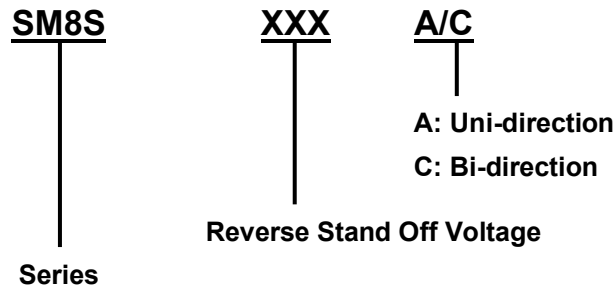


**DO-218AB**

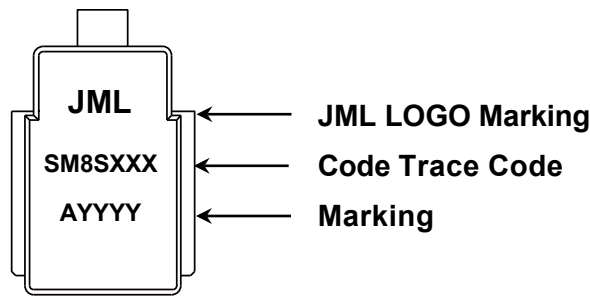
| DIM | Millimeters |        | Inch   |        |
|-----|-------------|--------|--------|--------|
|     | Min         | Max    | Min    | Max    |
| A   | 8.300       | 8.700  | 0.3268 | 0.3425 |
| B   | 9.500       | 10.500 | 0.3740 | 0.4134 |
| C   | 2.400       | 3.000  | 0.0945 | 0.1181 |
| D   | 7.000       | 8.000  | 0.2756 | 0.3150 |
| E   | 3.200       | 3.800  | 0.1260 | 0.1496 |
| F   | 4.600       | 5.200  | 0.1811 | 0.2047 |
| G   | 1.700       | 2.300  | 0.0669 | 0.0906 |
| H   | 1.500       | 2.100  | 0.0591 | 0.0827 |
| I   | 8.500       | 9.500  | 0.3346 | 0.3740 |
| J   | -           | 0.160  | -      | 0.0063 |
| K   | 9.500       | 10.500 | 0.3740 | 0.4134 |
| L   | 1.700       | 2.300  | 0.0669 | 0.0906 |
| M   | 2.400       | 3.000  | 0.0945 | 0.1181 |
| N   | 3.200       | 3.800  | 0.1260 | 0.1496 |
| O   | 8.700       | 9.300  | 0.3425 | 0.3661 |
| P   | 14.800      | 15.400 | 0.5827 | 0.6063 |

SM8S SERIES

## PART NUMBERING



## MARKING & PACKAGING



| Part Number | Package  | Quantity | Packaging |
|-------------|----------|----------|-----------|
| SM8SXXXA/C  | DO-218AB | 750pcs   | 13" Reel  |

SM8S SERIES