

## Transient Voltage Suppressors (TVS) Data Sheet

### Features

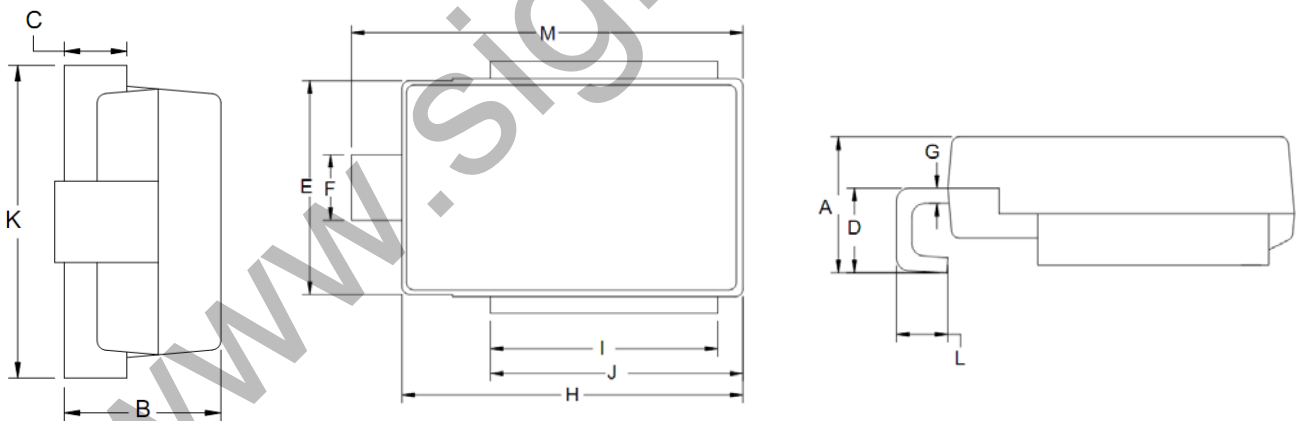
- High current transient suppressor
- Excellent Clamping Capability.
- Glass passivated junction.
- RoHS compliant
- Low leakage current
- Meets MSL level 1, per J-STD-020

### Maximum Ratings and Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

| Rating   | Symbol         | Value       | Units |
|--|----------------|-------------|-------|
| Peak pulse power dissipation on 10/1000µs waveform | $P_{PPM}$      | 8000        | W     |
| Peak pulse current of on 10/1000µs waveform        | $I_{PPM}$      | See table   | A     |
| Operating junction and Storage Temperature Range.  | $T_J, T_{STG}$ | -55 to +150 | °C    |

### Dimensions (DO-218AB)



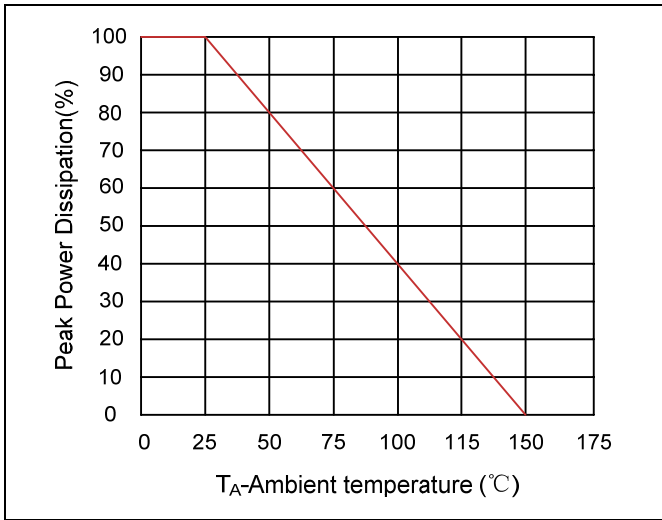
| Symbol | Millimeters |      |      | Symbol | Millimeters |      |      |
|--------|-------------|------|------|--------|-------------|------|------|
|        | Min.        | Nom. | Max. |        | Min.        | Nom. | Max. |
| A      | 4.8         | 5.3  | 5.8  | H      | 13.3        | 13.5 | 13.7 |
| B      | 4.9         | 5.0  | 5.2  | I      | 8.7         | 9.0  | 9.3  |
| C      | 1.7         | 2.0  | 2.3  | J      | 9.7         | 10.0 | 10.3 |
| D      | 2.8         | 3.3  | 3.8  | K      | 9.5         | 10.0 | 10.5 |
| E      | 8.3         | 8.5  | 8.7  | L      | 1.5         | 2.0  | 2.5  |
| F      | 2.3         | 2.6  | 2.9  | M      | 15.0        | 15.5 | 16.0 |
| G      | 0.5         | 0.6  | 0.7  |        |             |      |      |

**Electrical Characteristics (T<sub>A</sub>=25°C)**

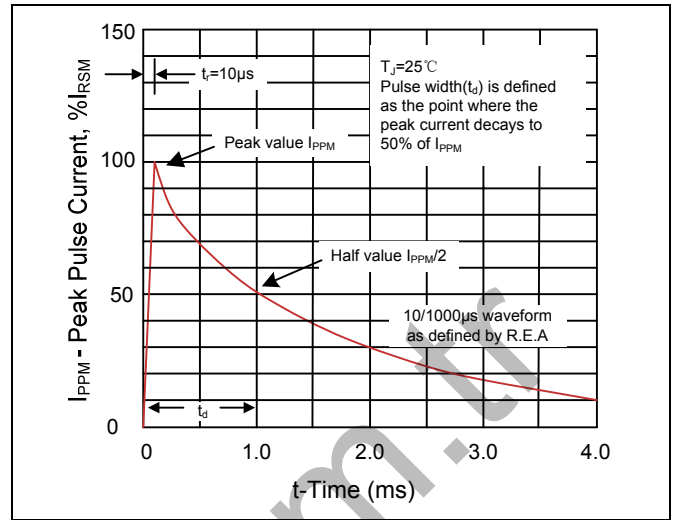
| Part Number | Reverse Stand-Off Voltage | Breakdown Voltage                          |  | Test Current        | Surge Discharge current           | Maximum Clamping Voltage               | Reverse Leakage                         |
|-------------|---------------------------|--|--|---------------------|-----------------------------------|--|---|
|             | V <sub>RWM</sub> (V)      | V <sub>BR</sub> (V)<br>MIN.@I <sub>T</sub> | V <sub>BR</sub> (V)<br>MAX.@I <sub>T</sub> | I <sub>T</sub> (mA) | I <sub>PP</sub> (A)<br>@10/1000μs | V <sub>C</sub> (V)<br>@I <sub>PP</sub> | I <sub>R</sub> (μA)<br>@V <sub>DC</sub> |
| SMEJ10A     | 10.0                      | 11.1                                       | 12.3                                       | 5                   | 475.0                             | 17.5                                   | 15                                      |
| SMEJ11A     | 11.0                      | 12.2                                       | 13.5                                       | 5                   | 443.8                             | 18.7                                   | 15                                      |
| SMEJ12A     | 12.0                      | 13.3                                       | 14.7                                       | 5                   | 405.0                             | 20.5                                   | 10                                      |
| SMEJ13A     | 13.0                      | 14.4                                       | 15.9                                       | 5                   | 373.8                             | 22.1                                   | 10                                      |
| SMEJ14A     | 14.0                      | 15.6                                       | 17.2                                       | 5                   | 345.0                             | 23.9                                   | 10                                      |
| SMEJ15A     | 15.0                      | 16.7                                       | 18.5                                       | 5                   | 327.5                             | 25.1                                   | 10                                      |
| SMEJ16A     | 16.0                      | 17.8                                       | 19.7                                       | 5                   | 307.5                             | 26.8                                   | 10                                      |
| SMEJ17A     | 17.0                      | 18.9                                       | 20.9                                       | 5                   | 288.8                             | 28.4                                   | 10                                      |
| SMEJ18A     | 18.0                      | 20.0                                       | 22.1                                       | 5                   | 272.5                             | 30.1                                   | 10                                      |
| SMEJ20A     | 20.0                      | 22.2                                       | 24.5                                       | 5                   | 245.0                             | 33.4                                   | 10                                      |
| SMEJ22A     | 22.0                      | 24.4                                       | 26.9                                       | 5                   | 222.5                             | 36.6                                   | 10                                      |
| SMEJ24A     | 24.0                      | 26.7                                       | 29.5                                       | 5                   | 202.5                             | 40.1                                   | 10                                      |
| SMEJ26A     | 26.0                      | 28.9                                       | 31.9                                       | 5                   | 186.3                             | 43.4                                   | 10                                      |
| SMEJ28A     | 28.0                      | 31.1                                       | 34.4                                       | 5                   | 171.3                             | 46.8                                   | 10                                      |
| SMEJ30A     | 30.0                      | 33.3                                       | 36.8                                       | 5                   | 160.0                             | 50.1                                   | 10                                      |
| SMEJ33A     | 33.0                      | 36.7                                       | 40.6                                       | 5                   | 145.0                             | 55.2                                   | 10                                      |
| SMEJ36A     | 36.0                      | 40.0                                       | 44.2                                       | 5                   | 132.5                             | 60.4                                   | 10                                      |
| SMEJ40A     | 40.0                      | 44.4                                       | 49.1                                       | 5                   | 117.5                             | 68.3                                   | 10                                      |
| SMEJ43A     | 43.0                      | 47.8                                       | 52.8                                       | 5                   | 108.9                             | 73.8                                   | 10                                      |
| SMEJ48A     | 48.0                      | 53.2                                       | 58.7                                       | 5                   | 93.5                              | 85.6                                   | 10                                      |

**Ratings and Characteristic Curves ( $T_A=25^{\circ}\text{C}$  unless otherwise noted)**

**Figure 1. Power Derating Curve**

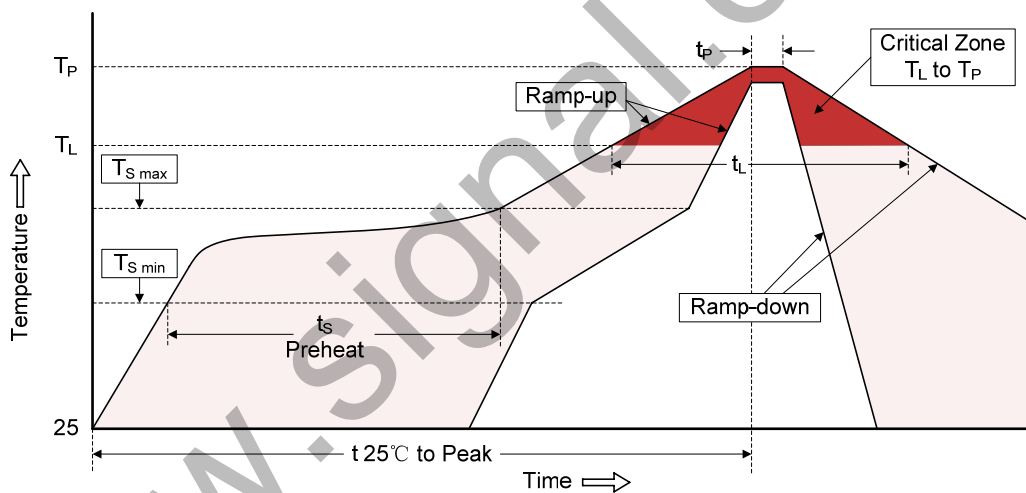


**Figure 2. Pulse Waveforms**



**Recommended Soldering Conditions**

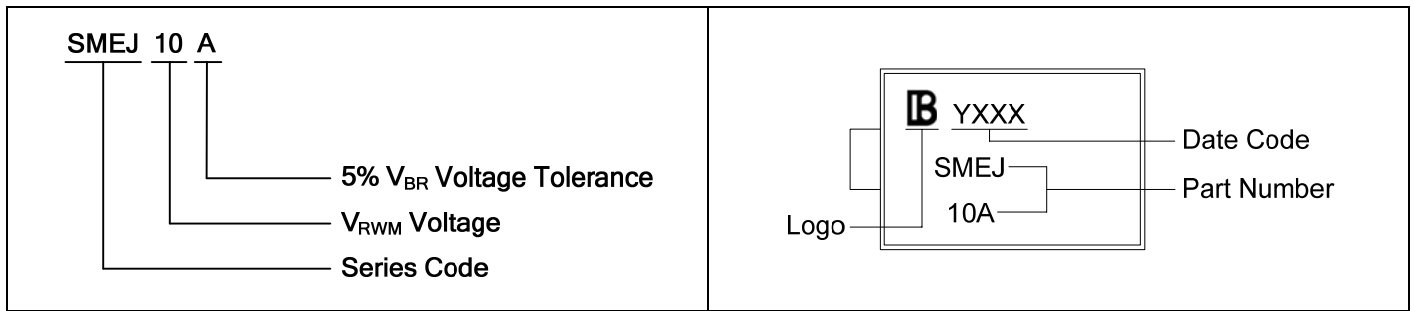
**Reflow Soldering**



**Recommended Conditions**

| Profile Feature                                      | Pb-Free Assembly |
|--|------------------|
| Average ramp-up rate ( $T_L$ to $T_P$ )              | 3°C/second max.  |
| Preheat  |                  |
| -Temperature Min ( $T_{S\ min}$ )                    | 150°C            |
| -Temperature Max ( $T_{S\ max}$ )                    | 200°C            |
| -Time (min to max) ( $t_s$ )                         | 60-180 seconds   |
| $T_{S\ max}$ to $T_L$                                |                  |
| -Ramp-up Rate  | 3°C/second max.  |
| Time maintained above:                               |                  |
| -Temperature ( $T_L$ )                               | 217°C            |
| -Time ( $t_L$ )                                      | 60-150 seconds   |
| Peak Temperature ( $T_P$ )                           | 260°C            |
| Time within 5°C of actual Peak Temperature ( $t_p$ ) | 20-40 seconds    |
| Ramp-down Rate                                       | 6°C/second max.  |
| Time 25°C to Peak Temperature                        | 8 minutes max.   |

**Part Number Code and Marking**



**Packaging**

| Tape             |           | Symbol           | Dimension (mm) |    |            |
|------------------|-----------|------------------|----------------|----|------------|
|                  |           | W                | 24.00±0.20     |    |            |
|                  |           | P0               | 4.00±0.10      |    |            |
|                  |           | P1               | 16.00±0.10     |    |            |
|                  |           | P2               | 2.00±0.10      |    |            |
|                  |           | D0               | Φ1.5±0.10      |    |            |
|                  |           | D1               | Φ1.5±0.10      |    |            |
|                  |           | E                | 1.50±0.10      |    |            |
|                  |           | F                | 12.25±0.10     |    |            |
|                  |           | A0               | 11.0±0.10      |    |            |
|                  |           | B0               | 17.0±0.10      |    |            |
|                  |           | K0               | 6.05±0.15      |    |            |
|                  |           | t0               | 0.40±0.05      |    |            |
|                  |           | 7" Reel          |                | D2 | Φ178.0±2.0 |
|                  |           |                  |                | D3 | Φ50.0Min.  |
| D4               | Φ13.0±0.5 |                  |                |    |            |
| W1               | 29.0±2.0  |                  |                |    |            |
| Quantity: 150PCS |           |                  |                |    |            |
| 13" Reel         |           |                  |                | D5 | Φ330.0±2.0 |
|                  |           | D6               | Φ13.5±0.5      |    |            |
|                  |           | H                | 2.5±1.0        |    |            |
|                  |           | W2               | 29.0±2.0       |    |            |
|                  |           | Quantity: 700PCS |                |    |            |