

Features

- 600W peak pulse power capability at 10/1000µs waveform, repetition rate (duty cycles):0.01%
- Excellent clamping capability
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Plastic package is flammability rated V-0 per UL-94
- Meet MSL level1, per J-STD-020, lead-frame maximum peak of 260°C

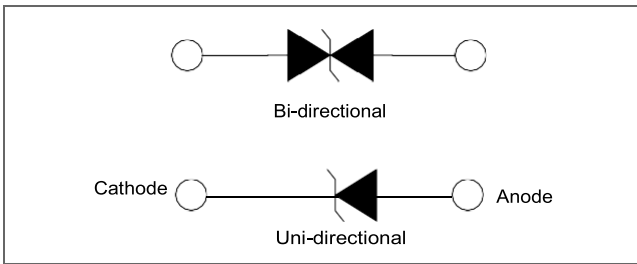
RoHS
Compliant



Applications

TVS devices are ideal for the transient voltage clamp protection of I/O Interfaces, DC power line bus and other circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

Function Diagram




| Maximum Ratings and Thermal Characteristics (T _A =25°C unless otherwise noted) | | | |
|---|------------------|------------|------|
| Parameter | Symbol | Value | Unit |
| Peak Pulse Power Dissipation at T _A =25°C by 10/1000µs Waveform (Fig.3) | P _{PPM} | 600 | W |
| Power Dissipation on Infinite Heat Sink at T _L =50°C | P _D | 3.3 | W |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1) | I _{FSM} | 60 | A |
| Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only | V _F | 3.5 | V |
| Operating Temperature Range | T _J | -55 to 150 | °C |
| Storage Temperature Range | T _{STG} | -55 to 150 | °C |

| AGENCY | AGENCY FILE NUMBER |
|--------|--------------------|
| | Pending |

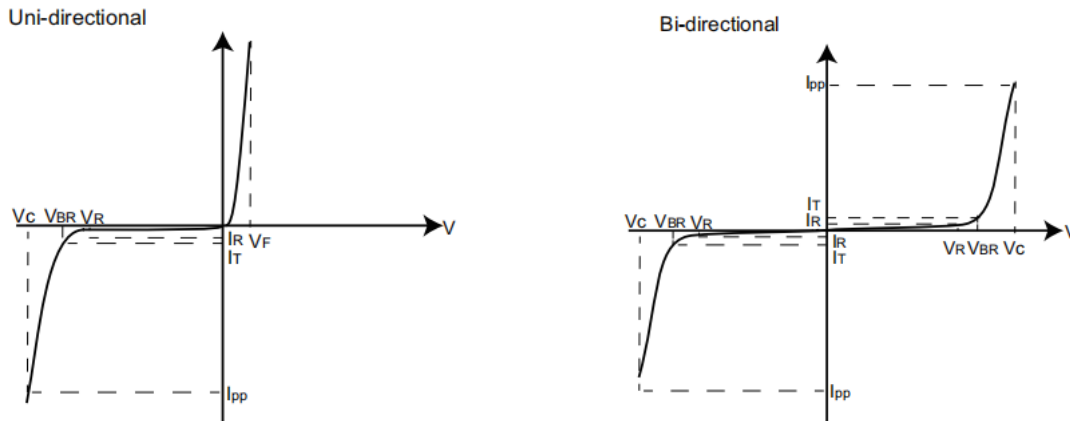
Notes:

1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

Characteristics (T = 25°C unless otherwise noted)

| Part Number (Uni) | Part Number (Bi) | Key Marking | | Reverse Stand off Voltage V _R (Volts) | Breakdown Voltage V _{BR} (Volts) @ I _T | | Test Current I _T (mA) | Maximum Clamping Voltage V _C @ I _{pp} (V) | Maximum Peak Pulse Current I _{pp} (A) | Maximum Reverse Leakage I _R @ V _R (μA) | Agency Approval  |
|----------------------|---------------------|-------------|----|---|--|-------|---|---|--|--|---|
| | | UNI | BI | | MIN | MAX | | | | | |
| SMA6L5.0A | \ | 6A005 | \ | 5.0 | 6.40 | 7.00 | 10 | 9.2 | 65.3 | 800 | |
| SMA6L6.0A | \ | 6A006 | \ | 6.0 | 6.67 | 7.37 | 10 | 10.3 | 58.3 | 800 | |
| SMA6L6.5A | \ | 6A06F | \ | 6.5 | 7.22 | 7.98 | 10 | 11.2 | 53.6 | 500 | |
| SMA6L7.0A | \ | 6A007 | \ | 7.0 | 7.78 | 8.60 | 10 | 12.0 | 50.0 | 200 | |
| SMA6L7.5A | \ | 6A07F | \ | 7.5 | 8.33 | 9.21 | 1 | 12.9 | 46.6 | 100 | |
| SMA6L8.0A | \ | 6A008 | \ | 8.0 | 8.89 | 9.83 | 1 | 13.6 | 44.2 | 50 | |
| SMA6L8.5A | \ | 6A08F | \ | 8.5 | 9.44 | 10.40 | 1 | 14.4 | 41.7 | 20 | |
| SMA6L9.0A | \ | 6A009 | \ | 9.0 | 10.00 | 11.10 | 1 | 15.4 | 39.0 | 10 | |
| SMA6L10A | \ | 6A010 | \ | 10.0 | 11.10 | 12.30 | 1 | 17.0 | 35.3 | 5 | |
| SMA6L11A | \ | 6A011 | \ | 11.0 | 12.20 | 13.50 | 1 | 18.2 | 33.0 | 1 | |
| SMA6L12A | \ | 6A012 | \ | 12.0 | 13.30 | 14.70 | 1 | 19.9 | 30.2 | 1 | |
| SMA6L13A | \ | 6A013 | \ | 13.0 | 14.40 | 15.90 | 1 | 21.5 | 28.0 | 1 | |
| SMA6L14A | \ | 6A014 | \ | 14.0 | 15.60 | 17.20 | 1 | 23.2 | 25.9 | 1 | |
| SMA6L15A | \ | 6A015 | \ | 15.0 | 16.70 | 18.50 | 1 | 24.4 | 24.6 | 1 | |
| SMA6L16A | \ | 6A016 | \ | 16.0 | 17.80 | 19.70 | 1 | 26.0 | 23.1 | 1 | |
| SMA6L17A | \ | 6A017 | \ | 17.0 | 18.90 | 20.90 | 1 | 27.6 | 21.8 | 1 | |
| SMA6L18A | \ | 6A018 | \ | 18.0 | 20.00 | 22.10 | 1 | 29.2 | 20.6 | 1 | |
| SMA6L20A | \ | 6A020 | \ | 20.0 | 22.20 | 24.50 | 1 | 32.4 | 18.6 | 1 | |
| SMA6L22A | \ | 6A022 | \ | 22.0 | 24.40 | 26.90 | 1 | 35.5 | 16.9 | 1 | |
| SMA6L24A | \ | 6A024 | \ | 24.0 | 26.70 | 29.50 | 1 | 38.9 | 15.5 | 1 | |
| SMA6L26A | \ | 6A026 | \ | 26.0 | 28.90 | 31.90 | 1 | 42.1 | 14.3 | 1 | |
| SMA6L28A | \ | 6A028 | \ | 28.0 | 31.10 | 34.40 | 1 | 45.4 | 13.3 | 1 | |
| SMA6L30A | \ | 6A030 | \ | 30.0 | 33.30 | 36.80 | 1 | 48.4 | 12.4 | 1 | |
| SMA6L33A | \ | 6A033 | \ | 33.0 | 36.70 | 40.60 | 1 | 53.3 | 11.3 | 1 | |
| SMA6L36A | \ | 6A036 | \ | 36.0 | 40.00 | 44.20 | 1 | 58.1 | 10.4 | 1 | |
| SMA6L40A | \ | 6A040 | \ | 40.0 | 44.40 | 49.10 | 1 | 64.5 | 9.3 | 1 | |
| SMA6L43A | \ | 6A043 | \ | 43.0 | 47.80 | 52.80 | 1 | 69.4 | 8.7 | 1 | |
| SMA6L45A | \ | 6A045 | \ | 45.0 | 50.00 | 55.30 | 1 | 72.7 | 8.3 | 1 | |
| SMA6L48A | \ | 6A048 | \ | 48.0 | 53.30 | 58.90 | 1 | 77.4 | 7.8 | 1 | |
| SMA6L51A | \ | 6A051 | \ | 51.0 | 56.70 | 62.70 | 1 | 82.4 | 7.3 | 1 | |
| SMA6L54A | \ | 6A054 | \ | 54.0 | 60.00 | 66.30 | 1 | 87.1 | 6.9 | 1 | |
| SMA6L58A | \ | 6A058 | \ | 58.0 | 64.40 | 71.20 | 1 | 93.6 | 6.5 | 1 | |
| SMA6L60A | \ | 6A060 | \ | 60.0 | 66.70 | 73.70 | 1 | 96.8 | 6.2 | 1 | |
| SMA6L64A | \ | 6A064 | \ | 64.0 | 71.10 | 78.60 | 1 | 103.0 | 5.9 | 1 | |
| SMA6L70A | \ | 6A070 | \ | 70.0 | 77.80 | 86.00 | 1 | 113.0 | 5.3 | 1 | |
| SMA6L75A | \ | 6A075 | \ | 75.0 | 83.30 | 92.10 | 1 | 121.0 | 5.0 | 1 | |
| SMA6L78A | \ | 6A078 | \ | 78.0 | 86.70 | 95.80 | 1 | 126.0 | 4.8 | 1 | |
| SMA6L85A | \ | 6A085 | \ | 85.0 | 94.40 | 104.0 | 1 | 137.0 | 4.4 | 1 | |

I-V Curve Characteristics



P_{PPM} Peak Pulse Power Dissipation -- Max power dissipation

V_R Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation

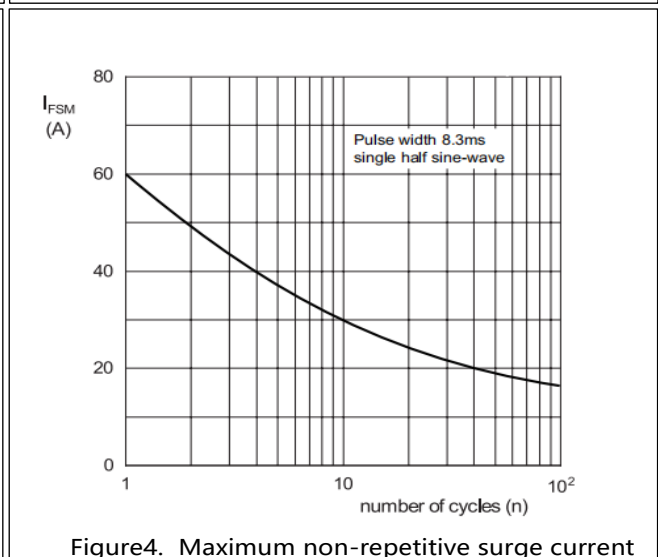
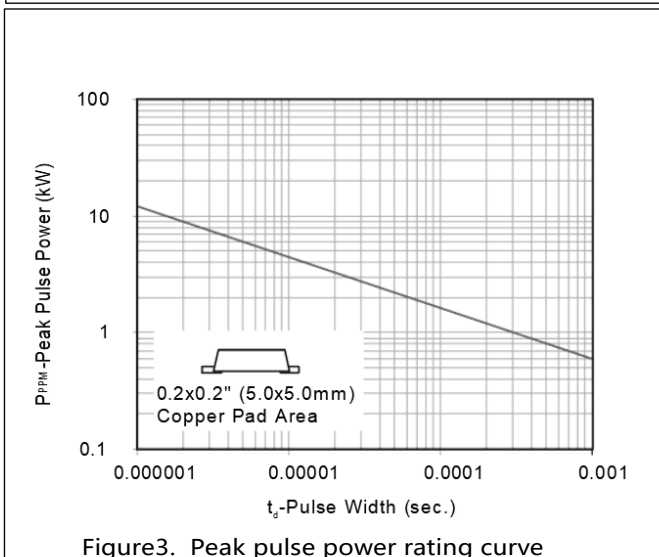
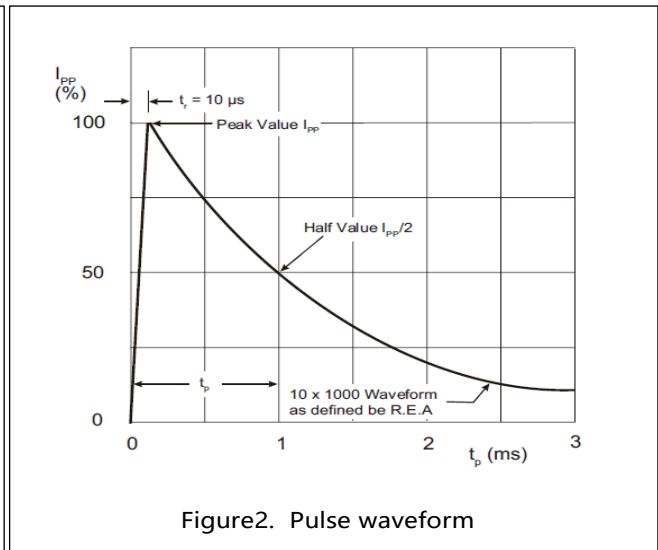
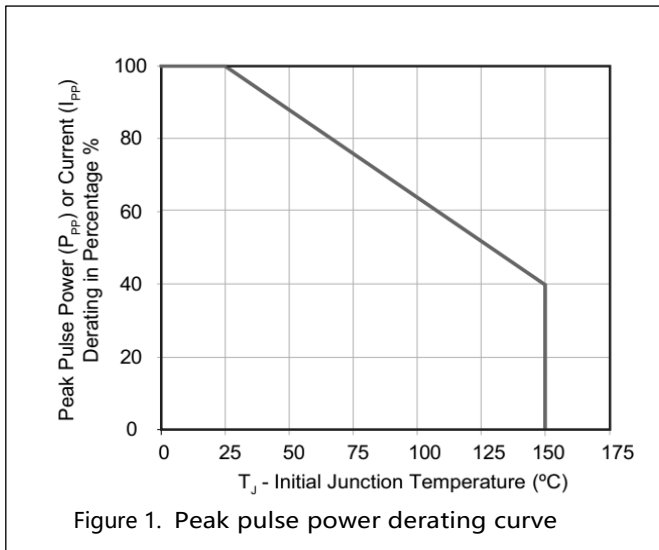
V_{BR} Breakdown Voltage -- Maximum voltage that flows through the TVS at a specified test current (I_T)

V_C Clamping Voltage -- Peak voltage measured across the TVS at a specified I_{PPM} (peak impulse current)

I_R Reverse Leakage Current -- Current measured at V_R

V_F Forward Voltage Drop for Uni-directional

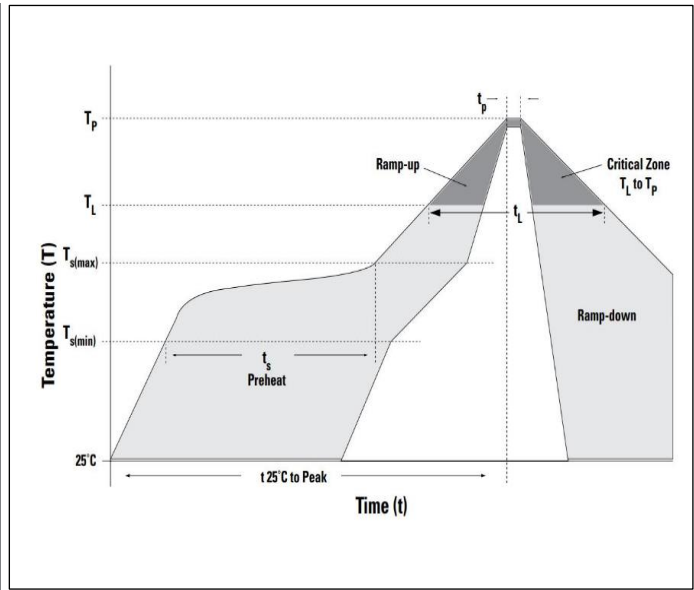
Ratings and Characteristic Curves (T = 25°C unless otherwise noted)



Soldering Parameters

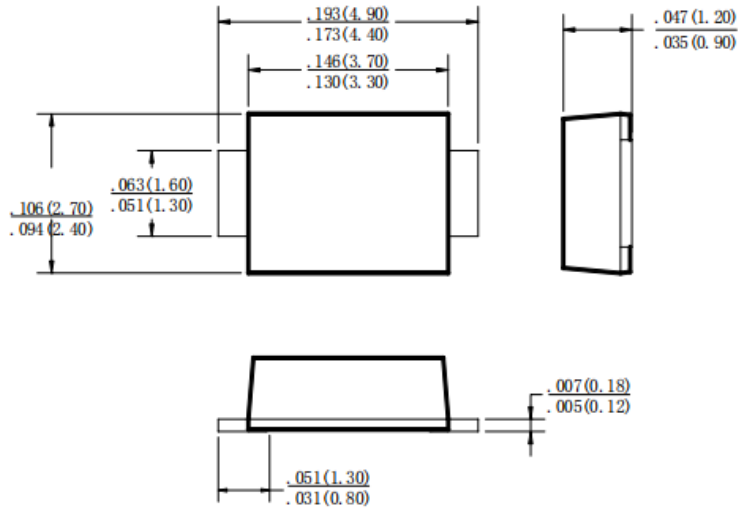
| | | |
|--|------------------------------------|-------------------------|
| Reflow Condition | | Lead-free assembly |
| Pre Heat | - Temperature Min ($T_{s(min)}$) | 150°C |
| | - Temperature Max ($T_{s(max)}$) | 200°C |
| | - Time (min to max) (t_s) | 60 – 180 secs |
| Average ramp up rate (Liquidus Temp (T_A) to peak) | | 3°C/second max |
| $T_{s(max)}$ to T_A - Ramp-up Rate | | 3°C/second max |
| Reflow | - Temperature (T_A) (Liquidus) | 217°C |
| | - Time (min to max) (t_s) | 60 – 150 seconds |
| Peak Temperature (T_p) | | 260 ^{+0/-5} °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 (T_p) | | 8 minutes Max. |
| Do not exceed | | 260°C |

Soldering profile



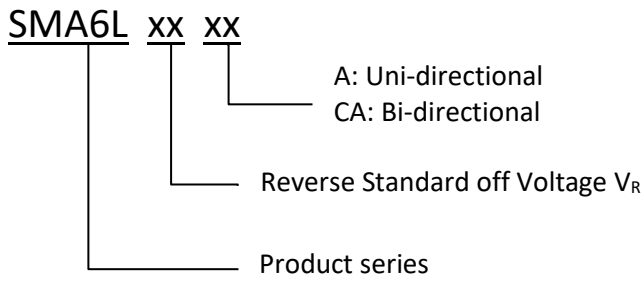
Dimensions

SMAF Package Outline Dimensions

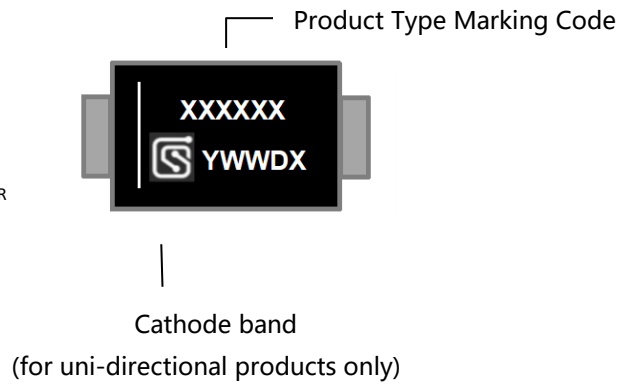


Dimensions in inches and (millimeters)

Part Numbering



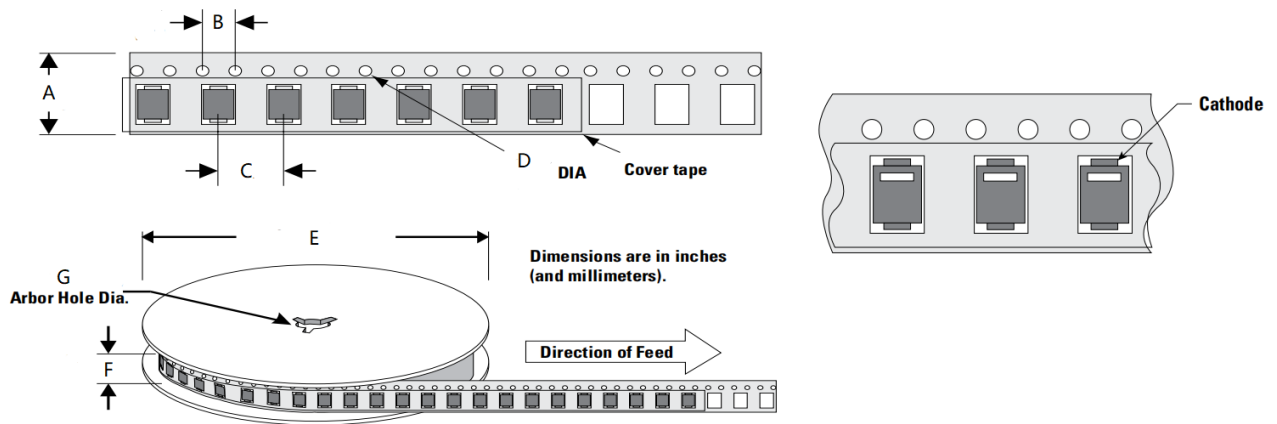
Part Marking



Packing

| Part number | Package name | Small packing quantity | Packing method |
|-------------|--------------|------------------------|----------------|
| SMA6LXXXX | SMAF | 5000 | Tape & Reel |

Tape and Reel Specification



| Symbol | Millimeter |
|--------|-------------|
| A | 12.00±0.10 |
| B | 4.00±0.10 |
| C | 4.00±0.10 |
| D | 1.55±0.05 |
| E | 330.20±2.00 |
| F | 15.70±2.00 |
| G | 13.30±0.30 |

Revision history of Specification

| Version | Change Items | Effective Date |
|---------|--------------------------------------|----------------|
| 1.0 | Initial Release | 13-July-2021 |
| 1.1 | Modified Temperature Range & Details | 16-August-2021 |

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