

200W Transient Voltage Suppressors

Features

- For surface mounted applications
- 200W peak pulse power capability with a 10/1000 μ s waveform
- IEC 61000-4-2 (ESD) \pm 30kV (air), \pm 30kV (contact)
- Low-profile package
- Ideal for automated placement
- Available in Unidirectional and Bidirectional
- Low incremental surge resistance, excellent clamping capability
- Very fast response time
- RoHS Compliant.

Mechanical Data

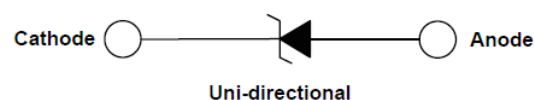
- Package: SOD-123FL
- Epoxy : UL 94V-0 rate flame retardant.
- Terminals: Tin plated leads, solderable per J-STD-002 and JESD22-B102
- Polarity: For uni-directional types the band denotes cathode end, no marking on bi-directional types
- Meets MSL level 1

SOD-123FL



Bi-directional

Uni-directional



Pin Configuration

Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|-----------------|----------------|---------------------------|
| Peak power dissipation with a 10/1000 μ s waveform ⁽¹⁾⁽²⁾ | P_{PP} | 200 | W |
| Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾ | I_{PP} | See Next Table | A |
| Power dissipation, on infinite heatsink at $T_L=75^\circ\text{C}$ | P_D | 0.4 | W |
| Peak forward surge current, 8.3 ms single half sine-wave unidirectional only ⁽³⁾ | I_{FSM} | 20 | A |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to + 150 | $^\circ\text{C}$ |
| Thermal resistance ,between junction and lead | $R_{\theta JL}$ | 26 | $^\circ\text{C}/\text{W}$ |
| Thermal resistance between junction and ambient | $R_{\theta JA}$ | 300 | $^\circ\text{C}/\text{W}$ |
| Thermal resistance between node and curve | $R_{\theta JC}$ | 40 | $^\circ\text{C}/\text{W}$ |

Notes:

1. Non repetitive current pulse τ per Fig2 and derated above $T_A=25^\circ\text{C}$ per Fig3.
2. $T_L=30^\circ\text{C}$ unless otherwise noted , $V_F \leq 1.25\text{V}@200\text{mA}$.
3. Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

| Electrical Characteristics (T _A = 25°C Unless otherwise noted) | | | | | | | | | | |
|---|------------------|--------------|-------|--|----------|---------------------|---|---|---|--|
| Part Number (Uni) | Part Number (Bi) | Marking Code | | Breakdown Voltage V _{BR} @ I _T | | | Maximum Reverse Leakage I _R @V _{RWM} (μA) | Working Peak Reverse Voltage V _{RWM} (V) | Maximum Reverse Current I _{PP} (A) | Maximum Clamping Voltage V _C @I _{PP} (V) |
| | | Uni | Bi | Min. (V) | Max. (V) | I _T (mA) | | | | |
| SMF5.0A-T | SMF5.0CA-T | 5.0A | 5.0CA | 6.40 | 7.07 | 10 | 400.0 | 5.0 | 21.74 | 9.2 |
| SMF6.0A-T | SMF6.0CA-T | 6.0A | 6.0CA | 6.67 | 7.37 | 10 | 400.0 | 6.0 | 19.42 | 10.3 |
| SMF6.5A-T | SMF6.5CA-T | 6.5A | 6.5CA | 7.22 | 7.98 | 10 | 250.0 | 6.5 | 17.86 | 11.2 |
| SMF7.0A-T | SMF7.0CA-T | 7.0A | 7.0CA | 7.78 | 8.60 | 10 | 100.0 | 7.0 | 16.67 | 12.0 |
| SMF7.5A-T | SMF7.5CA-T | 7.5A | 7.5CA | 8.33 | 9.21 | 1 | 50.0 | 7.5 | 15.50 | 12.9 |
| SMF8.0A-T | SMF8.0CA-T | 8.0A | 8.0CA | 8.89 | 9.83 | 1 | 25.0 | 8.0 | 14.71 | 13.6 |
| SMF8.5A-T | SMF8.5CA-T | 8.5A | 8.5CA | 9.44 | 10.40 | 1 | 10.0 | 8.5 | 13.89 | 14.4 |
| SMF9.0A-T | SMF9.0CA-T | 9.0A | 9.0CA | 10.00 | 11.10 | 1 | 5.0 | 9.0 | 12.99 | 15.4 |
| SMF10A-T | SMF10CA-T | 10A | 10CA | 11.10 | 12.30 | 1 | 2.5 | 10.0 | 11.76 | 17.0 |
| SMF11A-T | SMF11CA-T | 11A | 11CA | 12.20 | 13.50 | 1 | 2.5 | 11.0 | 10.99 | 18.2 |
| SMF12A-T | SMF12CA-T | 12A | 12CA | 13.30 | 14.70 | 1 | 2.5 | 12.0 | 10.05 | 19.9 |
| SMF13A-T | SMF13CA-T | 13A | 13CA | 14.40 | 15.90 | 1 | 1.0 | 13.0 | 9.30 | 21.5 |
| SMF14A-T | SMF14CA-T | 14A | 14CA | 15.60 | 17.20 | 1 | 1.0 | 14.0 | 8.62 | 23.2 |
| SMF15A-T | SMF15CA-T | 15A | 15CA | 16.70 | 18.50 | 1 | 1.0 | 15.0 | 8.20 | 24.4 |
| SMF16A-T | SMF16CA-T | 16A | 16CA | 17.80 | 19.70 | 1 | 1.0 | 16.0 | 7.69 | 26.0 |
| SMF17A-T | SMF17CA-T | 17A | 17CA | 18.90 | 20.90 | 1 | 1.0 | 17.0 | 7.25 | 27.6 |
| SMF18A-T | SMF18CA-T | 18A | 18CA | 20.00 | 22.10 | 1 | 1.0 | 18.0 | 6.85 | 29.2 |
| SMF19A-T | SMF19CA-T | 19A | 19CA | 21.10 | 23.30 | 1 | 1.0 | 19.0 | 6.54 | 30.6 |
| SMF20A-T | SMF20CA-T | 20A | 20CA | 22.20 | 24.50 | 1 | 1.0 | 20.0 | 6.17 | 32.4 |
| SMF22A-T | SMF22CA-T | 22A | 22CA | 24.40 | 26.90 | 1 | 1.0 | 22.0 | 5.63 | 35.5 |
| SMF24A-T | SMF24CA-T | 24A | 24CA | 26.70 | 29.50 | 1 | 1.0 | 24.0 | 5.14 | 38.9 |
| SMF26A-T | SMF26CA-T | 26A | 26CA | 28.90 | 31.90 | 1 | 1.0 | 26.0 | 4.75 | 42.1 |
| SMF28A-T | SMF28CA-T | 28A | 28CA | 31.10 | 34.40 | 1 | 1.0 | 28.0 | 4.41 | 45.4 |
| SMF30A-T | SMF30CA-T | 30A | 30CA | 33.30 | 36.80 | 1 | 1.0 | 30.0 | 4.13 | 48.4 |
| SMF33A-T | SMF33CA-T | 33A | 33CA | 36.70 | 40.60 | 1 | 1.0 | 33.0 | 3.75 | 53.3 |
| SMF36A-T | SMF36CA-T | 36A | 36CA | 40.00 | 44.20 | 1 | 1.0 | 36.0 | 3.44 | 58.1 |
| SMF40A-T | SMF40CA-T | 40A | 40CA | 44.40 | 49.10 | 1 | 1.0 | 40.0 | 3.10 | 64.5 |
| SMF43A-T | SMF43CA-T | 43A | 43CA | 47.80 | 52.80 | 1 | 1.0 | 43.0 | 2.88 | 69.4 |
| SMF45A-T | SMF45CA-T | 45A | 45CA | 50.00 | 55.30 | 1 | 1.0 | 45.0 | 2.75 | 72.7 |
| SMF48A-T | SMF48CA-T | 48A | 48CA | 53.30 | 58.90 | 1 | 1.0 | 48.0 | 2.58 | 77.4 |
| SMF51A-T | SMF51CA-T | 51A | 51CA | 56.70 | 62.70 | 1 | 1.0 | 51.0 | 2.43 | 82.4 |
| SMF54A-T | SMF54CA-T | 54A | 54CA | 60.00 | 66.30 | 1 | 1.0 | 54.0 | 2.30 | 87.1 |
| SMF58A-T | SMF58CA-T | 58A | 58CA | 64.40 | 71.20 | 1 | 1.0 | 58.0 | 2.14 | 93.6 |

| Electrical Characteristics (T _A = 25°C Unless otherwise noted) | | | | | | | | | | |
|---|------------------|--------------|-------|--|----------|---------------------|---|---|---|--|
| Part Number (Uni) | Part Number (Bi) | Marking Code | | Breakdown Voltage V _{BR} @ I _T | | | Maximum Reverse Leakage I _R @V _{RWM} (μA) | Working Peak Reverse Voltage V _{RWM} (V) | Maximum Reverse Current I _{PP} (A) | Maximum Clamping Voltage V _C @I _{PP} (V) |
| | | Uni | Bi | Min. (V) | Max. (V) | I _T (mA) | | | | |
| SMF60A-T | SMF60CA-T | 60A | 60CA | 66.70 | 73.70 | 1 | 1.0 | 60.0 | 2.07 | 96.8 |
| SMF64A-T | SMF64CA-T | 64A | 64CA | 71.10 | 78.60 | 1 | 1.0 | 64.0 | 1.94 | 103.0 |
| SMF70A-T | SMF70CA-T | 70A | 70CA | 77.80 | 86.00 | 1 | 1.0 | 70.0 | 1.77 | 113.0 |
| SMF75A-T | SMF75CA-T | 75A | 75CA | 83.30 | 92.10 | 1 | 1.0 | 75.0 | 1.65 | 121.0 |
| SMF78A-T | SMF78CA-T | 78A | 78CA | 86.70 | 95.80 | 1 | 1.0 | 78.0 | 1.59 | 126.0 |
| SMF80A-T | SMF80CA-T | 80A | 80CA | 88.80 | 97.60 | 1 | 1.0 | 80.0 | 1.55 | 129.0 |
| SMF85A-T | SMF85CA-T | 85A | 85CA | 94.40 | 104.00 | 1 | 1.0 | 85.0 | 1.46 | 137.0 |
| SMF90A-T | SMF90CA-T | 90A | 90CA | 100.00 | 111.00 | 1 | 1.0 | 90.0 | 1.37 | 146.0 |
| SMF100A-T | SMF100CA-T | 100A | 100CA | 111.00 | 123.00 | 1 | 1.0 | 100.0 | 1.23 | 162.0 |
| SMF110A-T | SMF110CA-T | 110A | 110CA | 122.00 | 135.00 | 1 | 1.0 | 110.0 | 1.13 | 177.0 |
| SMF120A-T | SMF120CA-T | 120A | 120CA | 133.00 | 147.00 | 1 | 1.0 | 120.0 | 1.04 | 193.0 |
| SMF130A-T | SMF130CA-T | 130A | 130CA | 144.00 | 159.00 | 1 | 1.0 | 130.0 | 0.96 | 209.0 |
| SMF140A-T | SMF140CA-T | 140A | 140CA | 155.00 | 171.00 | 1 | 1.0 | 140.0 | 0.89 | 224.0 |
| SMF150A-T | SMF150CA-T | 150A | 150CA | 167.00 | 185.00 | 1 | 1.0 | 150.0 | 0.82 | 243.0 |
| SMF160A-T | SMF160CA-T | 160A | 160CA | 178.00 | 197.00 | 1 | 1.0 | 160.0 | 0.77 | 259.0 |
| SMF170A-T | SMF170CA-T | 170A | 170CA | 189.00 | 209.00 | 1 | 1.0 | 170.0 | 0.73 | 275.0 |
| SMF180A-T | SMF180CA-T | 180A | 180CA | 200.00 | 220.00 | 1 | 1.0 | 180.0 | 0.68 | 292.0 |
| SMF190A-T | SMF190CA-T | 190A | 190CA | 211.00 | 232.00 | 1 | 1.0 | 190.0 | 0.65 | 308.0 |
| SMF200A-T | SMF200CA-T | 200A | 200CA | 224.00 | 247.00 | 1 | 1.0 | 200.0 | 0.62 | 324.0 |
| SMF220A-T | SMF220CA-T | 220A | 220CA | 246.00 | 272.00 | 1 | 1.0 | 220.0 | 0.56 | 356.0 |

Typical Performance Characteristics ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

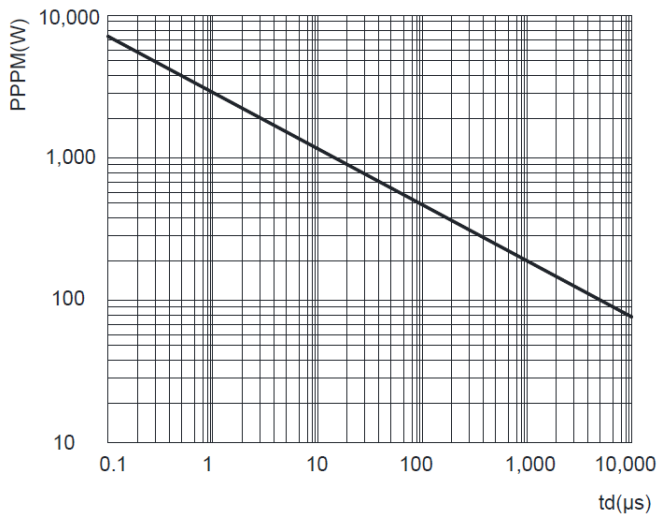


Fig 1. Peak Pulse Power Rating Curve

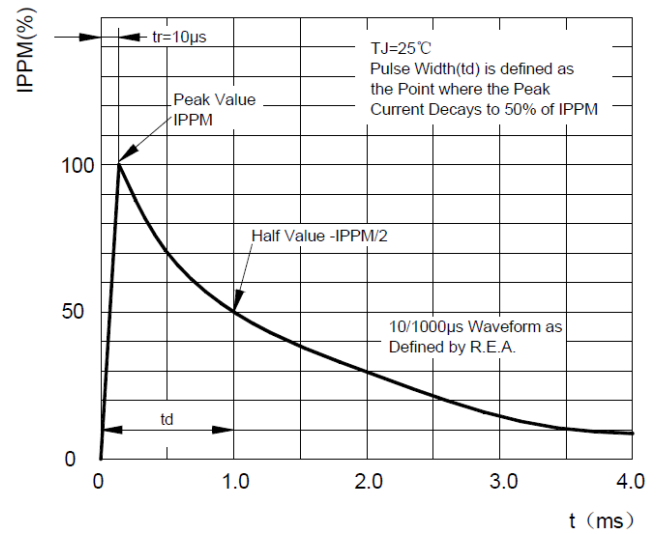


Fig 2. Pulse Waveform

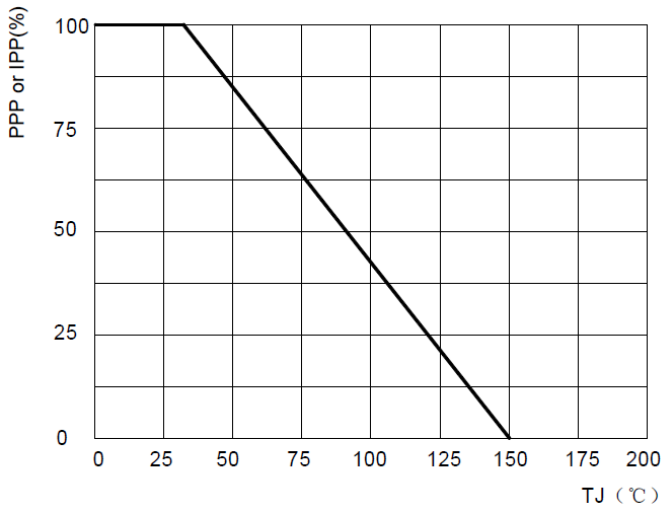


Fig 3. Pulse Power or Current vs. Initial Junction Temperature

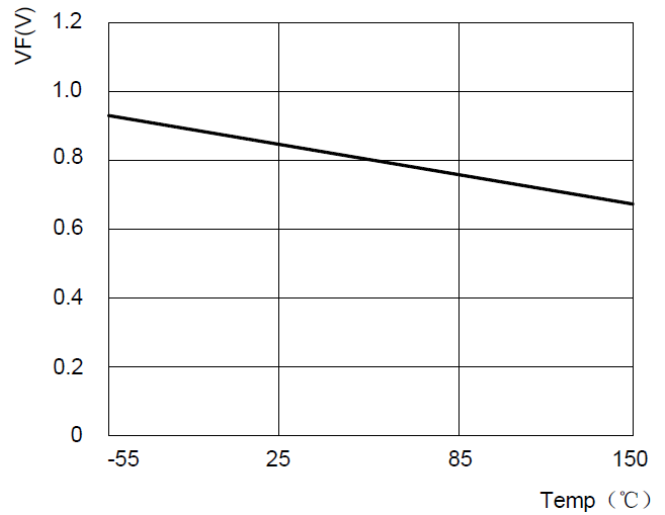


Fig 4. Forward Voltage Curve

Package Outline Drawing

| Symbol | Dimensions in millimeters | |
|--------|---------------------------|------|
| | Min. | Max. |
| A | 1.70 | 1.90 |
| B | 3.60 | 3.80 |
| C | 0.90 | 1.10 |
| D | 0.90 | 1.08 |
| E | 0.56 | 0.76 |
| F | 0.10 | 0.20 |

Ordering information

| Part Number | Package | Base qty | Reel Size | Delivery mode |
|----------------------|-----------|----------|-----------|---------------|
| | | (pcs) | (inch) | |
| SMFxxx(A)CA-T Series | SOD-123FL | 3,000 | 7 | Tape and reel |

Notes : "xxx" = Working Voltage