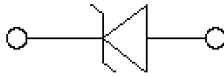


Surface Mount Transient Voltage Suppressor

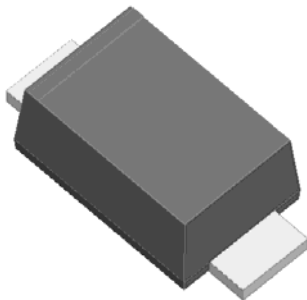
Uni-directional



Features

- For surface mounted applications
- Low-profile package
- Ideal for automated placement
- Available in Unidirectional
- 400 W peak pulse power capability with a 10/1000 μ s waveform
- Low incremental surge resistance, excellent clamping capability
- Very fast response time
- High temperature soldering guaranteed: 260 °C/10 s at terminals
- Meets MSL level 1
- Part no. with suffix "Q" means AEC-Q101 qualified

Bi-directional



Typical Applications

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, automotive and telecommunication.

Mechanical Date

- **Package:** SOD-123FL
Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- **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

■Maximum Ratings (T_A=25°C Unless otherwise specified)

| PARAMETER | SYMBOL | UNIT | Conditions | Max |
|--|------------------|------|------------------------------|------------------|
| Peak power dissipation ^{(1) (2)} (Fig.1) | P _{PPM} | W | with a 10/1000us waveform | 400 |
| Peak pulse current ⁽¹⁾ | I _{PPM} | A | with a 10/1000us waveform | (See Next Table) |
| Power dissipation, on infinite heat sink | P _D | W | T _A =25°C | 1 |
| Peak forward surge current, 8.3 ms single ⁽³⁾ | I _{FSM} | A | 8.3 ms single half sine-wave | 30 |
| Operating junction and | T _J | °C | - | -55 to +175 |
| Storage temperature range | T _{STG} | °C | - | -55 to +175 |
| Thermal resistance | R _{θJL} | °C/W | Between junction and lead | 30 |
| | R _{θJA} | | Between junction and ambient | 150 |
| | R _{θJC} | | Between junction and curve | 50 |

Notes:

- (1). Non-repetitive current pulse at T_J=25°C, per waveform of Fig2. and derated per Fig.3.
- (2). T_L=30°C unless otherwise noted, VF ≤1.25V@200mA.
- (3). Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum
- (4). Mounted on 0.31 x 0.35" (8.0 x 9.0 mm) copper pads to each terminal



SM4F SERIES

■ Electrical Characteristics (Ta=25°C unless otherwise noted)

| Part Number | | Breakdown Voltage $V_{BR}@I_T$ | | | Maximum Reverse Leakage I_R @ V_{RWM} (μA) | Working Peak Reverse Voltage V_{RWM} (V) | Maximum Reverse Surge Current I_{PP} (⁽²⁾ A) | Maximum Clamping Voltage V_C @ I_{PP} (V) |
|-------------|------------|--------------------------------|---------|------------------|---|---|---|--|
| (Uni) | (Bi) | Min(V) | Max (V) | $I_T^{(1)}$ (mA) | | | | |
| SM4F6.0AQ | SM4F6.0CAQ | 6.67 | 7.37 | 10 | 800 | 6.0 | 38.8 | 10.3 |
| SM4F6.5AQ | SM4F6.5CAQ | 7.22 | 7.98 | 10 | 500 | 6.5 | 35.7 | 11.2 |
| SM4F7.0AQ | SM4F7.0CAQ | 7.78 | 8.60 | 10 | 200 | 7.0 | 33.3 | 12.0 |
| SM4F7.5AQ | SM4F7.5CAQ | 8.33 | 9.21 | 1 | 100 | 7.5 | 31.0 | 12.9 |
| SM4F8.0AQ | SM4F8.0CAQ | 8.89 | 9.83 | 1 | 50 | 8.0 | 29.4 | 13.6 |
| SM4F8.5AQ | SM4F8.5CAQ | 9.44 | 10.40 | 1 | 10 | 8.5 | 27.8 | 14.4 |
| SM4F9.0AQ | SM4F9.0CAQ | 10.00 | 11.10 | 1 | 5 | 9.0 | 26.0 | 15.4 |
| SM4F10AQ | SM4F10CAQ | 11.10 | 12.30 | 1 | 2.5 | 10.0 | 23.5 | 17.0 |
| SM4F11AQ | SM4F11CAQ | 12.20 | 13.50 | 1 | 2.5 | 11.0 | 22.0 | 18.2 |
| SM4F12AQ | SM4F12CAQ | 13.30 | 14.70 | 1 | 2.5 | 12.0 | 20.1 | 19.9 |
| SM4F13AQ | SM4F13CAQ | 14.40 | 15.90 | 1 | 1.0 | 13.0 | 18.6 | 20.0 |
| SM4F14AQ | SM4F14CAQ | 15.60 | 17.20 | 1 | 1.0 | 14.0 | 17.2 | 23.2 |
| SM4F15AQ | SM4F15CAQ | 16.70 | 18.50 | 1 | 1.0 | 15.0 | 16.4 | 24.4 |
| SM4F16AQ | SM4F16CAQ | 17.80 | 19.70 | 1 | 1.0 | 16.0 | 15.4 | 26.0 |
| SM4F17AQ | SM4F17CAQ | 18.90 | 20.90 | 1 | 1.0 | 17.0 | 14.5 | 27.6 |
| SM4F18AQ | SM4F18CAQ | 20.00 | 22.10 | 1 | 1.0 | 18.0 | 13.7 | 29.2 |
| SM4F19AQ | SM4F19CAQ | 21.10 | 23.30 | 1 | 1.0 | 19.0 | 13.1 | 30.6 |
| SM4F20AQ | SM4F20CAQ | 22.20 | 24.50 | 1 | 1.0 | 20.0 | 12.3 | 32.4 |
| SM4F22AQ | SM4F22CAQ | 24.40 | 26.90 | 1 | 1.0 | 22.0 | 11.3 | 35.5 |
| SM4F24AQ | SM4F24CAQ | 26.70 | 29.50 | 1 | 1.0 | 24.0 | 10.3 | 38.9 |
| SM4F26AQ | / | 28.90 | 31.90 | 1 | 1.0 | 26.0 | 9.5 | 42.1 |
| SM4F28AQ | / | 31.10 | 34.40 | 1 | 1.0 | 28.0 | 8.8 | 45.4 |
| SM4F30AQ | / | 33.30 | 36.80 | 1 | 1.0 | 30.0 | 8.3 | 48.4 |
| SM4F33AQ | / | 36.70 | 40.60 | 1 | 1.0 | 33.0 | 7.5 | 53.3 |
| SM4F36AQ | / | 40.00 | 44.20 | 1 | 1.0 | 36.0 | 6.9 | 58.1 |
| SM4F40AQ | / | 44.40 | 49.10 | 1 | 1.0 | 40.0 | 6.2 | 64.5 |
| SM4F43AQ | / | 47.80 | 52.80 | 1 | 1.0 | 43.0 | 5.8 | 69.4 |
| SM4F45AQ | / | 50.00 | 55.30 | 1 | 1.0 | 45.0 | 5.5 | 72.7 |
| SM4F48AQ | / | 53.30 | 58.90 | 1 | 1.0 | 48.0 | 5.2 | 77.4 |
| SM4F51AQ | / | 56.70 | 62.70 | 1 | 1.0 | 51.0 | 4.9 | 82.4 |
| SM4F54AQ | / | 60.00 | 66.30 | 1 | 1.0 | 54.0 | 4.6 | 87.1 |
| SM4F58AQ | / | 64.40 | 71.20 | 1 | 1.0 | 58.0 | 4.3 | 93.6 |
| SM4F60AQ | / | 66.70 | 73.70 | 1 | 1.0 | 60.0 | 4.1 | 96.8 |
| SM4F64AQ | / | 71.10 | 78.60 | 1 | 1.0 | 64.0 | 3.9 | 103.0 |
| SM4F70AQ | / | 77.80 | 86.00 | 1 | 1.0 | 70.0 | 3.5 | 113.0 |
| SM4F75AQ | / | 83.30 | 92.10 | 1 | 1.0 | 75.0 | 3.3 | 121.0 |
| SM4F78AQ | / | 86.70 | 95.80 | 1 | 1.0 | 78.0 | 3.2 | 126.0 |
| SM4F80AQ | / | 88.80 | 97.60 | 1 | 1.0 | 80.0 | 3.1 | 129.0 |
| SM4F85AQ | / | 94.40 | 104.00 | 1 | 1.0 | 85.0 | 2.9 | 137.0 |
| SM4F90AQ | / | 100.00 | 111.00 | 1 | 1.0 | 90.0 | 2.7 | 146.0 |
| SM4F100AQ | / | 111.00 | 123.00 | 1 | 1.0 | 100.0 | 2.5 | 162.0 |

Notes:

(1) $t_p \leq 50ms$ Pulse test: $t_p \leq 50ms$.

(2) Surge current waveform per Fig. 2 and derated per Fig.3.



SM4F SERIES

■ Characteristics(Typical)

Fig.1 Peak Pulse Power Rating Curve

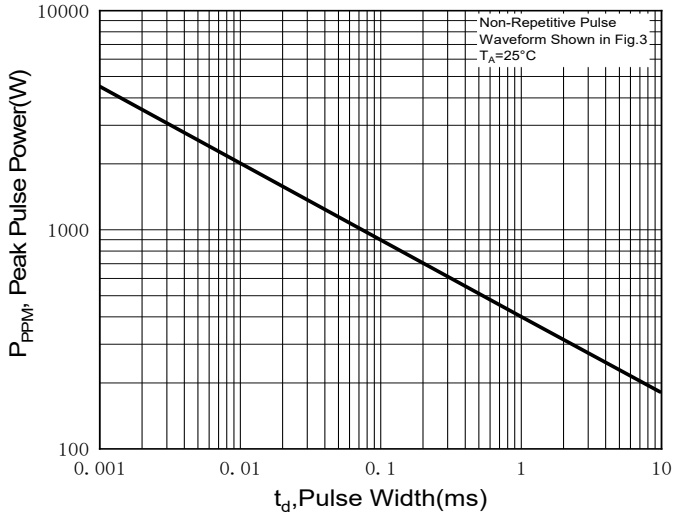


Fig.2 Pulse Waveform

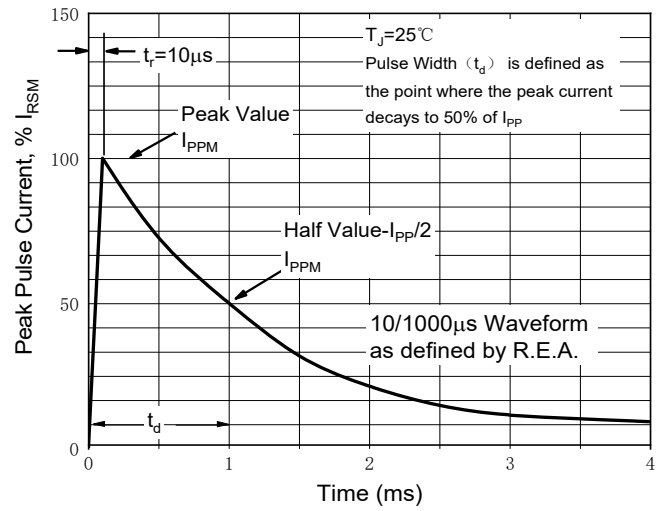


Fig.3 Pulse Power or Current vs. Initial Junction Temperature

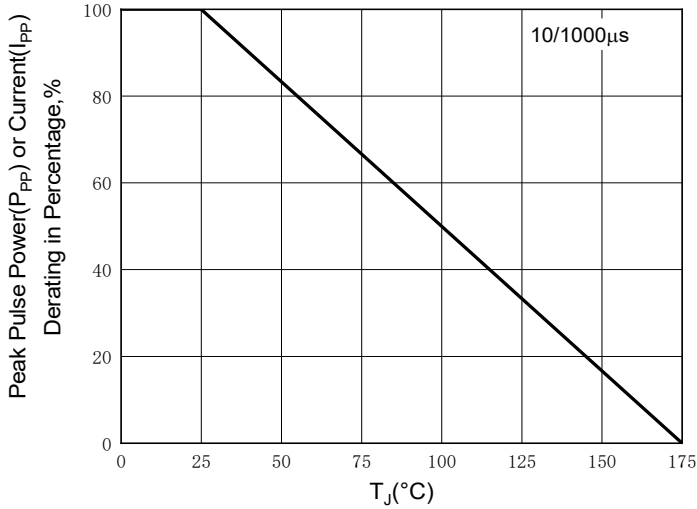


Fig.4 Maximum Non-Repetitive Forward Surge Current

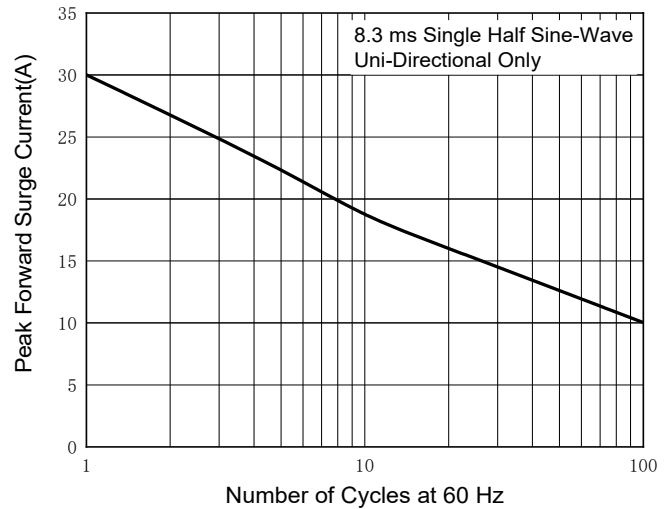


Fig.5 Typical Junction Capacitance

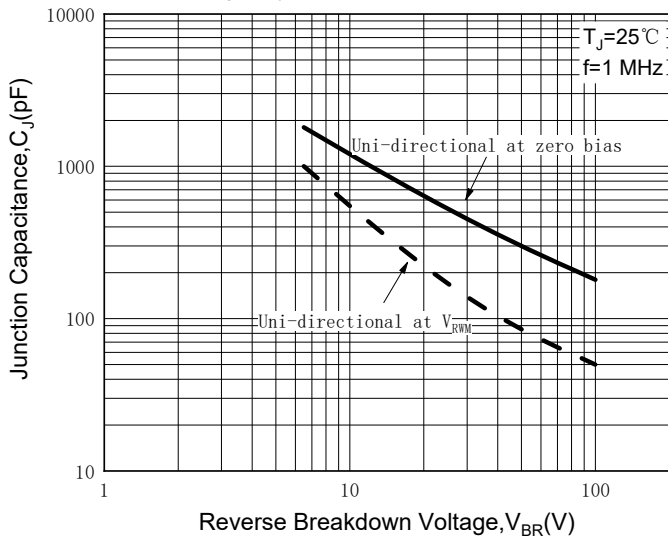
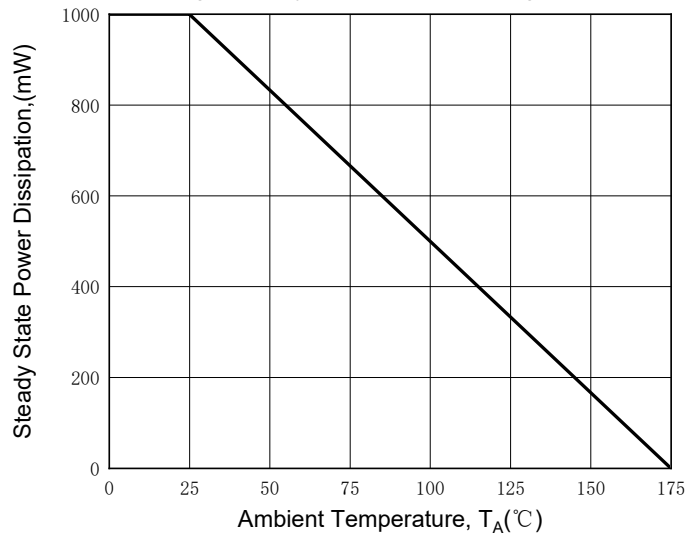


Fig.6 Steady State Power Derating Curve



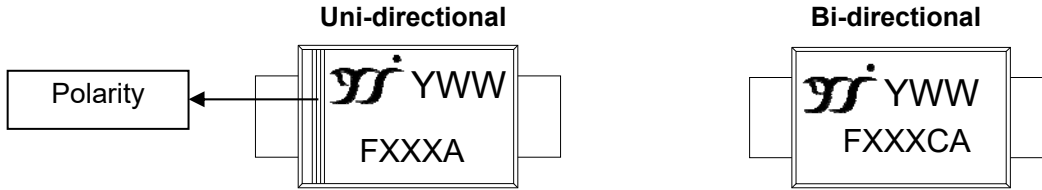


SM4F SERIES

Ordering Information (Example)

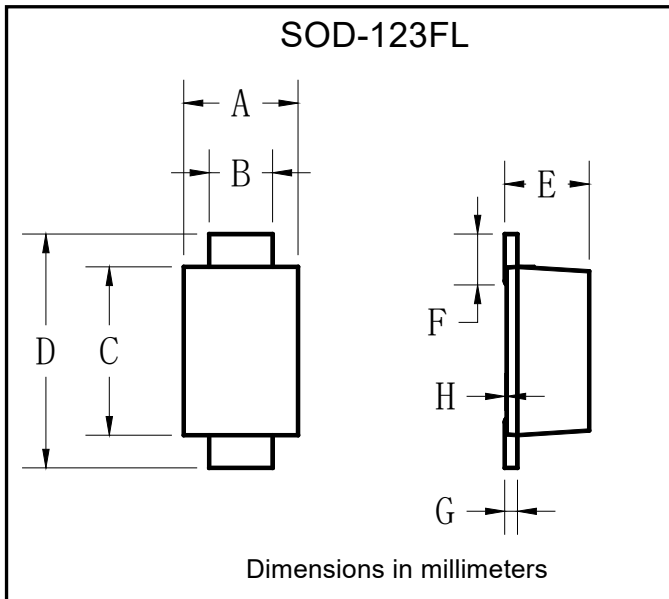
| PREFERED P/N | PACKING CODE | UNIT WEIGHT(g) | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|--------------|--------------|----------------|----------------------|-------------------------|----------------------------|---------------|
| SM4F SERIES | F1 | 0.0177 | 3000 | 30000 | 120000 | 7" reel |

Marking Information



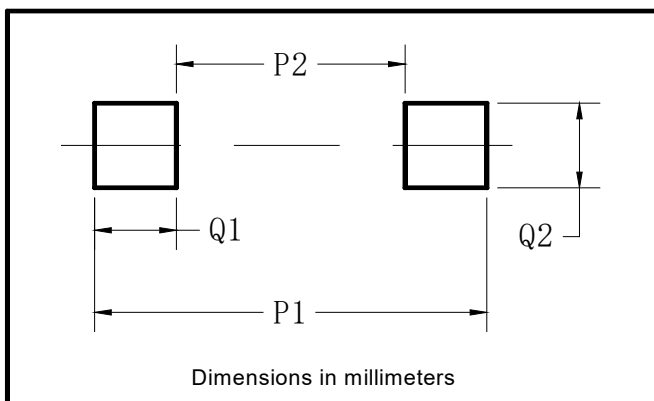
Note:
 1. All marking is at middle of the product body
 2. All marking is in laser printing
 3. XXX is marking code, like 6.0A/6.0CA marking code is 6.0
 4. Body color: Black
 5. YWW is date code, "Y" is year. "WW" is week.
 For instance:
 The 17th week of 2022, date code is 217
 The 17th week of 2023, date code is 317

Outline Dimensions



| SOD-123FL | | |
|-----------|------|------|
| Dim | Min | Max |
| A | 1.60 | 1.90 |
| B | 0.90 | 1.10 |
| C | 2.55 | 2.85 |
| D | 3.60 | 3.90 |
| E | 1.00 | 1.20 |
| F | 0.40 | 0.90 |
| G | 0.10 | 0.25 |
| H | 0.02 | 0.05 |

Suggested pad layout



| SOD-123FL | |
|-----------|-------------|
| Dim | Millimeters |
| P1 | 3.90 |
| P2 | 1.90 |
| Q1 | 1.00 |
| Q2 | 1.50 |



SM4F SERIES

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