Prisemi®

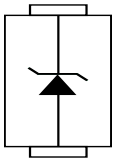
# P4SMAFJ5.0A THRU P4SMAFJ440A

## Surface mount transient voltage suppressor power 400 watts

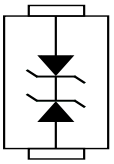
## Description

The SMAF Series are designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

Uni-directional



Bi-directional



## Feature

- For surface mounted applications in order to optimize board space.
- Low profile package
- Glass passivated junction
- Low inductance
- Plastic package has Underwriters Laboratory Flammability
- Excellent clamping capability
- Fast response time: typical less than 1.0 ps from 0V to $V_{BR}$ min
- 400W peak pulse power capability at 10/1000us waveform, Repetition rate (duty cycle): 0.01%

## Applications

TVS device are ideal for the protection of I/O interfaces, $V_{CC}$ bus and other vulnerable circuits used in telecom, computer industrial and consumer electronic application

## Absolute maximum rating@25℃

| Rating | Symbol | Value | Units |
|---|---|---|---|
| Peak Pulse Power Dissipation on TA=25°C (Note 1,2,4, Fig1) | $P_{PPM}$ | 400 | W |
| Peak Forward Surge Current (Note 3,Fig 5) | $I_{FSM}$ | 40 | A |
| Peak Pulse Current on 10/1000 us waveform (Note 1, Fig 2) | IPPM | see Table 1 | A |
| Maximum Junction capacitance at VR=100mV, f=1MHz | $C_J$ | 390 | pF |
| ESD Voltage per IEC6100-4-2 Contact Air | VESD1<br>VESD2 | ±55 to ±150 | KV |
| Typical Thermal Resistance Junction to Ambient(Note 2) | $R_{\theta JA}$ | 150 | ℃/W |
| Operating Junction Temperature and Storage Temperature Range | $T_j$, $T_{stg}$ | -55 to +150 | ℃ |

## Electrical characteristics per line@25℃( unless otherwise specified)

| Part Number (Uni) | Part Number (Bi) | Reverse Stand off Voltage $V_R$ (V) | Breakdown Voltage $V_{BR}$@ $I_T$ (V) | | Test Current $I_T$ (mA) | Maximum Reverse Leakage $I_R$@$V_{RWM}$ (uA) | Maximum Clamping Voltage $V_C$ @$I_{PP}$ (V) | Maximum Peak Pulse Current $I_{PP}$ (A) |
|---|---|---|---|---|---|---|---|---|
| | | | MIN | MAX | | | | |
| P4SMAFJ5.0A | P4SMAFJ5.0CA | 5.0 | 6.40 | 7.00 | 10 | 800 | 9.2 | 43.5 |
| P4SMAFJ6.0A | P4SMAFJ6.0CA | 6.0 | 6.67 | 7.37 | 10 | 800 | 10.3 | 38.8 |
| P4SMAFJ6.5A | P4SMAFJ6.5CA | 6.5 | 7.22 | 7.98 | 10 | 500 | 11.2 | 35.7 |
| P4SMAFJ7.0A | P4SMAFJ7.0CA | 7.0 | 7.78 | 8.60 | 10 | 200 | 12.0 | 33.3 |
| P4SMAFJ7.5A | P4SMAFJ7.5CA | 7.5 | 8.33 | 9.21 | 1 | 100 | 12.9 | 31.0 |
| P4SMAFJ8.0A | P4SMAFJ8.0CA | 8.0 | 8.89 | 9.83 | 1 | 50 | 13.6 | 29.4 |
| P4SMAFJ8.5A | P4SMAFJ8.5CA | 8.5 | 9.44 | 10.82 | 1 | 10 | 14.4 | 27.7 |
| P4SMAFJ9.0A | P4SMAFJ9.0CA | 9.0 | 10 | 11.5 | 1 | 5 | 15.4 | 26 |
| P4SMAFJ10A | P4SMAFJ10CA | 10 | 11.1 | 12.8 | 1 | 5 | 17 | 23.5 |
| P4SMAFJ11A | P4SMAFJ11CA | 11 | 12.2 | 14 | 1 | 1 | 18.2 | 22 |
| P4SMAFJ12A | P4SMAFJ12CA | 12 | 13.3 | 15.3 | 1 | 1 | 19.9 | 20.1 |
| P4SMAFJ13A | P4SMAFJ13CA | 13 | 14.4 | 16.5 | 1 | 1 | 21.5 | 18.6 |
| P4SMAFJ14A | P4SMAFJ14CA | 14 | 15.6 | 17.9 | 1 | 1 | 23.2 | 17.2 |
| P4SMAFJ15A | P4SMAFJ15CA | 15 | 16.7 | 19.2 | 1 | 1 | 24.4 | 16.4 |
| P4SMAFJ16A | P4SMAFJ16CA | 16 | 17.8 | 20.5 | 1 | 1 | 26 | 15.3 |
| P4SMAFJ17A | P4SMAFJ17CA | 17 | 18.9 | 21.7 | 1 | 1 | 27.6 | 14.5 |
| P4SMAFJ18A | P4SMAFJ18CA | 18 | 20 | 23.3 | 1 | 1 | 29.2 | 13.7 |
| P4SMAFJ20A | P4SMAFJ20CA | 20 | 22.2 | 25.5 | 1 | 1 | 32.4 | 12.3 |
| P4SMAFJ22A | P4SMAFJ22CA | 22 | 24.4 | 28 | 1 | 1 | 35.5 | 11.2 |
| P4SMAFJ24A | P4SMAFJ24CA | 24 | 26.7 | 30.7 | 1 | 1 | 38.9 | 10.3 |
| P4SMAFJ26A | P4SMAFJ26CA | 26 | 28.9 | 33.2 | 1 | 1 | 42.1 | 9.5 |
| P4SMAFJ28A | P4SMAFJ28CA | 28 | 31.1 | 35.8 | 1 | 1 | 45.4 | 8.8 |
| P4SMAFJ30A | P4SMAFJ30CA | 30 | 33.3 | 38.3 | 1 | 1 | 48.4 | 8.3 |
| P4SMAFJ33A | P4SMAFJ33CA | 33 | 36.7 | 42.2 | 1 | 1 | 53.3 | 7.5 |
| P4SMAFJ36A | P4SMAFJ36CA | 36 | 40 | 46 | 1 | 1 | 58.1 | 6.9 |
| P4SMAFJ40A | P4SMAFJ40CA | 40 | 44.4 | 51.1 | 1 | 1 | 64.5 | 6.2 |
| P4SMAFJ43A | P4SMAFJ43CA | 43 | 47.8 | 54.9 | 1 | 1 | 69.4 | 5.7 |
| P4SMAFJ45A | P4SMAFJ45CA | 45 | 50 | 57.5 | 1 | 1 | 72.7 | 5.5 |
| P4SMAFJ48A | P4SMAFJ48CA | 48 | 53.3 | 61.3 | 1 | 1 | 77.4 | 5.2 |
| P4SMAFJ51A | P4SMAFJ51CA | 51 | 56.7 | 65.2 | 1 | 1 | 82.4 | 4.9 |
| P4SMAFJ54A | P4SMAFJ54CA | 54 | 60 | 69 | 1 | 1 | 87.1 | 4.6 |
| P4SMAFJ58A | P4SMAFJ58CA | 58 | 64.4 | 74.1 | 1 | 1 | 93.6 | 4.3 |

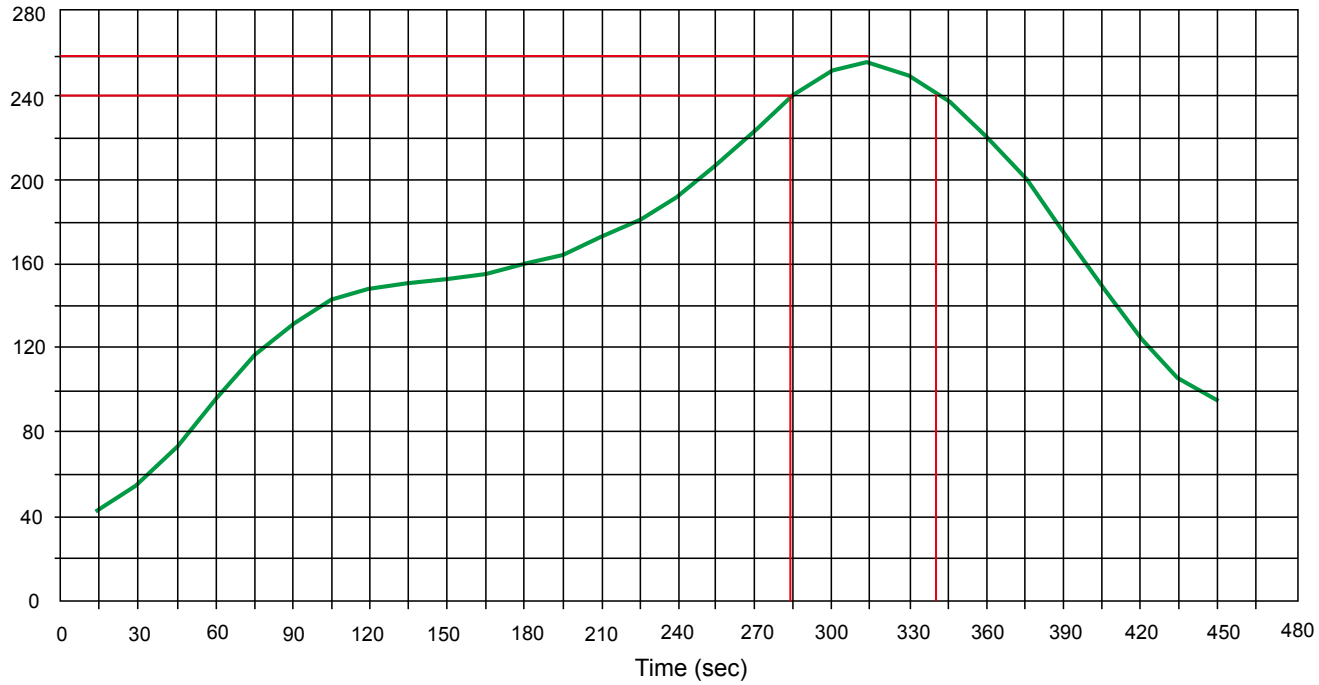
| Part Number (Uni) | Part Number (Bi) | Reverse Stand off Voltage $V_R$ (V) | Breakdown Voltage $V_{BR}$@ $I_T$ (V) | | Test Current $I_T$ (mA) | Maximum Reverse Leakage $I_R$@$V_{RWM}$ (uA) | Maximum Clamping Voltage $V_C$ @$I_{PP}$ (V) | Maximum Peak Pulse Current $I_{PP}$ (A) |
|---|---|---|---|---|---|---|---|---|
| | | | MIN | MAX | | | | |
| P4SMAFJ60A | P4SMAFJ60CA | 60 | 66.7 | 76.7 | 1 | 1 | 96.8 | 4.1 |
| P4SMAFJ64A | P4SMAFJ64CA | 64 | 71.1 | 81.8 | 1 | 1 | 103 | 3.9 |
| P4SMAFJ70A | P4SMAFJ70CA | 70 | 77.8 | 89.5 | 1 | 1 | 113 | 3.5 |
| P4SMAFJ75A | P4SMAFJ75CA | 75 | 83.3 | 95.8 | 1 | 1 | 121 | 3.3 |
| P4SMAFJ78A | P4SMAFJ78CA | 78 | 86.7 | 99.7 | 1 | 1 | 126 | 2.2 |
| P4SMAFJ85A | P4SMAFJ85CA | 85 | 94.4 | 108 | 1 | 1 | 137 | 2.9 |
| P4SMAFJ90A | P4SMAFJ90CA | 90 | 100 | 116 | 1 | 1 | 146 | 2.7 |
| P4SMAFJ100A | P4SMAFJ100CA | 100 | 111 | 128 | 1 | 1 | 162 | 2.5 |
| P4SMAFJ110A | P4SMAFJ110CA | 110 | 122 | 141 | 1 | 1 | 177 | 2.3 |
| P4SMAFJ120A | P4SMAFJ120CA | 120 | 133 | 153 | 1 | 1 | 193 | 2 |
| P4SMAFJ130A | P4SMAFJ130CA | 130 | 144 | 166 | 1 | 1 | 209 | 1.9 |
| P4SMAFJ150A | P4SMAFJ150CA | 150 | 167 | 193 | 1 | 1 | 243 | 1.6 |
| P4SMAFJ160A | P4SMAFJ160CA | 160 | 178 | 205 | 1 | 1 | 259 | 1.5 |
| P4SMAFJ170A | P4SMAFJ170CA | 170 | 189 | 218 | 1 | 1 | 275 | 1.4 |
| P4SMAFJ180A | P4SMAFJ180CA | 180 | 201 | 222 | 1 | 1 | 292 | 1.3 |
| P4SMAFJ200A | P4SMAFJ200CA | 200 | 224 | 247 | 1 | 1 | 324 | 1.2 |
| P4SMAFJ220A | P4SMAFJ220A | 220 | 246 | 272 | 1 | 1 | 356 | 1.1 |
| P4SMAFJ250A | P4SMAFJ250CA | 250 | 279 | 309 | 1 | 1 | 405 | 1.0 |
| P4SMAFJ300A | P4SMAFJ300CA | 300 | 335 | 371 | 1 | 1 | 486 | 0.8 |
| P4SMAFJ350A | P4SMAFJ350CA | 350 | 391 | 432 | 1 | 1 | 567 | 0.7 |
| P4SMAFJ400A | P4SMAFJ400CA | 400 | 447 | 494 | 1 | 1 | 648 | 0.6 |
| P4SMAFJ440A | P4SMAFJ440CA | 440 | 492 | 543 | 1 | 1 | 713 | 0.6 |

For bidirectional type having $V_{RWM}$ of 10 volts and less, the $I_R$ limit is double.

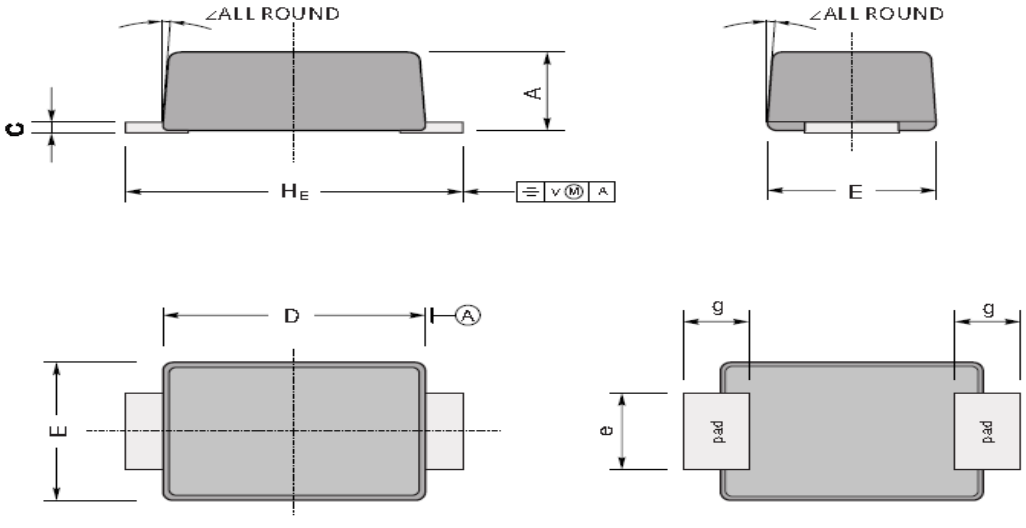
For parts without A ($V_{BR}$ is ±10% and $V_C$ is 5% higher than with A parts)

## Solder Reflow Recommendation

Peak Temp=257℃, Ramp Rate=0.802deg. ℃/sec

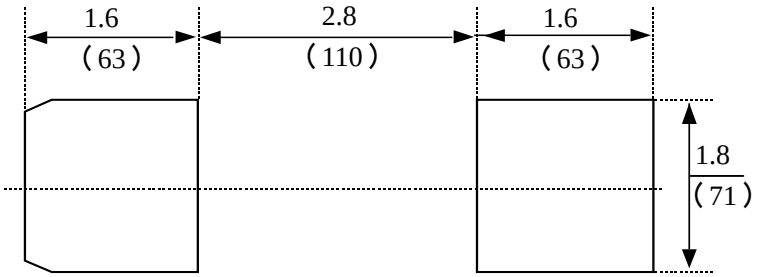



## Product dimension (SMAF)




| UNIT | | A | C | D | E | e | g | $H_E$ | ∠ |
|---|---|---|---|---|---|---|---|---|---|
| mm | max | 1.3 | 0.23 | 3.7 | 2.7 | 1.6 | 1.3 | 4.9 | 7° |
| | min | 1.1 | 0.18 | 3.3 | 2.4 | 1.3 | 1.0 | 4.4 | |
| mil | max | 51 | 9.1 | 146 | 106 | 63 | 51 | 193 | |
| | min | 43 | 7.1 | 130 | 94 | 51 | 39 | 173 | |

The recommended mounting pad size




Unit: mm / (mil)

## Ordering information

| Device | Package | Shipping |
|---|---|---|
| P4SMAFJ5.0A-P4SMAFJ440CA | SMAF (Pb-Free) | 5000/ Tape & Reel |

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