

P4SMA SERIES

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS



康 比 電 子
HORNBY ELECTRONIC

REVERSE VOLTAGE: 6.8 to 440 VOLTS

PEAK PULSE POWER: 400 WATTS

FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- 400W peak pulse power capability on 10/1000 μ s waveform, repetition rate (duty cycle): 0.01%
- Excellent clamping capability
- Low incremental surge resistance
- Very fast response time

MECHANICAL DATA

Case: Molded plastic, DO-214AC(SMA)

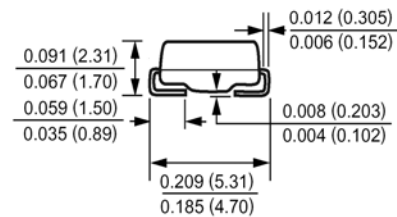
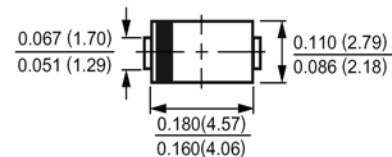
Terminals: Axial leads, solderable per MIL-STD-750, method 2026 guaranteed

Polarity: Color band denotes cathode except bipolar

Packaging: 12mm tape per EIA STD RS-481

Weight: 0.002 ounce, 0.064 gram

DO-214AC(SMA)



Dimensions in inches and (millimeters)

Maximum Ratings and Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Single phase, half wave, 60Hz, resistive or inductive load.

For capacitive load, derate current by 20%.

| | Symbols | Limit | Units |
|--|-----------------------------------|----------------|-------|
| Peak power dissipation with a 10/1000 μ s waveform (Note 1 , 2) (Fig. 1) | P _{PPM} | Minimum 400 | Watts |
| Peak pulse current with a 10/1000 μ s waveform (Note 1) (Fig. 3) | I _{PPM} | See Next Table | Amp |
| Power dissipation on infinite heatsink, T _A = 50°C | P _{M(AV)} | 1.0 | Watts |
| Peak forward surge current, 8.3ms single half sine-wave unidirectional only (Note 2) | I _{FSM} | 40 | Amp |
| Maximum instantaneous forward voltage at 25A for unidirectional only (Note 4) | V _F | 3.5/6.5 | Volts |
| Thermal resistance junction to leads | R _{θJL} | 30 | °C/W |
| Thermal resistance junction to ambient air (Note 3) | R _{θJA} | 120 | °C/W |
| Operating junction and storage temperature range | T _J , T _{stg} | -55 to +150 | °C |

NOTES:

1- Non-repetitive current pulse, per Fig. 3 and derated above T_A = 25°C per Fig. 2. Rating is 300W above 91V.

2- Mounted on 0.2 x 0.2" (5.0 x 5.0mm) copper pads to each terminal

3- Mounted on minimum recommended pad layout

4- V_F = 3.5V for P4SMA200(A) & below; V_F = 6.5V for P4SMA220(A) & above

Devices for Bidirectional Applications:

1- For bi-directional, use C or CA suffix for types P4SMA6.8 thru types P4SMA440A(e.g. P4SMA6.8C, P4SMA440CA).

2- Electrical characteristics apply in both directions.

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Single phase, half wave, 60Hz, resistive or inductive load.

For capacitive load, derate current by 20%.

| Device Type | Breakdown Voltage | | Test Current | Reverse Stand off Voltage | Maximum Reverse Leakage at V_{WM} | Maximum Peak Pulse Current | Maximum Clamping Voltage at I_{PPM} | Maximum Temperature Coefficient of V_{BR} |
|-------------|------------------------------|----------------|--------------|---------------------------|-------------------------------------|----------------------------|---------------------------------------|---|
| | V_{BR} at I_T (Note 1) | | I_T | V_{WM} | I_D (Note 3) | I_{PPM} (Note 2) | V_C | / |
| | Volts (min.) | Volts (max.) | mAmps | Volts | uAmps | Amps | Volts | % / °C |
| P4SMA6.8 | 6.12 | 7.48 | 10 | 5.50 | 1000 | 37.0 | 10.8 | 0.057 |
| P4SMA6.8A | 6.45 | 7.14 | 10 | 5.80 | 1000 | 38.1 | 10.5 | 0.057 |
| P4SMA7.5 | 6.75 | 8.25 | 10 | 6.05 | 500 | 34.2 | 11.7 | 0.061 |
| P4SMA7.5A | 7.13 | 7.88 | 10 | 6.40 | 500 | 35.4 | 11.3 | 0.061 |
| P4SMA8.2 | 7.38 | 9.02 | 10 | 6.63 | 200 | 32.0 | 12.5 | 0.065 |
| P4SMA8.2A | 7.79 | 8.61 | 10 | 7.02 | 200 | 33.1 | 12.1 | 0.065 |
| P4SMA9.1 | 8.19 | 10.0 | 1.0 | 7.37 | 50 | 29.0 | 13.8 | 0.068 |
| P4SMA9.1A | 8.65 | 9.55 | 1.0 | 7.78 | 50 | 29.9 | 13.4 | 0.068 |
| P4SMA10 | 9.00 | 11.0 | 1.0 | 8.10 | 10 | 26.7 | 15.0 | 0.073 |
| P4SMA10A | 9.50 | 10.5 | 1.0 | 8.55 | 10 | 27.6 | 14.5 | 0.073 |
| P4SMA11 | 9.90 | 12.1 | 1.0 | 8.92 | 5.0 | 24.7 | 16.2 | 0.075 |
| P4SMA11A | 10.5 | 11.6 | 1.0 | 9.40 | 5.0 | 25.6 | 15.6 | 0.075 |
| P4SMA12 | 10.8 | 13.2 | 1.0 | 9.72 | 5.0 | 23.1 | 17.3 | 0.078 |
| P4SMA12A | 11.4 | 12.6 | 1.0 | 10.2 | 5.0 | 24.0 | 16.7 | 0.078 |
| P4SMA13 | 11.7 | 14.3 | 1.0 | 10.5 | 5.0 | 21.1 | 19.0 | 0.081 |
| P4SMA13A | 12.4 | 13.7 | 1.0 | 11.1 | 5.0 | 22.0 | 18.2 | 0.081 |
| P4SMA15 | 13.5 | 16.5 | 1.0 | 12.1 | 5.0 | 18.2 | 22.0 | 0.084 |
| P4SMA15A | 14.3 | 15.8 | 1.0 | 12.8 | 5.0 | 18.9 | 21.2 | 0.084 |
| P4SMA16 | 14.4 | 17.6 | 1.0 | 12.9 | 5.0 | 17.0 | 23.5 | 0.086 |
| P4SMA16A | 15.2 | 16.8 | 1.0 | 13.6 | 5.0 | 17.8 | 22.5 | 0.086 |
| P4SMA18 | 16.2 | 19.8 | 1.0 | 14.5 | 5.0 | 15.1 | 26.5 | 0.088 |
| P4SMA18A | 17.1 | 18.9 | 1.0 | 15.3 | 5.0 | 15.9 | 25.2 | 0.088 |
| P4SMA20 | 18.0 | 22.0 | 1.0 | 16.2 | 5.0 | 13.7 | 29.1 | 0.090 |
| P4SMA20A | 19.0 | 21.0 | 1.0 | 17.1 | 5.0 | 14.4 | 27.7 | 0.090 |
| P4SMA22 | 19.8 | 24.2 | 1.0 | 17.8 | 5.0 | 12.5 | 31.9 | 0.092 |
| P4SMA22A | 20.9 | 23.1 | 1.0 | 18.8 | 5.0 | 13.1 | 30.6 | 0.092 |
| P4SMA24 | 21.6 | 26.4 | 1.0 | 19.4 | 5.0 | 11.5 | 34.7 | 0.094 |
| P4SMA24A | 22.8 | 25.2 | 1.0 | 20.5 | 5.0 | 12.0 | 33.2 | 0.094 |
| P4SMA27 | 24.3 | 29.7 | 1.0 | 21.8 | 5.0 | 10.2 | 39.1 | 0.096 |
| P4SMA27A | 25.7 | 28.4 | 1.0 | 23.1 | 5.0 | 10.7 | 37.5 | 0.096 |
| P4SMA30 | 27.0 | 33.0 | 1.0 | 24.3 | 5.0 | 9.2 | 43.5 | 0.097 |
| P4SMA30A | 28.5 | 31.5 | 1.0 | 25.6 | 5.0 | 9.7 | 41.4 | 0.097 |
| P4SMA33 | 29.7 | 36.3 | 1.0 | 26.8 | 5.0 | 8.4 | 47.7 | 0.098 |
| P4SMA33A | 31.4 | 34.7 | 1.0 | 28.2 | 5.0 | 8.8 | 45.7 | 0.098 |
| P4SMA36 | 32.4 | 39.6 | 1.0 | 29.1 | 5.0 | 7.7 | 52.0 | 0.099 |
| P4SMA36A | 34.2 | 37.8 | 1.0 | 30.8 | 5.0 | 8.0 | 49.9 | 0.099 |
| P4SMA39 | 35.1 | 42.9 | 1.0 | 31.6 | 5.0 | 7.1 | 56.4 | 0.100 |
| P4SMA39A | 37.1 | 41.0 | 1.0 | 33.3 | 5.0 | 7.4 | 53.9 | 0.100 |
| P4SMA43 | 38.7 | 47.3 | 1.0 | 34.8 | 5.0 | 6.5 | 61.9 | 0.101 |
| P4SMA43A | 40.9 | 45.2 | 1.0 | 36.8 | 5.0 | 6.7 | 59.3 | 0.101 |
| P4SMA47 | 42.3 | 51.7 | 1.0 | 38.1 | 5.0 | 5.9 | 67.8 | 0.101 |
| P4SMA47A | 44.7 | 49.4 | 1.0 | 40.2 | 5.0 | 6.2 | 64.8 | 0.101 |
| P4SMA51 | 45.9 | 56.1 | 1.0 | 41.3 | 5.0 | 5.4 | 73.5 | 0.102 |
| P4SMA51A | 48.5 | 53.6 | 1.0 | 43.6 | 5.0 | 5.7 | 70.1 | 0.102 |
| P4SMA56 | 50.4 | 61.6 | 1.0 | 45.4 | 5.0 | 5.0 | 80.5 | 0.103 |
| P4SMA56A | 53.2 | 58.8 | 1.0 | 47.8 | 5.0 | 5.2 | 77.0 | 0.103 |

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| Device Type | Breakdown Voltage | | Test Current | Reverse Stand off Voltage | Maximum Reverse Leakage at V_{WM} | Maximum Peak Pulse Current | Maximum Clamping Voltage at I_{PPM} | Maximum Temperature Coefficient of V_{BR} |
|-------------|------------------------------|----------------|--------------|---------------------------|-------------------------------------|----------------------------|---------------------------------------|---|
| | V_{BR} at I_T (Note 1) | | I_T | V_{WM} | I_D (Note 3) | I_{PPM} (Note 2) | V_C | / |
| | Volts (min.) | Volts (max.) | mAmps | Volts | uAmps | Amps | Volts | % / °C |
| P4SMA62 | 55.8 | 68.2 | 1.0 | 50.2 | 5.0 | 4.5 | 89.0 | 0.104 |
| P4SMA62A | 58.9 | 65.1 | 1.0 | 53.0 | 5.0 | 4.7 | 85.0 | 0.104 |
| P4SMA68 | 61.2 | 74.8 | 1.0 | 55.1 | 5.0 | 4.1 | 98.0 | 0.104 |
| P4SMA68A | 64.6 | 71.4 | 1.0 | 58.1 | 5.0 | 4.3 | 92.0 | 0.104 |
| P4SMA75 | 67.5 | 82.5 | 1.0 | 60.7 | 5.0 | 3.7 | 108 | 0.105 |
| P4SMA75A | 71.3 | 78.8 | 1.0 | 64.1 | 5.0 | 3.9 | 103 | 0.105 |
| P4SMA82 | 73.8 | 90.2 | 1.0 | 66.4 | 5.0 | 3.4 | 118 | 0.105 |
| P4SMA82A | 77.9 | 86.1 | 1.0 | 70.1 | 5.0 | 3.5 | 113 | 0.105 |
| P4SMA91 | 81.9 | 100 | 1.0 | 73.7 | 5.0 | 3.1 | 131 | 0.106 |
| P4SMA91A | 86.5 | 95.5 | 1.0 | 77.8 | 5.0 | 3.2 | 125 | 0.106 |
| P4SMA100 | 90.0 | 110 | 1.0 | 81.0 | 5.0 | 2.8 | 144 | 0.106 |
| P4SMA100A | 95.0 | 105 | 1.0 | 85.5 | 5.0 | 2.9 | 137 | 0.106 |
| P4SMA110 | 99.0 | 121 | 1.0 | 89.2 | 5.0 | 2.5 | 158 | 0.107 |
| P4SMA110A | 105 | 116 | 1.0 | 94.0 | 5.0 | 2.6 | 152 | 0.107 |
| P4SMA120 | 108 | 132 | 1.0 | 97.2 | 5.0 | 2.3 | 173 | 0.107 |
| P4SMA120A | 114 | 126 | 1.0 | 102 | 5.0 | 2.4 | 165 | 0.107 |
| P4SMA130 | 117 | 143 | 1.0 | 105 | 5.0 | 2.1 | 187 | 0.107 |
| P4SMA130A | 124 | 137 | 1.0 | 111 | 5.0 | 2.2 | 179 | 0.107 |
| P4SMA150 | 135 | 165 | 1.0 | 121 | 5.0 | 1.9 | 215 | 0.108 |
| P4SMA150A | 143 | 158 | 1.0 | 128 | 5.0 | 1.9 | 207 | 0.108 |
| P4SMA160 | 144 | 176 | 1.0 | 130 | 5.0 | 1.7 | 230 | 0.108 |
| P4SMA160A | 152 | 168 | 1.0 | 136 | 5.0 | 1.8 | 219 | 0.108 |
| P4SMA170 | 153 | 187 | 1.0 | 138 | 5.0 | 1.6 | 244 | 0.108 |
| P4SMA170A | 162 | 179 | 1.0 | 145 | 5.0 | 1.7 | 234 | 0.108 |
| P4SMA180 | 162 | 198 | 1.0 | 146 | 5.0 | 1.6 | 258 | 0.108 |
| P4SMA180A | 171 | 189 | 1.0 | 154 | 5.0 | 1.6 | 246 | 0.108 |
| P4SMA200 | 180 | 220 | 1.0 | 162 | 5.0 | 1.4 | 287 | 0.108 |
| P4SMA200A | 190 | 210 | 1.0 | 171 | 5.0 | 1.5 | 274 | 0.108 |
| P4SMA220 | 198 | 242 | 1.0 | 175 | 5.0 | 1.2 | 344 | 0.108 |
| P4SMA220A | 209 | 231 | 1.0 | 185 | 5.0 | 1.2 | 328 | 0.108 |
| P4SMA250 | 225 | 275 | 1.0 | 202 | 5.0 | 1.1 | 360 | 0.110 |
| P4SMA250A | 237 | 263 | 1.0 | 214 | 5.0 | 1.2 | 344 | 0.110 |
| P4SMA300 | 270 | 330 | 1.0 | 243 | 5.0 | 0.93 | 430 | 0.110 |
| P4SMA300A | 285 | 315 | 1.0 | 256 | 5.0 | 1.00 | 414 | 0.110 |
| P4SMA350 | 315 | 385 | 1.0 | 284 | 5.0 | 0.79 | 504 | 0.110 |
| P4SMA350A | 332 | 368 | 1.0 | 300 | 5.0 | 0.83 | 482 | 0.110 |
| P4SMA400 | 360 | 440 | 1.0 | 324 | 5.0 | 0.70 | 574 | 0.110 |
| P4SMA400A | 380 | 420 | 1.0 | 342 | 5.0 | 0.73 | 548 | 0.110 |
| P4SMA440 | 396 | 484 | 1.0 | 356 | 5.0 | 0.63 | 631 | 0.110 |
| P4SMA440A | 418 | 462 | 1.0 | 376 | 5.0 | 0.66 | 602 | 0.110 |

NOTES:

1- Pulse test: $t_p \leq 50ms$

2- Surge current waveform per Fig. 3 and derate per Fig. 2

3- For bidirectional types having V_{WM} of 10 volts and less, the I_D limit is doubled

4- All terms and symbols are consistent with ANSI/IEEE C62.35

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RATINGS AND CHARACTERISTIC CURVES

Fig. 1 – Peak Pulse Power Rating Curve

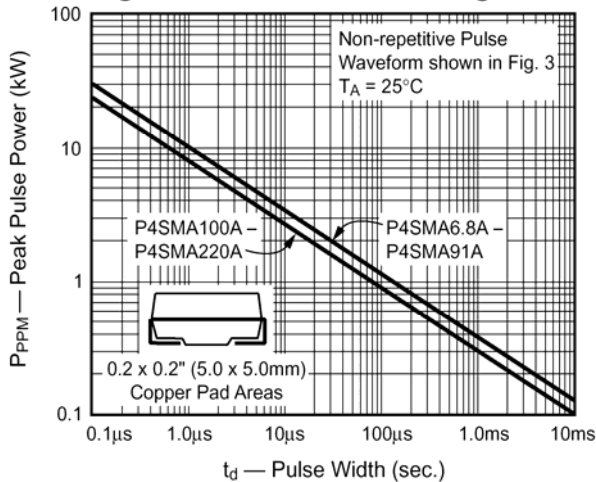


Fig. 2 – Pulse Derating Curve

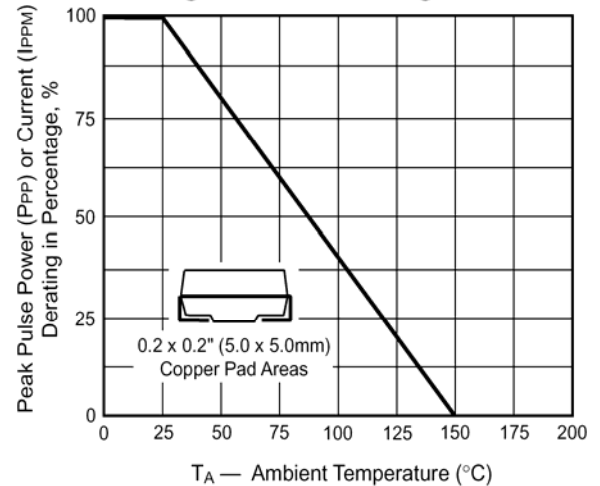


Fig. 3 – Pulse Waveform

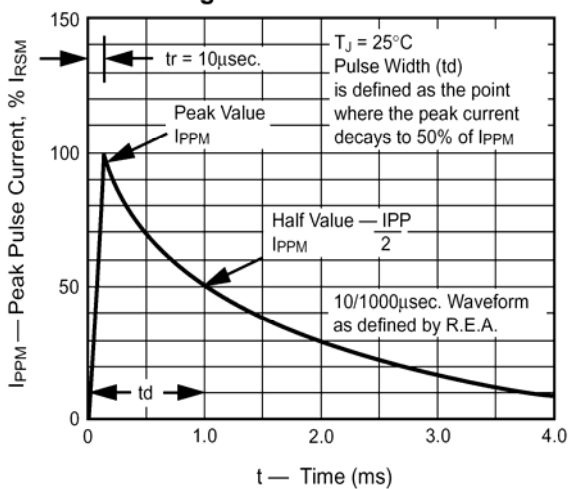


Fig. 4 – Typical Junction Capacitance

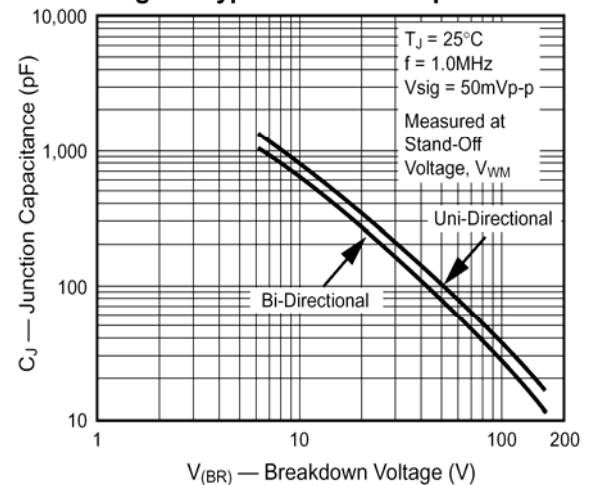


Fig. 5 – Typical Transient Thermal Impedance

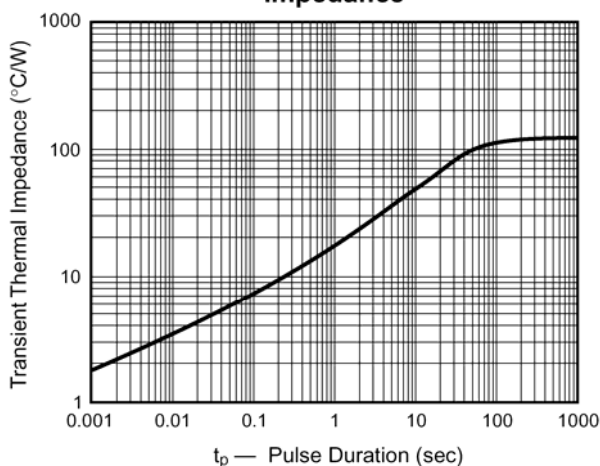


Fig. 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

