

## Silicon Avalanche Diodes

### 400W Surface Mount Transient Voltage Suppressors

#### **NEW** **RoHS** P4SMA Series

#### FEATURES

- RoHS compliant
- For surface mounted applications in order to optimize board space
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low Inductance
- Excellent clamping capability
- Repetition Rate (duty cycle):0.01%
- Fast response time: typically less than 1.0ps from 0 Volts to V(BR) for unidirectional types
- Typical IR less than 1µA above 10V
- High temperature soldering: 250°C/10 seconds at terminals

#### DEVICES FOR BIPOLAR APPLICATION

For Bidirectional use Suffix CA for types P4SMA6.8CA thru types P4SMA50CA

Electrical characteristics apply in both directions

**Agency Approvals:** Recognized under the Components Program of Underwriters Laboratories.

**Agency File Numbers:** E128667

#### ORDERING INFORMATION



T = Tape and reeled (5000pcs)



#### MAXIMUM RATINGS AND CHARACTERISTICS

@25°C AMBIENT TEMPERATURE (unless otherwise noted)

| PARAMETER   | SYMBOL                            | VALUE       | UNIT  |
|---|-----------------------------------|-------------|-------|
| Peak pulse power Dissipation on 10/1000µs waveform (Note 1.2,FIG.1)   | P <sub>PPM</sub>                  | Min 400     | Watts |
| Peak pulse current of on 10/1000µs waveform (Note 1, FIG.3)   | I <sub>PPM</sub>                  | See Table 1 | Amps  |
| Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load, (JEDEC Method)(Note2,3) | I <sub>FSM</sub>                  | 40          | Amps  |
| Operating junction and Storage Temperature Range  | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C    |

Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above T<sub>A</sub>= 25°C per Fig.2
2. Mounted on 5.0mm<sup>2</sup> (0.03mm thick) Copper Pads to each terminal
3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum

#### Mechanical Specifications:

- Weight:** 0.002 ounce, 0.061 gram
- Case:** JEDEC DO214AC. Molded plastic over glass passivated junction
- Mounting Position:** Any
- Polarity:** Color band denoted positive end (cathode) except Bidirectional
- Terminal:** Solder plated, solderable per MIL-STD-750, Method 2026
- Standard Packaging:** 12mm tape (EIA STD RS-481)

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### 400W Surface Mount Transient Voltage Suppressors

#### RoHS P4SMA Series

#### ELECTRICAL SPECIFICATION @ Tamb 25°C

| Part Number (Uni) | Part Number (Bi) | Device Marking Code |      | Reverse Stand off Voltage Vr (Volts) | Breakdown Voltage VBR (Volts) @ IT |        | Test Current IT (mA) | Maximum Clamping Voltage Vc @ IPP (Volts) | Maximum Peak Pulse Current IPP (A) | Maximum Reverse Leakage IR @ Vr (µA) |
|-------------------|------------------|---------------------|------|--------------------------------------|------------------------------------|--------|----------------------|---|------------------------------------|--------------------------------------|
|                   |                  | UNI                 | BI   |                                      | MIN                                | MAX    |                      |   |                                    |                                      |
| P4SMA6.8A         | P4SMA6.8CA       | 6V8A                | 6V8C | 5.80                                 | 6.45                               | 7.14   | 10                   | 10.5                                      | 39.0                               | 1000                                 |
| P4SMA7.5A         | P4SMA7.5CA       | 7V5A                | 7V5C | 6.40                                 | 7.13                               | 7.88   | 10                   | 11.3                                      | 36.3                               | 500                                  |
| P4SMA8.2A         | P4SMA8.2CA       | 8V2A                | 8V2C | 7.02                                 | 7.79                               | 8.61   | 10                   | 12.1                                      | 33.9                               | 200                                  |
| P4SMA9.1A         | P4SMA9.1CA       | 9V1A                | 9V1C | 7.78                                 | 8.65                               | 9.55   | 1                    | 13.4                                      | 30.6                               | 50                                   |
| P4SMA10A          | P4SMA10CA        | 10A                 | 10C  | 8.55                                 | 9.50                               | 10.50  | 1                    | 14.5                                      | 28.3                               | 10                                   |
| P4SMA11A          | P4SMA11CA        | 11A                 | 11C  | 9.40                                 | 10.50                              | 11.60  | 1                    | 15.6                                      | 26.3                               | 5                                    |
| P4SMA12A          | P4SMA12CA        | 12A                 | 12C  | 10.20                                | 11.40                              | 12.60  | 1                    | 16.7                                      | 24.6                               | 5                                    |
| P4SMA13A          | P4SMA13CA        | 13A                 | 13C  | 11.10                                | 12.40                              | 13.70  | 1                    | 18.2                                      | 22.5                               | 5                                    |
| P4SMA15A          | P4SMA15CA        | 15A                 | 15C  | 12.80                                | 14.30                              | 15.80  | 1                    | 21.2                                      | 19.3                               | 5                                    |
| P4SMA16A          | P4SMA16CA        | 16A                 | 16C  | 13.60                                | 15.20                              | 16.80  | 1                    | 22.5                                      | 18.2                               | 5                                    |
| P4SMA18A          | P4SMA18CA        | 18A                 | 18C  | 15.30                                | 17.10                              | 18.90  | 1                    | 25.5                                      | 16.1                               | 5                                    |
| P4SMA20A          | P4SMA20CA        | 20A                 | 20C  | 17.10                                | 19.00                              | 21.00  | 1                    | 27.7                                      | 14.8                               | 5                                    |
| P4SMA22A          | P4SMA22CA        | 22A                 | 22C  | 18.80                                | 20.90                              | 23.10  | 1                    | 30.6                                      | 13.4                               | 5                                    |
| P4SMA24A          | P4SMA24CA        | 24A                 | 24C  | 20.50                                | 22.80                              | 25.20  | 1                    | 33.2                                      | 12.3                               | 5                                    |
| P4SMA27A          | P4SMA27CA        | 27A                 | 27C  | 23.10                                | 25.70                              | 28.40  | 1                    | 37.5                                      | 10.9                               | 5                                    |
| P4SMA30A          | P4SMA30CA        | 30A                 | 30C  | 25.60                                | 28.50                              | 31.50  | 1                    | 41.4                                      | 9.9                                | 5                                    |
| P4SMA33A          | P4SMA33CA        | 33A                 | 33C  | 28.20                                | 31.40                              | 34.70  | 1                    | 45.7                                      | 9.0                                | 5                                    |
| P4SMA36A          | P4SMA36CA        | 36A                 | 36C  | 30.80                                | 34.20                              | 37.80  | 1                    | 49.9                                      | 8.2                                | 5                                    |
| P4SMA39A          | P4SMA39CA        | 39A                 | 39C  | 33.30                                | 37.10                              | 41.00  | 1                    | 53.9                                      | 7.6                                | 5                                    |
| P4SMA43A          | P4SMA43CA        | 43A                 | 43C  | 36.80                                | 40.90                              | 45.20  | 1                    | 59.3                                      | 6.9                                | 5                                    |
| P4SMA47A          | P4SMA47CA        | 47A                 | 47C  | 40.20                                | 44.70                              | 49.40  | 1                    | 64.8                                      | 6.3                                | 5                                    |
| P4SMA51A          | P4SMA51CA        | 51A                 | 51C  | 43.60                                | 48.50                              | 53.60  | 1                    | 70.1                                      | 5.8                                | 5                                    |
| P4SMA56A          | P4SMA56CA        | 56A                 | 56C  | 47.80                                | 53.20                              | 58.80  | 1                    | 77.0                                      | 5.3                                | 5                                    |
| P4SMA62A          | P4SMA62CA        | 62A                 | 62C  | 53.00                                | 58.90                              | 65.10  | 1                    | 85.0                                      | 4.8                                | 5                                    |
| P4SMA68A          | P4SMA68CA        | 68A                 | 68C  | 58.10                                | 64.60                              | 71.40  | 1                    | 92.0                                      | 4.5                                | 5                                    |
| P4SMA75A          | P4SMA75CA        | 75A                 | 75C  | 64.10                                | 71.30                              | 78.80  | 1                    | 103.0                                     | 4.0                                | 5                                    |
| P4SMA82A          | P4SMA82CA        | 82A                 | 82C  | 70.10                                | 77.90                              | 86.10  | 1                    | 113.0                                     | 3.6                                | 5                                    |
| P4SMA91A          | P4SMA91CA        | 91A                 | 91C  | 77.80                                | 86.50                              | 95.50  | 1                    | 125.0                                     | 3.3                                | 5                                    |
| P4SMA100A         | P4SMA100CA       | 100A                | 100C | 85.50                                | 95.00                              | 105.00 | 1                    | 137.0                                     | 3.0                                | 5                                    |
| P4SMA110A         | P4SMA110CA       | 110A                | 110C | 94.00                                | 105.00                             | 116.00 | 1                    | 152.0                                     | 2.7                                | 5                                    |
| P4SMA120A         | P4SMA120CA       | 120A                | 120C | 102.00                               | 114.00                             | 126.00 | 1                    | 165.0                                     | 2.5                                | 5                                    |
| P4SMA130A         | P4SMA130CA       | 130A                | 130C | 111.00                               | 124.00                             | 137.00 | 1                    | 179.0                                     | 2.3                                | 5                                    |
| P4SMA150A         | P4SMA150CA       | 150A                | 150C | 128.00                               | 143.00                             | 158.00 | 1                    | 207.0                                     | 2.0                                | 5                                    |
| P4SMA160A         | P4SMA160CA       | 160A                | 160C | 136.00                               | 152.00                             | 168.00 | 1                    | 219.0                                     | 1.9                                | 5                                    |
| P4SMA170A         | P4SMA170CA       | 170A                | 170C | 145.00                               | 162.00                             | 179.00 | 1                    | 234.0                                     | 1.8                                | 5                                    |
| P4SMA180A         | P4SMA180CA       | 180A                | 180C | 154.00                               | 171.00                             | 189.00 | 1                    | 246.0                                     | 1.7                                | 5                                    |
| P4SMA200A         | P4SMA200CA       | 200A                | 200C | 171.00                               | 190.00                             | 210.00 | 1                    | 274.0                                     | 1.5                                | 5                                    |
| P4SMA220A         | P4SMA220CA       | 220A                | 220C | 185.00                               | 209.00                             | 231.00 | 1                    | 328.0                                     | 1.3                                | 5                                    |
| P4SMA250A         | P4SMA250CA       | 250A                | 250C | 214.00                               | 237.00                             | 263.00 | 1                    | 344.0                                     | 1.2                                | 5                                    |
| P4SMA300A         | P4SMA300CA       | 300A                | 300C | 256.00                               | 285.00                             | 315.00 | 1                    | 414.0                                     | 1.0                                | 5                                    |
| P4SMA350A         | P4SMA350CA       | 350A                | 350C | 300.00                               | 332.00                             | 368.00 | 1                    | 482.0                                     | 0.9                                | 5                                    |
| P4SMA400A         | P4SMA400CA       | 400A                | 400C | 342.00                               | 380.00                             | 420.00 | 1                    | 548.0                                     | 0.8                                | 5                                    |
| P4SMA440A         | P4SMA440CA       | 440A                | 440C | 376.00                               | 418.00                             | 462.00 | 1                    | 602.0                                     | 0.7                                | 5                                    |
| P4SMA480A         | P4SMA480CA       | 480A                | 480C | 408.00                               | 456.00                             | 504.00 | 1                    | 658.0                                     | 0.6                                | 5                                    |
| P4SMA510A         | P4SMA510CA       | 510A                | 510C | 434.00                               | 485.00                             | 535.00 | 1                    | 698.0                                     | 0.6                                | 5                                    |
| P4SMA530A         | P4SMA530CA       | 530A                | 530C | 477.00                               | 503.50                             | 556.50 | 1                    | 725.0                                     | 0.6                                | 5                                    |
| P4SMA540A         | P4SMA540CA       | 540A                | 540C | 459.00                               | 513.00                             | 567.00 | 1                    | 740.0                                     | 0.5                                | 5                                    |
| P4SMA550A         | P4SMA550CA       | 550A                | 550C | 495.00                               | 522.50                             | 577.50 | 1                    | 760.0                                     | 0.5                                | 5                                    |

For bidirectional type having Vrwm of 10 volts and less, the IR limit is double.  
The available parts are "A" type only, the parts without A (VBR is ± 10%) is not available.

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### RoHS P4SMA Series

Ratings and Characteristic Curves  $T_A=25^\circ\text{C}$  unless otherwise noted

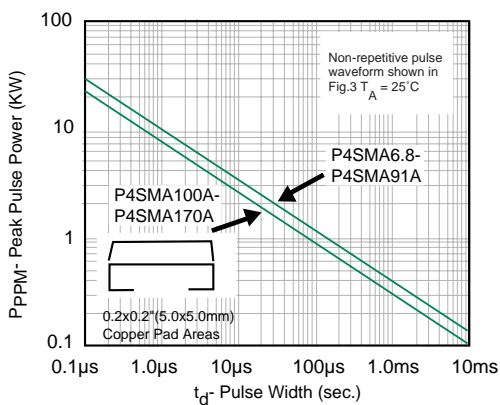


Fig. 1 Peak Pulse Power Rating

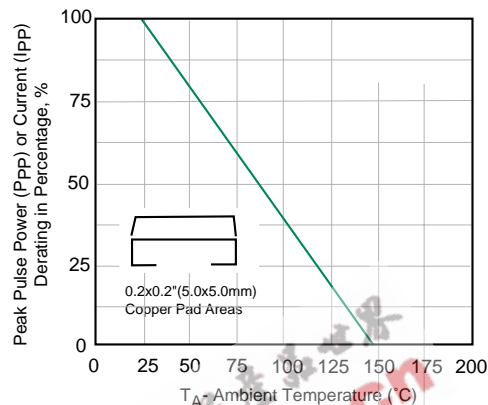


Fig. 2 Pulse Derating Curve

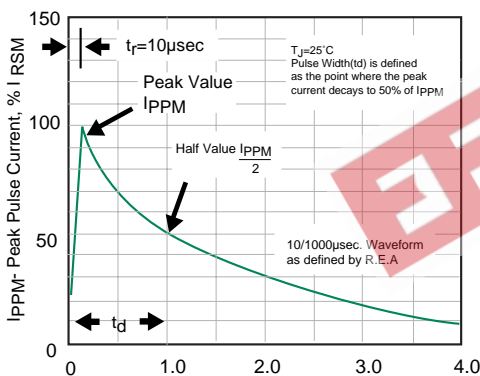


Fig. 3 Pulse Waveform

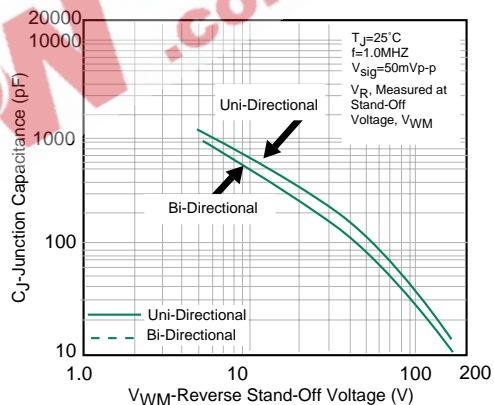


Fig. 4- Typical Junction Capacitance

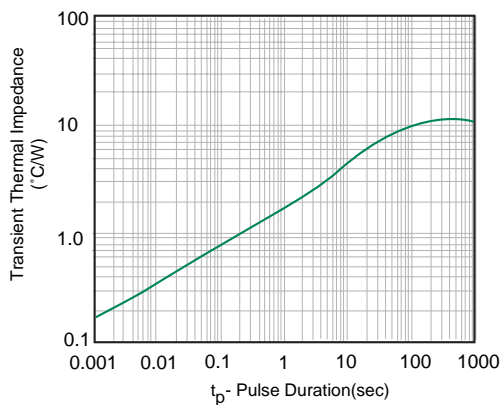


Fig. 5- Typ. Transient Thermal Impedance

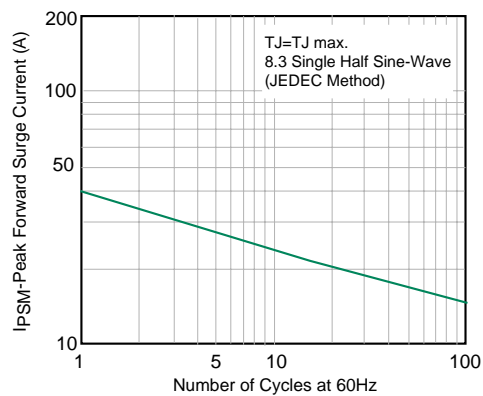


Fig. 6- Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only

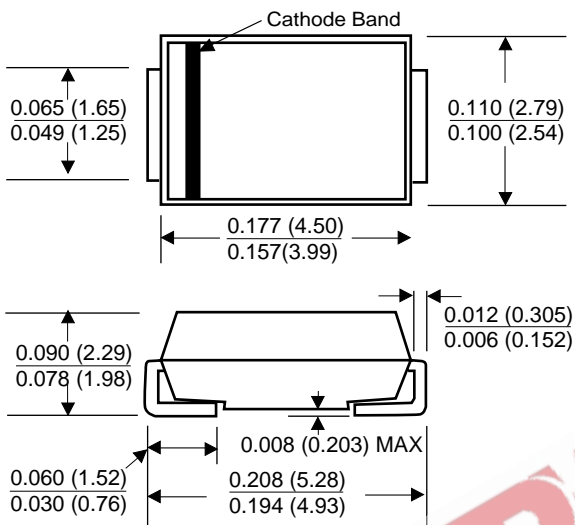
## Silicon Avalanche Diodes

### 400W Surface Mount Transient Voltage Suppressors

#### RoHS P4SMA Series

#### Package Outline Dimensions and Pad Layouts

##### DO-214AC (SMA)



Dimensions in inches and (millimeters)

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