

# Silicon Avalanche Diodes

## 600W Surface Mount Transient Voltage Suppressors

### RoHS P6SMBJ 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 lead inductance
- Excellent clamping capability
- Repetition Rate (duty cycle): 0.01%
- Fast response time: typically less than 1.0ps from 0 Volts to BV for unidirectional types
- Typical IR less than 1  $\mu$ A above 10V
- High Temperature soldering: 250°C/10 seconds at terminals

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

**Agency File Number:** E128662



#### MAXIMUM RATINGS AND CHARACTERISTICS

@25°C AMBIENT TEMPERATURE (unless otherwise noted)

| PARAMETER                                                                                                     | SYMBOL                            | VALUE       | UNIT  |
|---------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------|-------|
| Peak Reverse Power Dissipation on 10/1000 $\mu$ s waveform (note 1,2, FIG.1)                                  | P <sub>PPM</sub>                  | Min 600     | Watts |
| Peak pulse current of on 10/1000 $\mu$ s 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) (note 2.3) | I <sub>PSM</sub>                  | 100         | Amps  |
| Operating junction and Storage Temperature Range                                                              | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C    |

Note 1. Non-repetitive current pulse, per Fig.3 and derated above T<sub>A</sub> = 25°C per Fig.2

Note 2. Mounted on 5.0mm<sup>2</sup>(0.03mm thick) Copper Pads to each terminal

Note 3. 8.3 ms single half sine-wave, or equivalent square wave, Duty cycle= 4 pulses per minute

#### ORDERING INFORMATION

P6SMBJ L L L C I A

Voltage L L L C I A

Bi-Directional L L L C I A

5% Voltage Tolerance L L L C I A

Tape and reeled (3000 pcs)

#### Mechanical Specifications:

**Weight:** 0.003ounce, 0.093 gram

**Case:** JEDEC DO-214AA Molded Plastic over glass passivated junction

**Mounting Position:** Any

**Polarity:** Color band denotes cathode except Bidirectional

**Terminal:** Solder Plated solderable per MIL-STD-750, Method 2026

**Standard Packaging:** 12mm tape (EIA STF RS-481)

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### 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    |                      |                                           |                                    |                                      |
| P6SMBJ6.8A        | P6SMBJ6.8CA      | 6V8A                | 6V8CA | 5.80                                 | 6.45                               | 7.14   | 10                   | 10.5                                      | 58.1                               | 1000                                 |
| P6SMBJ7.5A        | P6SMBJ7.5CA      | 7V5A                | 7V5CA | 6.40                                 | 7.13                               | 7.88   | 10                   | 11.3                                      | 54.0                               | 500                                  |
| P6SMBJ8.2A        | P6SMBJ8.2CA      | 8V2A                | 8V2CA | 7.02                                 | 7.79                               | 8.61   | 10                   | 12.1                                      | 50.4                               | 200                                  |
| P6SMBJ9.1A        | P6SMBJ9.1CA      | 9V1A                | 9V1CA | 7.78                                 | 8.65                               | 9.55   | 1                    | 13.4                                      | 45.5                               | 50                                   |
| P6SMBJ10A         | P6SMBJ10CA       | 10A                 | 10CA  | 8.55                                 | 9.50                               | 10.50  | 1                    | 14.5                                      | 42.1                               | 10                                   |
| P6SMBJ11A         | P6SMBJ11CA       | 11A                 | 11CA  | 9.40                                 | 10.50                              | 11.60  | 1                    | 15.6                                      | 39.1                               | 5                                    |
| P6SMBJ12A         | P6SMBJ12CA       | 12A                 | 12CA  | 10.20                                | 11.40                              | 12.60  | 1                    | 16.7                                      | 36.5                               | 5                                    |
| P6SMBJ13A         | P6SMBJ13CA       | 13A                 | 13CA  | 11.10                                | 12.40                              | 13.70  | 1                    | 18.2                                      | 34.0                               | 5                                    |
| P6SMBJ15A         | P6SMBJ15CA       | 15A                 | 15CA  | 12.80                                | 14.30                              | 15.80  | 1                    | 21.2                                      | 30.8                               | 5                                    |
| P6SMBJ16A         | P6SMBJ16CA       | 16A                 | 16CA  | 13.60                                | 15.20                              | 16.80  | 1                    | 22.5                                      | 27.1                               | 5                                    |
| P6SMBJ18A         | P6SMBJ18CA       | 18A                 | 18CA  | 15.30                                | 17.10                              | 18.90  | 1                    | 25.5                                      | 24.2                               | 5                                    |
| P6SMBJ20A         | P6SMBJ20CA       | 20A                 | 20CA  | 17.10                                | 19.00                              | 21.00  | 1                    | 27.5                                      | 22.0                               | 5                                    |
| P6SMBJ22A         | P6SMBJ22CA       | 22A                 | 22CA  | 18.80                                | 20.90                              | 23.10  | 1                    | 30.6                                      | 19.9                               | 5                                    |
| P6SMBJ24A         | P6SMBJ24CA       | 24A                 | 24CA  | 20.50                                | 22.80                              | 25.20  | 1                    | 33.2                                      | 18.4                               | 5                                    |
| P6SMBJ27A         | P6SMBJ27CA       | 27A                 | 27CA  | 23.10                                | 25.70                              | 28.40  | 1                    | 37.5                                      | 16.3                               | 5                                    |
| P6SMBJ30A         | P6SMBJ30CA       | 30A                 | 30CA  | 25.60                                | 28.50                              | 31.50  | 1                    | 41.4                                      | 14.7                               | 5                                    |
| P6SMBJ33A         | P6SMBJ33CA       | 33A                 | 33CA  | 28.20                                | 31.40                              | 34.70  | 1                    | 45.7                                      | 13.3                               | 5                                    |
| P6SMBJ36A         | P6SMBJ36CA       | 36A                 | 36CA  | 30.80                                | 34.20                              | 38.00  | 1                    | 49.9                                      | 12.2                               | 5                                    |
| P6SMBJ39A         | P6SMBJ39CA       | 39A                 | 39CA  | 33.30                                | 37.00                              | 41.00  | 1                    | 53.9                                      | 11.3                               | 5                                    |
| P6SMBJ43A         | P6SMBJ43CA       | 43A                 | 43CA  | 36.80                                | 40.90                              | 45.20  | 1                    | 59.3                                      | 10.3                               | 5                                    |
| P6SMBJ47A         | P6SMBJ47CA       | 47A                 | 47CA  | 40.20                                | 44.70                              | 49.40  | 1                    | 64.8                                      | 9.4                                | 5                                    |
| P6SMBJ51A         | P6SMBJ51CA       | 51A                 | 51CA  | 43.60                                | 48.50                              | 53.60  | 1                    | 70.1                                      | 8.7                                | 5                                    |
| P6SMBJ56A         | P6SMBJ56CA       | 56A                 | 56CA  | 47.00                                | 52.20                              | 58.00  | 1                    | 77.0                                      | 7.9                                | 5                                    |
| P6SMBJ62A         | P6SMBJ62CA       | 62A                 | 62CA  | 50.00                                | 55.50                              | 61.50  | 1                    | 85.0                                      | 7.2                                | 5                                    |
| P6SMBJ68A         | P6SMBJ68CA       | 68A                 | 68CA  | 53.10                                | 59.40                              | 66.00  | 1                    | 92.0                                      | 6.6                                | 5                                    |
| P6SMBJ75A         | P6SMBJ75CA       | 75A                 | 75CA  | 56.00                                | 62.30                              | 69.00  | 1                    | 103.0                                     | 5.9                                | 5                                    |
| P6SMBJ82A         | P6SMBJ82CA       | 82A                 | 82CA  | 59.00                                | 66.10                              | 73.00  | 1                    | 113.0                                     | 5.4                                | 5                                    |
| P6SMBJ91A         | P6SMBJ91CA       | 91A                 | 91CA  | 65.00                                | 72.80                              | 80.00  | 1                    | 125.0                                     | 4.9                                | 5                                    |
| P6SMBJ100A        | P6SMBJ100CA      | 100A                | 100CA | 70.00                                | 78.00                              | 86.00  | 1                    | 137.0                                     | 4.5                                | 5                                    |
| P6SMBJ110A        | P6SMBJ110CA      | 110A                | 110CA | 75.00                                | 84.00                              | 93.00  | 1                    | 152.0                                     | 4.0                                | 5                                    |
| P6SMBJ120A        | P6SMBJ120CA      | 120A                | 120CA | 80.00                                | 90.00                              | 100.00 | 1                    | 165.0                                     | 3.7                                | 5                                    |
| P6SMBJ130A        | P6SMBJ130CA      | 130A                | 130CA | 85.00                                | 96.00                              | 106.00 | 1                    | 179.0                                     | 3.4                                | 5                                    |
| P6SMBJ150A        | P6SMBJ150CA      | 150A                | 150CA | 95.00                                | 106.00                             | 118.00 | 1                    | 207.0                                     | 2.9                                | 5                                    |
| P6SMBJ160A        | P6SMBJ160CA      | 160A                | 160CA | 100.00                               | 112.00                             | 124.00 | 1                    | 219.0                                     | 2.8                                | 5                                    |
| P6SMBJ170A        | P6SMBJ170CA      | 170A                | 170CA | 105.00                               | 118.00                             | 130.00 | 1                    | 234.0                                     | 2.6                                | 5                                    |
| P6SMBJ180A        | P6SMBJ180CA      | 180A                | 180CA | 110.00                               | 124.00                             | 138.00 | 1                    | 246.0                                     | 2.5                                | 5                                    |
| P6SMBJ200A        | P6SMBJ200CA      | 200A                | 200CA | 120.00                               | 134.00                             | 148.00 | 1                    | 274.0                                     | 2.2                                | 5                                    |
| P6SMBJ220A        | P6SMBJ220CA      | 220A                | 220CA | 130.00                               | 145.00                             | 160.00 | 1                    | 328.0                                     | 1.9                                | 5                                    |
| P6SMBJ250A        | P6SMBJ250CA      | 250A                | 250CA | 145.00                               | 162.00                             | 179.00 | 1                    | 344.0                                     | 1.8                                | 5                                    |
| P6SMBJ300A        | P6SMBJ300CA      | 300A                | 300CA | 170.00                               | 192.00                             | 214.00 | 1                    | 414.0                                     | 1.5                                | 5                                    |
| P6SMBJ350A        | P6SMBJ350CA      | 350A                | 350CA | 200.00                               | 224.00                             | 250.00 | 1                    | 482.0                                     | 1.3                                | 5                                    |
| P6SMBJ400A        | P6SMBJ400CA      | 400A                | 400CA | 230.00                               | 258.00                             | 290.00 | 1                    | 548.0                                     | 1.1                                | 5                                    |
| P6SMBJ440A        | P6SMBJ440CA      | 440A                | 440CA | 260.00                               | 292.00                             | 330.00 | 1                    | 602.0                                     | 1.0                                | 5                                    |
| P6SMBJ480A        | P6SMBJ480CA      | 480A                | 480CA | 290.00                               | 328.00                             | 370.00 | 1                    | 658.0                                     | 0.9                                | 5                                    |
| P6SMBJ510A        | P6SMBJ510CA      | 510A                | 510CA | 320.00                               | 366.00                             | 410.00 | 1                    | 698.0                                     | 0.9                                | 5                                    |
| P6SMBJ530A        | P6SMBJ530CA      | 530A                | 530CA | 350.00                               | 406.00                             | 450.00 | 1                    | 725.0                                     | 0.8                                | 5                                    |
| P6SMBJ540A        | P6SMBJ540CA      | 540A                | 540CA | 370.00                               | 428.00                             | 480.00 | 1                    | 740.0                                     | 0.8                                | 5                                    |
| P6SMBJ550A        | P6SMBJ550CA      | 550A                | 550CA | 390.00                               | 452.00                             | 500.00 | 1                    | 760.0                                     | 0.8                                | 5                                    |

For bidirectional type having Vrwm of 10 volts and less, the IR limit is double.  
For parts without A (VBR is ± 10%).

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## 600W Surface Mount Transient Voltage Suppressors

### RoHS P6SMBJ Series



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

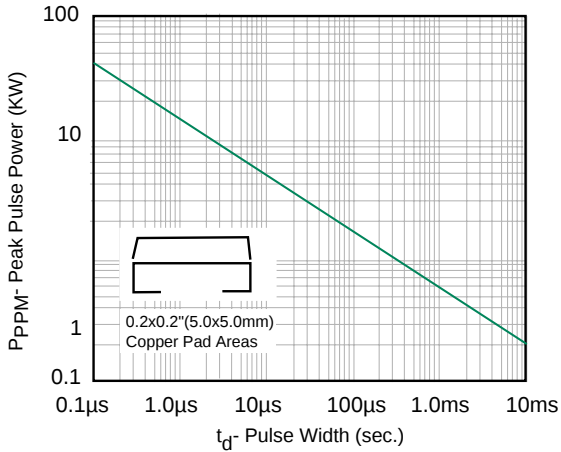


Fig. 1 Peak Pulse Power Rating

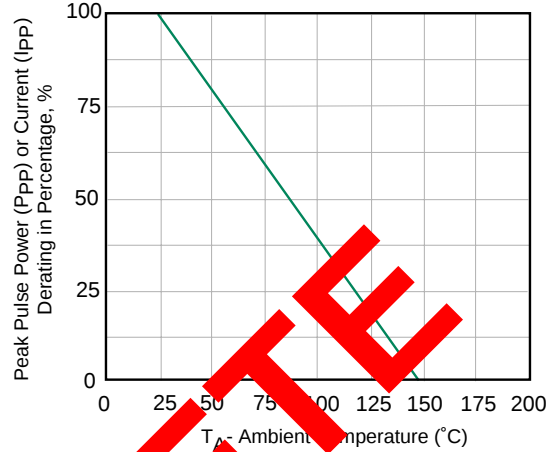


Fig. 2 Pulse Derating Curve

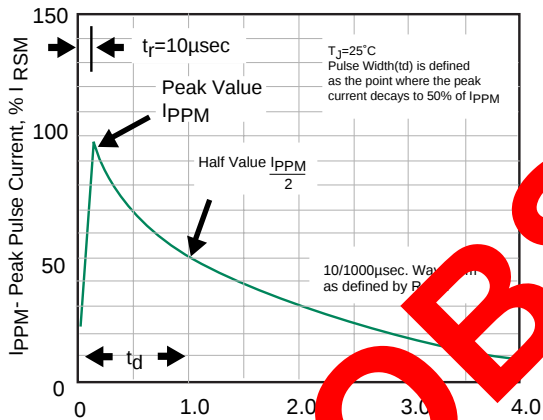


Fig. 3 Pulse Waveform

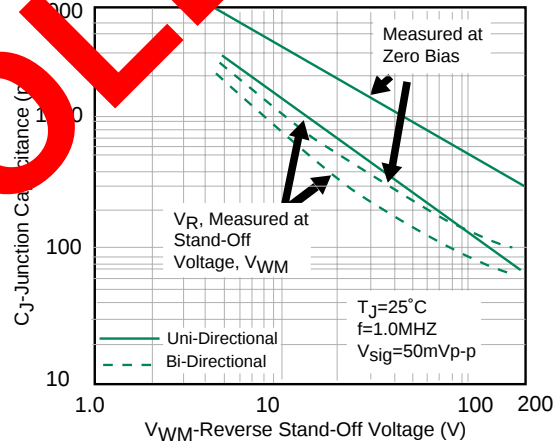


Fig. 4- Typical Junction Capacitance

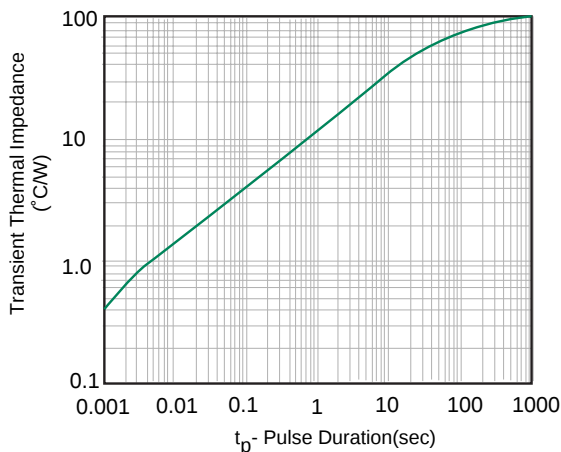


Fig. 5- Typ. Transient Thermal Impedance

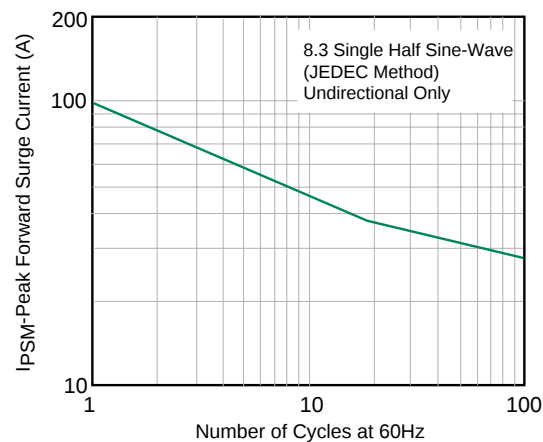


Fig. 6- Maximum Non-Repetitive Peak Forward Surge Current

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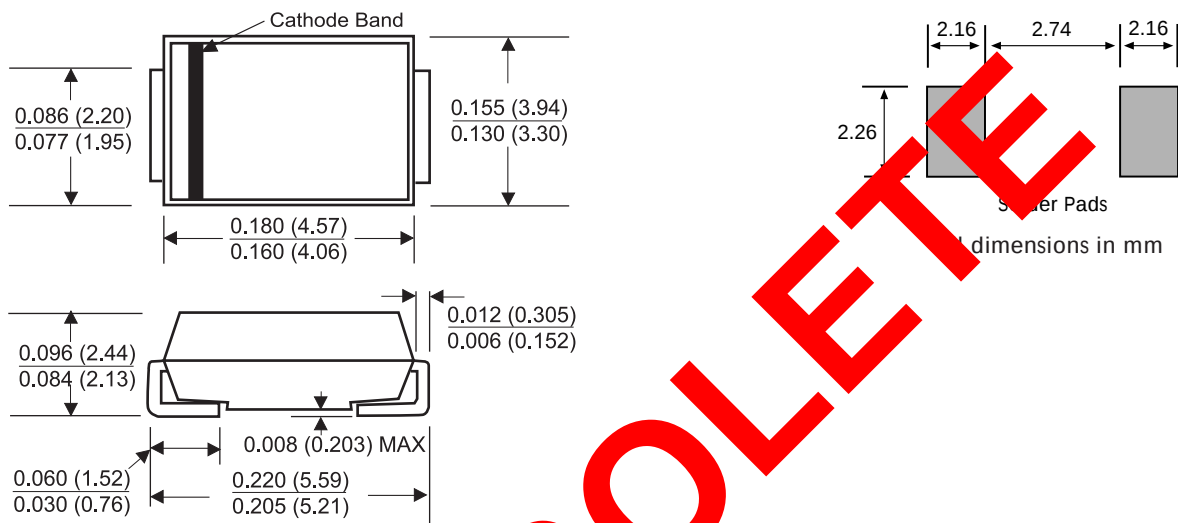
### 600W Surface Mount Transient Voltage Suppressors

#### RoHS P6SMBJ Series



#### Package Outline Dimensions and Pad Layout

DO-214AA (SMB J-Bend)



Dimensions in inches and (millimeters)

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