

## DATA SHEET

### TRANSIENT VOLTAGE SUPPRESSORS – P6SMB SERIES

#### FEATURE

- ✧ 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 VBR for unidirectional types.
- ✧ Typical IR less than 1 $\mu$ A above 10V.
- ✧ High Temperature soldering: 260°C/10 seconds at terminals.



SMB/DO-214AA

#### MECHANICAL DATE

- ✧ Case: JEDEC DO214AA. Molded plastic over glass passivated junction.
- ✧ Terminal: Solder plated, solderable per MIL-STD-750, Method 2026.
- ✧ Polarity: Color band denoted positive end (cathode) except Bidirectional.
- ✧ Standard Packaging: 12mm tape (EIA STD RS-481).
- ✧ Weight: 0.003 ounce, 0.093 grams.

#### DEVICES FOR BIPOLAR APPLICATION

For bidirectional use CA suffix for types P6SMB6.8CA thru types P6SMB550CA, electrical characteristics apply in both directions.

#### MAXIMUM RATINGS AND CHARACTERISTICS

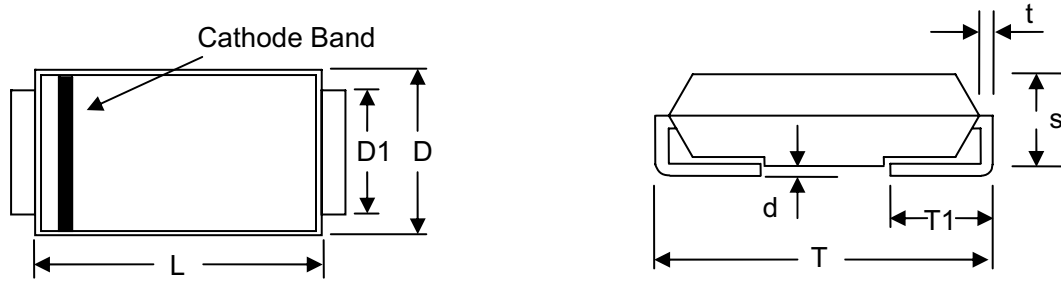
Ratings at 25°C ambient temperature unless otherwise specified.

| RATING   | SYMBOL                            | VALUE       | UNITS |
|--|-----------------------------------|-------------|-------|
| Peak Pulse Power Dissipation on 10/1000 $\mu$ s waveform (Note1,Note2, Fig.1).                                   | P <sub>PPM</sub>                  | Minimum 600 | Watts |
| Peak Pulse Current of on 10/1000 $\mu$ s waveform.(Note1,Fig.3)  | I <sub>PPM</sub>                  | See Table   | Amps  |
| Steady State Power Dissipation at T <sub>L</sub> =75°C,Lead lengths.375", (9.5mm) (Note2,Fig.5).                 | P <sub>M(AV)</sub>                | 5.0         | Watts |
| Peak Forward Surge Current,8.3ms Single Half Sine-Wave Superimposed on Rated Load, (JEDEC Method) (Note 3,Fig6). | I <sub>FSM</sub>                  | 100         | Amps  |
| Operating junction and Storage Temperature Range.  | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C    |

Notes: 1. Non-repetitive current pulse, per Fig. 3 and derated above TA = 25°C per Fig. 2.

2. Mounted on 5.0mm x 5.0mm (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.

**DIMENSIONS**

**SMB/DO-214AA**

| Item | Millimeters |       | Inches |       |
|------|-------------|-------|--------|-------|
|      | Min.        | Max.  | Min.   | Max.  |
| L    | 4.06        | 4.57  | 0.160  | 0.180 |
| D    | 3.30        | 3.94  | 0.130  | 0.155 |
| D1   | 1.95        | 2.20  | 0.077  | 0.086 |
| T    | 5.21        | 5.59  | 0.205  | 0.220 |
| T1   | 0.76        | 1.52  | 0.030  | 0.060 |
| d    | -           | 0.203 | -      | 0.008 |
| s    | 2.13        | 2.44  | 0.084  | 0.096 |
| t    | 0.152       | 0.305 | 0.006  | 0.012 |

**ELECTRICAL CHARACTERISTICS**

| Part Number |            | Device Marking Code |      | Reverse Stand-Off Voltage | Breakdown Voltage NIN.@I <sub>T</sub> | Breakdown Voltage MAX.@I <sub>T</sub> | Test Current        | Maximum Clamping Voltage @I <sub>PP</sub> | Peak Pulse Current  | Reverse Leakage @V <sub>RWM</sub> |
|-------------|------------|---------------------|------|---------------------------|---------------------------------------|---------------------------------------|---------------------|---|---------------------|-----------------------------------|
| UNT-POLAR   | BI-POLAR   | UNI                 | BI   | V <sub>RWM</sub> (V)      | V <sub>BR MIN. (V)</sub>              | V <sub>BR MAX. (V)</sub>              | I <sub>T</sub> (mA) | V <sub>C</sub> (V)                        | I <sub>PP</sub> (A) | I <sub>R</sub> (μA)               |
| P6SMB6.8A   | P6SMB6.8CA | 6V8A                | 6V8C | 5.80                      | 6.45                                  | 7.14                                  | 10                  | 10.5                                      | 58.1                | 1000                              |
| P6SMB7.5A   | P6SMB7.5CA | 7V5A                | 7V5C | 6.40                      | 7.13                                  | 7.88                                  | 10                  | 11.3                                      | 54.0                | 500                               |
| P6SMB8.2A   | P6SMB8.2CA | 8V2A                | 8V2C | 7.02                      | 7.79                                  | 8.61                                  | 10                  | 12.1                                      | 50.4                | 200                               |
| P6SMB9.1A   | P6SMB9.1CA | 9V1A                | 9V1C | 7.78                      | 8.65                                  | 9.55                                  | 1                   | 13.4                                      | 45.5                | 50                                |
| P6SMB10A    | P6SMB10CA  | 10A                 | 10C  | 8.55                      | 9.50                                  | 10.50                                 | 1                   | 14.5                                      | 42.1                | 10                                |
| P6SMB11A    | P6SMB11CA  | 11A                 | 11C  | 9.40                      | 10.50                                 | 11.60                                 | 1                   | 15.6                                      | 39.1                | 5                                 |
| P6SMB12A    | P6SMB12CA  | 12A                 | 12C  | 10.20                     | 11.40                                 | 12.60                                 | 1                   | 16.7                                      | 36.5                | 5                                 |
| P6SMB13A    | P6SMB13CA  | 13A                 | 13C  | 11.10                     | 12.40                                 | 13.70                                 | 1                   | 18.2                                      | 33.5                | 1                                 |
| P6SMB15A    | P6SMB15CA  | 15A                 | 15C  | 12.80                     | 14.30                                 | 15.80                                 | 1                   | 21.2                                      | 28.8                | 1                                 |
| P6SMB16A    | P6SMB16CA  | 16A                 | 16C  | 13.60                     | 15.20                                 | 16.80                                 | 1                   | 22.5                                      | 27.1                | 1                                 |
| P6SMB18A    | P6SMB18CA  | 18A                 | 18C  | 15.30                     | 17.10                                 | 18.90                                 | 1                   | 25.2                                      | 24.2                | 1                                 |
| P6SMB20A    | P6SMB20CA  | 20A                 | 20C  | 17.10                     | 19.00                                 | 21.00                                 | 1                   | 27.7                                      | 22.0                | 1                                 |
| P6SMB22A    | P6SMB22CA  | 22A                 | 22C  | 18.80                     | 20.90                                 | 23.10                                 | 1                   | 30.6                                      | 19.9                | 1                                 |
| P6SMB24A    | P6SMB24CA  | 24A                 | 24C  | 20.50                     | 22.80                                 | 25.20                                 | 1                   | 33.2                                      | 18.4                | 1                                 |
| P6SMB27A    | P6SMB27CA  | 27A                 | 27C  | 23.10                     | 25.70                                 | 28.40                                 | 1                   | 37.5                                      | 16.3                | 1                                 |

**ELECTRICAL CHARACTERISTICS**

| Part Number |            | Device Marking Code |      | Reverse Stand-Off Voltage | Breakdown Voltage NIN.@IT | Breakdown Voltage MAX.@IT | Test Current | Maximum Clamping Voltage @IPP | Peak Pulse Current | Reverse Leakage @VRWM |
|-------------|------------|---------------------|------|---------------------------|---------------------------|---------------------------|--------------|-------------------------------|--------------------|-----------------------|
| UNT-POLAR   | BI-POLAR   | UNI                 | BI   | VRWM(V)                   | VBR MIN.(V)               | VBR MAX.(V)               | IT(mA)       | VC(V)                         | IPP(A)             | IR(μA)                |
| P6SMB30A    | P6SMB30CA  | 30A                 | 30C  | 25.60                     | 28.50                     | 31.50                     | 1            | 41.4                          | 14.7               | 1                     |
| P6SMB33A    | P6SMB33CA  | 33A                 | 33C  | 28.20                     | 31.40                     | 34.70                     | 1            | 45.7                          | 13.3               | 1                     |
| P6SMB36A    | P6SMB36CA  | 36A                 | 36C  | 30.80                     | 34.20                     | 37.80                     | 1            | 49.9                          | 12.2               | 1                     |
| P6SMB39A    | P6SMB39CA  | 39A                 | 39C  | 33.30                     | 37.10                     | 41.00                     | 1            | 53.9                          | 11.3               | 1                     |
| P6SMB43A    | P6SMB43CA  | 43A                 | 43C  | 36.80                     | 40.90                     | 45.20                     | 1            | 59.3                          | 10.3               | 1                     |
| P6SMB47A    | P6SMB47CA  | 47A                 | 47C  | 40.20                     | 44.70                     | 49.40                     | 1            | 64.8                          | 9.4                | 1                     |
| P6SMB51A    | P6SMB51CA  | 51A                 | 51C  | 43.60                     | 48.50                     | 53.60                     | 1            | 70.1                          | 8.7                | 1                     |
| P6SMB56A    | P6SMB56CA  | 56A                 | 56C  | 47.80                     | 53.20                     | 58.80                     | 1            | 77.0                          | 7.9                | 1                     |
| P6SMB62A    | P6SMB62CA  | 62A                 | 62C  | 53.00                     | 58.90                     | 65.10                     | 1            | 85.0                          | 7.2                | 1                     |
| P6SMB68A    | P6SMB68CA  | 68A                 | 68C  | 58.10                     | 64.60                     | 71.40                     | 1            | 92.0                          | 6.6                | 1                     |
| P6SMB75A    | P6SMB75CA  | 75A                 | 75C  | 64.10                     | 71.30                     | 78.80                     | 1            | 103.0                         | 5.9                | 1                     |
| P6SMB82A    | P6SMB82CA  | 82A                 | 82C  | 70.10                     | 77.90                     | 86.10                     | 1            | 113.0                         | 5.4                | 1                     |
| P6SMB91A    | P6SMB91CA  | 91A                 | 91C  | 77.80                     | 86.50                     | 95.50                     | 1            | 125.0                         | 4.9                | 1                     |
| P6SMB100A   | P6SMB100CA | 100A                | 100C | 85.50                     | 95.00                     | 105.00                    | 1            | 137.0                         | 4.5                | 1                     |
| P6SMB110A   | P6SMB110CA | 110A                | 110C | 94.00                     | 105.00                    | 116.00                    | 1            | 152.0                         | 4.0                | 1                     |
| P6SMB120A   | P6SMB120CA | 120A                | 120C | 102.00                    | 114.00                    | 126.00                    | 1            | 165.0                         | 3.7                | 1                     |
| P6SMB130A   | P6SMB130CA | 130A                | 130C | 111.00                    | 124.00                    | 137.00                    | 1            | 179.0                         | 3.4                | 1                     |
| P6SMB150A   | P6SMB150CA | 150A                | 150C | 128.00                    | 143.00                    | 158.00                    | 1            | 207.0                         | 2.9                | 1                     |
| P6SMB160A   | P6SMB160CA | 160A                | 160C | 136.00                    | 152.00                    | 168.00                    | 1            | 219.0                         | 2.8                | 1                     |
| P6SMB170A   | P6SMB170CA | 170A                | 170C | 145.00                    | 162.00                    | 179.00                    | 1            | 234.0                         | 2.6                | 1                     |
| P6SMB180A   | P6SMB180CA | 180A                | 180C | 154.00                    | 171.00                    | 189.00                    | 1            | 246.0                         | 2.5                | 1                     |
| P6SMB200A   | P6SMB200CA | 200A                | 200C | 171.00                    | 190.00                    | 210.00                    | 1            | 274.0                         | 2.2                | 1                     |
| P6SMB220A   | P6SMB220CA | 220A                | 220C | 185.00                    | 209.00                    | 231.00                    | 1            | 328.0                         | 1.9                | 1                     |
| P6SMB250A   | P6SMB250CA | 250A                | 250C | 214.00                    | 237.00                    | 263.00                    | 1            | 344.0                         | 1.8                | 1                     |
| P6SMB300A   | P6SMB300CA | 300A                | 300C | 256.00                    | 285.00                    | 315.00                    | 1            | 414.0                         | 1.5                | 1                     |
| P6SMB350A   | P6SMB350CA | 350A                | 350C | 300.00                    | 332.00                    | 368.00                    | 1            | 482.0                         | 1.3                | 1                     |
| P6SMB400A   | P6SMB400CA | 400A                | 400C | 342.00                    | 380.00                    | 420.00                    | 1            | 548.0                         | 1.1                | 1                     |
| P6SMB440A   | P6SMB440CA | 440A                | 440C | 376.00                    | 418.00                    | 462.00                    | 1            | 602.0                         | 1.0                | 1                     |
| P6SMB480A   | P6SMB480CA | 480A                | 480C | 408.00                    | 456.00                    | 504.00                    | 1            | 658.0                         | 0.9                | 1                     |
| P6SMB510A   | P6SMB510CA | 510A                | 510C | 434.00                    | 485.00                    | 535.00                    | 1            | 698.0                         | 0.9                | 1                     |
| P6SMB530A   | P6SMB530CA | 530A                | 530C | 450.00                    | 503.50                    | 556.50                    | 1            | 725.0                         | 0.8                | 1                     |
| P6SMB540A   | P6SMB540CA | 540A                | 540C | 459.00                    | 513.00                    | 567.00                    | 1            | 740.0                         | 0.8                | 1                     |
| P6SMB550A   | P6SMB550CA | 550A                | 550C | 467.00                    | 522.50                    | 577.50                    | 1            | 760.0                         | 0.8                | 1                     |

Notes: For bidirectional type having VRWM of 10 volts and less, the IR limit is double.

RATINGS AND CHARACTERISTIC CURVES (TA=25°C unless otherwise noted)

Figure 1 - Peak Pulse Power Rating Curve

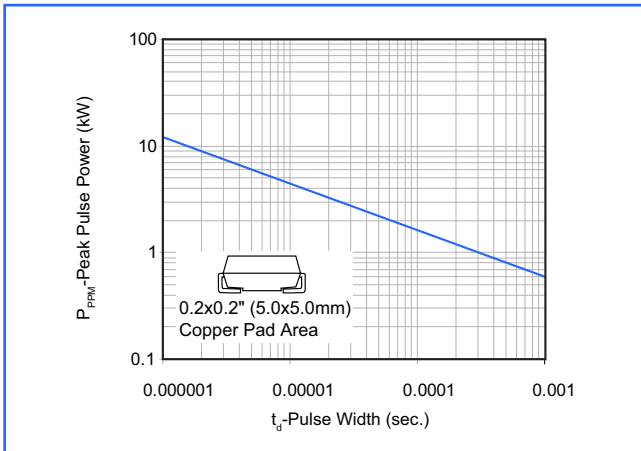


Figure 2 - Pulse Derating Curve

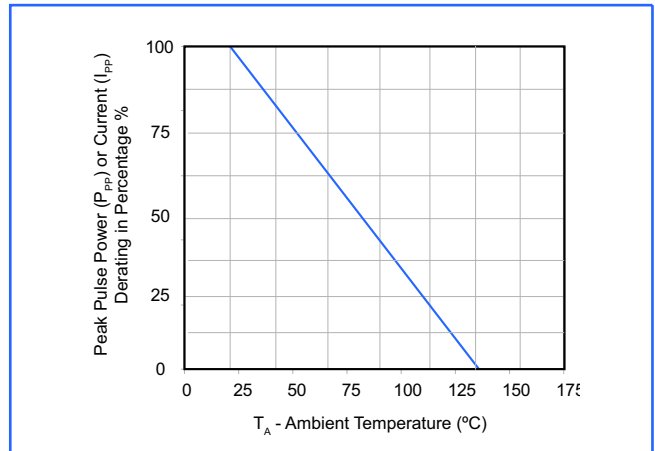


Figure 3 - Pulse Waveform

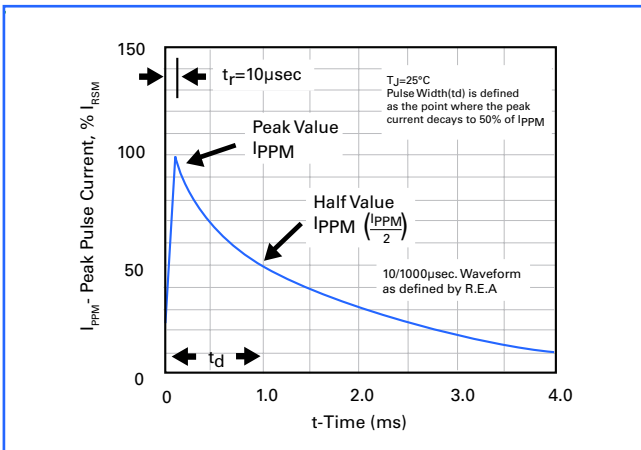


Figure 4 - Typical Junction Capacitance

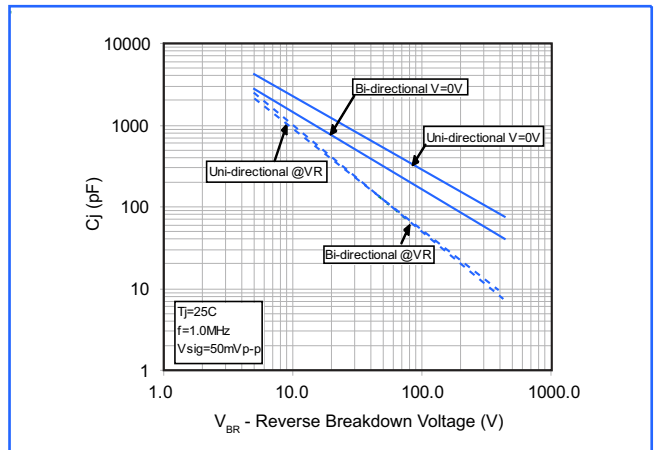


Figure 5 - Steady State Power Dissipation Derating Curve

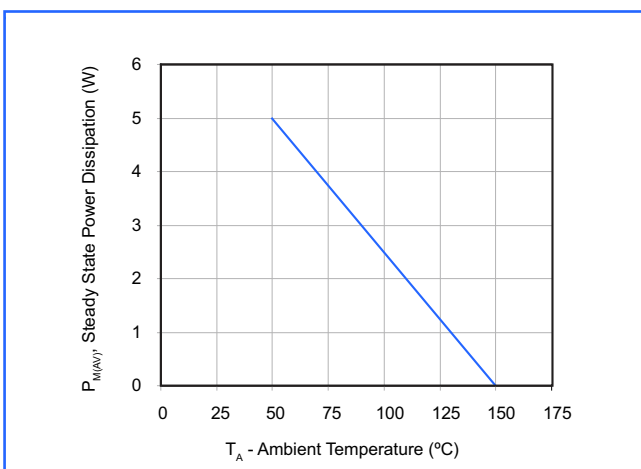
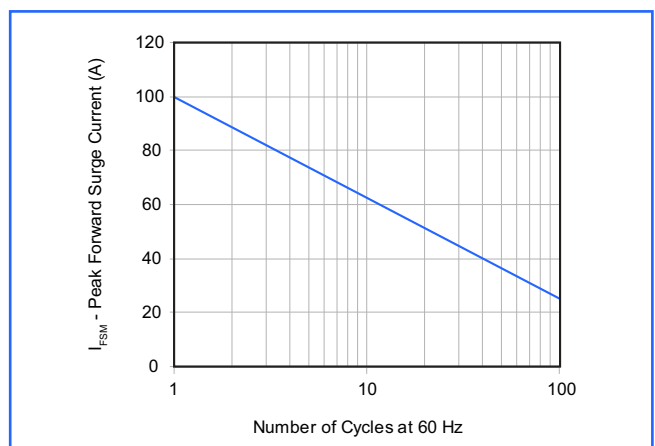


Figure 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



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