

## V. TVS & Overvoltage Protection Device

### 600W Surface Mount TVS (Breakdown Voltage: 6.8~600 Volts)

#### P6SMB Series

(Package: SMB (DO-214AA))

|  |   |
|--|---|
| <p><b>FEATURES</b></p> <ul style="list-style-type: none"> <li>• Glass passivated chip</li> <li>• 600W peak pulse power capability with a 10/1000<math>\mu</math>s waveform, repetitive rate (duty cycle) :0.01%</li> <li>• Low leakage</li> <li>• Uni and Bi-directional unit</li> <li>• Excellent clamping capability</li> <li>• Very fast response time</li> </ul> <p><b>MECHANICAL DATA</b></p> <ul style="list-style-type: none"> <li>• Case : Molded plastic</li> <li>• Epoxy : UL94V-0 rate flame retardant</li> <li>• Lead : Solderable per MIL-STD 750, Method 2026</li> <li>• Polarity : Color band denotes cathode except for bi-directional types</li> <li>• Mounting Position : Any</li> <li>• Weight : 0.090 grams</li> </ul> | <p>Case: SMB<br/>Dimensions in inches and (millimetres)</p> |
|--|---|

### Devices for Bi-Directional Applications

For bi-directional devices use suffix “CA” for types P6SMB6.8CA thru P6SMB600CA (e.g. P6SMB68CA)

Electrical characteristics apply in both directions.

### Maximum Ratings, Thermal & Electrical Characteristics

(Ratings at 25 ambient temperature unless otherwise specified)

| Ratings  | Symbol                            | Value          | Units |
|--|-----------------------------------|----------------|-------|
| Peak power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)</sup>                      | P <sub>PPM</sub>                  | 600            | Watts |
| Peak pulse current with a 10/1000 $\mu$ s waveform <sup>(1)</sup>                          | I <sub>PPM</sub>                  | See next table | Amps  |
| Power dissipation on infinite heatsink at T <sub>L</sub> =75                               | P <sub>D</sub>                    | 5.0            | Watts |
| Peak forward surge current, 8.3ms single half sine-wave unidirectional only <sup>(2)</sup> | I <sub>FSM</sub>                  | 100            | Amps  |
| Maximum instantaneous forward voltage at 25A for unidirectional only <sup>(3)</sup>        | V <sub>F</sub>                    | 3.5/5.0        | Volts |
| Operating junction and storage temperature range   | T <sub>J</sub> , T <sub>stg</sub> | -55 to +150    |       |

Notes:

1. Non-repetitive current pulse per Fig. 5 and derated above Ta = 25 per Fig. 1

2. Measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

3. V<sub>F</sub><3.5V for devices of V<sub>(BR)</sub><200V and V<sub>F</sub><5.0V for devices of V<sub>(BR)</sub>>201V

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**P6SMB Series**

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| Device Type  | Device Marking Code |          |      | Breakdown Voltage $V_{BR}$ @ $I_T$ |         |            | Maximum Reverse Leakage $I_R$ @ $V_{WM}$ ( $\mu A$ ) <sup>(1)</sup> | Working Peak Reverse Voltage $V_{WM}$ (V) | Maximum Reverse Surge Current $I_{PPM}$ (A) | Maximum Clamping Voltage $V_C$ @ $I_{PPM}$ (V) |
|--------------|---------------------|----------|------|------------------------------------|---------|------------|---|---|---|--|
|              | Option 1            | Option 2 |      | Min (V)                            | Max (V) | $I_T$ (mA) |   |   |   |  |
|              | Full Part Number    | Uni      | Bi   |                                    |         |            |   |   |   |  |
| P6SMB6.8(C)A | Full PN             | 6V8A     | 6V8C | 6.46                               | 7.14    | 10         | 1000  | 5.8                                       | 57.14                                       | 10.5   |
| P6SMB7.5(C)A | Full PN             | 7V5A     | 7V5C | 7.13                               | 7.88    | 10         | 500   | 6.4                                       | 53.10                                       | 11.3   |
| P6SMB8.2(C)A | Full PN             | 8V2A     | 8V2C | 7.79                               | 8.61    | 10         | 200   | 7.0                                       | 49.59                                       | 12.1   |
| P6SMB9.1(C)A | Full PN             | 9V1A     | 9V1C | 8.65                               | 9.56    | 1          | 50  | 7.8                                       | 44.78                                       | 13.4   |
| P6SMB10(C)A  | Full PN             | 10A      | 10C  | 9.50                               | 10.50   | 1          | 10  | 8.6                                       | 41.38                                       | 14.5   |
| P6SMB11(C)A  | Full PN             | 11A      | 11C  | 10.45                              | 11.55   | 1          | 5   | 9.4                                       | 38.46                                       | 15.6   |
| P6SMB12(C)A  | Full PN             | 12A      | 12C  | 11.40                              | 12.60   | 1          | 5   | 10.2                                      | 35.93                                       | 16.7   |
| P6SMB13(C)A  | Full PN             | 13A      | 13C  | 12.35                              | 13.65   | 1          | 1   | 11.1                                      | 32.97                                       | 18.2   |
| P6SMB15(C)A  | Full PN             | 15A      | 15C  | 14.25                              | 15.75   | 1          | 1   | 12.8                                      | 28.30                                       | 21.2   |
| P6SMB16(C)A  | Full PN             | 16A      | 16C  | 15.20                              | 16.80   | 1          | 1   | 13.6                                      | 26.67                                       | 22.5   |
| P6SMB18(C)A  | Full PN             | 18A      | 18C  | 17.10                              | 18.90   | 1          | 1   | 15.3                                      | 23.81                                       | 25.2   |
| P6SMB20(C)A  | Full PN             | 20A      | 20C  | 19.00                              | 21.00   | 1          | 1   | 17.1                                      | 21.66                                       | 27.7   |
| P6SMB22(C)A  | Full PN             | 22A      | 22C  | 20.90                              | 23.10   | 1          | 1   | 18.8                                      | 19.61                                       | 30.6   |
| P6SMB24(C)A  | Full PN             | 24A      | 24C  | 22.80                              | 25.20   | 1          | 1   | 20.5                                      | 18.07                                       | 33.2   |
| P6SMB27(C)A  | Full PN             | 27A      | 27C  | 25.65                              | 28.35   | 1          | 1   | 23.1                                      | 16.00                                       | 37.5   |
| P6SMB30(C)A  | Full PN             | 30A      | 30C  | 28.50                              | 31.50   | 1          | 1   | 25.6                                      | 14.49                                       | 41.4   |
| P6SMB33(C)A  | Full PN             | 33A      | 33C  | 31.35                              | 34.65   | 1          | 1   | 28.2                                      | 13.13                                       | 45.7   |
| P6SMB36(C)A  | Full PN             | 36A      | 36C  | 34.20                              | 37.80   | 1          | 1   | 30.8                                      | 12.02                                       | 49.9   |
| P6SMB39(C)A  | Full PN             | 39A      | 39C  | 37.05                              | 40.95   | 1          | 1   | 33.3                                      | 11.13                                       | 53.9   |
| P6SMB43(C)A  | Full PN             | 43A      | 43C  | 40.85                              | 45.15   | 1          | 1   | 36.8                                      | 10.12                                       | 59.3   |
| P6SMB47(C)A  | Full PN             | 47A      | 47C  | 44.65                              | 49.35   | 1          | 1   | 40.2                                      | 9.26  | 64.8   |
| P6SMB51(C)A  | Full PN             | 51A      | 51C  | 48.45                              | 53.55   | 1          | 1   | 43.6                                      | 8.56  | 70.1   |
| P6SMB56(C)A  | Full PN             | 56A      | 56C  | 53.20                              | 58.80   | 1          | 1   | 47.8                                      | 7.79  | 77.0   |
| P6SMB62(C)A  | Full PN             | 62A      | 62C  | 58.90                              | 65.10   | 1          | 1   | 53.0                                      | 7.06  | 85.0   |
| P6SMB68(C)A  | Full PN             | 68A      | 68C  | 64.60                              | 71.40   | 1          | 1   | 58.1                                      | 6.52  | 92.0   |
| P6SMB75(C)A  | Full PN             | 75A      | 75C  | 71.25                              | 78.75   | 1          | 1   | 64.1                                      | 5.83  | 103.0  |
| P6SMB82(C)A  | Full PN             | 82A      | 82C  | 77.90                              | 86.10   | 1          | 1   | 70.1                                      | 5.31  | 113.0  |
| P6SMB91(C)A  | Full PN             | 91A      | 91C  | 86.45                              | 95.55   | 1          | 1   | 77.8                                      | 4.80  | 125.0  |
| P6SMB100(C)A | Full PN             | 100A     | 100C | 95.00                              | 105.00  | 1          | 1   | 85.5                                      | 4.38  | 137.0  |
| P6SMB110(C)A | Full PN             | 110A     | 110C | 104.50                             | 115.50  | 1          | 1   | 94.0                                      | 3.95  | 152.0  |
| P6SMB120(C)A | Full PN             | 120A     | 120C | 114.00                             | 126.00  | 1          | 1   | 102.0                                     | 3.64  | 165.0  |
| P6SMB130(C)A | Full PN             | 130A     | 130C | 123.50                             | 136.50  | 1          | 1   | 111.0                                     | 3.35  | 179.0  |
| P6SMB150(C)A | Full PN             | 150A     | 150C | 142.50                             | 157.50  | 1          | 1   | 128.0                                     | 2.90  | 207.0  |
| P6SMB160(C)A | Full PN             | 160A     | 160C | 152.00                             | 168.00  | 1          | 1   | 136.0                                     | 2.74  | 219.0  |
| P6SMB170(C)A | Full PN             | 170A     | 170C | 161.50                             | 178.50  | 1          | 1   | 145.0                                     | 2.56  | 234.0  |
| P6SMB180(C)A | Full PN             | 180A     | 180C | 171.00                             | 189.00  | 1          | 1   | 154.0                                     | 2.44  | 246.0  |
| P6SMB200(C)A | Full PN             | 200A     | 200C | 190.00                             | 210.00  | 1          | 1   | 171.0                                     | 2.19  | 274.0  |
| P6SMB220(C)A | Full PN             | 220A     | 220C | 209.00                             | 231.00  | 1          | 1   | 185.0                                     | 1.83  | 328.0  |
| P6SMB250(C)A | Full PN             | 250A     | 250C | 237.50                             | 262.50  | 1          | 1   | 214.0                                     | 1.74  | 344.0  |
| P6SMB300(C)A | Full PN             | 300A     | 300C | 285.00                             | 315.00  | 1          | 1   | 256.0                                     | 1.45  | 414.0  |
| P6SMB350(C)A | Full PN             | 350A     | 350C | 332.50                             | 367.50  | 1          | 1   | 299.3                                     | 1.24  | 482.0  |
| P6SMB380(C)A | Full PN             | 380A     | 380C | 361.00                             | 399.00  | 1          | 1   | 324.9                                     | 1.14  | 524.4  |
| P6SMB400(C)A | Full PN             | 400A     | 400C | 380.00                             | 420.00  | 1          | 1   | 342.0                                     | 1.09  | 548.0  |
| P6SMB440(C)A | Full PN             | 440A     | 440C | 418.00                             | 462.00  | 1          | 1   | 376.2                                     | 0.99  | 607.2  |
| P6SMB480(C)A | Full PN             | 480A     | 480C | 456.00                             | 504.00  | 1          | 1   | 410.4                                     | 0.91  | 662.4  |
| P6SMB520(C)A | Full PN             | 520A     | 520C | 494.00                             | 546.00  | 1          | 1   | 444.6                                     | 0.84  | 717.6  |
| P6SMB550(C)A | Full PN             | 550A     | 550C | 522.50                             | 577.50  | 1          | 1   | 470.3                                     | 0.79  | 759.0  |
| P6SMB600(C)A | Full PN             | 600A     | 600C | 570.00                             | 630.00  | 1          | 1   | 513.0                                     | 0.72  | 828.0  |

Note:

1. For bi-directional types having  $V_{WM}$  of 10 volts and less, the  $I_R$  limit is doubled.

# Ratings and Characteristic Curves of P6SMB Series

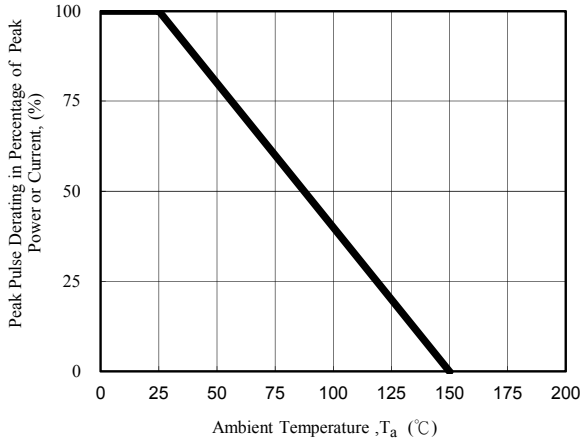


Fig. 1 - Pulse Derating Curve

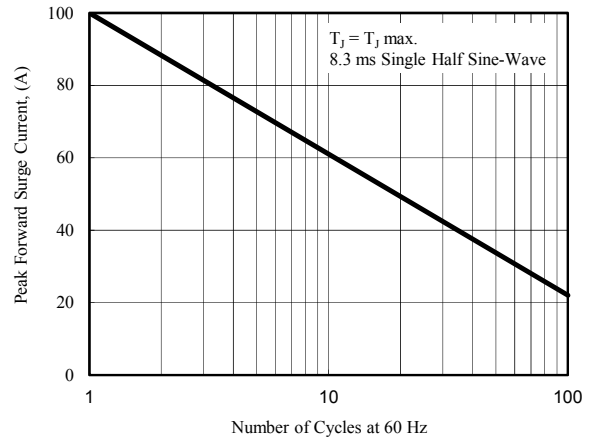


Fig. 2 - Maximum Non-Repetitive Surge Current

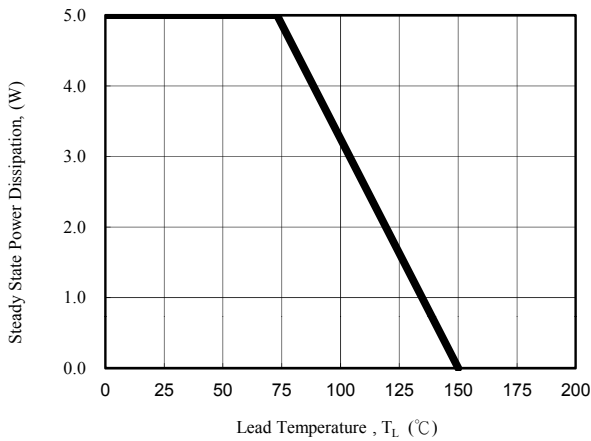


Fig. 3 - Steady State Power Derating Curve

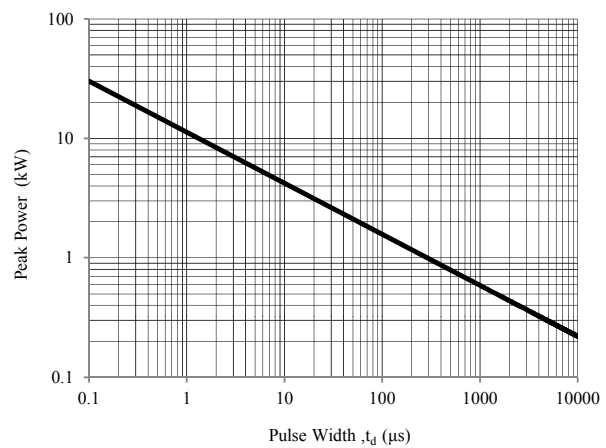


Fig. 4 - Peak Pulse Power Rating Curve

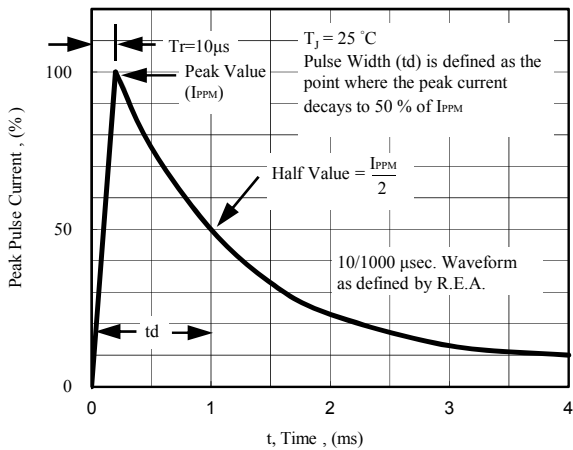


Fig. 5 - Pulse Waveform

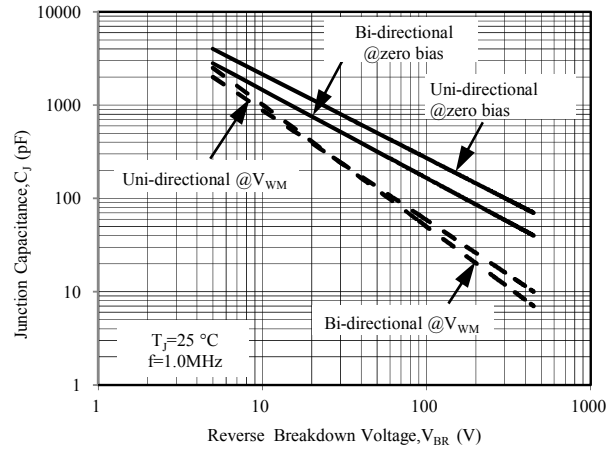


Fig. 6 - Typical Junction Capacitance