

# P6SMB6.8A thru P6SMB550CA

Surface Mount Transient Voltage Suppressors  
Peak Pulse Power 600W Breakdown Voltage 6.8 to 550V

## Features

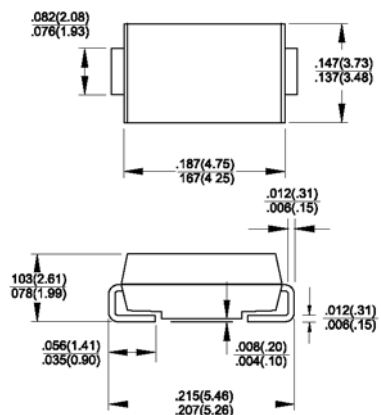
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Low profile package with built-in strain relief for surface mounted applications
- ◆ Glass passivated junction
- ◆ Low incremental surge resistance
- ◆ 600W peak pulse power capability with a 10/1000us waveform, repetition rate (duty cycle): 0.01%
- ◆ Excellent clamping capability
- ◆ Very fast response time
- ◆ High temperature soldering guaranteed: 250°C/10 seconds at terminals

## Mechanical Data

- ◆ Case: JEDEC DO-214AA (SMB) molded plastic over passivated junction
- ◆ Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- ◆ Polarity: For uni-directional types the band denotes the cathode, which is positive with respect to the anode under normal TVS operation
- ◆ Weight: 0.003oz., 0.093g



DO-214AA (SMB)



## Devices for Bidirectional Applications

For bi-directional devices, use suffix CA (e.g. P6SMB10CA). Electrical characteristics apply in both directions.

## Maximum Ratings and Thermal Characteristics

(Ratings at 25°C ambient temperature unless otherwise specified.)

| Parameter                                                                                   | Symbol          | Value          | Unit |
|---------------------------------------------------------------------------------------------|-----------------|----------------|------|
| Peak pulse power dissipation with a 10/1000us waveform <sup>(1)(2)</sup>                    | $P_{PPM}$       | Minimum 600    | W    |
| Peak pulse current with a 10/1000us waveform <sup>(1)</sup>                                 | $I_{PPM}$       | See Next Table | A    |
| Power dissipation on infinite heatsink, $T_A=50^\circ\text{C}$                              | $P_{M(AV)}$     | 5.0            | W    |
| Peak forward surge current, 8.3ms single half sine-wave uni-directional only <sup>(2)</sup> | $I_{FSM}$       | 100            | A    |
| Thermal resistance junction to leads                                                        | $R_{\theta JL}$ | 20             | °C/W |
| Thermal resistance junction to ambient air <sup>(3)</sup>                                   | $R_{\theta JA}$ | 100            | °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  $T_A=25^\circ\text{C}$  per Fig. 2
  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

## Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.  $V_F=3.5V$  at  $I_F=50A$  (uni-directional only)

| Device type | Device marking code |      | Breakdown voltage $V_{(BR)}$ (Volts) <sup>(1)</sup> |       | Test current at $I_T$ (mA) | Stand-off voltage $V_{WM}$ (Volts) | Maximum reverse leakage at $V_{WM}$ $I_{D(2)}$ (uA) | Maximum peak pulse current $I_{PPM}$ (A) | Maximum clamping voltage at $I_{PPM}$ $V_C$ (Volts) | Maximum temperature coefficient of $V_{(BR)}$ (% / °C) |
|-------------|---------------------|------|-----------------------------------------------------|-------|----------------------------|------------------------------------|-----------------------------------------------------|------------------------------------------|-----------------------------------------------------|--------------------------------------------------------|
|             | UNI                 | BI   | Min.                                                | Max.  |                            |                                    |                                                     |                                          |                                                     |                                                        |
| P6SMB6.8A   | 6V8A                | 6V8C | 6.45                                                | 7.14  | 10                         | 5.80                               | 1000                                                | 57.1                                     | 10.5                                                | 0.057                                                  |
| P6SMB7.5A   | 7V5A                | 7V5C | 7.13                                                | 7.88  | 10                         | 6.40                               | 500                                                 | 53.1                                     | 11.3                                                | 0.061                                                  |
| P6SMB8.2A   | 8V2A                | 8V2C | 7.79                                                | 8.61  | 10                         | 7.02                               | 200                                                 | 49.6                                     | 12.1                                                | 0.065                                                  |
| P6SMB9.1A   | 9V1A                | 9V1C | 8.65                                                | 9.55  | 1.0                        | 7.78                               | 50                                                  | 44.8                                     | 13.4                                                | 0.068                                                  |
| P6SMB10A    | 10A                 | 10C  | 9.50                                                | 10.5  | 1.0                        | 8.55                               | 10                                                  | 41.4                                     | 14.5                                                | 0.073                                                  |
| P6SMB11A    | 11A                 | 11C  | 10.5                                                | 11.6  | 1.0                        | 9.40                               | 5.0                                                 | 38.5                                     | 15.6                                                | 0.075                                                  |
| P6SMB12A    | 12A                 | 12C  | 11.4                                                | 12.6  | 1.0                        | 10.2                               | 5.0                                                 | 35.9                                     | 16.7                                                | 0.078                                                  |
| P6SMB13A    | 13A                 | 13C  | 12.4                                                | 13.7  | 1.0                        | 11.1                               | 5.0                                                 | 33.0                                     | 18.2                                                | 0.081                                                  |
| P6SMB15A    | 15A                 | 15C  | 14.3                                                | 15.8  | 1.0                        | 12.8                               | 1.0                                                 | 28.3                                     | 21.2                                                | 0.084                                                  |
| P6SMB16A    | 16A                 | 16C  | 15.2                                                | 16.8  | 1.0                        | 13.6                               | 1.0                                                 | 26.7                                     | 22.5                                                | 0.086                                                  |
| P6SMB18A    | 18A                 | 18C  | 17.1                                                | 18.9  | 1.0                        | 15.3                               | 1.0                                                 | 23.8                                     | 25.2                                                | 0.088                                                  |
| P6SMB20A    | 20A                 | 20C  | 19.0                                                | 21.0  | 1.0                        | 17.1                               | 1.0                                                 | 21.7                                     | 27.7                                                | 0.090                                                  |
| P6SMB22A    | 22A                 | 22C  | 20.9                                                | 23.1  | 1.0                        | 18.8                               | 1.0                                                 | 19.6                                     | 30.6                                                | 0.092                                                  |
| P6SMB24A    | 24A                 | 24C  | 22.8                                                | 25.2  | 1.0                        | 20.5                               | 1.0                                                 | 18.1                                     | 33.2                                                | 0.094                                                  |
| P6SMB27A    | 27A                 | 27C  | 25.7                                                | 28.4  | 1.0                        | 23.1                               | 1.0                                                 | 16.0                                     | 37.5                                                | 0.096                                                  |
| P6SMB30A    | 30A                 | 30C  | 28.5                                                | 31.5  | 1.0                        | 25.6                               | 1.0                                                 | 14.5                                     | 41.4                                                | 0.097                                                  |
| P6SMB33A    | 33A                 | 33C  | 31.4                                                | 34.7  | 1.0                        | 28.2                               | 1.0                                                 | 13.1                                     | 45.7                                                | 0.098                                                  |
| P6SMB36A    | 36A                 | 36C  | 34.2                                                | 37.8  | 1.0                        | 30.8                               | 1.0                                                 | 12.0                                     | 49.9                                                | 0.099                                                  |
| P6SMB39A    | 39A                 | 39C  | 37.1                                                | 41.0  | 1.0                        | 33.3                               | 1.0                                                 | 11.1                                     | 53.9                                                | 0.100                                                  |
| P6SMB43A    | 43A                 | 43C  | 40.9                                                | 45.2  | 1.0                        | 36.8                               | 1.0                                                 | 10.1                                     | 59.3                                                | 0.101                                                  |
| P6SMB47A    | 47A                 | 47C  | 44.7                                                | 49.4  | 1.0                        | 40.2                               | 1.0                                                 | 9.3                                      | 64.8                                                | 0.101                                                  |
| P6SMB51A    | 51A                 | 51C  | 48.5                                                | 53.6  | 1.0                        | 43.6                               | 1.0                                                 | 8.6                                      | 70.1                                                | 0.102                                                  |
| P6SMB56A    | 56A                 | 56C  | 53.2                                                | 58.8  | 1.0                        | 47.8                               | 1.0                                                 | 7.8                                      | 77.0                                                | 0.103                                                  |
| P6SMB62A    | 62A                 | 62C  | 58.9                                                | 65.1  | 1.0                        | 53.0                               | 1.0                                                 | 7.1                                      | 85.0                                                | 0.104                                                  |
| P6SMB68A    | 68A                 | 68C  | 64.6                                                | 71.4  | 1.0                        | 58.1                               | 1.0                                                 | 6.5                                      | 92.0                                                | 0.104                                                  |
| P6SMB75A    | 75A                 | 75C  | 71.3                                                | 78.8  | 1.0                        | 64.1                               | 1.0                                                 | 5.8                                      | 103                                                 | 0.105                                                  |
| P6SMB82A    | 82A                 | 82C  | 77.9                                                | 86.1  | 1.0                        | 70.1                               | 1.0                                                 | 5.3                                      | 113                                                 | 0.105                                                  |
| P6SMB91A    | 91A                 | 91C  | 86.5                                                | 95.5  | 1.0                        | 77.8                               | 1.0                                                 | 4.8                                      | 125                                                 | 0.106                                                  |
| P6SMB100A   | 100A                | 100C | 95.0                                                | 105   | 1.0                        | 85.5                               | 1.0                                                 | 4.4                                      | 137                                                 | 0.106                                                  |
| P6SMB110A   | 110A                | 110C | 105                                                 | 116   | 1.0                        | 94.0                               | 1.0                                                 | 3.9                                      | 152                                                 | 0.107                                                  |
| P6SMB120A   | 120A                | 120C | 114                                                 | 126   | 1.0                        | 102                                | 1.0                                                 | 3.6                                      | 165                                                 | 0.107                                                  |
| P6SMB130A   | 130A                | 130C | 124                                                 | 137   | 1.0                        | 111                                | 1.0                                                 | 3.4                                      | 179                                                 | 0.107                                                  |
| P6SMB150A   | 150A                | 150C | 143                                                 | 158   | 1.0                        | 128                                | 1.0                                                 | 2.9                                      | 207                                                 | 0.108                                                  |
| P6SMB160A   | 160A                | 160C | 152                                                 | 168   | 1.0                        | 136                                | 1.0                                                 | 2.7                                      | 219                                                 | 0.108                                                  |
| P6SMB170A   | 170A                | 170C | 162                                                 | 179   | 1.0                        | 145                                | 1.0                                                 | 2.6                                      | 234                                                 | 0.108                                                  |
| P6SMB180A   | 180A                | 180C | 171                                                 | 189   | 1.0                        | 154                                | 1.0                                                 | 2.4                                      | 246                                                 | 0.108                                                  |
| P6SMB200A   | 200A                | 200C | 190                                                 | 210   | 1.0                        | 171                                | 1.0                                                 | 2.2                                      | 274                                                 | 0.108                                                  |
| P6SMB220A   | 220A                | 220C | 209                                                 | 231   | 1.0                        | 185                                | 1.0                                                 | 1.9                                      | 328                                                 | 0.108                                                  |
| P6SMB250A   | 250A                | 250C | 237                                                 | 263   | 1.0                        | 214                                | 1.0                                                 | 1.8                                      | 344                                                 | 0.108                                                  |
| P6SMB300A   | 300A                | 300C | 285                                                 | 315   | 1.0                        | 256                                | 1.0                                                 | 1.5                                      | 414                                                 | 0.108                                                  |
| P6SMB350A   | 350A                | 350C | 332                                                 | 368   | 1.0                        | 300                                | 1.0                                                 | 1.3                                      | 482                                                 | 0.108                                                  |
| P6SMB400A   | 400A                | 400C | 380                                                 | 420   | 1.0                        | 342                                | 1.0                                                 | 1.1                                      | 548                                                 | 0.108                                                  |
| P6SMB440A   | 440A                | 440C | 418                                                 | 462   | 1.0                        | 376                                | 1.0                                                 | 1.0                                      | 602                                                 | 0.108                                                  |
| P6SMB480A   | 480A                | 480C | 456                                                 | 504   | 1.0                        | 408                                | 1.0                                                 | 0.9                                      | 658                                                 | 0.108                                                  |
| P6SMB510A   | 510A                | 510C | 485                                                 | 535   | 1.0                        | 434                                | 1.0                                                 | 0.9                                      | 698                                                 | 0.108                                                  |
| P6SMB530A   | 530A                | 530C | 503.5                                               | 556.5 | 1.0                        | 477                                | 1.0                                                 | 0.8                                      | 725                                                 | 0.108                                                  |
| P6SMB540A   | 540A                | 540C | 513                                                 | 567   | 1.0                        | 459                                | 1.0                                                 | 0.8                                      | 740                                                 | 0.108                                                  |
| P6SMB550A   | 550A                | 550C | 522.5                                               | 577.5 | 1.0                        | 495                                | 1.0                                                 | 0.8                                      | 760                                                 | 0.108                                                  |

- Notes:**
1.  $V_{(BR)}$  measured after  $I_T$  applied for 300us,  $I_T$ =square wave pulse or equivalent
  2. Surge current waveform per Fig. 3 and derate per Fig. 2
  3. For bidirectional types with  $V_{WM}$  of 10 volts and less, the  $I_D$  limit is doubled
  4. All terms and symbols are consistent with ANSI/IEEE C62.35

(T<sub>a</sub> = 25°C unless otherwise noted)

