



# P6SMB SERIES

## Surface Mount Transient Voltage Suppressor



Voltage Range  
6.8 to 200 Volts  
600 Watts Peak Power

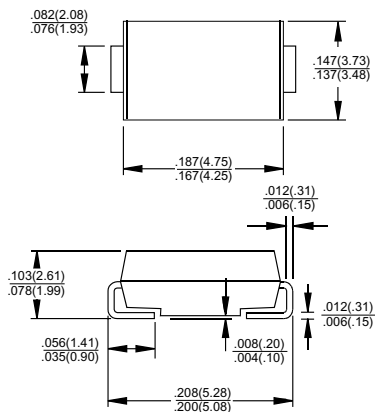
### Features

- ✧ For surface mounted application in order to optimize board space
- ✧ Low profile package
- ✧ Built-in strain relief
- ✧ Glass passivated junction
- ✧ Excellent clamping capability
- ✧ Fast response time: Typically less than 1.0ps from 0 volt to BV min.
- ✧ Typical  $I_R$  less than 1  $\mu$ A above 10V
- ✧ High temperature soldering guaranteed:  
250°C / 10 seconds at terminals
- ✧ Plastic material used carries Underwriters Laboratory  
Flammability Classification 94V-0
- ✧ 600 watts peak pulse power capability with a 10 x 1000 us  
waveform by 0.01% duty cycle

### Mechanical Data

- ✧ Case: Molded plastic
- ✧ Terminals: Solder plated
- ✧ Polarity: Indicated by cathode band
- ✧ Standard packaging: 12mm tape (EIA STD RS-481)
- ✧ Weight: 0.093gram

### SMB/DO-214AA



Dimensions in inches and (millimeters)

### Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

| Type Number                                                                                                                                | Symbol         | Value        | Units            |
|--------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------|------------------|
| Peak Power Dissipation at $T_A=25^\circ\text{C}$ ,<br>$T_p=1\text{ms}$ (Note 1)                                                            | $P_{PK}$       | Minimum 600  | Watts            |
| Peak Forward Surge Current, 8.3 ms Single Half<br>Sine-wave Superimposed on Rated Load<br>(JEDEC method) (Note 2, 3) - Unidirectional Only | $I_{FSM}$      | 100          | Amps             |
| Maximum Instantaneous Forward Voltage at<br>50.0A for Unidirectional Only (Note 4)                                                         | $V_F$          | 3.5          | Volts            |
| Operating and Storage Temperature Range                                                                                                    | $T_J, T_{STG}$ | -65 to + 150 | $^\circ\text{C}$ |

Notes: 1. Non-repetitive Current Pulse Per Fig. 3 and Derated above  $T_A=25^\circ\text{C}$  Per Fig. 2.

2. Mounted on 5.0mm<sup>2</sup> (.013 mm Thick) Copper Pads to Each Terminal.

3. 8.3ms Single Half Sine-wave or Equivalent Square Wave, Duty Cycle=4 pulses Per Minute  
Maximum.

Devices for Bipolar Applications

1. For Bidirectional Use C or CA Suffix for Types P6SMB6.8 through Types P6SMB200A.
2. Electrical Characteristics Apply in Both Directions.

**ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)**

| Device    | Device Marking Code | Breakdown Voltage |      | Test Current @I <sub>T</sub> (mA) | Stand-Off Voltage V <sub>WM</sub> (Volts) | Maximum Reverse Leakage at V <sub>WM</sub> I <sub>D</sub> (uA) | Maximum Peak Pulse Current I <sub>PSM</sub> (Note 2)(Amps) | Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>C</sub> (Volts) | Maximum Temperature Coefficient of V <sub>BR</sub> (% / °C) |
|-----------|---------------------|-------------------|------|-----------------------------------|-------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------|
|           |                     | V <sub>BR</sub>   |      |                                   |                                           |                                                                |                                                            |                                                                     |                                                             |
|           |                     | (Volts) (Note 1)  |      |                                   |                                           |                                                                |                                                            |                                                                     |                                                             |
|           |                     | Min               | Max  |                                   |                                           |                                                                |                                                            |                                                                     |                                                             |
| P6SMB6.8  | KDJ                 | 6.12              | 7.48 | 10                                | 5.50                                      | 1000                                                           | 58                                                         | 10.8                                                                | 0.057                                                       |
| P6SMB6.8A | KEJ                 | 6.45              | 7.14 | 10                                | 5.80                                      | 1000                                                           | 60                                                         | 10.5                                                                | 0.057                                                       |
| P6SMB7.5  | KFJ                 | 6.75              | 8.25 | 10                                | 6.05                                      | 500                                                            | 53                                                         | 11.7                                                                | 0.061                                                       |
| P6SMB7.5A | KGJ                 | 7.13              | 7.88 | 10                                | 6.40                                      | 500                                                            | 55                                                         | 11.3                                                                | 0.061                                                       |
| P6SMB8.2  | KHJ                 | 7.38              | 9.02 | 1.0                               | 6.63                                      | 200                                                            | 50                                                         | 12.5                                                                | 0.065                                                       |
| P6SMB8.2A | KKJ                 | 7.79              | 8.61 | 1.0                               | 7.02                                      | 200                                                            | 52                                                         | 12.1                                                                | 0.065                                                       |
| P6SMB9.1  | KLJ                 | 8.19              | 10.0 | 1.0                               | 7.37                                      | 50                                                             | 45                                                         | 13.8                                                                | 0.068                                                       |
| P6SMB9.1A | KMJ                 | 8.65              | 9.55 | 1.0                               | 7.78                                      | 50                                                             | 47                                                         | 13.4                                                                | 0.068                                                       |
| P6SMB10   | KNJ                 | 9.00              | 11.0 | 1.0                               | 8.10                                      | 10                                                             | 42                                                         | 15.0                                                                | 0.073                                                       |
| P6SMB10A  | KPJ                 | 9.50              | 10.5 | 1.0                               | 8.55                                      | 10                                                             | 43                                                         | 14.5                                                                | 0.073                                                       |
| P6SMB11   | KQJ                 | 9.90              | 12.1 | 1.0                               | 8.92                                      | 5.0                                                            | 38                                                         | 16.2                                                                | 0.075                                                       |
| P6SMB11A  | KRJ                 | 10.5              | 11.6 | 1.0                               | 9.40                                      | 5.0                                                            | 40                                                         | 15.6                                                                | 0.075                                                       |
| P6SMB12   | KSJ                 | 10.8              | 13.2 | 1.0                               | 9.72                                      | 5.0                                                            | 36                                                         | 17.3                                                                | 0.078                                                       |
| P6SMB12A  | KTJ                 | 11.4              | 12.6 | 1.0                               | 10.2                                      | 5.0                                                            | 37                                                         | 16.7                                                                | 0.078                                                       |
| P6SMB13   | KUJ                 | 11.7              | 14.3 | 1.0                               | 10.5                                      | 5.0                                                            | 33                                                         | 19.0                                                                | 0.081                                                       |
| P6SMB13A  | KVJ                 | 12.4              | 13.7 | 1.0                               | 11.1                                      | 5.0                                                            | 34                                                         | 18.2                                                                | 0.081                                                       |
| P6SMB15   | KWJ                 | 13.5              | 16.5 | 1.0                               | 12.1                                      | 5.0                                                            | 28                                                         | 22.0                                                                | 0.084                                                       |
| P6SMB15A  | KXJ                 | 14.3              | 15.8 | 1.0                               | 12.8                                      | 5.0                                                            | 29                                                         | 21.2                                                                | 0.084                                                       |
| P6SMB16   | KYJ                 | 14.4              | 17.6 | 1.0                               | 12.9                                      | 5.0                                                            | 26                                                         | 23.5                                                                | 0.086                                                       |
| P6SMB16A  | KZJ                 | 15.2              | 16.8 | 1.0                               | 13.6                                      | 5.0                                                            | 28                                                         | 22.5                                                                | 0.086                                                       |
| P6SMB18   | LDJ                 | 16.2              | 19.8 | 1.0                               | 14.5                                      | 5.0                                                            | 23                                                         | 26.5                                                                | 0.088                                                       |
| P6SMB18A  | LEJ                 | 17.1              | 18.9 | 1.0                               | 15.3                                      | 5.0                                                            | 25                                                         | 25.2                                                                | 0.088                                                       |
| P6SMB20   | LFJ                 | 18.0              | 22.0 | 1.0                               | 16.2                                      | 5.0                                                            | 21                                                         | 29.1                                                                | 0.090                                                       |
| P6SMB20A  | LGJ                 | 19.0              | 21.0 | 1.0                               | 17.1                                      | 5.0                                                            | 22                                                         | 27.7                                                                | 0.090                                                       |
| P6SMB22   | LHJ                 | 19.8              | 24.2 | 1.0                               | 17.8                                      | 5.0                                                            | 19                                                         | 31.9                                                                | 0.092                                                       |
| P6SMB22A  | LKJ                 | 20.9              | 23.1 | 1.0                               | 18.8                                      | 5.0                                                            | 20                                                         | 30.6                                                                | 0.092                                                       |
| P6SMB24   | LLJ                 | 21.6              | 26.4 | 1.0                               | 19.4                                      | 5.0                                                            | 18                                                         | 34.7                                                                | 0.094                                                       |
| P6SMB24A  | LMJ                 | 22.8              | 25.2 | 1.0                               | 20.5                                      | 5.0                                                            | 19                                                         | 33.2                                                                | 0.094                                                       |
| P6SMB27   | LNJ                 | 24.3              | 29.7 | 1.0                               | 21.8                                      | 5.0                                                            | 16                                                         | 39.1                                                                | 0.096                                                       |
| P6SMB27A  | LPJ                 | 25.7              | 28.4 | 1.0                               | 23.1                                      | 5.0                                                            | 16.8                                                       | 37.5                                                                | 0.096                                                       |
| P6SMB30   | LQJ                 | 27.0              | 33.0 | 1.0                               | 24.3                                      | 5.0                                                            | 14                                                         | 43.5                                                                | 0.097                                                       |
| P6SMB30A  | LRJ                 | 28.5              | 31.5 | 1.0                               | 25.6                                      | 5.0                                                            | 15                                                         | 41.4                                                                | 0.097                                                       |
| P6SMB33   | LSJ                 | 29.7              | 36.3 | 1.0                               | 26.8                                      | 5.0                                                            | 13.0                                                       | 47.7                                                                | 0.098                                                       |
| P6SMB33A  | LTJ                 | 31.4              | 34.7 | 1.0                               | 28.2                                      | 5.0                                                            | 13.8                                                       | 45.7                                                                | 0.098                                                       |
| P6SMB36   | LUJ                 | 32.4              | 39.6 | 1.0                               | 29.1                                      | 5.0                                                            | 12                                                         | 52.0                                                                | 0.099                                                       |
| P6SMB36A  | LVJ                 | 34.2              | 37.8 | 1.0                               | 30.8                                      | 5.0                                                            | 12.6                                                       | 49.9                                                                | 0.099                                                       |
| P6SMB39   | LWJ                 | 35.1              | 42.9 | 1.0                               | 31.6                                      | 5.0                                                            | 11.1                                                       | 56.4                                                                | 0.100                                                       |
| P6SMB39A  | LXJ                 | 37.1              | 41.0 | 1.0                               | 33.3                                      | 5.0                                                            | 11.6                                                       | 53.9                                                                | 0.100                                                       |
| P6SMB43   | LYJ                 | 38.7              | 47.3 | 1.0                               | 34.8                                      | 5.0                                                            | 10.0                                                       | 61.9                                                                | 0.101                                                       |
| P6SMB43A  | LZJ                 | 40.9              | 45.2 | 1.0                               | 36.8                                      | 5.0                                                            | 10.6                                                       | 59.3                                                                | 0.101                                                       |
| P6SMB47   | MDJ                 | 42.3              | 51.7 | 1.0                               | 38.1                                      | 5.0                                                            | 9.2                                                        | 67.8                                                                | 0.101                                                       |
| P6SMB47A  | MEJ                 | 44.7              | 49.4 | 1.0                               | 40.2                                      | 5.0                                                            | 9.7                                                        | 64.8                                                                | 0.101                                                       |
| P6SMB51   | MFJ                 | 45.9              | 56.1 | 1.0                               | 41.3                                      | 5.0                                                            | 8.5                                                        | 73.5                                                                | 0.102                                                       |
| P6SMB51A  | MGJ                 | 48.5              | 53.6 | 1.0                               | 43.6                                      | 5.0                                                            | 8.9                                                        | 70.1                                                                | 0.102                                                       |
| P6SMB56   | MHJ                 | 50.4              | 61.6 | 1.0                               | 45.4                                      | 5.0                                                            | 7.8                                                        | 80.5                                                                | 0.103                                                       |
| P6SMB56A  | MKJ                 | 53.2              | 58.8 | 1.0                               | 47.8                                      | 5.0                                                            | 8.1                                                        | 77.0                                                                | 0.103                                                       |
| P6SMB62   | MLJ                 | 55.8              | 68.2 | 1.0                               | 50.2                                      | 5.0                                                            | 7.0                                                        | 89.0                                                                | 0.104                                                       |
| P6SMB62A  | MMJ                 | 58.9              | 65.1 | 1.0                               | 53.0                                      | 5.0                                                            | 7.4                                                        | 85.0                                                                | 0.104                                                       |
| P6SMB68   | MNJ                 | 61.2              | 74.8 | 1.0                               | 55.1                                      | 5.0                                                            | 6.4                                                        | 98.0                                                                | 0.104                                                       |
| P6SMB68A  | MPJ                 | 64.6              | 71.4 | 1.0                               | 58.1                                      | 5.0                                                            | 6.8                                                        | 92.0                                                                | 0.104                                                       |
| P6SMB75   | MQJ                 | 67.5              | 82.5 | 1.0                               | 60.7                                      | 5.0                                                            | 5.8                                                        | 108.0                                                               | 0.105                                                       |
| P6SMB75A  | MRJ                 | 71.3              | 78.8 | 1.0                               | 64.1                                      | 5.0                                                            | 6.1                                                        | 103.0                                                               | 0.105                                                       |
| P6SMB82   | MSJ                 | 73.8              | 90.2 | 1.0                               | 66.4                                      | 5.0                                                            | 5.3                                                        | 118.0                                                               | 0.105                                                       |
| P6SMB82A  | MTJ                 | 77.9              | 86.1 | 1.0                               | 70.1                                      | 5.0                                                            | 5.5                                                        | 113.0                                                               | 0.105                                                       |

**ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)**

| Device    | Device Marking Code | Breakdown Voltage |       | Test            | Stand-Off       | Maximum             | Maximum                  | Maximum                     | Maximum                     |
|-----------|---------------------|-------------------|-------|-----------------|-----------------|---------------------|--------------------------|-----------------------------|-----------------------------|
|           |                     | V <sub>BR</sub>   |       | Current         | Voltage         | Reverse Leakage     | Peak Pulse               | Clamping                    | Temperature                 |
|           |                     | (Volts) (Note 1)  |       | @I <sub>T</sub> | V <sub>WM</sub> | at V <sub>WM</sub>  | Current I <sub>RSM</sub> | Voltage at I <sub>PPM</sub> | Coefficient                 |
|           |                     | Min               | Max   | (mA)            | (Volts)         | I <sub>D</sub> (uA) | (Note 2)(Amps)           | V <sub>C</sub> (Volts)      | of V <sub>BR</sub> (% / °C) |
| P6SMB91   | MUJ                 | 81.9              | 100.0 | 1.0             | 73.7            | 5.0                 | 4.8                      | 131.0                       | 0.106                       |
| P6SMB91A  | MVJ                 | 86.5              | 95.5  | 1.0             | 77.8            | 5.0                 | 5.0                      | 125.0                       | 0.106                       |
| P6SMB100  | MWJ                 | 90.0              | 110.0 | 1.0             | 81.0            | 5.0                 | 4.3                      | 144.0                       | 0.106                       |
| P6SMB100A | MXJ                 | 95.0              | 105.0 | 1.0             | 85.5            | 5.0                 | 4.5                      | 137.0                       | 0.106                       |
| P6SMB110  | MYJ                 | 99.0              | 121.0 | 1.0             | 89.2            | 5.0                 | 3.9                      | 158.0                       | 0.107                       |
| P6SMB110A | MZJ                 | 105.0             | 116.0 | 1.0             | 94.0            | 5.0                 | 4.1                      | 152.0                       | 0.107                       |
| P6SMB120  | NDJ                 | 108.0             | 132.0 | 1.0             | 97.2            | 5.0                 | 3.6                      | 173.0                       | 0.107                       |
| P6SMB120A | NEJ                 | 114.0             | 126.0 | 1.0             | 102.0           | 5.0                 | 3.8                      | 165.0                       | 0.107                       |
| P6SMB130  | NFJ                 | 117.0             | 143.0 | 1.0             | 105.0           | 5.0                 | 3.3                      | 187.0                       | 0.107                       |
| P6SMB130A | NGJ                 | 124.0             | 137.0 | 1.0             | 111.0           | 5.0                 | 3.5                      | 179.0                       | 0.107                       |
| P6SMB150  | NHJ                 | 135.0             | 165.0 | 1.0             | 121.0           | 5.0                 | 2.9                      | 215.0                       | 0.108                       |
| P6SMB150A | NKJ                 | 143.0             | 158.0 | 1.0             | 128.0           | 5.0                 | 3.0                      | 207.0                       | 0.108                       |
| P6SMB160  | NLJ                 | 144.0             | 176.0 | 1.0             | 130.0           | 5.0                 | 2.7                      | 230.0                       | 0.108                       |
| P6SMB160A | NMJ                 | 152.0             | 168.0 | 1.0             | 136.0           | 5.0                 | 2.8                      | 219.0                       | 0.108                       |
| P6SMB170  | NNJ                 | 153.0             | 187.0 | 1.0             | 138.0           | 5.0                 | 2.5                      | 244.0                       | 0.108                       |
| P6SMB170A | NPJ                 | 162.0             | 179.0 | 1.0             | 145.0           | 5.0                 | 2.6                      | 234.0                       | 0.108                       |
| P6SMB180  | NQJ                 | 162.0             | 198.0 | 1.0             | 146.0           | 5.0                 | 2.4                      | 258.0                       | 0.108                       |
| P6SMB180A | NRJ                 | 171.0             | 189.0 | 1.0             | 154.0           | 5.0                 | 2.5                      | 246.0                       | 0.108                       |
| P6SMB200  | NSJ                 | 180.0             | 220.0 | 1.0             | 162.0           | 5.0                 | 2.1                      | 287.0                       | 0.108                       |
| P6SMB200A | NTJ                 | 190.0             | 210.0 | 1.0             | 171.0           | 5.0                 | 2.2                      | 274.0                       | 0.108                       |

**Notes:**

1. VBR measured after IT applied for 300us, IT=square wave pulse or equivalent.
2. Surge current waveform per Figure 3 and derate per Figure 2.
3. For bipolar types having VWM of 10 volts and under, the Id limit is doubled.
4. For bidirectional use C or Ca suffix for types P6SMB6.8 through P6SMB200A.
5. All terms and symbols are consistent with ANSI/IEEE C62.35.

## RATINGS AND CHARACTERISTIC CURVES (P6SMB SERIES)

FIG.1- PEAK PULSE POWER RATING CURVE

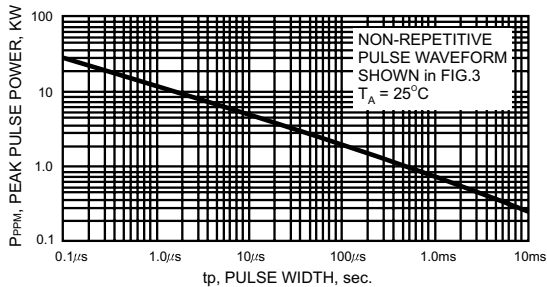


FIG.2- PULSE DERATING CURVE

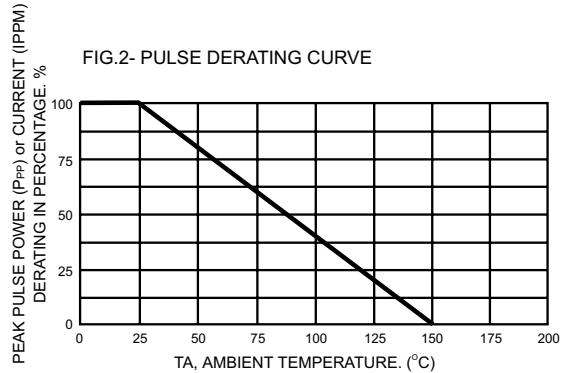


FIG.3- PULSE WAVEFORM

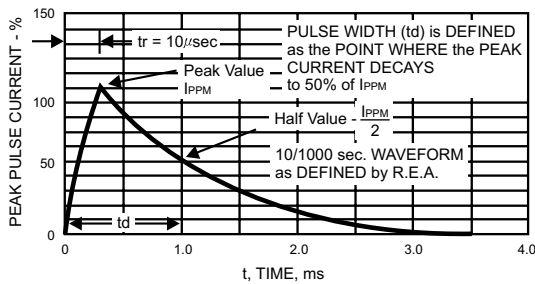


FIG.4- MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

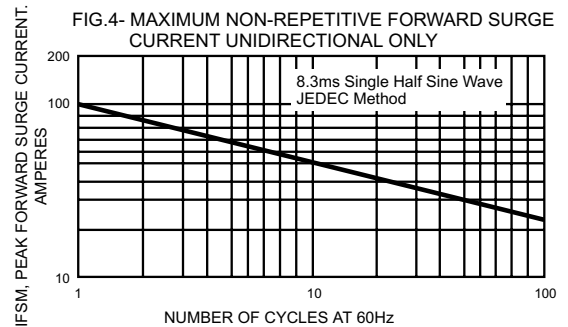


FIG.5- TYPICAL REVERSE LEAKAGE CHARACTERISTICS

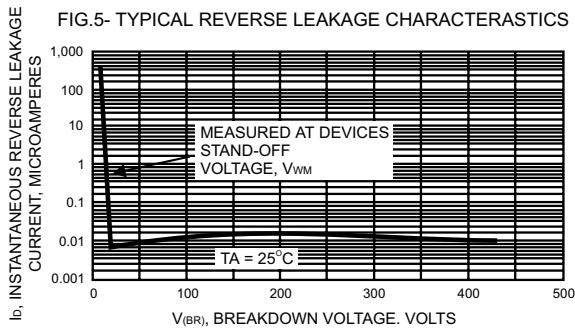


FIG.6- TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

