



# P6SMB SERIES

## Surface Mount Transient Voltage Suppressor



Voltage Range  
6.8 to 200 Volts  
600 Watts Peak Power

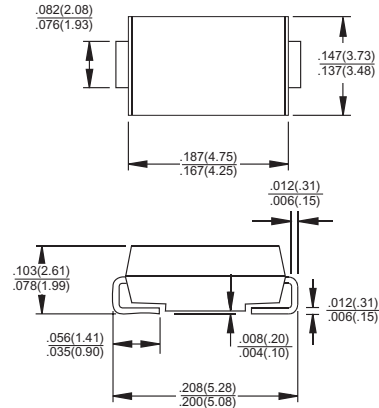
### Features

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

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

## RATINGS AND CHARACTERISTIC CURVES (P6SMB SERIES)

FIG. 1- PEAK PULSE POWER RATING CURVE

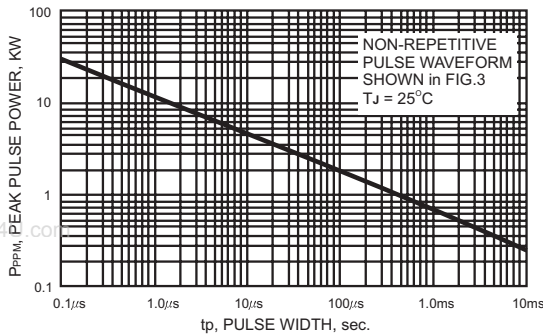


FIG. 2- PULSE DERATING CURVE

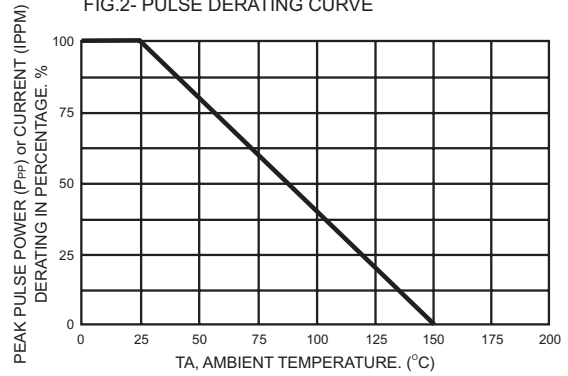


FIG. 3- PULSE WAVEFORM

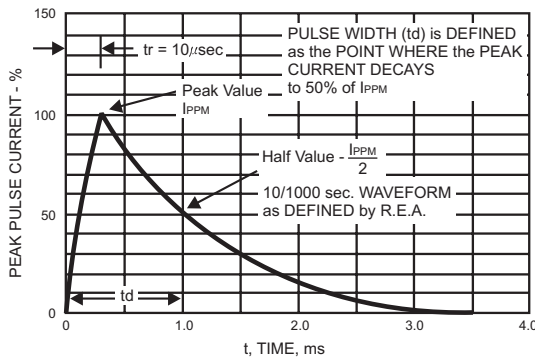


FIG. 4- MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

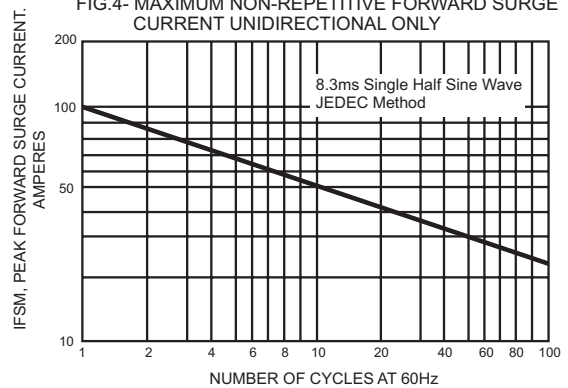


FIG. 5- TYPICAL REVERSE LEAKAGE CHARACTERISTICS

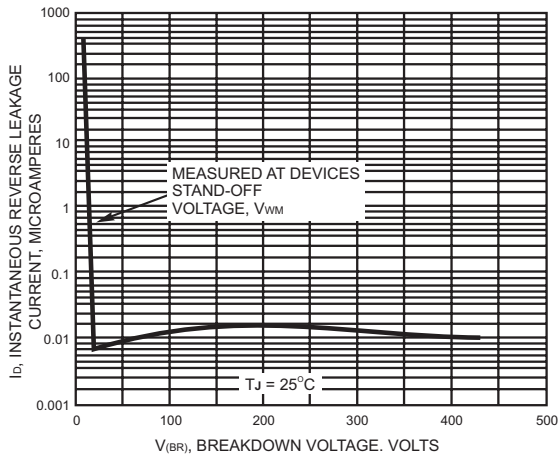
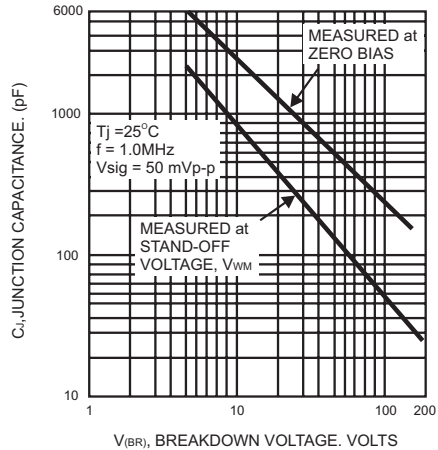


FIG. 6- TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL



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

| Device    | Device Marking Code | Breakdown Voltage    |      | Test Current @IT (mA) | Stand-Off Voltage VWM (Volts) | Maximum Reverse Leakage at VWM ID (uA) | Maximum Peak Pulse Current IRSM (Note 2)(Amps) | Maximum Clamping Voltage at IPPM Vc(Volts) | Maximum Temperature Coefficient of VBR(% / °C) |
|-----------|---------------------|----------------------|------|-----------------------|-------------------------------|--|--|--|--|
|           |                     | VBR (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 Current @IT (mA) | Stand-Off Voltage VWM (Volts) | Maximum Reverse Leakage at VWM Id (uA) | Maximum Peak Pulse Current IRSM (Note 2)(Amps) | Maximum Clamping Voltage at IPPM Vc(Volts) | Maximum Temperature Coefficient of VBR(% / °C) |
|-----------|---------------------|----------------------|-------|-----------------------|-------------------------------|--|--|--|--|
|           |                     | VBR (Volts) (Note 1) |       |                       |                               |  |  |  |  |
|           |                     | Min                  | Max   |                       |                               |  |  |  |  |
| 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  |
| P6SMB220  | NUJ                 | 198.0                | 242.0 | 1.0                   | 175.0                         | 5.0                                    | 1.8  | 342.0                                      | 0.108  |
| P6SMB220A | NVJ                 | 209.0                | 231.0 | 1.0                   | 185.0                         | 5.0                                    | 1.9  | 328.0                                      | 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.