

# P6SMBJ6.8 - 220CA series

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS

Protect sensitive electronics against voltage transients induced by electro-static discharge (ESD), inductive load switching, and lightning. Ideal for the protection of I/O interfaces, Vcc bus and other integrated circuits.

### FEATURES

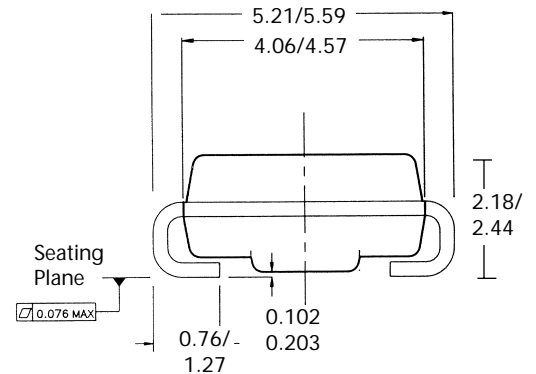
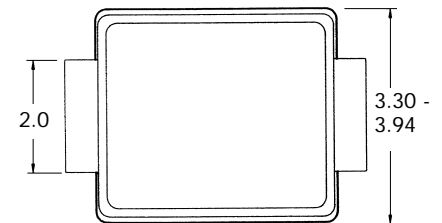
- Stand-off Voltage Range 5.5 to 185 Volts
- Uni-directional and Bi-directional
- Glass Passivated Junction
- Jedec package designed to meet SM assembly needs
- Low lead inductance
- Each device 100% surge tested
- UL Recognized

### MAXIMUM RATINGS

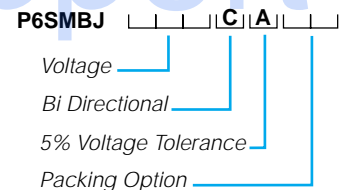
- Peak Pulse Power (Ppk) 600 Watts (10 X 1000µs)  
(see diagram on page 6 for wave form)
- 1.5 Watt Steady State
- Response time: 1 X 10-12 secs (theoretical)
- Forward surge rating: 100A, 8.3 ms single half sine-wave  
(Uni-directional only)
- Operating & storage Temp.: -55°C to +150°C

### MECHANICAL DATA

- CASE: D0214AA moulded plastic over glass passivated junction UL94V(O) (Thermoset) Epoxy.
- Terminals: Solder plated solderable per MIL-STD-750 Method 2026
- Solderable leads: 230°C for 10 seconds.
- Marking: cathode band(positive terminal, uni-directional devices only), device code, logo
- Weight: 0.093 gram (approx.)



### ORDERING INFORMATION



T1 = Taped (500 pcs)

T3 = Taped (3000 pcs)

Figure 1 - Capacitance

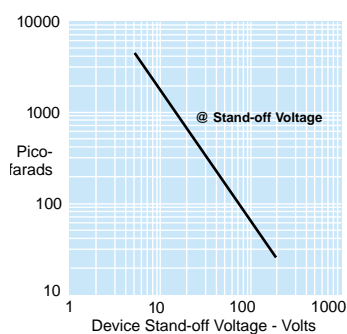


Figure 2 - Pad Size

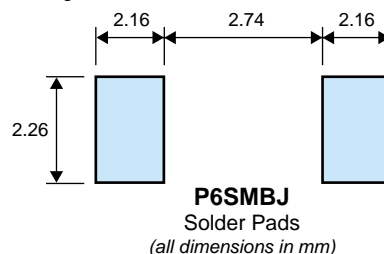
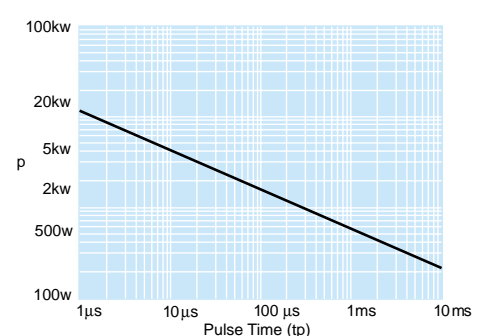


Figure 3 - Peak Pulse Power vs. Pulse Time



ELECTRICAL SPECIFICATION @ Tamb = 25°C

| PART NUMBER<br>UNI-POLAR   | DEVICE CODE  | REVERSE STANDOFF VOLTAGE Vr (Volts) | BREAKDOWN VOLTAGE VBR (Volts) @ IT |       |      | MAXIMUM REVERSE LEAKAGE Ir @ Vr (µA) | MAXIMUM CLAMPING VOLTAGE Vc @ IPP (Volts) (mA) | MAXIMUM PEAK PULSE CURRENT IPP @ Vc (A) | MAXIMUM FORWARD VOLTAGE (Vf) @ IT (Volts) |
|----------------------------|--------------|-------------------------------------|------------------------------------|-------|------|--------------------------------------|--|---|---|
|                            |              |                                     | MIN                                | MAX   |      |                                      |  |   |   |
| P6SMBJ 6V8 / P6SMBJ 6V8C   | 6V8 / 6V8C   | 5.50                                | 6.12                               | 7.48  | 10.0 | 1000.0 (4)                           | 10.8   | 56.0                                    | 3.5                                       |
| P6SMBJ 6V8A / P6SMBJ 6V8CA | 6V8A / 6V8CA | 5.80                                | 6.45                               | 7.14  | 10.0 | 1000.0 (4)                           | 10.5   | 57.0                                    | 3.5                                       |
| P6SMBJ 7V5 / P6SMBJ 7V5C   | 7V5 / 7V5C   | 6.05                                | 6.75                               | 8.25  | 10.0 | 500.0 (4)                            | 11.7   | 51.0                                    | 3.5                                       |
| P6SMBJ 7V5A / P6SMBJ 7V5CA | 7V5A / 7V5CA | 6.40                                | 7.13                               | 7.88  | 10.0 | 500.0 (4)                            | 11.3   | 53.0                                    | 3.5                                       |
| P6SMBJ 8V2 / P6SMBJ 8V2C   | 8V2 / 8V2C   | 6.63                                | 7.38                               | 9.02  | 10.0 | 200.0 (4)                            | 12.5   | 48.0                                    | 3.5                                       |
| P6SMBJ 8V2A / P6SMBJ 8V2CA | 8V2A / 8V2CA | 7.02                                | 7.79                               | 8.61  | 10.0 | 200.0 (4)                            | 12.1   | 50.0                                    | 3.5                                       |
| P6SMBJ 9V1 / P6SMBJ 9V1C   | 9V1 / 9V1C   | 7.37                                | 8.19                               | 10.00 | 1.0  | 50.0 (4)                             | 13.8   | 44.0                                    | 3.5                                       |
| P6SMBJ 9V1A / P6SMBJ 9V1CA | 9V1A / 9V1CA | 7.78                                | 8.65                               | 9.55  | 1.0  | 50.0 (4)                             | 13.4   | 45.0                                    | 3.5                                       |
| P6SMBJ 10 / P6SMBJ 10C     | 10 / 10C     | 8.10                                | 9.00                               | 11.00 | 1.0  | 10.0 (4)                             | 15.0   | 40.0                                    | 3.5                                       |
| P6SMBJ 10A / P6SMBJ 10CA   | 10A / 10CA   | 8.55                                | 9.50                               | 10.50 | 1.0  | 10.0 (4)                             | 14.5   | 41.0                                    | 3.5                                       |
| P6SMBJ 11 / P6SMBJ 11C     | 11 / 11C     | 8.92                                | 9.90                               | 12.10 | 1.0  | 5.0 (4)                              | 16.2   | 37.0                                    | 3.5                                       |
| P6SMBJ 11A / P6SMBJ 11CA   | 11A / 11CA   | 9.40                                | 10.50                              | 11.60 | 1.0  | 5.0 (4)                              | 15.6   | 38.0                                    | 3.5                                       |
| P6SMBJ 12 / P6SMBJ 12C     | 12 / 12C     | 9.72                                | 10.80                              | 13.20 | 1.0  | 5.0 (4)                              | 17.3   | 35.0                                    | 3.5                                       |
| P6SMBJ 12A / P6SMBJ 12CA   | 12A / 12CA   | 10.2                                | 11.40                              | 12.60 | 1.0  | 5.0                                  | 16.7   | 36.0                                    | 3.5                                       |
| P6SMBJ 13 / P6SMBJ 13C     | 13 / 13C     | 10.5                                | 11.70                              | 14.30 | 1.0  | 5.0                                  | 19.0   | 32.0                                    | 3.5                                       |
| P6SMBJ 13A / P6SMBJ 13CA   | 13A / 13CA   | 11.1                                | 12.40                              | 13.70 | 1.0  | 5.0                                  | 18.2   | 33.0                                    | 3.5                                       |
| P6SMBJ 15 / P6SMBJ 15C     | 15 / 15C     | 12.1                                | 13.50                              | 16.50 | 1.0  | 5.0                                  | 22.0   | 27.0                                    | 3.5                                       |
| P6SMBJ 15A / P6SMBJ 15CA   | 15A / 15CA   | 12.8                                | 14.30                              | 15.80 | 1.0  | 5.0                                  | 21.2   | 28.0                                    | 3.5                                       |
| P6SMBJ 16 / P6SMBJ 16C     | 16 / 16C     | 12.9                                | 14.40                              | 17.60 | 1.0  | 5.0                                  | 23.5   | 26.0                                    | 3.5                                       |
| P6SMBJ 16A / P6SMBJ 16CA   | 16A / 16CA   | 13.6                                | 15.20                              | 16.80 | 1.0  | 5.0                                  | 22.5   | 27.0                                    | 3.5                                       |
| P6SMBJ 18 / P6SMBJ 18C     | 18 / 18C     | 14.5                                | 16.20                              | 19.80 | 1.0  | 5.0                                  | 26.1   | 23.0                                    | 3.5                                       |
| P6SMBJ 18A / P6SMBJ 18CA   | 18A / 18CA   | 15.3                                | 17.10                              | 18.90 | 1.0  | 5.0                                  | 25.2   | 24.0                                    | 3.5                                       |
| P6SMBJ 20 / P6SMBJ 20C     | 20 / 20C     | 16.2                                | 18.00                              | 22.00 | 1.0  | 5.0                                  | 29.1   | 21.0                                    | 3.5                                       |
| P6SMBJ 20A / P6SMBJ 20CA   | 20A / 20CA   | 17.1                                | 19.00                              | 21.00 | 1.0  | 5.0                                  | 27.7   | 22.0                                    | 3.5                                       |
| P6SMBJ 22 / P6SMBJ 22C     | 22 / 22C     | 17.8                                | 19.80                              | 24.20 | 1.0  | 5.0                                  | 31.9   | 19.0                                    | 3.5                                       |
| P6SMBJ 22A / P6SMBJ 22CA   | 22A / 22CA   | 18.8                                | 20.90                              | 23.10 | 1.0  | 5.0                                  | 30.6   | 20.0                                    | 3.5                                       |
| P6SMBJ 24 / P6SMBJ 24C     | 24 / 24C     | 19.4                                | 21.60                              | 26.40 | 1.0  | 5.0                                  | 34.7   | 17.0                                    | 3.5                                       |
| P6SMBJ 24A / P6SMBJ 24CA   | 24A / 24CA   | 20.5                                | 22.80                              | 25.20 | 1.0  | 5.0                                  | 33.2   | 18.0                                    | 3.5                                       |
| P6SMBJ 27 / P6SMBJ 27C     | 27 / 27C     | 21.8                                | 24.30                              | 29.70 | 1.0  | 5.0                                  | 39.1   | 15.0                                    | 3.5                                       |
| P6SMBJ 27A / P6SMBJ 27CA   | 27A / 27CA   | 23.1                                | 25.70                              | 28.40 | 1.0  | 5.0                                  | 37.5   | 16.0                                    | 3.5                                       |
| P6SMBJ 30 / P6SMBJ 30C     | 30 / 30C     | 24.3                                | 27.00                              | 33.0  | 1.0  | 5.0                                  | 43.5   | 14.0                                    | 3.5                                       |
| P6SMBJ 30A / P6SMBJ 30CA   | 30A / 30CA   | 25.6                                | 28.50                              | 31.50 | 1.0  | 5.0                                  | 41.4   | 14.4                                    | 3.5                                       |
| P6SMBJ 33 / P6SMBJ 33C     | 30 / 33C     | 26.8                                | 29.70                              | 36.30 | 1.0  | 5.0                                  | 47.7   | 12.6                                    | 3.5                                       |
| P6SMBJ 33A / P6SMBJ 33CA   | 33A / 33CA   | 28.2                                | 31.40                              | 34.70 | 1.0  | 5.0                                  | 45.7   | 13.2                                    | 3.5                                       |
| P6SMBJ 36 / P6SMBJ 36C     | 36 / 36C     | 29.1                                | 32.40                              | 39.60 | 1.0  | 5.0                                  | 52.0   | 11.6                                    | 3.5                                       |
| P6SMBJ 36A / P6SMBJ 36CA   | 36A / 36CA   | 30.8                                | 34.20                              | 37.80 | 1.0  | 5.0                                  | 49.9   | 12.0                                    | 3.5                                       |
| P6SMBJ 39 / P6SMBJ 39C     | 39 / 39C     | 31.6                                | 35.10                              | 42.90 | 1.0  | 5.0                                  | 56.4   | 10.5                                    | 3.5                                       |
| P6SMBJ 39A / P6SMBJ 39CA   | 39A / 39CA   | 33.3                                | 37.10                              | 41.00 | 1.0  | 5.0                                  | 53.9   | 11.2                                    | 3.5                                       |
| P6SMBJ 43 / P6SMBJ 43C     | 43 / 43C     | 34.8                                | 38.70                              | 47.30 | 1.0  | 5.0                                  | 61.9   | 9.6                                     | 3.5                                       |
| P6SMBJ 43A / P6SMBJ 43CA   | 43A / 43CA   | 36.8                                | 40.90                              | 45.20 | 1.0  | 5.0                                  | 59.3   | 10.1                                    | 3.5                                       |
| P6SMBJ 47 / P6SMBJ 47C     | 47 / 47C     | 38.1                                | 42.30                              | 51.70 | 1.0  | 5.0                                  | 67.8   | 8.9                                     | 3.5                                       |
| P6SMBJ 47A / P6SMBJ 47CA   | 47A / 47CA   | 40.2                                | 44.70                              | 49.40 | 1.0  | 5.0                                  | 64.8   | 9.3                                     | 3.5                                       |
| P6SMBJ 51 / P6SMBJ 51C     | 51 / 51C     | 41.3                                | 45.90                              | 56.10 | 1.0  | 5.0                                  | 73.5   | 8.2                                     | 3.5                                       |
| P6SMBJ 51A / P6SMBJ 51CA   | 51A / 51CA   | 43.6                                | 48.50                              | 53.60 | 1.0  | 5.0                                  | 70.1   | 8.6                                     | 3.5                                       |

Notes:

1. Testing is performed @ 25°
2. Bv is measured using a pulse of 20 milliseconds or less
3. Vf, for uni-directional devices, is measured using a 300 microsecond square wave pulse @ It = 50A
4. Ir is doubled for Bi-directional devices only with Vr equal or less than 10 volts

All products are sold to the commercial specifications shown, for any additional reliability testing or extended parameters, please consult the factory.

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ELECTRICAL SPECIFICATION @ Tamb = 25°C

| PART NUMBER<br>UNI-POLAR   | DEVICE CODE  | REVERSE STANDOFF VOLTAGE<br>V <sub>R</sub><br>(Volts) | BREAKDOWN VOLTAGE<br>V <sub>BR</sub> (Volts) @ I <sub>T</sub> |        |     | MAXIMUM REVERSE LEAKAGE<br>I <sub>R</sub> @ V <sub>R</sub><br>(µA) | MAXIMUM CLAMPING VOLTAGE<br>V <sub>C</sub> @ I <sub>PP</sub><br>(Volts)<br>(mA) | MAXIMUM PEAK PULSE CURRENT<br>I <sub>PP</sub> @ V <sub>C</sub><br>(A) | MAXIMUM FORWARD VOLTAGE<br>(V <sub>F</sub> ) @ I <sub>T</sub><br>(Volts) |
|----------------------------|--------------|---|---|--------|-----|--|---|---|--|
|                            |              |   | MIN   | MAX    |     |  |   |   |  |
| P6SMBJ 56 / P6SMBJ 56C     | 56 / 56C     | 45.4  | 50.40   | 61.60  | 1.0 | 5.0  | 80.5  | 7.4   | 3.5  |
| P6SMBJ 56A / P6SMBJ 56CA   | 56A / 56CA   | 47.8  | 53.20   | 58.80  | 1.0 | 5.0  | 77.0  | 7.8   | 3.5  |
| P6SMBJ 62 / P6SMBJ 62C     | 62 / 62C     | 50.2  | 55.80   | 68.20  | 1.0 | 5.0  | 89.0  | 6.8   | 3.5  |
| P6SMBJ 62A / P6SMBJ 62CA   | 62A / 62CA   | 53.0  | 58.90   | 65.10  | 1.0 | 5.0  | 85.0  | 7.1   | 3.5  |
| P6SMBJ 68 / P6SMBJ 68C     | 68 / 68C     | 55.1  | 61.20   | 74.80  | 1.0 | 5.0  | 98.0  | 6.1   | 3.5  |
| P6SMBJ 68A / P6SMBJ 68CA   | 68A / 68CA   | 58.1  | 64.60   | 71.40  | 1.0 | 5.0  | 92.0  | 6.5   | 3.5  |
| P6SMBJ 75 / P6SMBJ 75C     | 75 / 75C     | 60.7  | 67.50   | 82.50  | 1.0 | 5.0  | 108.0   | 5.5   | 3.5  |
| P6SMBJ 75A / P6SMBJ 75CA   | 75A / 75CA   | 64.1  | 71.30   | 78.80  | 1.0 | 5.0  | 103.0   | 5.8   | 3.5  |
| P6SMBJ 82 / P6SMBJ 82C     | 82 / 82C     | 66.4  | 73.80   | 90.20  | 1.0 | 5.0  | 118.0   | 5.1   | 3.5  |
| P6SMBJ 82A / P6SMBJ 82CA   | 82A / 82CA   | 70.1  | 77.90   | 86.10  | 1.0 | 5.0  | 113.0   | 5.3   | 3.5  |
| P6SMBJ 91 / P6SMBJ 91C     | 91 / 91C     | 73.7  | 81.90   | 100.00 | 1.0 | 5.0  | 131.0   | 4.5   | 3.5  |
| P6SMBJ 91A / P6SMBJ 91CA   | 91A / 91CA   | 77.8  | 86.50   | 95.50  | 1.0 | 5.0  | 125.0   | 4.8   | 3.5  |
| P6SMBJ 100 / P6SMBJ 100C   | 100 / 100C   | 81.0  | 90.00   | 110.00 | 1.0 | 5.0  | 144.0   | 4.2   | 3.5  |
| P6SMBJ 100A / P6SMBJ 100CA | 100A / 100CA | 85.5  | 95.00   | 105.00 | 1.0 | 5.0  | 137.0   | 4.4   | 3.5  |
| P6SMBJ 110 / P6SMBJ 110C   | 110 / 110C   | 89.2  | 99.00   | 121.00 | 1.0 | 5.0  | 158.0   | 3.8   | 3.5  |
| P6SMBJ 110A / P6SMBJ 110CA | 110A / 110CA | 94.0  | 105.00  | 116.00 | 1.0 | 5.0  | 152.0   | 4.0   | 3.5  |
| P6SMBJ 120 / P6SMBJ 120C   | 120 / 120C   | 97.2  | 108.00  | 132.00 | 1.0 | 5.0  | 173.0   | 3.5   | 3.5  |
| P6SMBJ 120A / P6SMBJ 120CA | 120A / 120CA | 102.0   | 114.00  | 126.00 | 1.0 | 5.0  | 165.0   | 3.6   | 3.5  |
| P6SMBJ 130 / P6SMBJ 130C   | 130 / 130C   | 105.0   | 117.00  | 143.00 | 1.0 | 5.0  | 187.0   | 3.2   | 3.5  |
| P6SMBJ 130A / P6SMBJ 130CA | 130A / 130CA | 111.0   | 124.00  | 137.00 | 1.0 | 5.0  | 179.0   | 3.3   | 3.5  |
| P6SMBJ 150 / P6SMBJ 150C   | 150 / 150C   | 121.0   | 135.00  | 165.00 | 1.0 | 5.0  | 215.0   | 2.8   | 3.5  |
| P6SMBJ 150A / P6SMBJ 150CA | 150A / 150CA | 128.0   | 143.00  | 158.00 | 1.0 | 5.0  | 207.0   | 2.9   | 3.5  |
| P6SMBJ 160 / P6SMBJ 160C   | 160 / 160C   | 130.0   | 144.00  | 176.00 | 1.0 | 5.0  | 230.0   | 2.6   | 3.5  |
| P6SMBJ 160A / P6SMBJ 160CA | 160A / 160CA | 136.0   | 152.00  | 168.00 | 1.0 | 5.0  | 219.0   | 2.7   | 3.5  |
| P6SMBJ 170 / P6SMBJ 170C   | 170 / 170C   | 138.0   | 153.00  | 187.00 | 1.0 | 5.0  | 244.0   | 2.5   | 3.5  |
| P6SMBJ 170A / P6SMBJ 170CA | 170A / 170CA | 145.0   | 162.00  | 179.00 | 1.0 | 5.0  | 234.0   | 2.6   | 3.5  |
| P6SMBJ 180 / P6SMBJ 180C   | 180 / 180C   | 146.0   | 162.00  | 198.00 | 1.0 | 5.0  | 258.0   | 2.3   | 3.5  |
| P6SMBJ 180A / P6SMBJ 180CA | 180A / 180CA | 154.0   | 171.00  | 189.00 | 1.0 | 5.0  | 246.0   | 2.4   | 3.5  |
| P6SMBJ 200 / P6SMBJ 200C   | 200 / 200C   | 162.0   | 180.00  | 220.00 | 1.0 | 5.0  | 287.0   | 2.1   | 3.5  |
| P6SMBJ 200A / P6SMBJ 200CA | 200A / 200CA | 171.0   | 190.00  | 210.00 | 1.0 | 5.0  | 274.0   | 2.2   | 3.5  |
| P6SMBJ 220 / P6SMBJ 220C   | 220 / 220C   | 175.0   | 198.00  | 242.00 | 1.0 | 5.0  | 344.0   | 1.8   | 3.5  |
| P6SMBJ 220A / P6SMBJ 220CA | 220A / 220CA | 185.0   | 209.00  | 231.00 | 1.0 | 5.0  | 328.0   | 1.8   | 3.5  |

Notes:

1. Testing is performed @ 25°
2. B<sub>v</sub> is measured using a pulse of 20 milliseconds or less
3. V<sub>F</sub>, for uni-directional devices, is measured using a 300 microsecond square wave pulse @ I<sub>T</sub> = 50A
4. I<sub>R</sub> is doubled for Bi-directional devices only with V<sub>R</sub> equal or less than 10 volts

All products are sold to the commercial specifications shown for any additional reliability testing or extended parameters, please consult the factory.