



# P4SMA SERIES

## Surface Mount Transient Voltage Suppressor



Voltage Range  
6.8 to 200 Volts  
400 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:  
260°C / 10 seconds at terminals
- ✦ Plastic material used carries Underwriters Laboratory  
Flammability Classification 94V-0
- ✦ 300 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)

1. Weight: 0.064 gram

### SMA/DO-214AC



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 $T_A=25^\circ C$ ,<br>$T_p=1ms$ (Note 1)   | $P_{PK}$       | Minimum 400  | Watts      |
| Peak Forward Surge Current, 8.3 ms Single Half<br>Sine-wave Superimposed on Rated Load<br>(JEDEC method) (Note 2, 3) | $I_{FSM}$      | 40.0         | Amps       |
| Maximum Instantaneous Forward Voltage at<br>25.0A for Unidirectional Only  | $V_F$          | 3.5          | Volts      |
| Operating and Storage Temperature Range  | $T_J, T_{STG}$ | -55 to + 150 | $^\circ C$ |

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

2. Mounted on  $5.0mm^2$  (.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 P4SMA 6.8 through Types P4SMA200A.

2. Electrical Characteristics Apply in Both Directions.

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 IPPM (Note 2)(Amps) | Maximum Clamping Voltage at IPPM Vc(Volts) | Maximum Temperature Coefficient of VBR(% / °C) |
|-----------|---------------------|----------------------|-------|-----------------------|-------------------------------|--|--|--|--|
|           |                     | VBR (Volts) (Note 1) |       |                       |                               |  |  |  |  |
|           |                     | Min                  | Max   |                       |                               |  |  |  |  |
| P4SMA6.8  | ADJ                 | 6.12                 | 7.48  | 10                    | 5.50                          | 1000                                   | 38   | 10.8                                       | 0.057  |
| P4SMA6.8A | AEJ                 | 6.46                 | 7.14  | 10                    | 5.80                          | 1000                                   | 40   | 10.5                                       | 0.057  |
| P4SMA7.5  | AFJ                 | 6.75                 | 8.25  | 10                    | 6.05                          | 500                                    | 35   | 11.7                                       | 0.061  |
| P4SMA7.5A | AGJ                 | 7.13                 | 7.88  | 10                    | 6.40                          | 500                                    | 37   | 11.3                                       | 0.061  |
| P4SMA8.2  | AHJ                 | 7.38                 | 9.02  | 10                    | 6.63                          | 200                                    | 33   | 12.5                                       | 0.065  |
| P4SMA8.2A | AKJ                 | 7.79                 | 8.61  | 10                    | 7.02                          | 200                                    | 34   | 12.1                                       | 0.065  |
| P4SMA9.1  | ALJ                 | 8.19                 | 10.0  | 1.0                   | 7.37                          | 50                                     | 30   | 13.8                                       | 0.068  |
| P4SMA9.1A | AMJ                 | 8.65                 | 9.55  | 1.0                   | 7.78                          | 50                                     | 31   | 13.4                                       | 0.068  |
| P4SMA10   | ANJ                 | 9.00                 | 11.0  | 1.0                   | 8.10                          | 10                                     | 28   | 15.0                                       | 0.073  |
| P4SMA10A  | APJ                 | 9.50                 | 10.5  | 1.0                   | 8.55                          | 10                                     | 29   | 14.5                                       | 0.073  |
| P4SMA11   | AQJ                 | 9.90                 | 12.1  | 1.0                   | 8.92                          | 5.0                                    | 26   | 16.2                                       | 0.075  |
| P4SMA11A  | ARJ                 | 10.5                 | 11.6  | 1.0                   | 9.40                          | 5.0                                    | 27   | 15.6                                       | 0.075  |
| P4SMA12   | ASJ                 | 10.8                 | 13.2  | 1.0                   | 9.72                          | 5.0                                    | 24   | 17.3                                       | 0.078  |
| P4SMA12A  | ATJ                 | 11.4                 | 12.6  | 1.0                   | 10.2                          | 5.0                                    | 25   | 16.7                                       | 0.078  |
| P4SMA13   | AUJ                 | 11.7                 | 14.3  | 1.0                   | 10.5                          | 5.0                                    | 22   | 19.0                                       | 0.081  |
| P4SMA13A  | AVJ                 | 12.4                 | 13.7  | 1.0                   | 11.1                          | 5.0                                    | 23   | 18.2                                       | 0.081  |
| P4SMA15   | AWJ                 | 13.5                 | 16.5  | 1.0                   | 12.1                          | 5.0                                    | 19   | 22.0                                       | 0.084  |
| P4SMA15A  | AXJ                 | 14.3                 | 15.8  | 1.0                   | 12.8                          | 5.0                                    | 20   | 21.2                                       | 0.084  |
| P4SMA16   | AYJ                 | 14.4                 | 17.6  | 1.0                   | 12.9                          | 5.0                                    | 17.8   | 23.5                                       | 0.086  |
| P4SMA16A  | AZJ                 | 15.2                 | 16.8  | 1.0                   | 13.6                          | 5.0                                    | 18.6   | 22.5                                       | 0.086  |
| P4SMA18   | BDJ                 | 16.2                 | 19.8  | 1.0                   | 14.5                          | 5.0                                    | 16   | 26.5                                       | 0.088  |
| P4SMA18A  | BEJ                 | 17.1                 | 18.9  | 1.0                   | 15.3                          | 5.0                                    | 16.5   | 25.5                                       | 0.088  |
| P4SMA20   | BFJ                 | 18.0                 | 22.0  | 1.0                   | 16.2                          | 5.0                                    | 14   | 29.1                                       | 0.090  |
| P4SMA20A  | BGJ                 | 19.0                 | 21.0  | 1.0                   | 17.1                          | 5.0                                    | 15   | 27.7                                       | 0.090  |
| P4SMA22   | BHJ                 | 19.8                 | 24.2  | 1.0                   | 17.8                          | 5.0                                    | 13   | 31.9                                       | 0.092  |
| P4SMA22A  | BKJ                 | 20.9                 | 23.1  | 1.0                   | 18.8                          | 5.0                                    | 13.7   | 30.6                                       | 0.092  |
| P4SMA24   | BLJ                 | 21.6                 | 26.4  | 1.0                   | 19.4                          | 5.0                                    | 12   | 34.7                                       | 0.094  |
| P4SMA24A  | BMJ                 | 22.8                 | 25.2  | 1.0                   | 20.5                          | 5.0                                    | 12.6   | 33.2                                       | 0.094  |
| P4SMA27   | BNJ                 | 24.3                 | 29.7  | 1.0                   | 21.8                          | 5.0                                    | 10.7   | 39.1                                       | 0.096  |
| P4SMA27A  | BPJ                 | 25.7                 | 28.4  | 1.0                   | 23.1                          | 5.0                                    | 11.0   | 37.5                                       | 0.096  |
| P4SMA30   | BQJ                 | 27.0                 | 33.0  | 1.0                   | 24.3                          | 5.0                                    | 9.6  | 43.5                                       | 0.097  |
| P4SMA30A  | BRJ                 | 28.5                 | 31.5  | 1.0                   | 25.6                          | 5.0                                    | 10   | 41.4                                       | 0.097  |
| P4SMA33   | BSJ                 | 29.7                 | 36.3  | 1.0                   | 26.8                          | 5.0                                    | 8.8  | 47.7                                       | 0.098  |
| P4SMA33A  | BTJ                 | 31.4                 | 34.7  | 1.0                   | 28.2                          | 5.0                                    | 9.0  | 45.7                                       | 0.098  |
| P4SMA36   | BUJ                 | 32.4                 | 39.6  | 1.0                   | 29.1                          | 5.0                                    | 8.0  | 52.0                                       | 0.099  |
| P4SMA36A  | BVJ                 | 34.2                 | 37.8  | 1.0                   | 30.8                          | 5.0                                    | 8.4  | 49.9                                       | 0.099  |
| P4SMA39   | BWJ                 | 35.1                 | 42.9  | 1.0                   | 31.6                          | 5.0                                    | 7.4  | 56.4                                       | 0.100  |
| P4SMA39A  | BXJ                 | 37.1                 | 41.0  | 1.0                   | 33.3                          | 5.0                                    | 7.7  | 53.9                                       | 0.100  |
| P4SMA43   | BYJ                 | 38.7                 | 47.3  | 1.0                   | 34.8                          | 5.0                                    | 6.7  | 61.9                                       | 0.101  |
| P4SMA43A  | BZJ                 | 40.9                 | 45.2  | 1.0                   | 36.8                          | 5.0                                    | 7.0  | 59.3                                       | 0.101  |
| P4SMA47   | CDJ                 | 42.3                 | 51.7  | 1.0                   | 38.1                          | 5.0                                    | 6.2  | 67.8                                       | 0.101  |
| P4SMA47A  | CEJ                 | 44.7                 | 49.4  | 1.0                   | 40.2                          | 5.0                                    | 6.4  | 64.8                                       | 0.101  |
| P4SMA51   | CFJ                 | 45.9                 | 56.1  | 1.0                   | 41.3                          | 5.0                                    | 5.7  | 73.5                                       | 0.102  |
| P4SMA51A  | CGJ                 | 48.5                 | 53.6  | 1.0                   | 43.6                          | 5.0                                    | 6.0  | 70.1                                       | 0.102  |
| P4SMA56   | CHJ                 | 50.4                 | 61.6  | 1.0                   | 45.4                          | 5.0                                    | 5.2  | 80.5                                       | 0.103  |
| P4SMA56A  | CKJ                 | 53.2                 | 58.8  | 1.0                   | 47.8                          | 5.0                                    | 5.4  | 77.0                                       | 0.103  |
| P4SMA62   | CLJ                 | 55.8                 | 68.2  | 1.0                   | 50.2                          | 5.0                                    | 4.7  | 89.0                                       | 0.104  |
| P4SMA62A  | CMJ                 | 58.9                 | 65.1  | 1.0                   | 53.0                          | 5.0                                    | 5.0  | 85.0                                       | 0.104  |
| P4SMA68   | CNJ                 | 61.2                 | 74.8  | 1.0                   | 55.1                          | 5.0                                    | 4.2  | 98.0                                       | 0.104  |
| P4SMA68A  | CPJ                 | 64.6                 | 71.4  | 1.0                   | 58.1                          | 5.0                                    | 4.5  | 92.0                                       | 0.104  |
| P4SMA75   | CQJ                 | 67.5                 | 82.5  | 1.0                   | 60.7                          | 5.0                                    | 3.8  | 108.0                                      | 0.105  |
| P4SMA75A  | CRJ                 | 71.3                 | 78.8  | 1.0                   | 64.1                          | 5.0                                    | 4.0  | 103.0                                      | 0.105  |
| P4SMA82   | CSJ                 | 73.8                 | 90.2  | 1.0                   | 66.4                          | 5.0                                    | 3.5  | 118.0                                      | 0.105  |
| P4SMA82A  | CTJ                 | 77.9                 | 86.1  | 1.0                   | 70.1                          | 5.0                                    | 3.7  | 113.0                                      | 0.105  |
| P4SMA91   | CUJ                 | 81.9                 | 100.0 | 1.0                   | 73.7                          | 5.0                                    | 3.2  | 131.0                                      | 0.106  |
| P4SMA91A  | CVJ                 | 86.5                 | 95.5  | 1.0                   | 77.8                          | 5.0                                    | 3.3  | 125.0                                      | 0.106  |

**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>PPM</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   |                                   |   |  |  |   |   |
| P4SMA100  | CWJ                 | 90.0                             | 110.0 | 1.0                               | 81.0                                      | 5.0  | 2.9  | 144.0   | 0.106   |
| P4SMA100A | CXJ                 | 95.0                             | 105.0 | 1.0                               | 85.5                                      | 5.0  | 3.0  | 137.0   | 0.106   |
| P4SMA110  | CYJ                 | 99.0                             | 121.0 | 1.0                               | 89.2                                      | 5.0  | 2.6  | 158.0   | 0.107   |
| P4SMA110A | CZJ                 | 105.0                            | 116.0 | 1.0                               | 94.0                                      | 5.0  | 2.7  | 152.0   | 0.107   |
| P4SMA120  | RDJ                 | 108.0                            | 132.0 | 1.0                               | 97.2                                      | 5.0  | 2.4  | 173.0   | 0.107   |
| P4SMA120A | REJ                 | 114.0                            | 126.0 | 1.0                               | 102.0                                     | 5.0  | 2.5  | 165.0   | 0.107   |
| P4SMA130  | RFJ                 | 117.0                            | 143.0 | 1.0                               | 105.0                                     | 5.0  | 2.2  | 187.0   | 0.107   |
| P4SMA130A | RGJ                 | 124.0                            | 137.0 | 1.0                               | 111.0                                     | 5.0  | 2.3  | 179.0   | 0.107   |
| P4SMA150  | RHJ                 | 135.0                            | 165.0 | 1.0                               | 121.0                                     | 5.0  | 1.9  | 215.0   | 0.108   |
| P4SMA150A | RKJ                 | 143.0                            | 158.0 | 1.0                               | 128.0                                     | 5.0  | 2.0  | 207.0   | 0.108   |
| P4SMA160  | RLJ                 | 144.0                            | 176.0 | 1.0                               | 130.0                                     | 5.0  | 1.8  | 230.0   | 0.108   |
| P4SMA160A | RMJ                 | 152.0                            | 168.0 | 1.0                               | 136.0                                     | 5.0  | 1.9  | 219.0   | 0.108   |
| P4SMA170  | RNJ                 | 153.0                            | 187.0 | 1.0                               | 138.0                                     | 5.0  | 1.7  | 244.0   | 0.108   |
| P4SMA170A | RPJ                 | 162.0                            | 179.0 | 1.0                               | 145.0                                     | 5.0  | 1.8  | 234.0   | 0.108   |
| P4SMA180  | RQJ                 | 162.0                            | 198.0 | 1.0                               | 146.0                                     | 5.0  | 1.6  | 258.0   | 0.108   |
| P4SMA180A | RRJ                 | 171.0                            | 189.0 | 1.0                               | 154.0                                     | 5.0  | 1.7  | 246.0   | 0.108   |
| P4SMA200  | RSJ                 | 180.0                            | 220.0 | 1.0                               | 162.0                                     | 5.0  | 1.4  | 287.0   | 0.108   |
| P4SMA200A | RTJ                 | 190.0                            | 210.0 | 1.0                               | 171.0                                     | 5.0  | 1.51   | 274.0   | 0.108   |

**Notes:**

1. V<sub>BR</sub> measured after I<sub>T</sub> applied for 300us, I<sub>T</sub>=square wave pulse or equivalent.
2. Surge current waveform per Figure 3 and derate per Figure 2.
3. For bipolar types having V<sub>WM</sub> of 10 volts and under, the I<sub>D</sub> limit is doubled.
4. For bidirectional use C or CA suffix for types P4SMA6.8 through P4SMA200A.
5. All terms and symbols are consistent with ANSI/IEEE C62.35.



## RATINGS AND CHARACTERISTIC CURVES (P4SMA SERIES)

FIG.1- PEAK PULSE POWER RATING CURVE

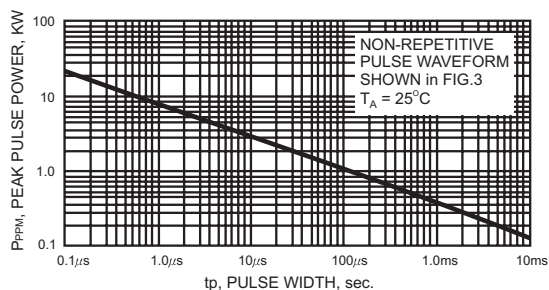


FIG.2- PULSE DERATING CURVE

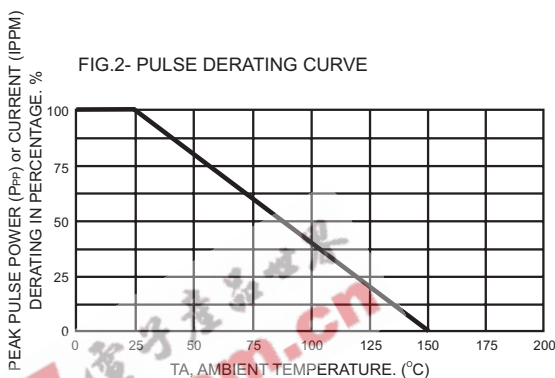


FIG.3- PULSE WAVEFORM

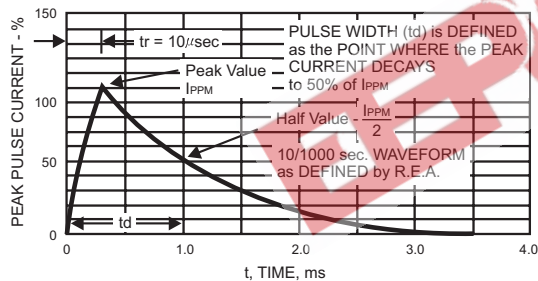


FIG.4- MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

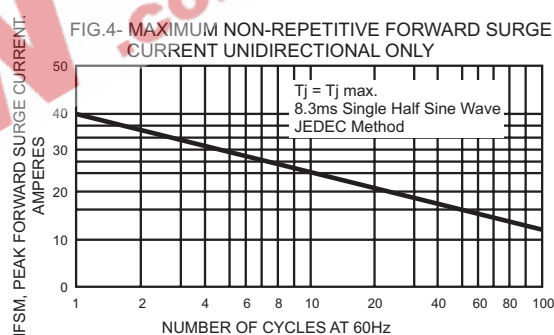


FIG.5- TYPICAL REVERSE LEAKAGE CHARACTERISTICS

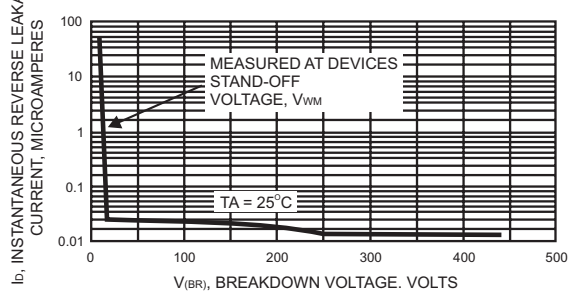


FIG.6- TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

