



P4SMAJ SERIES

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR POWER 400 Watt

STAND-OFF VOLTAGE

5 to 220 Volt

SMA / DO-214AC

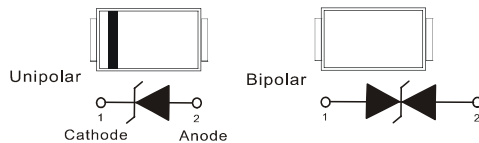
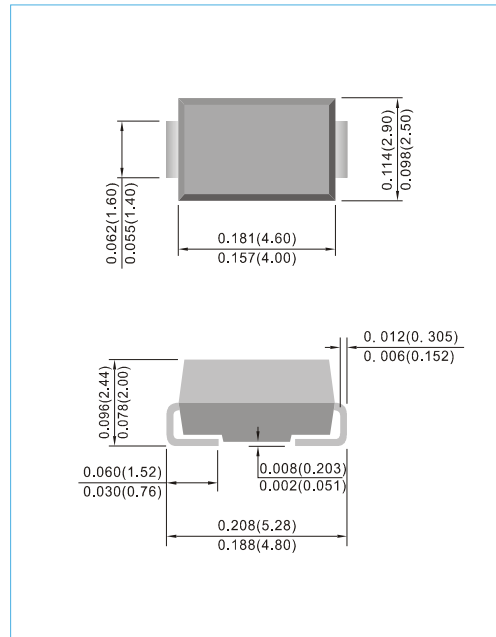
Unit : inch(mm)

FEATURES

- For surface mounted applications in order to optimize board space.
- Glass passivated junction
- Low inductance
- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- High temperature soldering : 260°C /10 seconds at terminals
- ESD IEC-61000-4-2 Air \pm 30kV, Contact \pm 30kV
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

MECHANICAL DATA

- Case: JEDEC DO-214AC, Molded plastic over passivated junction
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode end
- Standard Packaging: 12mm tape (EIA-481)
- Weight: 0.0023 ounces, 0.0679 grams



DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types P4SMAJ5.0 thru types P4SMAJ220.
Electrical characteristics apply in both directions.

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

| Rating | Symbol | Value | Units |
|---|-----------------|----------------------|-----------------------------|
| Peak Pulse Power Dissipation on $T_A = 25^\circ\text{C}$ (Notes 1,2,5, Fig.1) | P_{PP} | 400 | Watts |
| Peak Forward Surge Current per Fig.5 (Notes 3) | I_{FSM} | 40 | Amps |
| Peak Pulse Current on $t_p=10/1000\mu\text{s}$ waveform (Notes 1) Fig.2 | I_{PPM} | see Table 1 | Amps |
| Typical Thermal Resistance Junction to Air (Notes 2) | $R_{\theta JA}$ | 70 | $^\circ\text{C} / \text{W}$ |
| ESD IEC-61000-4-2 (Air) ESD IEC-61000-4-2 (Contact) | V_{ESD} | ± 30 ± 30 | kV |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 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 5mm² copper pads to each terminal.
3. 8.3ms single half sine-wave, or equivalent square wave, duty cycle = 4 pulses per minutes maximum.
4. Lead temperature at 75°C = T_L .
5. Peak pulse power waveform is 10/1000 μs .
6. A transient suppressor is selected according to the working peak reverse voltage (V_{RWM}), which should be equal to or greater than the DC or continuous peak operating voltage level.



P4SMAJ SERIES

| Part Number | | Reverse Stand-off Voltage | Breakdown Voltage | | Test Current | Reverse Leakage | | Max. Clamp Voltage 10/1000 μ s | Peak Pulse Current 10/1000 μ s | Marking Code | |
|-------------|-------------|---------------------------|-------------------|-------|--------------|-----------------|---------|---------------------------------------|---------------------------------------|--------------|----|
| | | | $V_{BR} @ I_T$ | | | $I_R @ V_{RWM}$ | | | | | |
| | | V_{RWM} (Notes 6) | Min. | Max. | I_T | UNI | BI | $V_C @ I_{PP}$ | I_{PP} | | |
| UNI | BI | V | V | V | mA | μ A | μ A | V | A | UNI | BI |
| P4SMAJ5.0 | P4SMAJ5.0C | 5 | 6.4 | 7.55 | 10 | 800 | 1600 | 9.6 | 41.6 | HD | TD |
| P4SMAJ5.0A | P4SMAJ5.0CA | 5 | 6.4 | 7 | 10 | 800 | 1600 | 9.2 | 43.5 | HE | TE |
| P4SMAJ6.0 | P4SMAJ6.0C | 6 | 6.67 | 8.45 | 10 | 800 | 1600 | 11.4 | 35.1 | HF | TF |
| P4SMAJ6.0A | P4SMAJ6.0CA | 6 | 6.67 | 7.37 | 10 | 800 | 1600 | 10.3 | 38.8 | HG | TG |
| P4SMAJ6.5 | P4SMAJ6.5C | 6.5 | 7.22 | 9.14 | 10 | 500 | 1000 | 12.3 | 32.5 | HH | TH |
| P4SMAJ6.5A | P4SMAJ6.5CA | 6.5 | 7.22 | 7.98 | 10 | 500 | 1000 | 11.2 | 35.7 | HK | TK |
| P4SMAJ7.0 | P4SMAJ7.0C | 7 | 7.78 | 9.86 | 10 | 200 | 400 | 13.3 | 30.1 | HL | TL |
| P4SMAJ7.0A | P4SMAJ7.0CA | 7 | 7.78 | 8.6 | 10 | 200 | 400 | 12 | 33.3 | HM | TM |
| P4SMAJ7.5 | P4SMAJ7.5C | 7.5 | 8.33 | 10.67 | 1 | 100 | 200 | 14.3 | 28 | HN | TN |
| P4SMAJ7.5A | P4SMAJ7.5CA | 7.5 | 8.33 | 9.21 | 1 | 100 | 200 | 12.9 | 31 | HP | TP |
| P4SMAJ8.0 | P4SMAJ8.0C | 8 | 8.89 | 11.3 | 1 | 50 | 100 | 15 | 26.5 | HQ | TQ |
| P4SMAJ8.0A | P4SMAJ8.0CA | 8 | 8.89 | 9.83 | 1 | 50 | 100 | 13.6 | 29.4 | HR | TR |
| P4SMAJ8.5 | P4SMAJ8.5C | 8.50 | 9.44 | 11.92 | 1 | 10 | 20 | 15.9 | 25.1 | HS | TS |
| P4SMAJ8.5A | P4SMAJ8.5CA | 8.50 | 9.44 | 10.4 | 1 | 10 | 20 | 14.4 | 27.7 | HT | TT |
| P4SMAJ9.0 | P4SMAJ9.0C | 9 | 10 | 12.6 | 1 | 5 | 5 | 16.9 | 23.6 | HU | TU |
| P4SMAJ9.0A | P4SMAJ9.0CA | 9 | 10 | 11.1 | 1 | 5 | 5 | 15.4 | 26 | HV | TV |
| P4SMAJ10 | P4SMAJ10C | 10 | 11.1 | 14.1 | 1 | 5 | 5 | 18.8 | 21.2 | HW | TW |
| P4SMAJ10A | P4SMAJ10CA | 10 | 11.1 | 12.3 | 1 | 5 | 5 | 17 | 23.5 | HX | TX |
| P4SMAJ11 | P4SMAJ11C | 11 | 12.2 | 15.4 | 1 | 1 | 1 | 20.1 | 20 | HY | TY |
| P4SMAJ11A | P4SMAJ11CA | 11 | 12.2 | 13.5 | 1 | 1 | 1 | 18.2 | 22 | HZ | TZ |
| P4SMAJ12 | P4SMAJ12C | 12 | 13.3 | 16.9 | 1 | 1 | 1 | 22 | 18.1 | ID | UD |
| P4SMAJ12A | P4SMAJ12CA | 12 | 13.3 | 14.7 | 1 | 1 | 1 | 19.9 | 20.1 | IE | UE |
| P4SMAJ13 | P4SMAJ13C | 13 | 14.4 | 18.2 | 1 | 1 | 1 | 23.8 | 16.8 | IF | UF |
| P4SMAJ13A | P4SMAJ13CA | 13 | 14.4 | 15.9 | 1 | 1 | 1 | 21.5 | 18.6 | IG | UG |
| P4SMAJ14 | P4SMAJ14C | 14 | 15.6 | 19.8 | 1 | 1 | 1 | 25.8 | 15.5 | IH | UH |
| P4SMAJ14A | P4SMAJ14CA | 14 | 15.6 | 17.2 | 1 | 1 | 1 | 23.2 | 17.2 | IK | UK |
| P4SMAJ15 | P4SMAJ15C | 15 | 16.7 | 21.1 | 1 | 1 | 1 | 26.9 | 14.8 | IL | UL |
| P4SMAJ15A | P4SMAJ15CA | 15 | 16.7 | 18.5 | 1 | 1 | 1 | 24.4 | 16.4 | IM | UM |
| P4SMAJ16 | P4SMAJ16C | 16 | 17.8 | 22.6 | 1 | 1 | 1 | 28.8 | 13.8 | IN | UN |
| P4SMAJ16A | P4SMAJ16CA | 16 | 17.8 | 19.7 | 1 | 1 | 1 | 26 | 15.3 | IP | UP |
| P4SMAJ17 | P4SMAJ17C | 17 | 18.9 | 23.9 | 1 | 1 | 1 | 30.5 | 13.1 | IQ | UQ |
| P4SMAJ17A | P4SMAJ17CA | 17 | 18.9 | 20.9 | 1 | 1 | 1 | 27.6 | 14.5 | IR | UR |
| P4SMAJ18 | P4SMAJ18C | 18 | 20 | 25.3 | 1 | 1 | 1 | 32.2 | 12.4 | IS | US |
| P4SMAJ18A | P4SMAJ18CA | 18 | 20 | 22.1 | 1 | 1 | 1 | 29.2 | 13.7 | IT | UT |
| P4SMAJ20 | P4SMAJ20C | 20 | 22.2 | 28.1 | 1 | 1 | 1 | 35.8 | 11.1 | IU | UU |
| P4SMAJ20A | P4SMAJ20CA | 20 | 22.2 | 24.5 | 1 | 1 | 1 | 32.4 | 12.3 | IV | UV |
| P4SMAJ22 | P4SMAJ22C | 22 | 24.4 | 30.9 | 1 | 1 | 1 | 39.4 | 10.1 | IW | UW |
| P4SMAJ22A | P4SMAJ22CA | 22 | 24.4 | 26.9 | 1 | 1 | 1 | 35.5 | 11.2 | IX | UX |
| P4SMAJ24 | P4SMAJ24C | 24 | 26.7 | 33.8 | 1 | 1 | 1 | 43 | 9.3 | IY | UY |
| P4SMAJ24A | P4SMAJ24CA | 24 | 26.7 | 29.5 | 1 | 1 | 1 | 38.9 | 10.3 | IZ | UZ |
| P4SMAJ26 | P4SMAJ26C | 26 | 28.9 | 36.6 | 1 | 1 | 1 | 46.6 | 8.6 | JD | VD |
| P4SMAJ26A | P4SMAJ26CA | 26 | 28.9 | 31.9 | 1 | 1 | 1 | 42.1 | 9.5 | JE | VE |
| P4SMAJ28 | P4SMAJ28C | 28 | 31.1 | 39.4 | 1 | 1 | 1 | 50 | 8 | JF | VF |
| P4SMAJ28A | P4SMAJ28CA | 28 | 31.1 | 34.4 | 1 | 1 | 1 | 45.4 | 8.8 | JG | VG |
| P4SMAJ30 | P4SMAJ30C | 30 | 33.3 | 42.2 | 1 | 1 | 1 | 53.5 | 7.5 | JH | VH |
| P4SMAJ30A | P4SMAJ30CA | 30 | 33.3 | 36.8 | 1 | 1 | 1 | 48.4 | 8.3 | JK | VK |
| P4SMAJ33 | P4SMAJ33C | 33 | 36.7 | 46.5 | 1 | 1 | 1 | 59 | 6.8 | JL | VL |
| P4SMAJ33A | P4SMAJ33CA | 33 | 36.7 | 40.6 | 1 | 1 | 1 | 53.3 | 7.5 | JM | VM |
| P4SMAJ36 | P4SMAJ36C | 36 | 40 | 50.7 | 1 | 1 | 1 | 64.3 | 6.2 | JN | VN |
| P4SMAJ36A | P4SMAJ36CA | 36 | 40 | 44.2 | 1 | 1 | 1 | 58.1 | 6.9 | JP | VP |
| P4SMAJ40 | P4SMAJ40C | 40 | 44.4 | 56.3 | 1 | 1 | 1 | 71.4 | 5.6 | JQ | VQ |
| P4SMAJ40A | P4SMAJ40CA | 40 | 44.4 | 49.1 | 1 | 1 | 1 | 64.5 | 6.2 | JR | VR |



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| Part Number | | Reverse Stand-off Voltage | Breakdown Voltage | | Test Current | Reverse Leakage | | Max. Clamp Voltage 10/1000µs | Peak Pulse Current 10/1000µs | Marking Code | |
|-------------|-------------|---------------------------|----------------------------------|-------|--------------|-----------------------------------|----------------|---------------------------------|---------------------------------|--------------|----|
| | | | V _{BR} @ I _T | | | I _R @ V _{RRM} | | | | | |
| | | | V _{RRM} (Notes 6) | Min. | | Max. | I _T | | | | |
| UNI | BI | V | V | V | mA | µA | µA | V | A | UNI | BI |
| P4SMAJ43 | P4SMAJ43C | 43 | 47.8 | 60.5 | 1 | 1 | 1 | 76.7 | 5.2 | JS | VS |
| P4SMAJ43A | P4SMAJ43CA | 43 | 47.8 | 52.8 | 1 | 1 | 1 | 69.4 | 5.7 | JT | VT |
| P4SMAJ45 | P4SMAJ45C | 45 | 50 | 63.3 | 1 | 1 | 1 | 80.3 | 5 | JU | VU |
| P4SMAJ45A | P4SMAJ45CA | 45 | 50 | 55.3 | 1 | 1 | 1 | 72.7 | 5.5 | JV | VV |
| P4SMAJ48 | P4SMAJ48C | 48 | 53.3 | 67.5 | 1 | 1 | 1 | 85.5 | 4.7 | JW | VW |
| P4SMAJ48A | P4SMAJ48CA | 48 | 53.3 | 58.9 | 1 | 1 | 1 | 77.4 | 5.2 | JX | VX |
| P4SMAJ51 | P4SMAJ51C | 51 | 56.7 | 71.8 | 1 | 1 | 1 | 91.1 | 4.4 | JY | VY |
| P4SMAJ51A | P4SMAJ51CA | 51 | 56.7 | 62.7 | 1 | 1 | 1 | 82.4 | 4.9 | JZ | VZ |
| P4SMAJ54 | P4SMAJ54C | 54 | 60 | 76 | 1 | 1 | 1 | 96.3 | 4.2 | RD | WD |
| P4SMAJ54A | P4SMAJ54CA | 54 | 60 | 66.3 | 1 | 1 | 1 | 87.1 | 4.6 | RE | WE |
| P4SMAJ58 | P4SMAJ58C | 58 | 64.4 | 81.6 | 1 | 1 | 1 | 103 | 3.9 | RF | WF |
| P4SMAJ58A | P4SMAJ58CA | 58 | 64.4 | 71.2 | 1 | 1 | 1 | 93.6 | 4.3 | RG | WG |
| P4SMAJ60 | P4SMAJ60C | 60 | 66.7 | 84.5 | 1 | 1 | 1 | 107 | 3.7 | RH | WH |
| P4SMAJ60A | P4SMAJ60CA | 60 | 66.7 | 73.7 | 1 | 1 | 1 | 96.8 | 4.1 | RK | WK |
| P4SMAJ64 | P4SMAJ64C | 64 | 71.1 | 90.1 | 1 | 1 | 1 | 114 | 3.5 | RL | WL |
| P4SMAJ64A | P4SMAJ64CA | 64 | 71.1 | 78.6 | 1 | 1 | 1 | 103 | 3.9 | RM | WM |
| P4SMAJ70 | P4SMAJ70C | 70 | 77.8 | 98.6 | 1 | 1 | 1 | 125 | 3.2 | RN | WN |
| P4SMAJ70A | P4SMAJ70CA | 70 | 77.8 | 86 | 1 | 1 | 1 | 113 | 3.5 | RP | WP |
| P4SMAJ75 | P4SMAJ75C | 75 | 83.3 | 105.7 | 1 | 1 | 1 | 134 | 3 | RQ | WQ |
| P4SMAJ75A | P4SMAJ75CA | 75 | 83.3 | 92.1 | 1 | 1 | 1 | 121 | 3.3 | RR | WR |
| P4SMAJ78 | P4SMAJ78C | 78 | 86.7 | 109.8 | 1 | 1 | 1 | 139 | 2.9 | RS | WS |
| P4SMAJ78A | P4SMAJ78CA | 78 | 86.7 | 95.8 | 1 | 1 | 1 | 126 | 3.2 | RT | WT |
| P4SMAJ85 | P4SMAJ85C | 85 | 94.4 | 119.2 | 1 | 1 | 1 | 151 | 2.6 | RU | WU |
| P4SMAJ85A | P4SMAJ85CA | 85 | 94.4 | 104 | 1 | 1 | 1 | 137 | 2.9 | RV | WV |
| P4SMAJ90 | P4SMAJ90C | 90 | 100 | 126.5 | 1 | 1 | 1 | 160 | 2.5 | RW | WW |
| P4SMAJ90A | P4SMAJ90CA | 90 | 100 | 111 | 1 | 1 | 1 | 146 | 2.7 | RX | WX |
| P4SMAJ100 | P4SMAJ100C | 100 | 111 | 141 | 1 | 1 | 1 | 179 | 2.2 | RY | WY |
| P4SMAJ100A | P4SMAJ100CA | 100 | 111 | 123 | 1 | 1 | 1 | 162 | 2.5 | RZ | WZ |
| P4SMAJ110 | P4SMAJ110C | 110 | 122 | 154.5 | 1 | 1 | 1 | 196 | 2 | SD | XD |
| P4SMAJ110A | P4SMAJ110CA | 110 | 122 | 135 | 1 | 1 | 1 | 177 | 2.3 | SE | XE |
| P4SMAJ120 | P4SMAJ120C | 120 | 133 | 169 | 1 | 1 | 1 | 214 | 1.9 | SF | XF |
| P4SMAJ120A | P4SMAJ120CA | 120 | 133 | 147 | 1 | 1 | 1 | 193 | 2 | SG | XG |
| P4SMAJ130 | P4SMAJ130C | 130 | 144 | 182.5 | 1 | 1 | 1 | 231 | 1.7 | SH | XH |
| P4SMAJ130A | P4SMAJ130CA | 130 | 144 | 159 | 1 | 1 | 1 | 209 | 1.9 | SK | XK |
| P4SMAJ150 | P4SMAJ150C | 150 | 167 | 211.5 | 1 | 1 | 1 | 268 | 1.5 | SL | XL |
| P4SMAJ150A | P4SMAJ150CA | 150 | 167 | 185 | 1 | 1 | 1 | 243 | 1.6 | SM | XM |
| P4SMAJ160 | P4SMAJ160C | 160 | 178 | 226 | 1 | 1 | 1 | 287 | 1.4 | SN | XN |
| P4SMAJ160A | P4SMAJ160CA | 160 | 178 | 197 | 1 | 1 | 1 | 259 | 1.5 | SP | XP |
| P4SMAJ170 | P4SMAJ170C | 170 | 189 | 239.5 | 1 | 1 | 1 | 304 | 1.3 | SQ | XQ |
| P4SMAJ170A | P4SMAJ170CA | 170 | 189 | 209 | 1 | 1 | 1 | 275 | 1.4 | SR | XR |
| P4SMAJ180 | P4SMAJ180C | 180 | 198 | 253.8 | 1 | 1 | 1 | 322 | 1.2 | SS | YS |
| P4SMAJ180A | P4SMAJ180CA | 180 | 198 | 222 | 1 | 1 | 1 | 292 | 1.3 | ST | YT |
| P4SMAJ190 | P4SMAJ190C | 190 | 209 | 267.9 | 1 | 1 | 1 | 340 | 1.2 | SU | YU |
| P4SMAJ190A | P4SMAJ190CA | 190 | 209 | 243.2 | 1 | 1 | 1 | 308 | 1.3 | SV | YV |
| P4SMAJ200 | P4SMAJ200C | 200 | 220 | 282 | 1 | 1 | 1 | 358 | 1.1 | SW | YW |
| P4SMAJ200A | P4SMAJ200CA | 200 | 220 | 247 | 1 | 1 | 1 | 324 | 1.2 | SX | YX |
| P4SMAJ210 | P4SMAJ210C | 210 | 231 | 296.1 | 1 | 1 | 1 | 376 | 1.1 | SY | YY |
| P4SMAJ210A | P4SMAJ210CA | 210 | 231 | 268.8 | 1 | 1 | 1 | 340 | 1.2 | SZ | YZ |
| P4SMAJ220 | P4SMAJ220C | 220 | 242 | 310.2 | 1 | 1 | 1 | 394 | 1 | GD | ZD |
| P4SMAJ220A | P4SMAJ220CA | 220 | 242 | 272 | 1 | 1 | 1 | 356 | 1.1 | GE | ZE |



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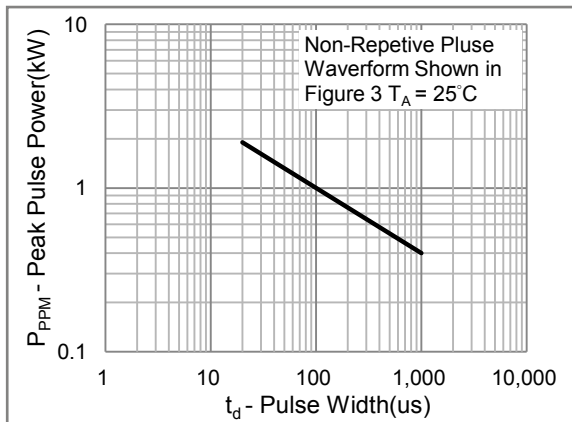


Fig.1 Peak Pulse Power Rating

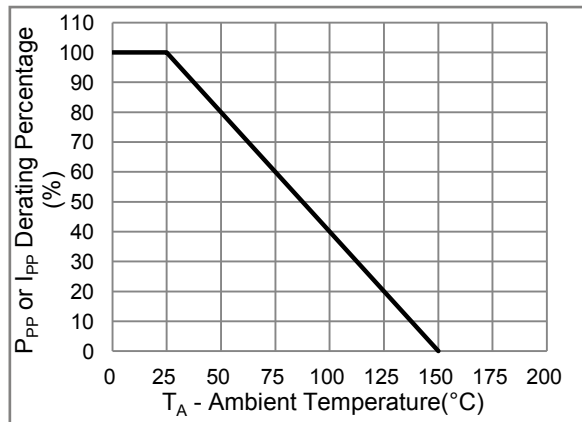


Fig.2 Derating Curve

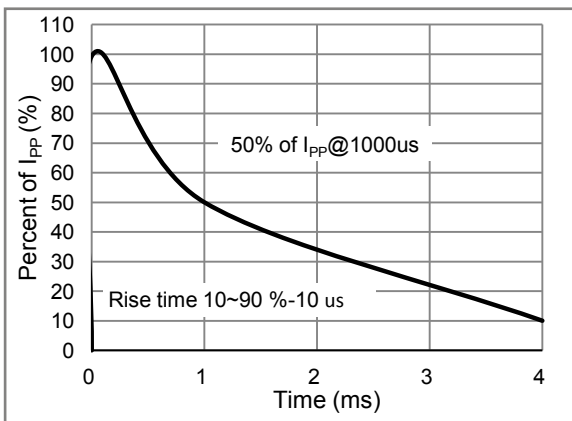


Fig.3 Pulse Waveform

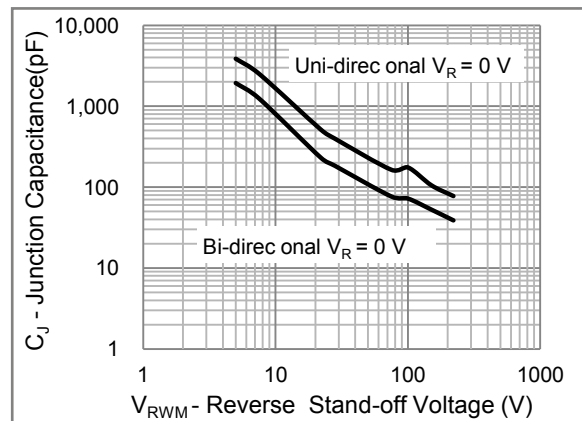
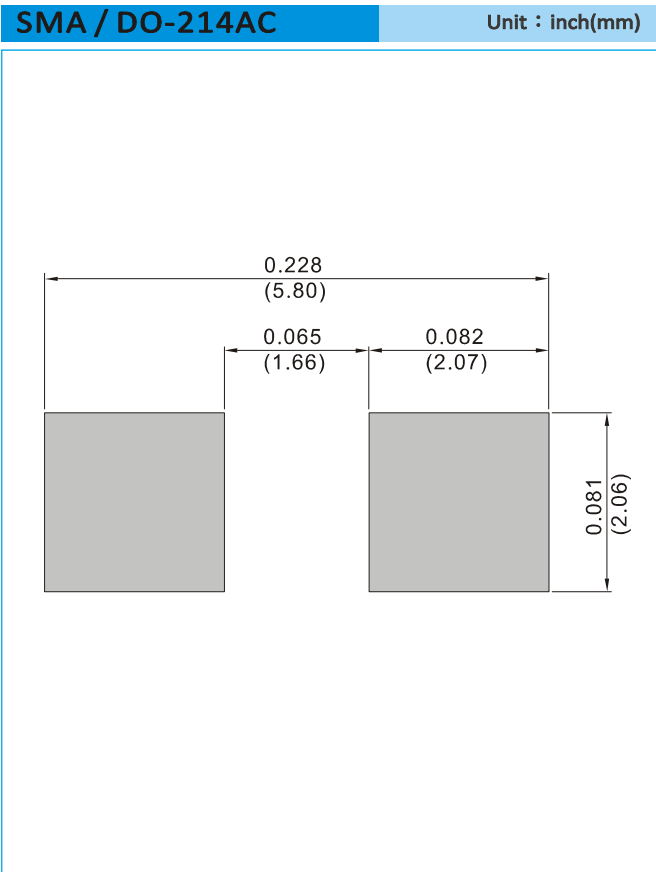


Fig.4 Typical Capacitance



P4SMAJ SERIES

MOUNTING PAD LAYOUT



ORDER INFORMATION

- Packing information
T/R - 7.5K per 13" plastic Reel
T/R - 1.8K per 7" plastic Reel



P4SMAJ SERIES

Part No_packing code_Version

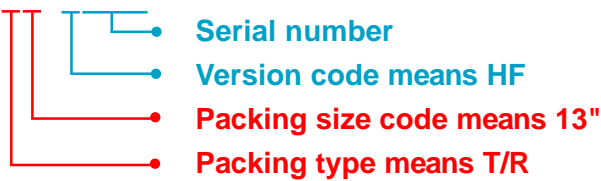
P4SMAJ5.0_R1_00001

P4SMAJ5.0_R2_00001

For example :

RB500V-40_R2_00001

Part No.



| Packing Code XX | | | | Version Code XXXXX | | |
|--------------------------------------|----------------------|----------------------------------|----------------------|---------------------------|----------------------|---------------------------------------|
| Packing type | 1 st Code | Packing size code | 2 nd Code | HF or RoHS | 1 st Code | 2 nd ~5 th Code |
| Tape and Ammunition Box (T/B) | A | N/A | 0 | HF | 0 | serial number |
| Tape and Reel (T/R) | R | 7" | 1 | RoHS | 1 | serial number |
| Bulk Packing (B/P) | B | 13" | 2 | | | |
| Tube Packing (T/P) | T | 26mm | X | | | |
| Tape and Reel (Right Oriented) (TRR) | S | 52mm | Y | | | |
| Tape and Reel (Left Oriented) (TRL) | L | PANASERT T/B CATHODE UP (PBCU) | U | | | |
| FORMING | F | PANASERT T/B CATHODE DOWN (PBCD) | D | | | |