



DATA SHEET

SEMICONDUCTOR

P4SMAJ Series

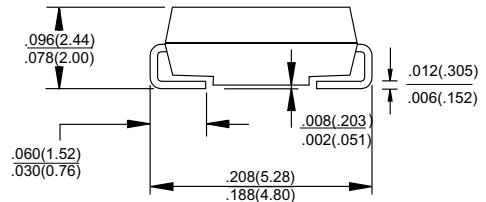
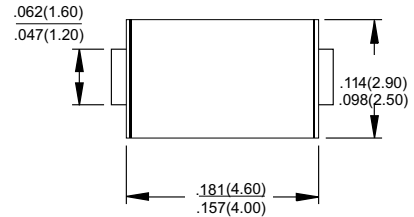
SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE - 5.0 to 440 Volts 400 Watt Peak Power Pulse



SMA/DO-214AC Unit:inch(mm)

FEATURES

- For surface mounted applications in order to optimize board space.
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Excellent clamping capability
- Low inductance
- Fast response time: typically less than 1.0 ps from 0 volts to BV min
- Typical IR less than 1µA above 10V
- High temperature soldering : 250°C/10 seconds at terminals.
- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- High temperature soldering : 260°C / 10 seconds at terminals
- Pb free product at available : 99% Sn above meet RoHS environment substance directive request



MECHANICAL DATA

- Case: JEDEC DO-214AC low profile molded plastic
- Terminals: Solder leads, solderable per MIL-STD-750, Method 2026
- Polarity: Indicated by cathode band except Bi-directional types.
- Standard Packageing: 12mm tape per(EIA-481)
- Weight: 0.002 ounces, 0.064 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating at 25°C ambient temperature unless otherwise specified. Resistive or inductive load, 60Hz.

For Capacitive load derate current by 20%.

| RATING | SYMBOL | VALUE | UNITS |
|---|----------|-------------|-------|
| Peak Power Dissipation at TA=25°C, TP=1ms(Note 1,2,5)Fig.1 | PPPM | Minimum 400 | Watts |
| Peak Forward Surge Current, per Figure 5(Note 3) | IFSM | 40.0 | Amps |
| Peak Pulse Current Current on 10/1000µs waveform(Note 1,2,5)Fig.2 | IPPM | See Table 1 | Amps |
| Steady State Power Dissipation(Note 4) | PM(AV) | 1.0 | Watts |
| Operating and Storage Temperature Range | TJ, TSTG | -55 to +150 | °C |

NOTES:

- 1.Non-repetitive current pulse, per Fig. 3 and derated above TA=25°Cper Fig. 2.
- 2.Mounted on 5.0mm² Copper pads to each terminal.
- 3.8.3ms single half sine-wave, duty cycle= 4 pulses per minutes maximum.
- 4.lead temperature at 75°C=TL.
- 5.Peak pluse power waveformis 10/1000µS.

P4SMAJ Series

| Part Number | | Reverse Stand-off Voltage | Breakdown Voltage | | Test Current | Reverse Leakage | | Max. Clamp Voltage | Peak Pulse Current | Package | |
|--|-------------|---------------------------|-------------------|-------|--------------|-----------------|--------|--------------------|--------------------|---------|--------------|
| | | | VBR@ I T | | | I R@ VRWM | Vc@Ipp | | | Ipp | SMA/DO-214AC |
| UNI | BI | VRWM | Min. | Max. | I T | | | UNI | BI | | V |
| | | | V | V | | V | m A | μA | μA | V | |
| 400W Transient Voltage Suppressor | | | | | | | | | | | |
| P4SMAJ5.0 | P4SMAJ5.0C | 5.0 | 6.40 | 7.82 | 10 | 800.0 | 1600.0 | 9.6 | 41.7 | 5.0V | 5.0C |
| P4SMAJ5.0A | P4SMAJ5.0CA | 5.0 | 6.40 | 7.07 | 10 | 800.0 | 1600.0 | 9.2 | 43.85 | 5.0A | 5.0D |
| P4SMAJ6.0 | P4SMAJ6.0C | 6.0 | 6.67 | 8.15 | 10 | 800.0 | 1600.0 | 11.4 | 35.1 | 6.0V | 6.0C |
| P4SMAJ6.0A | P4SMAJ6.0CA | 6.0 | 6.67 | 7.37 | 10 | 800.0 | 1600.0 | 10.3 | 38.8 | 6.0A | 6.0D |
| P4SMAJ6.5 | P4SMAJ6.5C | 6.5 | 7.22 | 8.82 | 10 | 500.0 | 1000.0 | 12.3 | 32.5 | 6.5V | 6.5C |
| P4SMAJ6.5A | P4SMAJ6.5CA | 6.5 | 7.22 | 7.98 | 10 | 500.0 | 1000.0 | 11.2 | 35.7 | 6.5A | 6.5D |
| P4SMAJ7.0 | P4SMAJ7.0C | 7.0 | 7.78 | 9.51 | 10 | 200.0 | 400.0 | 13.3 | 30.1 | 7.0V | 7.0C |
| P4SMAJ7.0A | P4SMAJ7.0CA | 7.0 | 7.78 | 8.60 | 10 | 200.0 | 400.0 | 12.0 | 33.3 | 7.0A | 7.0D |
| P4SMAJ7.5 | P4SMAJ7.5C | 7.5 | 8.33 | 10.20 | 1 | 100.0 | 200.0 | 14.3 | 28.0 | 7.5V | 7.5C |
| P4SMAJ7.5A | P4SMAJ7.5CA | 7.5 | 8.33 | 9.21 | 1 | 100.0 | 200.0 | 12.9 | 31.0 | 7.5A | 7.5C |
| P4SMAJ8.0 | P4SMAJ8.0C | 8.0 | 8.89 | 10.90 | 1 | 50.0 | 100.0 | 15.0 | 26.7 | 8.0V | 8.0D |
| P4SMAJ8.0A | P4SMAJ8.0CA | 8.0 | 8.89 | 9.83 | 1 | 50.0 | 100.0 | 13.6 | 29.4 | 8.0A | 8.0C |
| P4SMAJ8.5 | P4SMAJ8.5C | 8.5 | 9.44 | 11.50 | 1 | 10.0 | 20.0 | 15.9 | 25.2 | 8.5V | 8.5D |
| P4SMAJ8.5A | P4SMAJ8.5CA | 8.5 | 9.44 | 10.40 | 1 | 10.0 | 20.0 | 14.4 | 27.8 | 8.5A | 8.5C |
| P4SMAJ9.0 | P4SMAJ9.0C | 9.0 | 10.00 | 12.20 | 1 | 5.0 | 10.0 | 16.9 | 23.7 | 9.0V | 9.0D |
| P4SMAJ9.0A | P4SMAJ9.0CA | 9.0 | 10.00 | 11.10 | 1 | 5.0 | 10.0 | 15.4 | 26.0 | 9.0A | 9.0C |
| P4SMAJ10 | P4SMAJ10C | 10.0 | 11.10 | 13.60 | 1 | 5.0 | 10.0 | 18.8 | 21.3 | 10V | 10D |
| P4SMAJ10A | P4SMAJ10CA | 10.0 | 11.10 | 12.30 | 1 | 5.0 | 10.0 | 17.0 | 23.5 | 10A | 10C |
| P4SMAJ11 | P4SMAJ11C | 11.0 | 12.20 | 14.90 | 1 | 5.0 | 5.0 | 20.1 | 19.9 | 11V | 11D |
| P4SMAJ11A | P4SMAJ11CA | 11.0 | 12.20 | 13.50 | 1 | 5.0 | 5.0 | 18.2 | 22.0 | 11A | 11C |
| P4SMAJ12 | P4SMAJ12C | 12.0 | 13.30 | 16.30 | 1 | 5.0 | 5.0 | 22.0 | 18.2 | 12V | 12D |
| P4SMAJ12A | P4SMAJ12CA | 12.0 | 13.30 | 14.70 | 1 | 5.0 | 5.0 | 19.9 | 20.1 | 12A | 12C |
| P4SMAJ13 | P4SMAJ13C | 13.0 | 14.40 | 17.60 | 1 | 5.0 | 5.0 | 23.8 | 16.8 | 13V | 13D |
| P4SMAJ13A | P4SMAJ13CA | 13.0 | 14.40 | 15.90 | 1 | 5.0 | 5.0 | 21.5 | 18.6 | 13A | 13C |
| P4SMAJ14 | P4SMAJ14C | 14.0 | 15.60 | 19.10 | 1 | 5.0 | 5.0 | 25.8 | 15.5 | 14V | 14D |
| P4SMAJ14A | P4SMAJ14CA | 14.0 | 15.60 | 17.20 | 1 | 5.0 | 5.0 | 23.2 | 17.2 | 14A | 14C |
| P4SMAJ15 | P4SMAJ15C | 15.0 | 16.70 | 20.40 | 1 | 5.0 | 5.0 | 26.9 | 14.9 | 15V | 15C |
| P4SMAJ15A | P4SMAJ15CA | 15.0 | 16.70 | 18.50 | 1 | 5.0 | 5.0 | 24.4 | 16.4 | 15A | 15D |
| P4SMAJ16 | P4SMAJ16C | 16.0 | 17.80 | 21.80 | 1 | 5.0 | 5.0 | 28.8 | 13.9 | 16V | 16C |
| P4SMAJ16A | P4SMAJ16CA | 16.0 | 17.80 | 19.70 | 1 | 5.0 | 5.0 | 26.0 | 15.4 | 16A | 16D |
| P4SMAJ17 | P4SMAJ17C | 17.0 | 18.90 | 23.10 | 1 | 5.0 | 5.0 | 30.5 | 13.1 | 17V | 17C |
| P4SMAJ17A | P4SMAJ17CA | 17.0 | 18.90 | 20.90 | 1 | 5.0 | 5.0 | 27.6 | 14.5 | 17A | 17D |
| P4SMAJ18 | P4SMAJ18C | 18.0 | 20.00 | 24.40 | 1 | 5.0 | 5.0 | 32.2 | 12.4 | 18V | 18C |
| P4SMAJ18A | P4SMAJ18CA | 18.0 | 20.00 | 22.10 | 1 | 5.0 | 5.0 | 29.2 | 13.7 | 18A | 18D |
| P4SMAJ20 | P4SMAJ20C | 20.0 | 22.20 | 27.10 | 1 | 5.0 | 5.0 | 35.8 | 11.2 | 20V | 20C |
| P4SMAJ20A | P4SMAJ20CA | 20.0 | 22.20 | 24.50 | 1 | 5.0 | 5.0 | 32.4 | 12.3 | 20A | 20D |
| P4SMAJ22 | P4SMAJ22C | 22.0 | 24.40 | 29.80 | 1 | 5.0 | 5.0 | 39.4 | 10.2 | 22V | 22C |
| P4SMAJ22A | P4SMAJ22CA | 22.0 | 24.40 | 26.90 | 1 | 5.0 | 5.0 | 35.5 | 11.3 | 22A | 22D |
| P4SMAJ24 | P4SMAJ24C | 24.0 | 26.70 | 32.60 | 1 | 5.0 | 5.0 | 43.0 | 9.3 | 24V | 24C |
| P4SMAJ24A | P4SMAJ24CA | 24.0 | 26.70 | 29.50 | 1 | 5.0 | 5.0 | 38.9 | 10.3 | 24A | 24D |
| P4SMAJ26 | P4SMAJ26C | 26.0 | 28.90 | 35.30 | 1 | 5.0 | 5.0 | 46.6 | 8.6 | 26V | 26C |
| P4SMAJ26A | P4SMAJ26CA | 26.0 | 28.90 | 31.90 | 1 | 5.0 | 5.0 | 42.1 | 9.5 | 26A | 26D |
| P4SMAJ28 | P4SMAJ28C | 28.0 | 31.10 | 38.00 | 1 | 5.0 | 5.0 | 50.0 | 8.0 | 28V | 28C |
| P4SMAJ28A | P4SMAJ28CA | 28.0 | 31.10 | 34.40 | 1 | 5.0 | 5.0 | 45.4 | 8.8 | 28A | 28D |
| P4SMAJ30 | P4SMAJ30C | 30.0 | 33.30 | 40.70 | 1 | 5.0 | 5.0 | 53.5 | 7.5 | 30V | 30C |
| P4SMAJ30A | P4SMAJ30CA | 30.0 | 33.30 | 36.80 | 1 | 5.0 | 5.0 | 48.4 | 8.3 | 30A | 30D |
| P4SMAJ33 | P4SMAJ33C | 33.0 | 36.70 | 44.90 | 1 | 5.0 | 5.0 | 59.0 | 6.8 | 33V | 33C |

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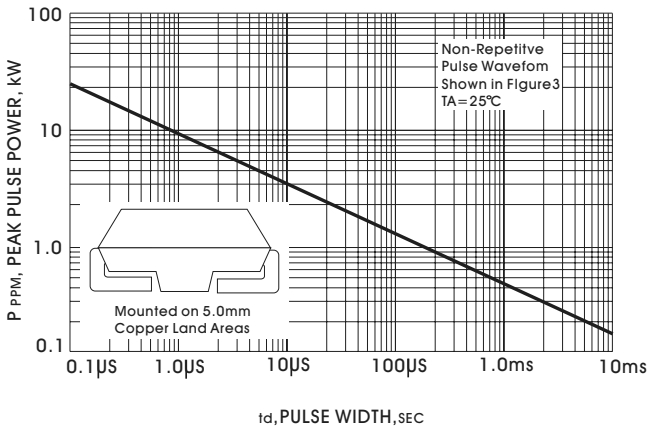
| Part Number | | Reverse Stand-off Voltage | Breakdown Voltage | | Test Current | Reverse Leakage | | Max. Clamp Voltage | Peak Pulse Current | Package | |
|--|-------------|---------------------------|-------------------|--------|--------------|-----------------|-------------|--------------------|--------------------|---------|------|
| | | | VBR@ I T | | | I T | I R@ VRWM | | | Vc@Ipp | Ipp |
| UNI | BI | V | Min. V | Max. V | m A | | UNI μ A | BI μ A | V | | |
| 400W Transient Voltage Suppressor | | | | | | | | | | | |
| P4SMAJ33A | P4SMAJ33CA | 33.0 | 36.70 | 40.60 | 1 | 5.0 | 5.0 | 53.3 | 7.5 | 33A | 33D |
| P4SMAJ36 | P4SMAJ36C | 36.0 | 40.00 | 48.90 | 1 | 5.0 | 5.0 | 64.3 | 6.2 | 36V | 36C |
| P4SMAJ36A | P4SMAJ36CA | 36.0 | 40.00 | 44.20 | 1 | 5.0 | 5.0 | 58.1 | 6.9 | 36A | 36D |
| P4SMAJ40 | P4SMAJ40C | 40.0 | 44.40 | 54.30 | 1 | 5.0 | 5.0 | 71.4 | 5.6 | 40V | 40C |
| P4SMAJ40A | P4SMAJ40A | 40.0 | 44.40 | 49.10 | 1 | 5.0 | 5.0 | 64.5 | 6.2 | 40A | 40D |
| P4SMAJ43 | P4SMAJ43C | 43.0 | 47.80 | 58.40 | 1 | 5.0 | 5.0 | 76.7 | 5.2 | 43V | 43C |
| P4SMAJ43A | P4SMAJ43CA | 43.0 | 47.80 | 52.80 | 1 | 5.0 | 5.0 | 69.4 | 5.8 | 43A | 43D |
| P4SMAJ45 | P4SMAJ45C | 45.0 | 50.00 | 61.10 | 1 | 5.0 | 5.0 | 80.3 | 5.0 | 45V | 45C |
| P4SMAJ45A | P4SMAJ45CA | 45.0 | 50.00 | 55.30 | 1 | 5.0 | 5.0 | 72.7 | 5.5 | 45A | 45D |
| P4SMAJ48 | P4SMAJ48C | 48.0 | 53.30 | 65.10 | 1 | 5.0 | 5.0 | 85.5 | 4.7 | 48V | 48C |
| P4SMAJ48A | P4SMAJ48CA | 48.0 | 53.30 | 58.90 | 1 | 5.0 | 5.0 | 77.4 | 5.2 | 48A | 48D |
| P4SMAJ51 | P4SMAJ51C | 51.0 | 56.70 | 69.30 | 1 | 5.0 | 5.0 | 91.1 | 4.4 | 51V | 51C |
| P4SMAJ51A | P4SMAJ51CA | 51.0 | 56.70 | 62.70 | 1 | 5.0 | 5.0 | 82.4 | 4.9 | 51A | 51D |
| P4SMAJ54 | P4SMAJ54C | 54.0 | 60.00 | 73.30 | 1 | 5.0 | 5.0 | 96.3 | 4.2 | 54V | 54C |
| P4SMAJ54A | P4SMAJ54CA | 54.0 | 60.00 | 66.30 | 1 | 5.0 | 5.0 | 87.1 | 4.6 | 54A | 54D |
| P4SMAJ58 | P4SMAJ58C | 58.0 | 64.40 | 78.70 | 1 | 5.0 | 5.0 | 103.0 | 3.9 | 58V | 58C |
| P4SMAJ58A | P4SMAJ58CA | 58.0 | 64.40 | 71.20 | 1 | 5.0 | 5.0 | 93.6 | 4.3 | 58A | 58D |
| P4SMAJ60 | P4SMAJ60C | 60.0 | 66.70 | 81.50 | 1 | 5.0 | 5.0 | 107.0 | 3.7 | 60V | 60C |
| P4SMAJ60A | P4SMAJ60CA | 60.0 | 66.70 | 73.70 | 1 | 5.0 | 5.0 | 96.8 | 4.1 | 60A | 60D |
| P4SMAJ64 | P4SMAJ64C | 64.0 | 71.10 | 86.90 | 1 | 5.0 | 5.0 | 114.0 | 3.5 | 64V | 64C |
| P4SMAJ64A | P4SMAJ64CA | 64.0 | 71.10 | 78.60 | 1 | 5.0 | 5.0 | 103.0 | 3.9 | 64A | 64D |
| P4SMAJ70 | P4SMAJ70C | 70.0 | 77.80 | 95.10 | 1 | 5.0 | 5.0 | 125.0 | 3.2 | 70V | 70C |
| P4SMAJ70A | P4SMAJ70CA | 70.0 | 77.80 | 86.00 | 1 | 5.0 | 5.0 | 113.0 | 3.5 | 70A | 70D |
| P4SMAJ75 | P4SMAJ75C | 75.0 | 83.30 | 102.00 | 1 | 5.0 | 5.0 | 134.0 | 3.0 | 75V | 75C |
| P4SMAJ75A | P4SMAJ75CA | 75.0 | 83.30 | 92.10 | 1 | 5.0 | 5.0 | 121.0 | 3.0 | 75A | 75D |
| P4SMAJ78 | P4SMAJ78C | 78.0 | 86.70 | 106.00 | 1 | 5.0 | 5.0 | 139.0 | 2.9 | 78V | 78C |
| P4SMAJ78A | P4SMAJ78CA | 78.0 | 86.70 | 95.80 | 1 | 5.0 | 5.0 | 126.0 | 3.2 | 78A | 78D |
| P4SMAJ85 | P4SMAJ85C | 85.0 | 94.40 | 115.00 | 1 | 5.0 | 5.0 | 151.0 | 2.0 | 85V | 85C |
| P4SMAJ85A | P4SMAJ85CA | 85.0 | 94.40 | 104.00 | 1 | 5.0 | 5.0 | 137.0 | 2.2 | 85A | 85D |
| P4SMAJ90 | P4SMAJ90C | 90.0 | 100.00 | 122.00 | 1 | 5.0 | 5.0 | 160.0 | 1.9 | 90V | 90C |
| P4SMAJ90A | P4SMAJ90CA | 90.0 | 100.00 | 111.00 | 1 | 5.0 | 5.0 | 146.0 | 2.1 | 90A | 90D |
| P4SMAJ100 | P4SMAJ100C | 100.0 | 111.00 | 136.00 | 1 | 5.0 | 5.0 | 179.0 | 1.7 | 100V | 100C |
| P4SMAJ100A | P4SMAJ100CA | 100.0 | 111.00 | 123.00 | 1 | 5.0 | 5.0 | 162.0 | 1.9 | 100A | 100D |
| P4SMAJ110 | P4SMAJ110C | 110.0 | 122.00 | 149.00 | 1 | 5.0 | 5.0 | 196.0 | 1.5 | 110V | 110C |
| P4SMAJ110A | P4SMAJ110CA | 110.0 | 122.00 | 135.00 | 1 | 5.0 | 5.0 | 177.0 | 1.7 | 110A | 110D |
| P4SMAJ120 | P4SMAJ120C | 120.0 | 133.00 | 163.00 | 1 | 5.0 | 5.0 | 214.0 | 1.4 | 120V | 120C |
| P4SMAJ120A | P4SMAJ120CA | 120.0 | 133.00 | 147.00 | 1 | 5.0 | 5.0 | 193.0 | 1.6 | 120A | 120D |
| P4SMAJ130 | P4SMAJ130C | 130.0 | 144.00 | 176.00 | 1 | 5.0 | 5.0 | 231.0 | 1.3 | 130V | 130C |
| P4SMAJ130A | P4SMAJ130CA | 130.0 | 144.00 | 159.00 | 1 | 5.0 | 5.0 | 209.0 | 1.4 | 130A | 130D |
| P4SMAJ150 | P4SMAJ150C | 150.0 | 167.00 | 204.00 | 1 | 5.0 | 5.0 | 268.0 | 1.1 | 150V | 150C |
| P4SMAJ150A | P4SMAJ150CA | 150.0 | 167.00 | 185.00 | 1 | 5.0 | 5.0 | 243.0 | 1.2 | 150A | 150D |
| P4SMAJ160 | P4SMAJ160C | 160.0 | 178.00 | 218.00 | 1 | 5.0 | 5.0 | 287.0 | 1.1 | 160V | 160C |
| P4SMAJ160A | P4SMAJ160CA | 160.0 | 178.00 | 197.00 | 1 | 5.0 | 5.0 | 259.0 | 1.2 | 160A | 160D |
| P4SMAJ170 | P4SMAJ170C | 170.0 | 189.00 | 231.00 | 1 | 5.0 | 5.0 | 304.0 | 1.1 | 170V | 170C |
| P4SMAJ170A | P4SMAJ170CA | 170.0 | 189.00 | 209.00 | 1 | 5.0 | 5.0 | 275.0 | 1.1 | 170A | 170D |
| P4SMAJ188 | P4SMAJ188C | 188.0 | 209.00 | 255.00 | 1 | 5.0 | 5.0 | 344.0 | 0.9 | 188V | 188C |
| P4SMAJ188A | P4SMAJ188CA | 188.0 | 209.00 | 231.00 | 1 | 5.0 | 5.0 | 328.0 | 0.9 | 188A | 188D |

P4SMAJ Series

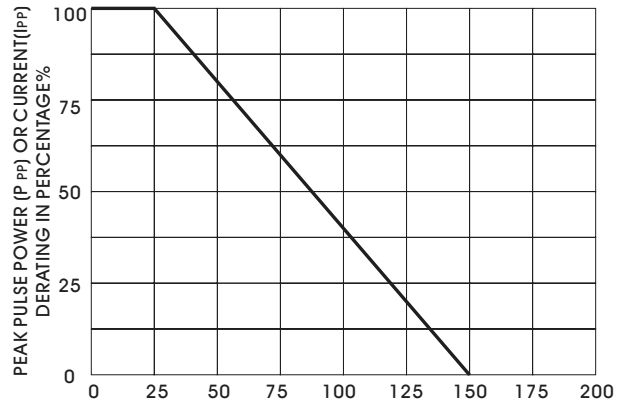
| Part Number | | Reverse Stand-off Voltage | Breakdown Voltage | | Test Current | Reverse Leakage | | Max. Clamp Voltage | Peak Pulse Current | Package | |
|--|-------------|---------------------------|-------------------|--------|--------------|-----------------|-----|--------------------|---------------------|---------|------|
| | | | VBR@ I T | I T | | I R@ VRWM | | | | Vc@Ipp | Ipp |
| | | VRWM | | | Min. | Max. | UNI | BI | Device Marking Code | | |
| UNI | BI | V | V | V | m A | μA | μA | V | A | UNI | BI |
| 400W Transient Voltage Suppressor | | | | | | | | | | | |
| P4SMAJ200A | P4SMAJ200CA | 200.0 | 224.00 | 247.00 | 1 | 5.0 | 5.0 | 324.0 | 1.2 | 200A | 200D |
| P4SMAJ220A | P4SMAJ220CA | 220.0 | 246.00 | 272.00 | 1 | 5.0 | 5.0 | 356.0 | 1.1 | 220A | 220D |
| P4SMAJ250A | P4SMAJ250CA | 250.0 | 279.00 | 309.00 | 1 | 5.0 | 5.0 | 405.0 | 1.0 | 250A | 250D |
| P4SMAJ300A | P4SMAJ300CA | 300.0 | 335.00 | 371.00 | 1 | 5.0 | 5.0 | 486.0 | 0.8 | 300A | 300D |
| P4SMAJ350A | P4SMAJ350CA | 350.0 | 391.00 | 432.00 | 1 | 5.0 | 5.0 | 567.0 | 0.7 | 350A | 350D |
| P4SMAJ400A | P4SMAJ400CA | 400.0 | 447.00 | 494.00 | 1 | 5.0 | 5.0 | 648.0 | 0.6 | 400A | 400D |
| P4SMAJ440A | P4SMAJ440CA | 440.0 | 492.00 | 543.00 | 1 | 5.0 | 5.0 | 713.0 | 0.6 | 440A | 440D |

DEVICE CHARACTERISTICS

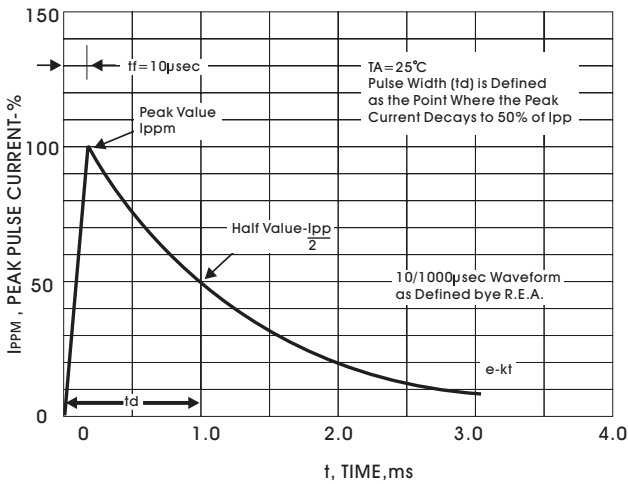
P4SMAJ Series



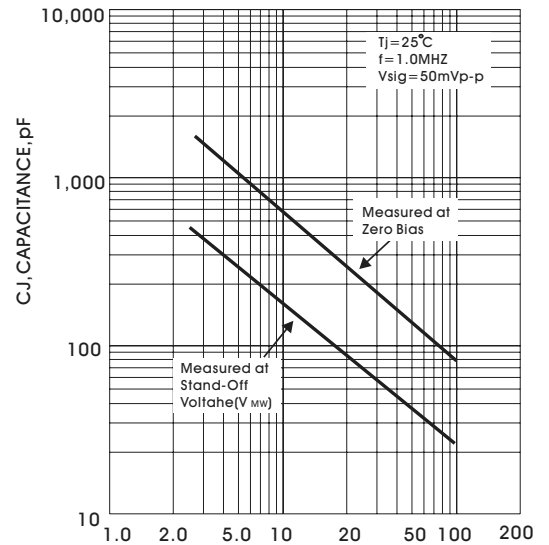
t_d , PULSE WIDTH, SEC
FIGURE 1-PEAK PULSE POWER RATING CURVE



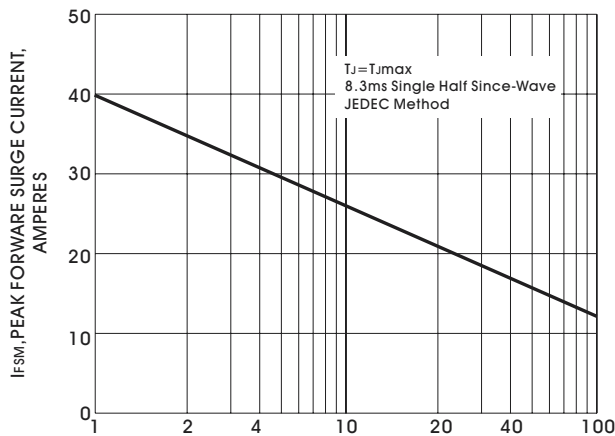
T_A, AMBIENT TEMPERATURE, °C
FIGURE 2 DERATING CURVE



t, TIME, ms
FIGURE 3-PULSE WAVEFORM



V_{BR}, BREAKDOWN VOLTAGE, VOLTS
FIGURE 4-TYPICAL CAPACITANCE



T_L, LEAD TEMPERATURE, °C
FIG. 5-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT