

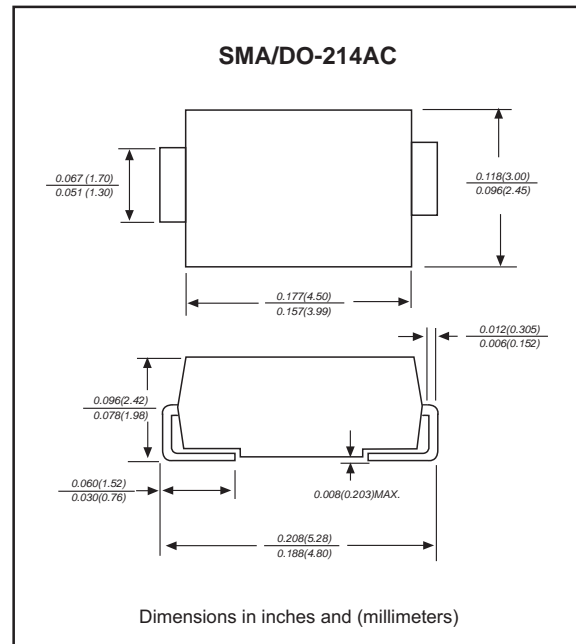
Features

- 400W peak pulse power capability with a 10/1000us waveform, repetition rate (duty cycle): 0.01%.
- Excellent clamping capability.
- Low incremental surge resistance.
- Fast response time from 0V to V_{BR} , typically less than 1 pS for uni-directional & 5 nS for bi-directional types.
- Ultra high-speed switching.
- Glass passivated chip junction.
- Lead-free parts meet environmental standards of MIL-STD-19500 /228
- Compliant to Halogen-free

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AC / SMA
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any

Package outline



Maximum ratings (AT $T_A=25^\circ\text{C}$ unless otherwise noted)

| PARAMETER | CONDITIONS | Symbol | MIN. | TYP. | MAX. | UNIT |
|---------------------------------------|---|-------------|-------------|------|---------|------------------|
| Peak power dissipation | with a 10/1000us waveform, Note 1 & Fig. 1 | P_{PPM} | | | 400 | W |
| Peak pulse current | with a 10/1000us waveform | I_{PPM} | See table 1 | | | A |
| Steady state power dissipation | at $T_L=75^\circ\text{C}$ lead length 0.375" (9.5 mm) | $P_{M(AV)}$ | | | 1.0 | W |
| Peak forward surge current | 8.3ms single half sine-wave superimposed on rated load (jedec method), note 2 | I_{FSM} | | | 40 | A |
| Maximum instantaneous forward voltage | for uni-directional types only, at 25A, see note 3 | V_F | | | 3.5/5.0 | V |
| Operating temperature | | T_J | -55 | | +150 | $^\circ\text{C}$ |
| Storage temperature | | T_{STG} | -65 | | +175 | $^\circ\text{C}$ |

Note 1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2

2. Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum

3. $V_F=3.5\text{V}$ max. for devices of $V_{BR}<200\text{V}$, and $V_F=5.0\text{V}$ max. for devices of $V_{BR}>201\text{V}$

Electrical characteristics (at T =25°C unless otherwise noted)

| Type Number | | Marking | | Reverse Stand-Off Voltage | Breakdown Voltage Min. @I _T | Breakdown Voltage Max. @ I _T | Test Current | Maximum Clamping Voltage @I _{PP} | Peak Pulse Current | Reverse Leakage @V _{RMW} |
|-------------|------------|---------|-------|---------------------------|--|---|---------------------|---|---------------------|-----------------------------------|
| (Uni) | (Bi) | (Uni) | (Bi) | V _{RMW} (V) | V _{BR MIN} (V) | V _{BR MAX} (V) | I _T (mA) | V _C (V) | I _{PP} (A) | I _R (uA) |
| P4SMA6.8 | P4SMA6.8C | 6V8 | 6V8C | 5.50 | 6.12 | 7.48 | 10 | 10.8 | 38.0 | 1000.0 |
| P4SMA6.8A | P4SMA6.8CA | 6V8A | 6V8CA | 5.80 | 6.45 | 7.14 | 10 | 10.5 | 40.0 | 1000.0 |
| P4SMA7.5 | P4SMA7.5C | 7V5 | 7V5C | 6.05 | 6.75 | 8.25 | 10 | 11.7 | 36.0 | 500.0 |
| P4SMA7.5A | P4SMA7.5CA | 7V5A | 7V5CA | 6.40 | 7.13 | 7.88 | 10 | 11.3 | 37.0 | 500.0 |
| P4SMA8.2 | P4SMA8.2C | 8V2 | 8V2C | 6.63 | 7.38 | 9.02 | 10 | 12.5 | 33.0 | 200.0 |
| P4SMA8.2A | P4SMA8.2CA | 8V2A | 8V2CA | 7.02 | 7.79 | 8.61 | 10 | 12.1 | 35.0 | 200.0 |
| P4SMA9.1 | P4SMA9.1C | 9V1 | 9V1C | 7.37 | 8.19 | 10.0 | 1.0 | 13.8 | 30.0 | 50.0 |
| P4SMA9.1A | P4SMA9.1CA | 9V1A | 9V1CA | 7.78 | 8.65 | 9.55 | 1.0 | 13.4 | 31.0 | 50.0 |
| P4SMA10 | P4SMA10C | 10 | 10C | 8.10 | 9.00 | 11.0 | 1.0 | 15.0 | 28.0 | 10.0 |
| P4SMA10A | P4SMA10CA | 10A | 10CA | 8.55 | 9.50 | 10.5 | 1.0 | 14.5 | 29.0 | 10.0 |
| P4SMA11 | P4SMA11C | 11 | 11C | 8.92 | 9.90 | 12.1 | 1.0 | 16.2 | 26.0 | 5.0 |
| P4SMA11A | P4SMA11CA | 11A | 11CA | 9.40 | 10.5 | 11.6 | 1.0 | 15.6 | 27.0 | 5.0 |
| P4SMA12 | P4SMA12C | 12 | 12C | 9.72 | 10.8 | 13.2 | 1.0 | 17.3 | 24.0 | 5.0 |
| P4SMA12A | P4SMA12CA | 12A | 12CA | 10.2 | 11.4 | 12.6 | 1.0 | 16.7 | 25.0 | 5.0 |
| P4SMA13 | P4SMA13C | 13 | 13C | 10.5 | 11.7 | 14.3 | 1.0 | 19.0 | 22.0 | 5.0 |
| P4SMA13A | P4SMA13CA | 13A | 13CA | 11.1 | 12.4 | 13.7 | 1.0 | 18.2 | 23.0 | 5.0 |
| P4SMA15 | P4SMA15C | 15 | 15C | 12.1 | 13.5 | 16.5 | 1.0 | 22.0 | 19.0 | 5.0 |
| P4SMA15A | P4SMA15CA | 15A | 15CA | 12.8 | 14.3 | 15.8 | 1.0 | 21.2 | 20.0 | 5.0 |
| P4SMA16 | P4SMA16C | 16 | 16C | 12.9 | 14.4 | 17.6 | 1.0 | 23.5 | 18.0 | 5.0 |
| P4SMA16A | P4SMA16CA | 16A | 16CA | 13.6 | 15.2 | 16.8 | 1.0 | 22.5 | 19.0 | 5.0 |
| P4SMA18 | P4SMA18C | 18 | 18C | 14.5 | 16.2 | 19.8 | 1.0 | 26.5 | 16.0 | 5.0 |
| P4SMA18A | P4SMA18CA | 18A | 18CA | 15.3 | 17.1 | 18.9 | 1.0 | 25.2 | 17.0 | 5.0 |
| P4SMA20 | P4SMA20C | 20 | 20C | 16.2 | 18.0 | 22.0 | 1.0 | 29.1 | 14.0 | 5.0 |
| P4SMA20A | P4SMA20CA | 20A | 20CA | 17.1 | 19.0 | 21.0 | 1.0 | 27.7 | 15.0 | 5.0 |
| P4SMA22 | P4SMA22C | 22 | 22C | 17.8 | 19.8 | 24.2 | 1.0 | 31.9 | 13.0 | 5.0 |
| P4SMA22A | P4SMA22CA | 22A | 22CA | 18.8 | 20.9 | 23.1 | 1.0 | 30.6 | 14.0 | 5.0 |
| P4SMA24 | P4SMA24C | 24 | 24C | 19.4 | 21.6 | 26.4 | 1.0 | 34.7 | 12.0 | 5.0 |
| P4SMA24A | P4SMA24CA | 24A | 24CA | 20.5 | 22.8 | 25.2 | 1.0 | 33.2 | 13.0 | 5.0 |
| P4SMA27 | P4SMA27C | 27 | 27C | 21.8 | 24.3 | 29.7 | 1.0 | 39.1 | 11.0 | 5.0 |
| P4SMA27A | P4SMA27CA | 27A | 27CA | 23.1 | 25.7 | 28.4 | 1.0 | 37.5 | 11.2 | 5.0 |
| P4SMA30 | P4SMA30C | 30 | 30C | 24.3 | 27.0 | 33.0 | 1.0 | 43.5 | 10.0 | 5.0 |
| P4SMA30A | P4SMA30CA | 30A | 30CA | 25.6 | 28.5 | 31.5 | 1.0 | 41.4 | 10.0 | 5.0 |
| P4SMA33 | P4SMA33C | 33 | 33C | 26.8 | 29.7 | 36.3 | 1.0 | 47.7 | 9.0 | 5.0 |
| P4SMA33A | P4SMA33CA | 33A | 33CA | 28.2 | 31.4 | 34.7 | 1.0 | 45.7 | 9.0 | 5.0 |
| P4SMA36 | P4SMA36C | 36 | 36C | 29.1 | 32.4 | 39.6 | 1.0 | 52.0 | 8.0 | 5.0 |
| P4SMA36A | P4SMA36CA | 36A | 36CA | 30.8 | 34.2 | 37.8 | 1.0 | 49.9 | 8.4 | 5.0 |

※ For Bi-directional type having VRWM of 10 Volts and less, the IR limit is double

Electrical characteristics (at T =25°C unless otherwise noted)

| Type Number | | Marking | | Reverse Stand-Off Voltage | Breakdown Voltage Min. @I _T | Breakdown Voltage Max. @ I _T | Test Current | Maximum Clamping Voltage @I _{PP} | Peak Pulse Current | Reverse Leakage @V _{RMW} |
|-------------|------------|---------|-------|---------------------------|--|---|---------------------|---|---------------------|-----------------------------------|
| (Uni) | (Bi) | (Uni) | (Bi) | V _{RMW} (V) | V _{BR MIN} (V) | V _{BR MAX} (V) | I _T (mA) | V _C (V) | I _{PP} (A) | I _R (uA) |
| P4SMA39 | P4SMA39C | 39 | 39C | 31.6 | 35.1 | 42.9 | 1.0 | 56.4 | 7.4 | 5.0 |
| P4SMA39A | P4SMA39CA | 39A | 39CA | 33.3 | 37.1 | 41.0 | 1.0 | 53.9 | 7.8 | 5.0 |
| P4SMA43 | P4SMA43C | 43 | 43C | 34.8 | 38.7 | 47.3 | 1.0 | 61.9 | 6.8 | 5.0 |
| P4SMA43A | P4SMA43CA | 43A | 43CA | 36.8 | 40.9 | 45.2 | 1.0 | 59.3 | 7.1 | 5.0 |
| P4SMA47 | P4SMA47C | 47 | 47C | 38.1 | 42.3 | 51.7 | 1.0 | 67.8 | 6.2 | 5.0 |
| P4SMA47A | P4SMA47CA | 47A | 47CA | 40.2 | 44.7 | 49.4 | 1.0 | 64.8 | 5.0 | 5.0 |
| P4SMA51 | P4SMA51C | 51 | 51C | 41.3 | 45.9 | 56.1 | 1.0 | 73.5 | 5.7 | 5.0 |
| P4SMA51A | P4SMA51CA | 51A | 51CA | 43.6 | 48.5 | 53.6 | 1.0 | 70.1 | 6.0 | 5.0 |
| P4SMA56 | P4SMA56C | 56 | 56C | 45.4 | 50.4 | 61.6 | 1.0 | 80.5 | 5.2 | 5.0 |
| P4SMA56A | P4SMA56CA | 56A | 56CA | 47.8 | 53.2 | 58.8 | 1.0 | 77.0 | 5.5 | 5.0 |
| P4SMA62 | P4SMA62C | 62 | 62C | 50.2 | 55.8 | 68.2 | 1.0 | 89.0 | 4.7 | 5.0 |
| P4SMA62A | P4SMA62CA | 62A | 62CA | 53.0 | 58.9 | 65.1 | 1.0 | 85.0 | 5.0 | 5.0 |
| P4SMA68 | P4SMA68C | 68 | 68C | 55.1 | 61.2 | 74.8 | 1.0 | 98.0 | 4.3 | 5.0 |
| P4SMA68A | P4SMA68CA | 68A | 68CA | 58.1 | 64.6 | 71.4 | 1.0 | 92.0 | 4.6 | 5.0 |
| P4SMA75 | P4SMA75C | 75 | 75C | 60.7 | 67.5 | 82.5 | 1.0 | 108 | 3.9 | 5.0 |
| P4SMA75A | P4SMA75CA | 75A | 75CA | 64.1 | 71.3 | 78.8 | 1.0 | 103 | 4.1 | 5.0 |
| P4SMA82 | P4SMA82C | 82 | 82C | 66.4 | 73.8 | 90.2 | 1.0 | 118 | 3.6 | 5.0 |
| P4SMA82A | P4SMA82CA | 82A | 82CA | 70.1 | 77.9 | 86.1 | 1.0 | 113 | 3.7 | 5.0 |
| P4SMA91 | P4SMA91C | 91 | 91C | 73.7 | 81.9 | 100 | 1.0 | 131 | 3.2 | 5.0 |
| P4SMA91A | P4SMA91CA | 91A | 91CA | 77.8 | 86.5 | 95.5 | 1.0 | 125 | 3.4 | 5.0 |
| P4SMA100 | P4SMA100C | 100 | 100C | 81.0 | 90.0 | 110 | 1.0 | 144 | 2.9 | 5.0 |
| P4SMA100A | P4SMA100CA | 100A | 100CA | 85.5 | 95.0 | 105 | 1.0 | 137 | 3.1 | 5.0 |
| P4SMA110 | P4SMA110C | 110 | 110C | 89.2 | 99.0 | 121 | 1.0 | 158 | 2.7 | 5.0 |
| P4SMA110A | P4SMA110CA | 110A | 110CA | 94.0 | 105 | 116 | 1.0 | 152 | 2.8 | 5.0 |
| P4SMA120 | P4SMA120C | 120 | 120C | 97.2 | 108 | 132 | 1.0 | 173 | 2.4 | 5.0 |
| P4SMA120A | P4SMA120CA | 120A | 120CA | 102 | 114 | 126 | 1.0 | 165 | 2.5 | 5.0 |
| P4SMA130 | P4SMA130C | 130 | 130C | 105 | 117 | 143 | 1.0 | 187 | 2.2 | 5.0 |
| P4SMA130A | P4SMA130CA | 130A | 130CA | 111 | 124 | 137 | 1.0 | 179 | 2.3 | 5.0 |
| P4SMA150 | P4SMA150C | 150 | 150C | 121 | 135 | 165 | 1.0 | 215 | 2.0 | 5.0 |
| P4SMA150A | P4SMA150CA | 150A | 150CA | 128 | 143 | 158 | 1.0 | 207 | 2.0 | 5.0 |
| P4SMA160 | P4SMA160C | 160 | 160C | 130 | 144 | 176 | 1.0 | 230 | 1.8 | 5.0 |
| P4SMA160A | P4SMA160CA | 160A | 160CA | 136 | 152 | 168 | 1.0 | 219 | 1.9 | 5.0 |

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Electrical characteristics (at T =25°C unless otherwise noted)

| Type Number | | Marking | | Reverse Stand-Off Voltage | Breakdown Voltage Min. @I _T | Breakdown Voltage Max. @ I _T | Test Current | Maximum Clamping Voltage @I _{PP} | Peak Pulse Current | Reverse Leakage @V _{RMW} |
|-------------|------------|---------|-------|---------------------------|--|---|---------------------|---|---------------------|-----------------------------------|
| (Uni) | (Bi) | (Uni) | (Bi) | V _{RMW} (V) | V _{BR MIN} (V) | V _{BR MAX} (V) | I _T (mA) | V _C (V) | I _{PP} (A) | I _R (uA) |
| P4SMA170 | P4SMA170C | 170 | 170C | 138 | 153 | 187 | 1.0 | 244 | 1.7 | 5.0 |
| P4SMA170A | P4SMA170CA | 170A | 170CA | 145 | 162 | 179 | 1.0 | 234 | 1.8 | 5.0 |
| P4SMA180 | P4SMA180C | 180 | 180C | 146 | 162 | 198 | 1.0 | 258 | 1.6 | 5.0 |
| P4SMA180A | P4SMA180CA | 180A | 180CA | 154 | 171 | 189 | 1.0 | 246 | 1.7 | 5.0 |
| P4SMA200 | P4SMA200C | 200 | 200C | 162 | 180 | 220 | 1.0 | 287 | 1.5 | 5.0 |
| P4SMA200A | P4SMA200CA | 200A | 200CA | 171 | 190 | 210 | 1.0 | 274 | 1.53 | 5.0 |
| P4SMA220 | P4SMA220C | 220 | 220C | 175 | 198 | 242 | 1.0 | 344 | 1.16 | 5.0 |
| P4SMA220A | P4SMA220CA | 220A | 220CA | 185 | 209 | 231 | 1.0 | 328 | 1.22 | 5.0 |
| P4SMA250 | P4SMA250C | 250 | 250C | 202 | 225 | 275 | 1.0 | 360 | 1.1 | 5.0 |
| P4SMA250A | P4SMA250CA | 250A | 250CA | 214 | 237 | 263 | 1.0 | 344 | 1.16 | 5.0 |
| P4SMA300 | P4SMA300C | 300 | 300C | 243 | 270 | 330 | 1.0 | 430 | 0.93 | 5.0 |
| P4SMA300A | P4SMA300CA | 300A | 300CA | 256 | 285 | 315 | 1.0 | 414 | 0.97 | 5.0 |
| P4SMA350 | P4SMA350C | 350 | 350C | 284 | 315 | 385 | 1.0 | 504 | 0.79 | 5.0 |
| P4SMA350A | P4SMA350CA | 350A | 350CA | 300 | 333 | 368 | 1.0 | 482 | 0.83 | 5.0 |
| P4SMA400 | P4SMA400C | 400 | 400C | 324 | 360 | 440 | 1.0 | 574 | 0.70 | 5.0 |
| P4SMA400A | P4SMA400CA | 400A | 400CA | 342 | 380 | 420 | 1.0 | 548 | 0.73 | 5.0 |
| P4SMA440 | P4SMA440C | 440 | 440C | 356 | 396 | 484 | 1.0 | 631 | 0.63 | 5.0 |
| P4SMA440A | P4SMA440CA | 440A | 440CA | 376 | 418 | 462 | 1.0 | 602 | 0.65 | 5.0 |

※ For Bi-directional type having VRWM of 10 Volts and less, the IR limit is double

Rating and characteristic curves (P4SMA SERIES)

Fig.1 - PEAK PULSE POWER RATING CURVE

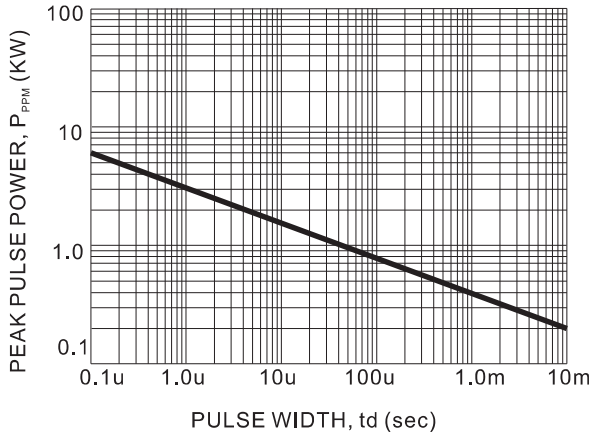


Fig.2 - PULSE DERATING CURVE

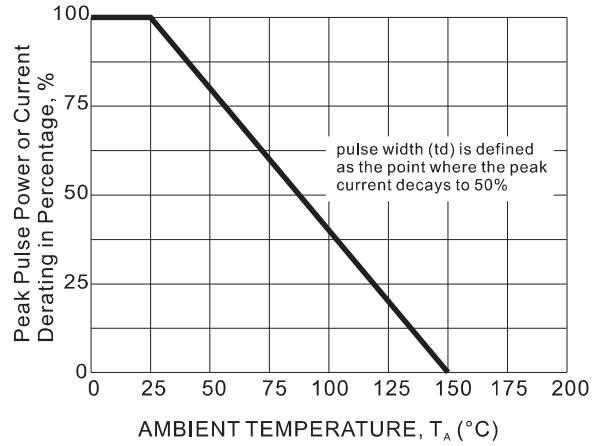


Fig.3 - Pulse Waveform

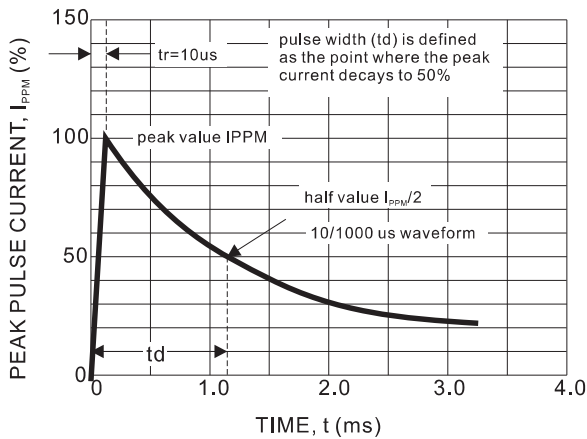


Fig.4 - Typical Junction Capacitance

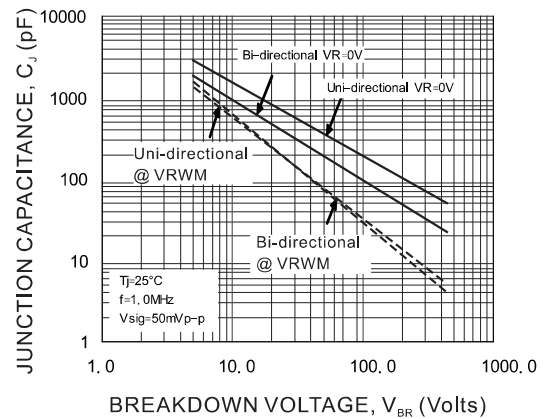


Fig.5 - STEADY STATE POWER DERATING CURVE

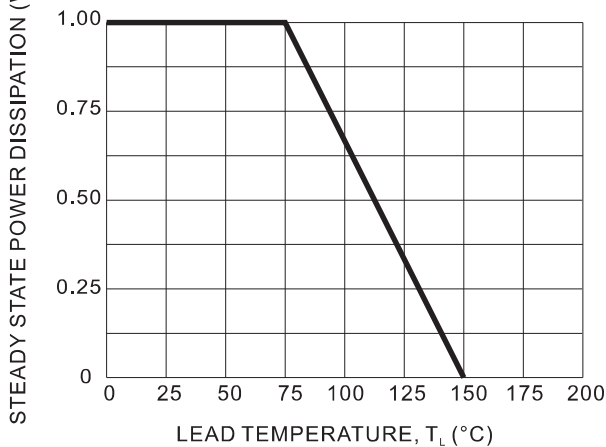
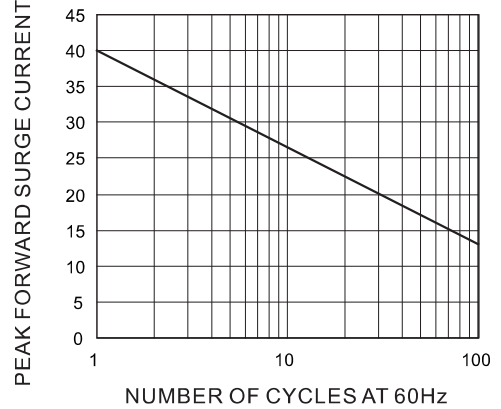






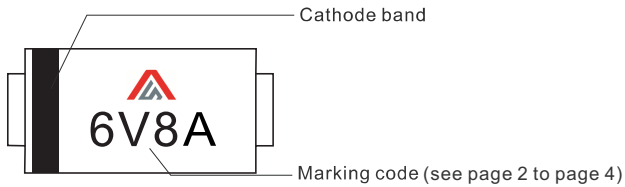
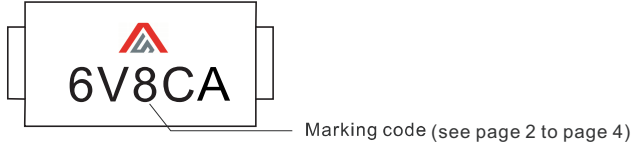
Fig.6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT



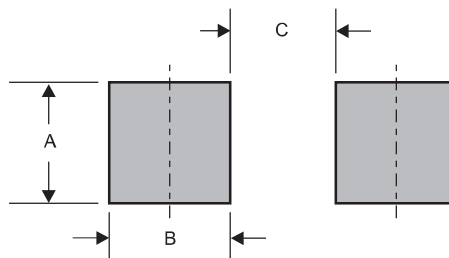
Pinning information

| Pin | Simplified outline | Symbol |
|---|--|---|
| Uni-Directional Pin1 cathode Pin2 anode |  |  |
| Bi-Directional |  |  |

Marking

| Type number | Example |
|-----------------|---|
| Uni-Directional |  <p>Cathode band</p> <p>Marking code (see page 2 to page 4)</p> |
| Bi-Directional |  <p>Marking code (see page 2 to page 4)</p> |

Suggested solder pad layout



Dimensions in inches and (millimeters)

| PACKAGE | A | B | C |
|---------|--------------|--------------|--------------|
| SMA | 0.063 (1.60) | 0.059 (1.50) | 0.110 (2.80) |