

FEATURES

- | Low profile package
- | Ideal for automated placement
- | 400 Watt peak pulse power capability with a 10/1000µs waveform
- | For surface mounted applications to optimize board space
- | Excellent clamping capability
- | Very fast response time
- | Low incremental surge resistance



DO-214AC(SMA)



Uni-directional



Bi-directional

APPLICATIONS

- | Power supply protection
- | Automotive application
- | Industrial application
- | Power management

APPROVALS

| | |
|-------------|------------------------------------|
| RoHS | Compliance with 2011/65/EU |
| HF | Compliance with IEC61249-2-21:2003 |

MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$)

| Parameter | Symbol | Value | Unit |
|---|-----------|-------|-------|
| Peak Pulse Power Dissipation on 10/1000us waveform (Note1, Note2). | P_{PPM} | 400 | Watts |
| Steady State Power Dissipation at $T_L=75^{\circ}\text{C}$, Lead lengths.375" (9.5mm) (Note2) | P_D | 3.3 | Watts |

Notes : 1.Non-repetitive current pulse, $T_A=25^{\circ}\text{C}$.

2.Mounted on 5.0mm x 5.0mm (0.03mm thick) Copper Pads to each terminal.

THERMAL CONSIDERATIONS

| Parameter | Symbol | Value | Unit |
|--|-----------------|-------------|-----------------------------|
| Operating Junction Temperature | T_J | -55 to +150 | $^{\circ}\text{C}$ |
| Storage Temperature Range | T_{STG} | -55 to +150 | $^{\circ}\text{C}$ |
| Junction to Ambient on printed circuit | $R_{\theta JA}$ | 120 | $^{\circ}\text{C}/\text{W}$ |

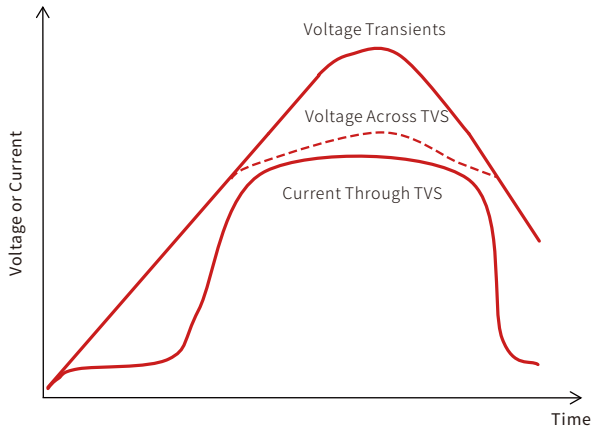
ELECTRICAL CHARACTERISTICS (T_A = 25°C)

| Part Number | | Device Marking Code | | 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 _{RWM} |
|-------------|------------|---------------------|------|---------------------------|---------------------------------------|---------------------------------------|---------------------|---|---------------------|-----------------------------------|
| Uni-Polar | Bi-Polar | Uni | Bi | V _{RWM} (V) | V _{BR} (V) | V _{BR} (V) | I _T (mA) | V _C (V) | I _{PP} (A) | I _R (uA) |
| P4SMA6.8A | P4SMA6.8CA | 6V8A | 6V8C | 5.8 | 6.45 | 7.14 | 10 | 10.5 | 39 | 1000 |
| P4SMA7.5A | P4SMA7.5CA | 7V5A | 7V5C | 6.4 | 7.13 | 7.88 | 10 | 11.3 | 36.3 | 500 |
| P4SMA8.2A | P4SMA8.2CA | 8V2A | 8V2C | 7.02 | 7.79 | 8.61 | 10 | 12.1 | 33.9 | 200 |
| P4SMA9.1A | P4SMA9.1CA | 9V1A | 9V1C | 7.78 | 8.65 | 9.55 | 1 | 13.4 | 30.6 | 50 |
| P4SMA10A | P4SMA10CA | 10A | 10C | 8.55 | 9.5 | 10.5 | 1 | 14.5 | 28.3 | 10 |
| P4SMA11A | P4SMA11CA | 11A | 11C | 9.4 | 10.5 | 11.6 | 1 | 15.6 | 26.3 | 5 |
| P4SMA12A | P4SMA12CA | 12A | 12C | 10.2 | 11.4 | 12.6 | 1 | 16.7 | 24.6 | 5 |
| P4SMA13A | P4SMA13CA | 13A | 13C | 11.1 | 12.4 | 13.7 | 1 | 18.2 | 22.5 | 1 |
| P4SMA15A | P4SMA15CA | 15A | 15C | 12.8 | 14.3 | 15.8 | 1 | 21.2 | 19.3 | 1 |
| P4SMA16A | P4SMA16CA | 16A | 16C | 13.6 | 15.2 | 16.8 | 1 | 22.5 | 18.2 | 1 |
| P4SMA18A | P4SMA18CA | 18A | 18C | 15.3 | 17.1 | 18.9 | 1 | 25.5 | 16.1 | 1 |
| P4SMA20A | P4SMA20CA | 20A | 20C | 17.1 | 19.0 | 21.0 | 1 | 27.7 | 14.8 | 1 |
| P4SMA22A | P4SMA22CA | 22A | 22C | 18.8 | 20.9 | 23.1 | 1 | 30.6 | 13.4 | 1 |
| P4SMA24A | P4SMA24CA | 24A | 24C | 20.5 | 22.8 | 25.2 | 1 | 33.2 | 12.3 | 1 |
| P4SMA27A | P4SMA27CA | 27A | 27C | 23.1 | 25.7 | 28.4 | 1 | 37.5 | 10.9 | 1 |
| P4SMA30A | P4SMA30CA | 30A | 30C | 25.6 | 28.5 | 31.5 | 1 | 41.4 | 9.9 | 1 |
| P4SMA33A | P4SMA33CA | 33A | 33C | 28.2 | 31.4 | 34.7 | 1 | 45.7 | 9.0 | 1 |
| P4SMA36A | P4SMA36CA | 36A | 36C | 30.8 | 34.2 | 37.8 | 1 | 49.9 | 8.2 | 1 |
| P4SMA39A | P4SMA39CA | 39A | 39C | 33.3 | 37.1 | 41.0 | 1 | 53.9 | 7.6 | 1 |
| P4SMA43A | P4SMA43CA | 43A | 43C | 36.8 | 40.9 | 45.2 | 1 | 59.3 | 6.9 | 1 |
| P4SMA47A | P4SMA47CA | 47A | 47C | 40.2 | 44.7 | 49.4 | 1 | 64.8 | 6.3 | 1 |
| P4SMA51A | P4SMA51CA | 51A | 51C | 43.6 | 48.5 | 53.6 | 1 | 70.1 | 5.8 | 1 |
| P4SMA56A | P4SMA56CA | 56A | 56C | 47.8 | 53.2 | 58.8 | 1 | 77.0 | 5.3 | 1 |
| P4SMA62A | P4SMA62CA | 62A | 62C | 53.0 | 58.9 | 65.1 | 1 | 85.0 | 4.8 | 1 |
| P4SMA68A | P4SMA68CA | 68A | 68C | 58.1 | 64.6 | 71.4 | 1 | 92.0 | 4.5 | 1 |
| P4SMA75A | P4SMA75CA | 75A | 75C | 64.1 | 71.30 | 78.8 | 1 | 103 | 4.0 | 1 |
| P4SMA82A | P4SMA82CA | 82A | 82C | 70.1 | 77.9 | 86.1 | 1 | 113 | 3.6 | 1 |
| P4SMA91A | P4SMA91CA | 91A | 91C | 77.8 | 86.5 | 95.5 | 1 | 125 | 3.3 | 1 |
| P4SMA100A | P4SMA100CA | 100A | 100C | 85.5 | 95 | 105 | 1 | 137 | 3.0 | 1 |
| P4SMA110A | P4SMA110CA | 110A | 110C | 94.0 | 105 | 116 | 1 | 152 | 2.7 | 1 |
| P4SMA120A | P4SMA120CA | 120A | 120C | 102 | 114 | 126 | 1 | 165 | 2.5 | 1 |
| P4SMA130A | P4SMA130CA | 130A | 130C | 111 | 124 | 137 | 1 | 179 | 2.3 | 1 |

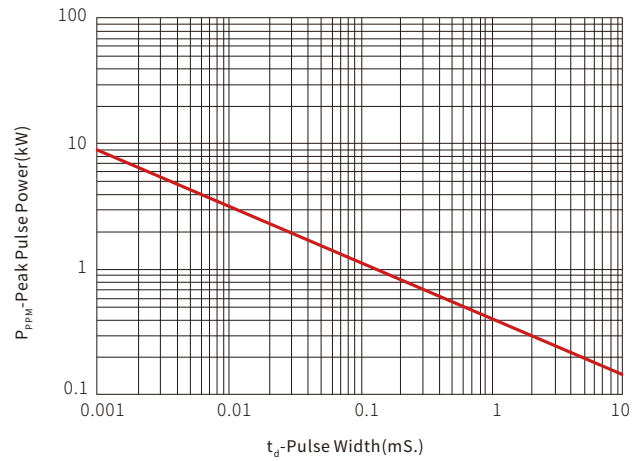
| Part Number | | Device Marking Code | | Reverse Stand-off Voltage | Breakdown Voltage Min.@I _T | Breakdown Voltage Max.@I _T | Test Current | Maximum Clamping Voltage @I _{PP} | Peak Pulse Current | Reverse Leakage @V _{RWM} |
|-------------|------------|---------------------|------|---------------------------|---------------------------------------|---------------------------------------|---------------------|---|---------------------|-----------------------------------|
| Uni-Polar | Bi-Polar | Uni | Bi | V _{RWM} (V) | V _{BR} (V) | V _{BR} (V) | I _T (mA) | V _C (V) | I _{PP} (A) | I _R (uA) |
| P4SMA150A | P4SMA150CA | 150A | 150C | 128 | 143 | 158 | 1 | 207 | 2.0 | 1 |
| P4SMA160A | P4SMA160CA | 160A | 160C | 136 | 152 | 168 | 1 | 219 | 1.9 | 1 |
| P4SMA170A | P4SMA170CA | 170A | 170C | 145 | 162 | 179 | 1 | 234 | 1.8 | 1 |
| P4SMA180A | P4SMA180CA | 180A | 180C | 154 | 171 | 189 | 1 | 246 | 1.7 | 1 |
| P4SMA200A | P4SMA200CA | 200A | 200C | 171 | 190 | 210 | 1 | 274 | 1.5 | 1 |
| P4SMA220A | P4SMA220CA | 220A | 220C | 185 | 209 | 231 | 1 | 328 | 1.3 | 1 |
| P4SMA250A | P4SMA250CA | 250A | 250C | 214 | 237 | 263 | 1 | 344 | 1.2 | 1 |
| P4SMA300A | P4SMA300CA | 300A | 300C | 256 | 285 | 315 | 1 | 414 | 1.0 | 1 |
| P4SMA350A | P4SMA350CA | 350A | 350C | 300 | 332 | 368 | 1 | 482 | 0.85 | 1 |
| P4SMA400A | P4SMA400CA | 400A | 400C | 342 | 380 | 420 | 1 | 548 | 0.75 | 1 |
| P4SMA440A | P4SMA440CA | 440A | 440C | 376 | 418 | 462 | 1 | 602 | 0.68 | 1 |
| P4SMA480A | P4SMA480CA | 480A | 480C | 408 | 456 | 504 | 1 | 658 | 0.61 | 1 |
| P4SMA510A | P4SMA510CA | 510A | 510C | 434 | 485 | 535 | 1 | 698 | 0.57 | 1 |
| P4SMA530A | P4SMA530CA | 530A | 530C | 451 | 503.5 | 556.5 | 1 | 725 | 0.55 | 1 |
| P4SMA540A | P4SMA540CA | 540A | 540C | 459 | 513 | 567 | 1 | 740 | 0.54 | 1 |
| P4SMA550A | P4SMA550CA | 550A | 550C | 467 | 522.5 | 577.5 | 1 | 760 | 0.52 | 1 |
| P4SMA600A | P4SMA600CA | 600A | 600C | 510 | 570 | 630 | 1 | 828 | 0.48 | 1 |

CHARACTERISTIC CURVES

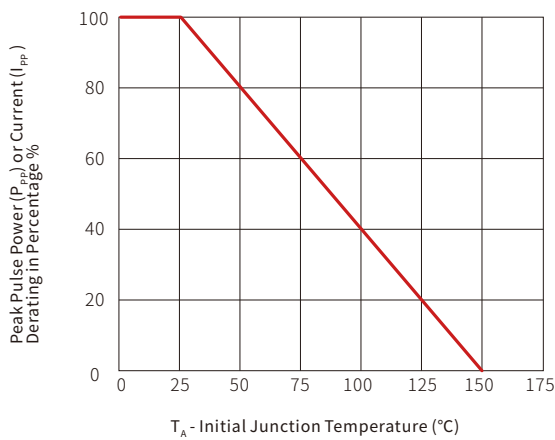
TVS Transients Clamping Waveform



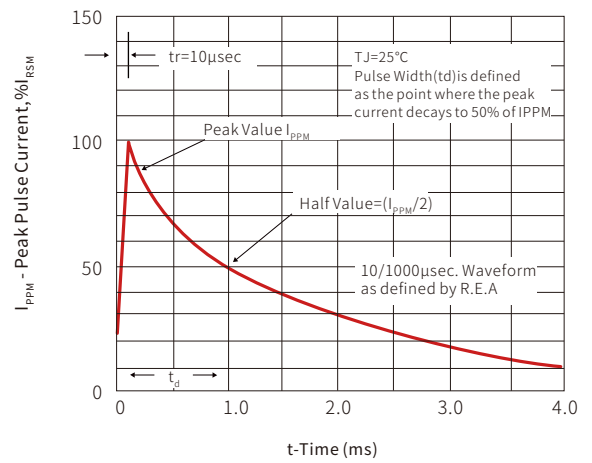
Peak Pulse Power Rating Curve



Pulse Derating Curve



Pulse Waveform

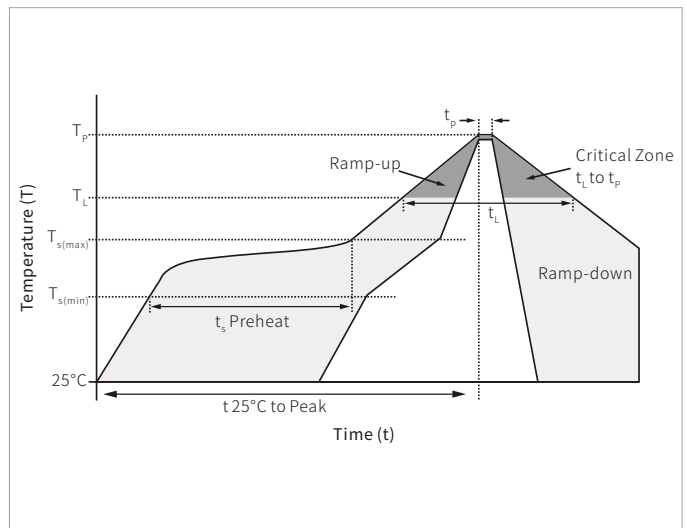


Typical Junction Capacitance

Steady State Power Dissipation Derating Curve


SOLDERING PARAMETERS

| Reflow Condition | | Lead-free assembly |
|--|----------------------------------|--------------------|
| Pre Heat | Temperature Max ($T_{s(min)}$) | 150°C |
| | Temperature Max ($T_{s(max)}$) | 200°C |
| | Time (min to max) (t_s) | 60 – 180 secs |
| Average ramp up rate (Liquidus Temp (T_L) to peak) | | 3°C/second max |
| $T_{s(max)}$ to T_L - Ramp-up Rate | | 3°C/second max |
| Reflow | Temperature (T_L) (Liquidus) | 217°C |
| | Time (min to max) (t_i) | 60 – 150 seconds |
| Peak Temperature (T_p) | | 260°C |
| Time within 5°C of actual peak Temperature (t_p) | | 20 – 40 seconds |
| Ramp-down Rate | | 6°C/second max |
| Time 25°C to peak Temperature (T_p) | | 8 minutes max. |
| Do not exceed | | 260°C |



DO-214AC(SMA) PACKAGE INFORMATION



| Ref. | Millimeters | | Inches | |
|------|-------------|------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 1.20 | 1.60 | 0.047 | 0.063 |
| B | 4.20 | 4.60 | 0.165 | 0.181 |
| C | 2.40 | 2.80 | 0.094 | 0.110 |
| D | 2.00 | 2.40 | 0.079 | 0.094 |
| E | 0.76 | 1.52 | 0.030 | 0.060 |
| F | 0.02 | 0.20 | 0.001 | 0.008 |
| G | 4.85 | 5.25 | 0.191 | 0.207 |
| H | 0.15 | 0.30 | 0.006 | 0.012 |

RECOMMENDED PAD LAYOUT DIMENSIONS



| Ref. | Millimeters | | Inches | |
|------|-------------|------|----------|-------|
| | Min. | Max. | Min. | Max. |
| A | 1.63 | - | 0.064 | - |
| B | 1.45 | - | 0.057 | - |
| C | - | 2.80 | - | 0.090 |
| D | 1.45 | - | 0.057 | - |
| E | 5.28REF | | 0.208REF | |

ORDERING INFORMATION

| Part Number | Component Package | QTY/Reel | Reel Size |
|-------------|-------------------|----------|-----------|
| P4SMAxx(C)A | DO-214AC(SMA) | 5000PCS | 13" |

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