

# MDE Semiconductor, Inc.

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## P4SMA SERIES

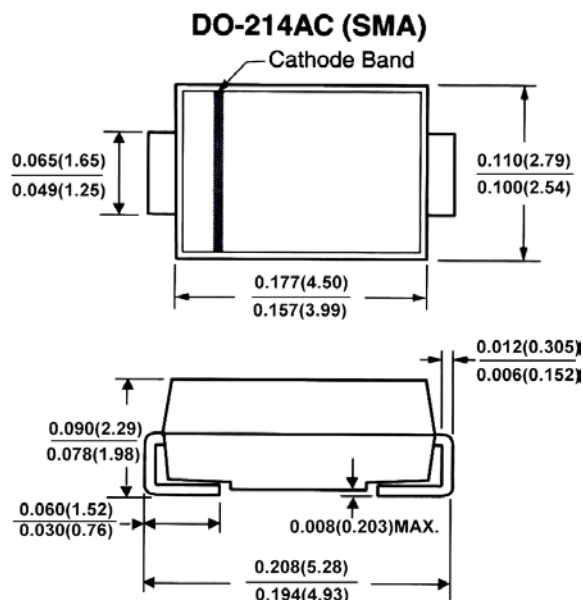
### GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE-6.8 TO 550 Volts 400 Watt Peak Pulse Power

#### FEATURES

- For surface mounted applications in order to optimize board space
- Glass passivated junction
- Built-in strain relief
- Excellent clamping capability
- Low profile package
- Low inductance
- Excellent clamping capability
- Fast response time: typically less than 1.0 ps from 0 volts to BV min
- Typical IR less than 1 $\mu$ A above 10V
- High temperature soldering guaranteed: 250°C/10 seconds at terminals

#### MECHANICAL DATA

Case: JEDEC DO-214AC Molded plastic  
Terminal : Solder plated, solderable per MIL-STD-750, Method 2026  
Polarity: Color band denoted positive end (cathode) except Bipolar  
Standard Packaging: 12mm tape(EIA STD RS-481)  
Weight: 0.002 ounces, 0.061 grams



Dimensions in inches (millimeters)

#### DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use CA Suffix for types P4SMA6.8CA thru types P4SMA550CA  
Electrical characteristics apply in both directions.

#### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

| RATING  | SYMBOL                            | VALUE       | UNITS |
|---|-----------------------------------|-------------|-------|
| Peak Pulse Power Dissipation at TA = 25 °C, TP = 1ms (Note 1)   | P <sub>PPM</sub>                  | Minimum 400 | Watts |
| Peak Pulse Current of on 10/1000 $\mu$ s waveform (Note 1)  | I <sub>PPM</sub>                  | SEE TABLE 1 | Amps  |
| Steady State Power Dissipation at TL = 75°C<br>Lead lengths .375", 9.5mm (Note 2)                             | P <sub>M(AV)</sub>                | 1.0         | Watts |
| Peak Forward Surge Current, 8.3ms Single Half Sine-wave<br>Superimposed on Rated Load, (JEDEC Method)(Note 3) | I <sub>FSM</sub>                  | 40          | Amps  |
| Operatings and Storage Temperature Range  | T <sub>J</sub> , T <sub>STG</sub> | -55 +150    | °C    |

**NOTES:**

1. Non-repetitive current pulse, per Fig.3 and derated above Ta=25 °C per Fig.2.
2. Mounted on 5.0mm<sup>2</sup> (0.03mm thick) Copper Pads to each terminal
3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle=4 pulses per minutes maximum.

Certified RoHS Compliant

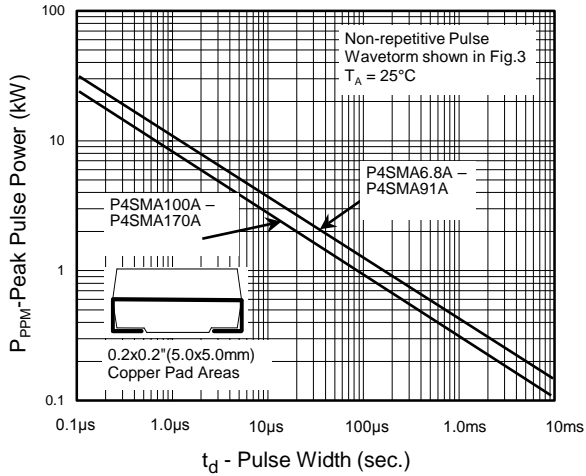
UL File # E223026

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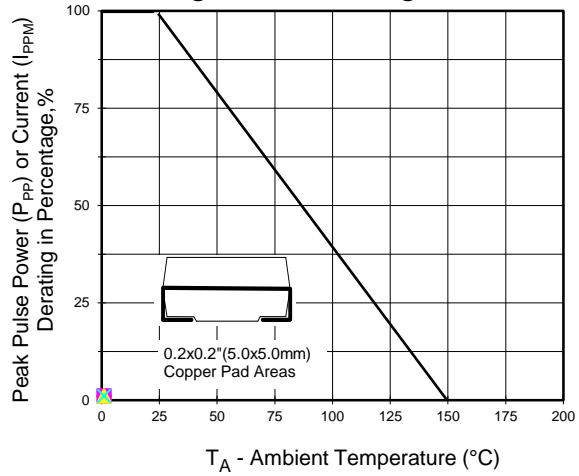
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## RATING AND CHARACTERISTIC CURVES P4SMA SERIES

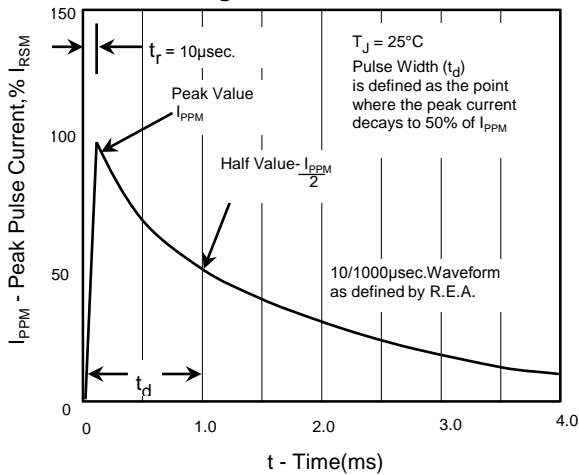
**Fig. 1 - Peak Pulse Power Rating Curve**



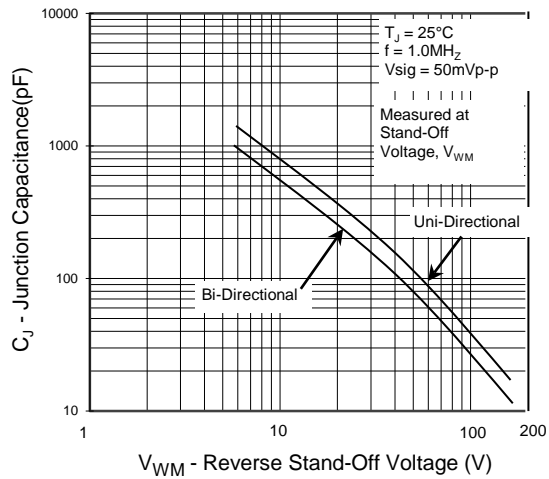
**Fig.2 - Pulse Derating Curve**



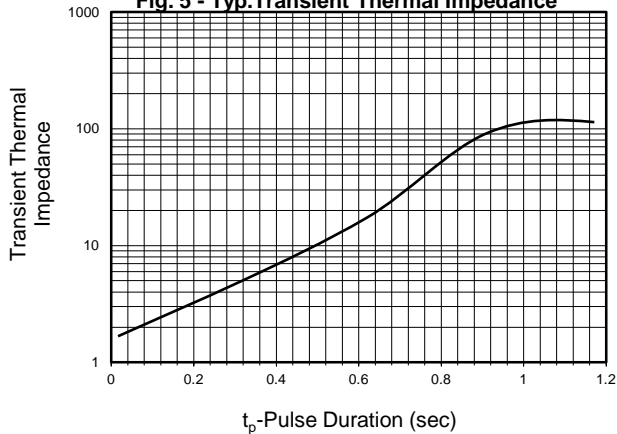
**Fig.3 - Pulse Waveform**



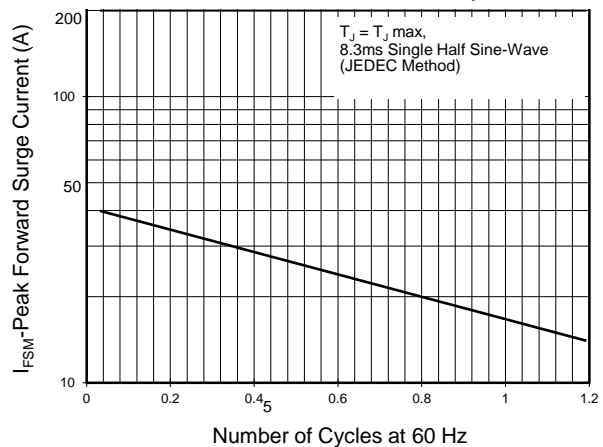
**Fig.4 - Typical Junction Capacitance**



**Fig. 5 - Typ. Transient Thermal Impedance**



**Fig.6 - Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only**



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## 400 Watt TVS

| P4SMA<br>PART NUMBER |      |       | MARKING<br>CODE |              | REVERSE<br>STAND-<br>OFF<br>VOLTAGE<br>V <sub>RWM</sub> (V) | BREAKDOWN<br>VOLTAGE<br>V <sub>BR</sub> (V)<br>MIN.@I <sub>T</sub> | BREAKDOWN<br>VOLTAGE<br>V <sub>BR</sub> (V)<br>MAX.@I <sub>T</sub> | TEST<br>CURRENT<br>I <sub>T</sub> (mA) | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>@I <sub>pp</sub> Vc(V) | PEAK<br>PULSE<br>CURRENT<br>I <sub>pp</sub> (A) | REVERSE<br>LEAKAGE<br>@ VRWM<br>IR(μA) |
|----------------------|------|-------|-----------------|--------------|---|--|--|--|--|---|--|
|                      |      |       | UNI-<br>POLAR   | BI-<br>POLAR |   |  |  |  |  |   |  |
| P4SMA                | 6.8A | 6.8CA | 6V8A            | 6V8C         | 5.80  | 6.45   | 7.14   | 10                                     | 10.5   | 39.0  | 1000                                   |
| P4SMA                | 7.5A | 7.5CA | 7V5A            | 7V5C         | 6.40  | 7.13   | 7.88   | 10                                     | 11.3   | 36.3  | 500                                    |
| P4SMA                | 8.2A | 8.2CA | 8V2A            | 8V2C         | 7.02  | 7.79   | 8.61   | 10                                     | 12.1   | 33.9  | 200                                    |
| P4SMA                | 9.1A | 9.1CA | 9V1A            | 9V1C         | 7.78  | 8.65   | 9.55   | 1                                      | 13.4   | 30.6  | 50                                     |
| P4SMA                | 10A  | 10CA  | 10A             | 10C          | 8.55  | 9.50   | 10.50  | 1                                      | 14.5   | 28.3  | 10                                     |
| P4SMA                | 11A  | 11CA  | 11A             | 11C          | 9.40  | 10.50  | 11.60  | 1                                      | 15.6   | 26.3  | 5                                      |
| P4SMA                | 12A  | 12CA  | 12A             | 12C          | 10.20   | 11.40  | 12.60  | 1                                      | 16.7   | 24.6  | 5                                      |
| P4SMA                | 13A  | 13CA  | 13A             | 13C          | 11.10   | 12.40  | 13.70  | 1                                      | 18.2   | 22.5  | 5                                      |
| P4SMA                | 15A  | 15CA  | 15A             | 15C          | 12.80   | 14.30  | 15.80  | 1                                      | 21.2   | 19.3  | 5                                      |
| P4SMA                | 16A  | 16CA  | 16A             | 16C          | 13.60   | 15.20  | 16.80  | 1                                      | 22.5   | 18.2  | 5                                      |
| P4SMA                | 18A  | 18CA  | 18A             | 18C          | 15.30   | 17.10  | 18.90  | 1                                      | 25.5   | 16.1  | 5                                      |
| P4SMA                | 20A  | 20CA  | 20A             | 20C          | 17.10   | 19.00  | 21.00  | 1                                      | 27.7   | 14.8  | 5                                      |
| P4SMA                | 22A  | 22CA  | 22A             | 22C          | 18.80   | 20.90  | 23.10  | 1                                      | 30.6   | 13.4  | 5                                      |
| P4SMA                | 24A  | 24CA  | 24A             | 24C          | 20.50   | 22.80  | 25.20  | 1                                      | 33.2   | 12.3  | 5                                      |
| P4SMA                | 27A  | 27CA  | 27A             | 27C          | 23.10   | 25.70  | 28.40  | 1                                      | 37.5   | 10.9  | 5                                      |
| P4SMA                | 30A  | 30CA  | 30A             | 30C          | 25.60   | 28.50  | 31.50  | 1                                      | 41.4   | 9.9   | 5                                      |
| P4SMA                | 33A  | 33CA  | 33A             | 33C          | 28.20   | 31.40  | 34.70  | 1                                      | 45.7   | 9.0   | 5                                      |
| P4SMA                | 36A  | 36CA  | 36A             | 36C          | 30.80   | 34.20  | 37.80  | 1                                      | 49.9   | 8.2   | 5                                      |
| P4SMA                | 39A  | 39CA  | 39A             | 39C          | 33.30   | 37.10  | 41.00  | 1                                      | 53.9   | 7.6   | 5                                      |
| P4SMA                | 43A  | 43CA  | 43A             | 43C          | 36.80   | 40.90  | 45.20  | 1                                      | 59.3   | 6.9   | 5                                      |
| P4SMA                | 47A  | 47CA  | 47A             | 47C          | 40.20   | 44.70  | 49.40  | 1                                      | 64.8   | 6.3   | 5                                      |
| P4SMA                | 51A  | 51CA  | 51A             | 51C          | 43.60   | 48.50  | 53.60  | 1                                      | 70.1   | 5.8   | 5                                      |
| P4SMA                | 56A  | 56CA  | 56A             | 56C          | 47.80   | 53.20  | 58.80  | 1                                      | 77.0   | 5.3   | 5                                      |
| P4SMA                | 62A  | 62CA  | 62A             | 62C          | 53.00   | 58.90  | 65.10  | 1                                      | 85.0   | 4.8   | 5                                      |
| P4SMA                | 68A  | 68CA  | 68A             | 68C          | 58.10   | 64.60  | 71.40  | 1                                      | 92.0   | 4.5   | 5                                      |
| P4SMA                | 75A  | 75CA  | 75A             | 75C          | 64.10   | 71.30  | 78.80  | 1                                      | 103.0  | 4.0   | 5                                      |
| P4SMA                | 82A  | 82CA  | 82A             | 82C          | 70.10   | 77.90  | 86.10  | 1                                      | 113.0  | 3.6   | 5                                      |
| P4SMA                | 91A  | 91CA  | 91A             | 91C          | 77.80   | 86.50  | 95.50  | 1                                      | 125.0  | 3.3   | 5                                      |
| P4SMA                | 100A | 100CA | 100A            | 100C         | 85.50   | 95.00  | 105.00   | 1                                      | 137.0  | 3.0   | 5                                      |
| P4SMA                | 110A | 110CA | 110A            | 110C         | 94.00   | 105.00   | 116.00   | 1                                      | 152.0  | 2.7   | 5                                      |
| P4SMA                | 120A | 120CA | 120A            | 120C         | 102.00  | 114.00   | 126.00   | 1                                      | 165.0  | 2.5   | 5                                      |
| P4SMA                | 130A | 130CA | 130A            | 130C         | 111.00  | 124.00   | 137.00   | 1                                      | 179.0  | 2.3   | 5                                      |
| P4SMA                | 150A | 150CA | 150A            | 150C         | 128.00  | 143.00   | 158.00   | 1                                      | 207.0  | 2.0   | 5                                      |
| P4SMA                | 160A | 160CA | 160A            | 160C         | 136.00  | 152.00   | 168.00   | 1                                      | 219.0  | 1.9   | 5                                      |
| P4SMA                | 170A | 170CA | 170A            | 170C         | 145.00  | 162.00   | 179.00   | 1                                      | 234.0  | 1.8   | 5                                      |
| P4SMA                | 180A | 180CA | 180A            | 180C         | 154.00  | 171.00   | 189.00   | 1                                      | 246.0  | 1.7   | 5                                      |
| P4SMA                | 200A | 200CA | 200A            | 200C         | 171.00  | 190.00   | 210.00   | 1                                      | 274.0  | 1.5   | 5                                      |
| P4SMA                | 220A | 220CA | 220A            | 220C         | 185.00  | 209.00   | 231.00   | 1                                      | 328.0  | 1.3   | 5                                      |
| P4SMA                | 250A | 250CA | 250A            | 250C         | 214.00  | 237.00   | 263.00   | 1                                      | 344.0  | 1.2   | 5                                      |
| P4SMA                | 300A | 300CA | 300A            | 300C         | 256.00  | 285.00   | 315.00   | 1                                      | 414.0  | 1.0   | 5                                      |
| P4SMA                | 350A | 350CA | 350A            | 350C         | 300.00  | 332.00   | 368.00   | 1                                      | 482.0  | 0.9   | 5                                      |
| P4SMA                | 400A | 400CA | 400A            | 400C         | 342.00  | 380.00   | 420.00   | 1                                      | 548.0  | 0.8   | 5                                      |
| P4SMA                | 440A | 440CA | 440A            | 440C         | 376.00  | 418.00   | 462.00   | 1                                      | 602.0  | 0.7   | 5                                      |
| P4SMA                | 480A | 480CA | 480A            | 480C         | 408.00  | 456.00   | 504.00   | 1                                      | 658.0  | 0.6   | 5                                      |
| P4SMA                | 510A | 510CA | 510A            | 510C         | 434.00  | 485.00   | 535.00   | 1                                      | 698.0  | 0.6   | 5                                      |
| P4SMA                | 530A | 530CA | 530A            | 530C         | 450.00  | 503.50   | 556.50   | 1                                      | 725.0  | 0.6   | 5                                      |
| P4SMA                | 540A | 540CA | 540A            | 540C         | 459.00  | 513.00   | 567.00   | 1                                      | 740.0  | 0.5   | 5                                      |
| P4SMA                | 550A | 550CA | 550A            | 550C         | 467.00  | 522.50   | 577.50   | 1                                      | 760.0  | 0.5   | 5                                      |

For bidirectional type having Vrwm of 10 volts and less, the IR limit is double.

The available parts are "A" type only, the parts without A (VBR is ± 10%) are not available.

Certified RoHS Compliant  
UL File # E223026

8/11/2020