

# MDE Semiconductor, Inc.

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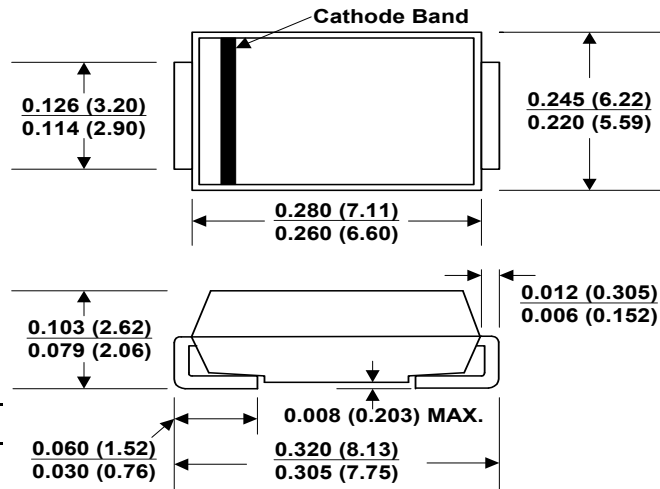
## SMDJ SERIES

### SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE- 5.0 TO 250 Volts 3000 Watt Peak Pulse Power

#### FEATURES

- For surface mounted applications in order to optimize board space
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- Repetition rate (duty cycle):0.01%
- Fast response time: typically less than 1.0 ps from 0 volts to BV for unidirectional types
- Typical IR less than 1µA above 10V
- High temperature soldering:  
250°C/10 seconds at terminals
- Plastic package has Underwriters Laboratory Flammability Classification 94 V-O

#### DO-214AB (SMC J-Bend)



*Dimensions in inches and(millimeters)*

#### MECHANICAL DATA

Case: JEDEC DO214AB. Molded plastic over glass passivated junction  
Terminals: Solder plated, solderable per MIL-STD-750, Method 2026  
Polarity: Color band denoted positive end (cathode) except Bidirectional  
Standard Packaging: 12mm tape (EIA STD RS-481)  
Weight: 0.007 ounces, 0.21 grams)

#### DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types SMDJ5.0 thru types SMDJ250 (e.g. SMDJ5.0C, SMDJ170CA) 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 on 10/1000 µs waveform (NOTE 1, 2, Fig.1)                                       | $P_{PPM}$      | Minimum 3000 | Watts |
| Peak Pulse Current of on 10/1000 µs waveform (Note 1, Fig 3)   | $I_{PPM}$      | SEE TABLE 1  | Amps  |
| Peak Forward Surge Current, 8.3ms Single Half Sine-wave Superimposed on Rated Load, (JEDEC Method)(Note2, 3) | $I_{FSM}$      | 300          | Amps  |
| Operatings and Storage Temperature Range   | $T_J, T_{STG}$ | -55 +150     | °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 Copper Pad area of 8.0mm x 8.0mm (20x20mm) per Fig.5.
3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle=4 pulses per minutes maximum.

Certified RoHS Compliant

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## **3000 Watt Surface Mount TVS**

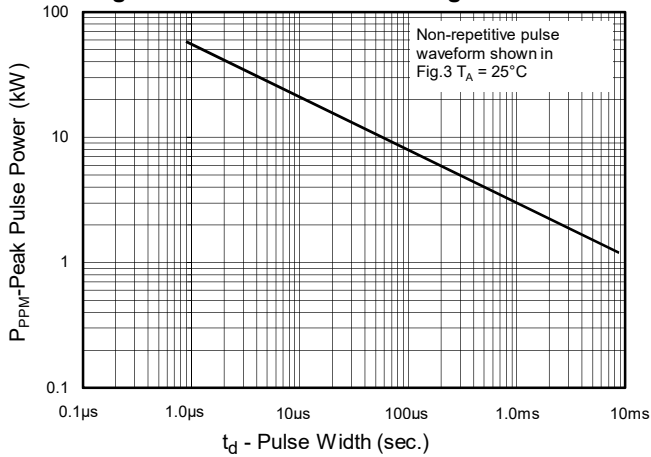
| UNI-POLAR | BI-POLAR  | DEVICE MARKING CODE |     | REVERSE STANDOFF VOLTAGE<br>V <sub>RWM</sub> (V) | BREAKDOWN VOLTAGE<br>V <sub>BR</sub> (V)<br>MIN. @ I <sub>T</sub> | BREAKDOWN VOLTAGE<br>V <sub>BR</sub> (V)<br>MAX. @ I <sub>T</sub> | TEST CURRENT<br>(I <sub>T</sub> )<br>mA | MAXIMUM CLAMPING VOLTAGE<br>@I <sub>PP</sub> V <sub>C</sub> (V) | PEAK PULSE CURRENT<br>I <sub>PP</sub> (A) | REVERSE LEAKAGE<br>@ V <sub>RWM</sub><br>I <sub>R</sub> (µA) |
|-----------|-----------|---------------------|-----|--|---|---|---|---|---|--|
|           |           | UNI                 | BI  |  |   |   |   |   |   |  |
| SMDJ5.0A  | SMDJ5.0CA | RDE                 | DDE | 5.00   | 6.40  | 7.00  | 10                                      | 9.2   | 326.1                                     | 800  |
| SMDJ6.0A  | SMDJ6.0CA | RDG                 | DDG | 6.00   | 6.67  | 7.37  | 10                                      | 10.3  | 291.3                                     | 800  |
| SMDJ6.5A  | SMDJ6.5CA | RDK                 | DDK | 6.50   | 7.22  | 7.98  | 10                                      | 11.2  | 267.9                                     | 500  |
| SMDJ7.0A  | SMDJ7.0CA | PDM                 | DDM | 7.00   | 7.78  | 8.60  | 10                                      | 12.0  | 250.0                                     | 200  |
| SMDJ7.5A  | SMDJ7.5CA | PDP                 | DDP | 7.50   | 8.33  | 9.21  | 1                                       | 12.9  | 232.6                                     | 100  |
| SMDJ8.0A  | SMDJ8.0CA | PDR                 | DDR | 8.00   | 8.89  | 9.83  | 1                                       | 13.6  | 220.6                                     | 50   |
| SMDJ8.5A  | SMDJ8.5CA | PDT                 | DDT | 8.50   | 9.44  | 10.40   | 1                                       | 14.4  | 208.3                                     | 20   |
| SMDJ9.0A  | SMDJ9.0CA | PDV                 | DDV | 9.00   | 10.00   | 11.10   | 1                                       | 15.4  | 194.8                                     | 10   |
| SMDJ10A   | SMDJ10CA  | PDX                 | DDX | 10.00  | 11.10   | 12.30   | 1                                       | 17.0  | 176.5                                     | 5  |
| SMDJ11A   | SMDJ11CA  | PDZ                 | DDZ | 11.00  | 12.20   | 13.50   | 1                                       | 18.2  | 164.8                                     | 2  |
| SMDJ12A   | SMDJ12CA  | PEE                 | DEE | 12.00  | 13.30   | 14.70   | 1                                       | 19.9  | 150.8                                     | 2  |
| SMDJ13A   | SMDJ13CA  | PEG                 | DEG | 13.00  | 14.40   | 15.90   | 1                                       | 21.5  | 139.5                                     | 2  |
| SMDJ14A   | SMDJ14CA  | PEK                 | DEK | 14.00  | 15.60   | 17.20   | 1                                       | 23.2  | 129.3                                     | 2  |
| SMDJ15A   | SMDJ15CA  | PEM                 | DEM | 15.00  | 16.70   | 18.50   | 1                                       | 24.4  | 123.0                                     | 2  |
| SMDJ16A   | SMDJ16CA  | PEP                 | DEP | 16.00  | 17.80   | 19.70   | 1                                       | 26.0  | 115.4                                     | 2  |
| SMDJ17A   | SMDJ17CA  | PER                 | DER | 17.00  | 18.90   | 20.90   | 1                                       | 27.6  | 108.7                                     | 2  |
| SMDJ18A   | SMDJ18CA  | PET                 | DET | 18.00  | 20.00   | 22.10   | 1                                       | 29.2  | 102.7                                     | 2  |
| SMDJ20A   | SMDJ20CA  | PEV                 | DEV | 20.00  | 22.20   | 24.50   | 1                                       | 32.4  | 92.6                                      | 2  |
| SMDJ22A   | SMDJ22CA  | PEX                 | DEX | 22.00  | 24.40   | 26.90   | 1                                       | 35.5  | 84.5                                      | 2  |
| SMDJ24A   | SMDJ24CA  | PEZ                 | DEZ | 24.00  | 26.70   | 29.50   | 1                                       | 38.9  | 77.1                                      | 2  |
| SMDJ26A   | SMDJ26CA  | PFE                 | DFE | 26.00  | 28.90   | 31.90   | 1                                       | 42.1  | 71.3                                      | 2  |
| SMDJ28A   | SMDJ28CA  | PFG                 | DFG | 28.00  | 31.10   | 34.40   | 1                                       | 45.4  | 66.1                                      | 2  |
| SMDJ30A   | SMDJ30CA  | PFK                 | DFK | 30.00  | 33.30   | 36.80   | 1                                       | 48.4  | 62.0                                      | 2  |
| SMDJ33A   | SMDJ33CA  | PFM                 | DFM | 33.00  | 36.70   | 40.60   | 1                                       | 53.3  | 56.3                                      | 2  |
| SMDJ36A   | SMDJ36CA  | PFP                 | DFP | 36.00  | 40.00   | 44.20   | 1                                       | 58.1  | 51.6                                      | 2  |
| SMDJ40A   | SMDJ40CA  | PFR                 | DFR | 40.00  | 44.40   | 49.10   | 1                                       | 64.5  | 46.5                                      | 2  |
| SMDJ43A   | SMDJ43CA  | PFT                 | DFT | 43.00  | 47.80   | 52.80   | 1                                       | 69.4  | 43.2                                      | 2  |
| SMDJ45A   | SMDJ45CA  | PFV                 | DFV | 45.00  | 50.00   | 55.30   | 1                                       | 72.7  | 41.3                                      | 2  |
| SMDJ48A   | SMDJ48CA  | PFX                 | DFX | 48.00  | 53.30   | 58.90   | 1                                       | 77.4  | 38.8                                      | 2  |
| SMDJ51A   | SMDJ51CA  | PFZ                 | DFZ | 51.00  | 56.70   | 62.70   | 1                                       | 82.4  | 36.4                                      | 2  |
| SMDJ54A   | SMDJ54CA  | RGE                 | DGE | 54.00  | 60.00   | 66.30   | 1                                       | 87.1  | 34.4                                      | 2  |
| SMDJ58A   | SMDJ58CA  | PGG                 | DGG | 58.00  | 64.40   | 71.20   | 1                                       | 93.6  | 32.1                                      | 2  |
| SMDJ60A   | SMDJ60CA  | PGK                 | DGK | 60.00  | 66.70   | 73.70   | 1                                       | 96.8  | 31.0                                      | 2  |
| SMDJ64A   | SMDJ64CA  | PGM                 | DGM | 64.00  | 71.10   | 78.60   | 1                                       | 103.0   | 29.1                                      | 2  |
| SMDJ70A   | SMDJ70CA  | PGP                 | DGP | 70.00  | 77.80   | 86.00   | 1                                       | 113.0   | 26.5                                      | 2  |
| SMDJ75A   | SMDJ75CA  | PGR                 | DGR | 75.00  | 83.30   | 92.10   | 1                                       | 121.0   | 24.8                                      | 2  |
| SMDJ78A   | SMDJ78CA  | PGT                 | DGT | 78.00  | 86.70   | 95.80   | 1                                       | 126.0   | 23.8                                      | 2  |
| SMDJ85A   | SMDJ85CA  | PGV                 | DGV | 85.00  | 94.40   | 104.00  | 1                                       | 137.0   | 21.9                                      | 2  |
| SMDJ90A   | SMDJ90CA  | PGX                 | DGX | 90.00  | 100.00  | 111.00  | 1                                       | 146.0   | 20.5                                      | 2  |
| SMDJ100A  | SMDJ100CA | PGZ                 | DGZ | 100.00   | 111.00  | 123.00  | 1                                       | 162.0   | 18.5                                      | 2  |
| SMDJ110A  | SMDJ110CA | PHE                 | DHE | 110.00   | 122.00  | 135.00  | 1                                       | 177.0   | 16.9                                      | 2  |
| SMDJ120A  | SMDJ120CA | PHG                 | DHG | 120.00   | 133.00  | 147.00  | 1                                       | 193.0   | 15.5                                      | 2  |
| SMDJ130A  | SMDJ130CA | PHK                 | DHK | 130.00   | 144.00  | 159.00  | 1                                       | 209.0   | 14.4                                      | 2  |
| SMDJ150A  | SMDJ150CA | PHM                 | DHM | 150.00   | 167.00  | 185.00  | 1                                       | 243.0   | 12.3                                      | 2  |
| SMDJ160A  | SMDJ160CA | PHP                 | DHP | 160.00   | 178.00  | 197.00  | 1                                       | 259.0   | 11.6                                      | 2  |
| SMDJ170A  | SMDJ170CA | PHR                 | DHR | 170.00   | 189.00  | 209.00  | 1                                       | 275.0   | 10.9                                      | 2  |
| SMDJ180A  | SMDJ180CA | PHT                 | DHT | 180.00   | 201.00  | 222.00  | 1                                       | 292.0   | 10.3                                      | 2  |
| SMDJ200A  | SMDJ200CA | PHV                 | DVE | 200.00   | 224.00  | 247.00  | 1                                       | 324.0   | 9.3                                       | 2  |
| SMDJ220A  | SMDJ220CA | PKE                 | DKE | 220.00   | 246.00  | 272.00  | 1                                       | 356.0   | 8.4                                       | 2  |
| SMDJ250A  | SMDJ250CA | PKG                 | DKG | 250.00   | 279.00  | 309.00  | 1                                       | 405.0   | 7.5                                       | 2  |

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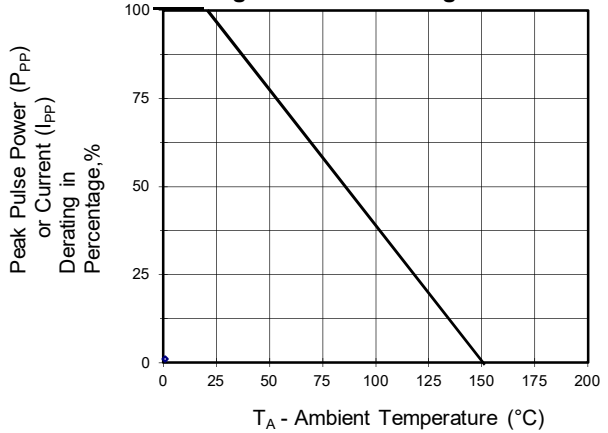
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## RATING AND CHARACTERISTIC CURVES SMDJ SERIES

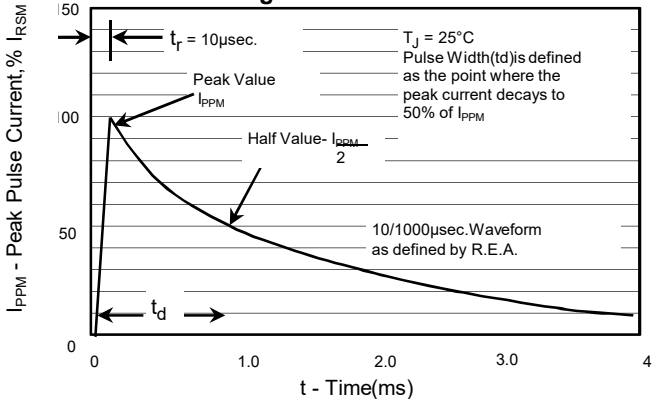
**Fig. 1 - Peak Pulse Power Rating Curve**



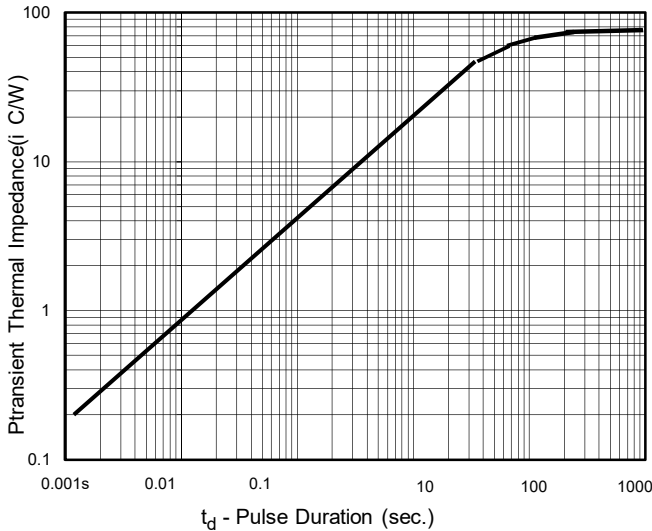
**Fig.2 - Pulse Derating Curve**



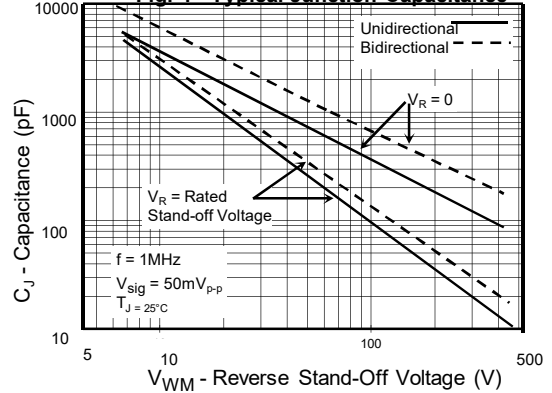
**Fig.3 - Pulse Waveform**



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



**Fig. 4 - Typical Junction Capacitance**



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

