

# **MDE Semiconductor, Inc.**

78-150 Calle Tampico, Unit 210, La Quinta, CA., USA 92253 Tel : 760-564-8656 • Fax : 760-564-2414  
1-800-831-4881 Email: sales@mdesemiconductor.com Web: www.mdesemiconductor.com

## **5.0 SMDJ SERIES**

### **SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE-5.0 TO 170 Volts 5000 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 1 $\mu$ A above 10V
- High temperature soldering:  
250°C/10 seconds at terminals
- Plastic package has Underwriters Laboratory Flammability Classification 94 V-O

#### **MECHANICAL DATA**

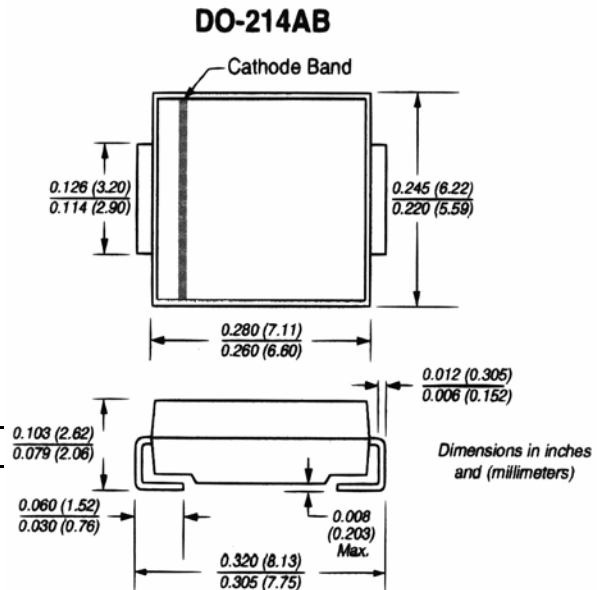
Case: JEDEC DO214AB. Molded plastic over glass passivated junction

Terminals: Solder plated, solderable per MIL-STD-750, Method 2026

Polarity: Color band denoted positive end (cathode) except Bidirectional

Standard Packaging: 16mm tape (EIA STD RS-481)

Weight: 0.007 ounces, 0.021 grams)



Dimensions in inches and (millimeters)

#### **DEVICES FOR BIPOLAR APPLICATIONS**

For Bidirectional use C or CA Suffix for types 5.0SMDJ5.0 thru types 5.0SMDJ170 (e.g. 5.0SMDJ5.0C, 5.0SMDJ170CA)  
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 $\mu$ s waveform (NOTE 1, 2, Fig.1)                                  | $P_{PPM}$      | Minimum 5000 | Watts |
| Peak Pulse Current of on 10/1000 $\mu$ s 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) | $I_{FSM}$      | 400          | 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 8.0mm x 8.0mm 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

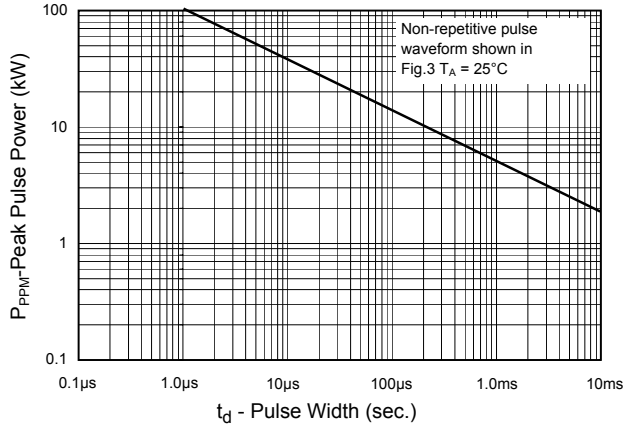
UL File # E223026

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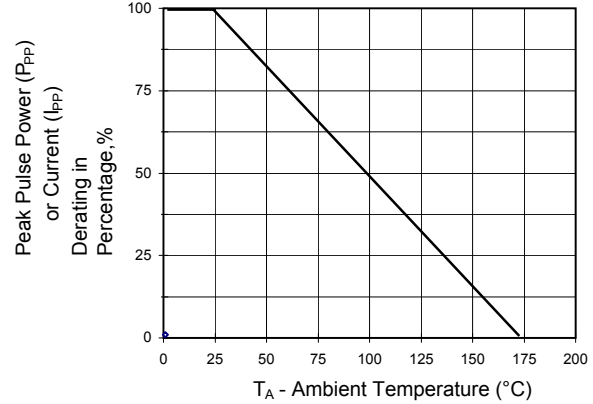
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## RATING AND CHARACTERISTIC CURVES 5.0SMDJ SERIES

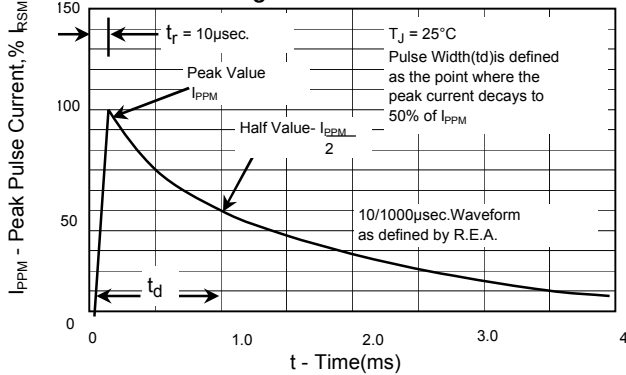
**Fig. 1 - Peak Pulse Power Rating Curve**



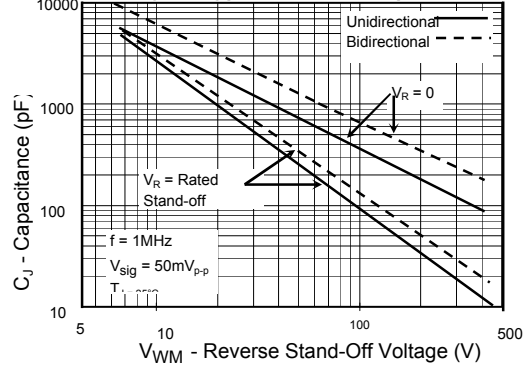
**Fig.2 - Pulse Derating Curve**



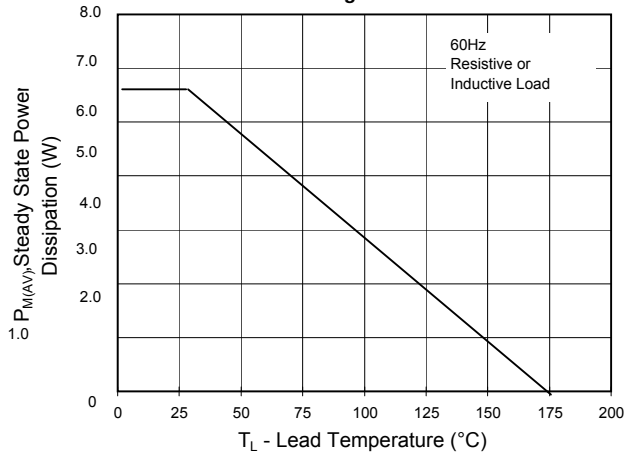
**Fig.3 - Pulse Waveform**



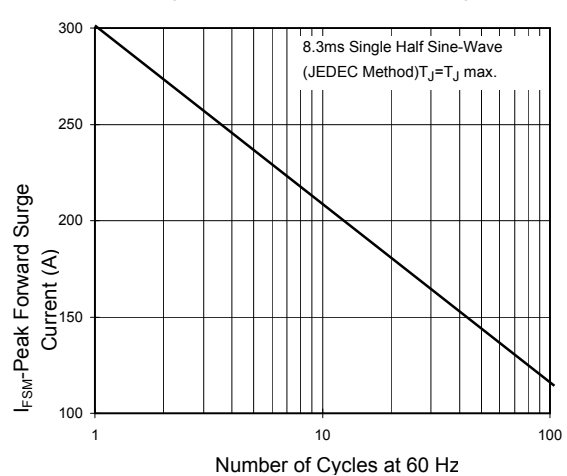
**Fig. 4 - Typical Junction Capacitance**



**Fig. 5 - Steady State Power Derating Curve**



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



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## 5000 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   |                                                  |                                                                   |                                                                   |                                         |                                                                 |                                           |                                                              |
| 5.0SMDJ11A  | 5.0SMDJ11CA | 5PEN                | 5BEN | 11.0                                             | 12.20                                                             | 13.50                                                             | 10                                      | 18.2                                                            | 275.0                                     | 800                                                          |
| 5.0SMDJ12A  | 5.0SMDJ12CA | 5PEP                | 5BEP | 12.0                                             | 13.30                                                             | 14.70                                                             | 10                                      | 19.9                                                            | 252.0                                     | 800                                                          |
| 5.0SMDJ13A  | 5.0SMDJ13CA | 5PEQ                | 5BEQ | 13.0                                             | 14.40                                                             | 15.90                                                             | 10                                      | 21.5                                                            | 233.0                                     | 500                                                          |
| 5.0SMDJ14A  | 5.0SMDJ14CA | 5PER                | 5BER | 14.0                                             | 15.60                                                             | 17.20                                                             | 10                                      | 23.2                                                            | 216.0                                     | 200                                                          |
| 5.0SMDJ15A  | 5.0SMDJ20CA | 5PES                | 5BES | 15.0                                             | 16.70                                                             | 18.50                                                             | 1                                       | 24.4                                                            | 205.0                                     | 100                                                          |
| 5.0SMDJ16A  | 5.0SMDJ20CA | 5PET                | 5BET | 16.0                                             | 17.80                                                             | 19.70                                                             | 1                                       | 26.0                                                            | 193.0                                     | 50                                                           |
| 5.0SMDJ17A  | 5.0SMDJ20CA | 5PEU                | 5BEU | 17.0                                             | 18.90                                                             | 20.90                                                             | 1                                       | 27.6                                                            | 181.0                                     | 20                                                           |
| 5.0SMDJ18A  | 5.0SMDJ20CA | 5PEV                | 5BEV | 18.0                                             | 20.00                                                             | 22.10                                                             | 1                                       | 29.2                                                            | 172.0                                     | 10                                                           |
| 5.0SMDJ20A  | 5.0SMDJ20CA | 5PEW                | 5BEW | 20.0                                             | 22.20                                                             | 24.50                                                             | 1                                       | 32.4                                                            | 155.0                                     | 5                                                            |
| 5.0SMDJ22A  | 5.0SMDJ22CA | 5PEX                | 5BEX | 22.0                                             | 24.40                                                             | 26.90                                                             | 1                                       | 35.5                                                            | 141.0                                     | 5                                                            |
| 5.0SMDJ24A  | 5.0SMDJ24CA | 5PEZ                | 5BEZ | 24.0                                             | 26.70                                                             | 29.50                                                             | 1                                       | 38.9                                                            | 129.0                                     | 5                                                            |
| 5.0SMDJ26A  | 5.0SMDJ26CA | 5PFE                | 5BFE | 26.0                                             | 28.90                                                             | 31.90                                                             | 1                                       | 42.1                                                            | 119.0                                     | 5                                                            |
| 5.0SMDJ28A  | 5.0SMDJ28CA | 5PFG                | 5BFG | 28.0                                             | 31.10                                                             | 34.40                                                             | 1                                       | 45.4                                                            | 110.0                                     | 5                                                            |
| 5.0SMDJ30A  | 5.0SMDJ30CA | 5PFK                | 5BFK | 30.0                                             | 33.30                                                             | 36.80                                                             | 1                                       | 48.4                                                            | 103.0                                     | 5                                                            |
| 5.0SMDJ33A  | 5.0SMDJ33CA | 5PFM                | 5BFM | 33.0                                             | 36.70                                                             | 40.60                                                             | 1                                       | 53.3                                                            | 93.9                                      | 5                                                            |
| 5.0SMDJ36A  | 5.0SMDJ36CA | 5PFP                | 5BFP | 36.0                                             | 40.00                                                             | 44.20                                                             | 1                                       | 58.1                                                            | 86.1                                      | 5                                                            |
| 5.0SMDJ40A  | 5.0SMDJ40CA | 5PFR                | 5BFR | 40.0                                             | 44.40                                                             | 49.10                                                             | 1                                       | 64.5                                                            | 77.6                                      | 5                                                            |
| 5.0SMDJ43A  | 5.0SMDJ43CA | 5PFT                | 5BFT | 43.0                                             | 47.80                                                             | 52.80                                                             | 1                                       | 69.4                                                            | 72.1                                      | 5                                                            |
| 5.0SMDJ45A  | 5.0SMDJ45CA | 5PFV                | 5BFV | 45.0                                             | 50.00                                                             | 55.30                                                             | 1                                       | 72.7                                                            | 68.8                                      | 5                                                            |
| 5.0SMDJ48A  |             | 5PFX                |      | 48.0                                             | 53.30                                                             | 58.90                                                             | 1                                       | 77.4                                                            | 64.7                                      | 5                                                            |
| 5.0SMDJ51A  |             | 5PFZ                |      | 51.0                                             | 56.70                                                             | 62.70                                                             | 1                                       | 82.4                                                            | 60.7                                      | 5                                                            |
| 5.0SMDJ54A  |             | 5PGE                |      | 54.0                                             | 60.00                                                             | 66.30                                                             | 1                                       | 87.1                                                            | 57.5                                      | 5                                                            |
| 5.0SMDJ58A  |             | 5PGG                |      | 58.0                                             | 64.40                                                             | 71.20                                                             | 1                                       | 93.6                                                            | 53.5                                      | 5                                                            |
| 5.0SMDJ60A  |             | 5PGK                |      | 60.0                                             | 66.70                                                             | 73.70                                                             | 1                                       | 96.8                                                            | 51.7                                      | 5                                                            |
| 5.0SMDJ64A  |             | 5PGM                |      | 64.0                                             | 71.10                                                             | 78.60                                                             | 1                                       | 103.0                                                           | 48.6                                      | 5                                                            |
| 5.0SMDJ70A  |             | 5PGP                |      | 70.0                                             | 77.80                                                             | 86.00                                                             | 1                                       | 113.0                                                           | 44.3                                      | 5                                                            |
| 5.0SMDJ75A  |             | 5PGR                |      | 75.0                                             | 83.30                                                             | 92.10                                                             | 1                                       | 121.0                                                           | 41.4                                      | 5                                                            |
| 5.0SMDJ78A  |             | 5PGT                |      | 78.0                                             | 86.70                                                             | 95.80                                                             | 1                                       | 126.0                                                           | 39.7                                      | 5                                                            |
| 5.0SMDJ85A  |             | 5PGV                |      | 85.0                                             | 94.40                                                             | 104.00                                                            | 1                                       | 137.0                                                           | 36.5                                      | 5                                                            |
| 5.0SMDJ90A  |             | 5PGX                |      | 90.0                                             | 100.00                                                            | 111.00                                                            | 1                                       | 146.0                                                           | 34.3                                      | 5                                                            |
| 5.0SMDJ100A |             | 5PGZ                |      | 100.0                                            | 111.00                                                            | 123.00                                                            | 1                                       | 162.0                                                           | 30.9                                      | 5                                                            |
| 5.0SMDJ110A |             | 5PHE                |      | 110.0                                            | 122.00                                                            | 135.00                                                            | 1                                       | 177.0                                                           | 28.3                                      | 5                                                            |
| 5.0SMDJ120A |             | 5PHG                |      | 120.0                                            | 133.00                                                            | 147.00                                                            | 1                                       | 193.0                                                           | 26.0                                      | 5                                                            |
| 5.0SMDJ130A |             | 5PHK                |      | 130.0                                            | 144.00                                                            | 159.00                                                            | 1                                       | 209.0                                                           | 24.0                                      | 5                                                            |
| 5.0SMDJ150A |             | 5PHM                |      | 150.0                                            | 167.00                                                            | 185.00                                                            | 1                                       | 243.0                                                           | 20.6                                      | 5                                                            |
| 5.0SMDJ160A |             | 5PHP                |      | 160.0                                            | 178.00                                                            | 197.00                                                            | 1                                       | 259.0                                                           | 19.3                                      | 5                                                            |
| 5.0SMDJ170A |             | 5PHR                |      | 170.0                                            | 189.00                                                            | 209.00                                                            | 1                                       | 275.0                                                           | 18.2                                      | 5                                                            |

For bidirectional type having V<sub>rw</sub> of 10 volts and less, the I<sub>R</sub> limit is double.

For parts without A , the V<sub>BR</sub> is ± 10%

Certified RoHS Compliant

UL File # E223026