

# 5.0SMDJ Series

## Surface Mount – 5000W

### Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Part Number (Uni) | Part Number (Bi) | Marking |      | Reverse Stand off Voltage $V_R$ (Volts) | Breakdown Voltage $V_{BR}$ (Volts) @ $I_T$ |       | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C$ @ $I_{PP}$ (10/1000 $\mu\text{s}$ ) (V) | Maximum Peak Pulse Current $I_{PP}$ (10/1000 $\mu\text{s}$ ) (A) | Maximum Clamping Voltage $V_C$ @ $I_{PP}$ (8/20 $\mu\text{s}$ ) (V) | Maximum Peak Pulse Current $I_{PP}$ (8/20 $\mu\text{s}$ ) (A) | Maximum Reverse Leakage $I_R$ @ $V_R$ ( $\mu\text{A}$ ) | Maximum Temperature Coefficient of $V_{BR}$ (%/C) | Agency Approval  |
|-------------------|------------------|---------|------|-----------------------------------------|--------------------------------------------|-------|-------------------------|------------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|                   |                  | Uni     | Bi   |                                         | Min.                                       | Max.  |                         |                                                                        |                                                                  |                                                                     |                                                               |                                                         |                                                   |                                                                                                     |
| 5.0SMDJ12A        | 5.0SMDJ12CA      | 5PEP    | 5BEP | 12.0                                    | 13.3                                       | 14.7  | 10                      | 19.9                                                                   | 252.0                                                            | 25.7                                                                | 1890.0                                                        | 800                                                     | 0.075                                             | X                                                                                                   |
| 5.0SMDJ13A        | 5.0SMDJ13CA      | 5PEQ    | 5BEQ | 13.0                                    | 14.4                                       | 15.9  | 10                      | 21.5                                                                   | 233.0                                                            | 27.8                                                                | 1747.5                                                        | 500                                                     | 0.076                                             | X                                                                                                   |
| 5.0SMDJ14A        | 5.0SMDJ14CA      | 5PER    | 5BER | 14.0                                    | 15.6                                       | 17.2  | 10                      | 23.2                                                                   | 216.0                                                            | 30.0                                                                | 1620.0                                                        | 200                                                     | 0.08                                              | X                                                                                                   |
| 5.0SMDJ15A        | 5.0SMDJ15CA      | 5PES    | 5BES | 15.0                                    | 16.7                                       | 18.5  | 1                       | 24.4                                                                   | 205.0                                                            | 31.5                                                                | 1537.5                                                        | 100                                                     | 0.083                                             | X                                                                                                   |
| 5.0SMDJ16A        | 5.0SMDJ16CA      | 5PET    | 5BET | 16.0                                    | 17.8                                       | 19.7  | 1                       | 26.0                                                                   | 193.0                                                            | 33.6                                                                | 1447.5                                                        | 50                                                      | 0.084                                             | X                                                                                                   |
| 5.0SMDJ17A        | 5.0SMDJ17CA      | 5PEU    | 5BEU | 17.0                                    | 18.9                                       | 20.9  | 1                       | 27.6                                                                   | 181.0                                                            | 35.7                                                                | 1357.5                                                        | 20                                                      | 0.085                                             | X                                                                                                   |
| 5.0SMDJ18A        | 5.0SMDJ18CA      | 5PEV    | 5BEV | 18.0                                    | 20.0                                       | 22.1  | 1                       | 29.2                                                                   | 172.0                                                            | 37.7                                                                | 1290.0                                                        | 10                                                      | 0.088                                             | X                                                                                                   |
| 5.0SMDJ20A        | 5.0SMDJ20CA      | 5PEW    | 5BEW | 20.0                                    | 22.2                                       | 24.5  | 1                       | 32.4                                                                   | 155.0                                                            | 41.9                                                                | 850.0                                                         | 5                                                       | 0.091                                             | X                                                                                                   |
| 5.0SMDJ22A        | 5.0SMDJ22CA      | 5PEX    | 5BEX | 22.0                                    | 24.4                                       | 26.9  | 1                       | 35.5                                                                   | 141.0                                                            | 45.9                                                                | 1057.5                                                        | 5                                                       | 0.092                                             | X                                                                                                   |
| 5.0SMDJ24A        | 5.0SMDJ24CA      | 5PEZ    | 5BEZ | 24.0                                    | 26.7                                       | 29.5  | 1                       | 38.9                                                                   | 129.0                                                            | 50.3                                                                | 967.5                                                         | 5                                                       | 0.092                                             | X                                                                                                   |
| 5.0SMDJ26A        | 5.0SMDJ26CA      | 5PFE    | 5BFE | 26.0                                    | 28.9                                       | 31.9  | 1                       | 42.1                                                                   | 119.0                                                            | 54.4                                                                | 892.5                                                         | 5                                                       | 0.093                                             | X                                                                                                   |
| 5.0SMDJ28A        | 5.0SMDJ28CA      | 5PFG    | 5BFG | 28.0                                    | 31.1                                       | 34.4  | 1                       | 45.4                                                                   | 110.0                                                            | 58.7                                                                | 825.0                                                         | 5                                                       | 0.094                                             | X                                                                                                   |
| 5.0SMDJ30A        | 5.0SMDJ30CA      | 5PFG    | 5BFG | 30.0                                    | 33.3                                       | 36.8  | 1                       | 48.4                                                                   | 103.0                                                            | 62.5                                                                | 772.5                                                         | 5                                                       | 0.096                                             | X                                                                                                   |
| 5.0SMDJ33A        | 5.0SMDJ33CA      | 5PFM    | 5BFM | 33.0                                    | 36.7                                       | 40.6  | 1                       | 53.3                                                                   | 93.9                                                             | 68.9                                                                | 704.3                                                         | 5                                                       | 0.097                                             | X                                                                                                   |
| 5.0SMDJ36A        | 5.0SMDJ36CA      | 5PFP    | 5BFP | 36.0                                    | 40.0                                       | 44.2  | 1                       | 58.1                                                                   | 86.1                                                             | 75.1                                                                | 645.8                                                         | 5                                                       | 0.098                                             | X                                                                                                   |
| 5.0SMDJ40A        | 5.0SMDJ40CA      | 5PFR    | 5BFR | 40.0                                    | 44.4                                       | 49.1  | 1                       | 64.5                                                                   | 77.6                                                             | 83.3                                                                | 582.0                                                         | 5                                                       | 0.099                                             | X                                                                                                   |
| 5.0SMDJ43A        | 5.0SMDJ43CA      | 5PFT    | 5BFT | 43.0                                    | 47.8                                       | 52.8  | 1                       | 69.4                                                                   | 72.1                                                             | 89.7                                                                | 540.8                                                         | 5                                                       | 0.1                                               | X                                                                                                   |
| 5.0SMDJ45A        | 5.0SMDJ45CA      | 5PFV    | 5BFV | 45.0                                    | 50.0                                       | 55.3  | 1                       | 72.7                                                                   | 68.8                                                             | 93.9                                                                | 516.0                                                         | 5                                                       | 0.101                                             | X                                                                                                   |
| 5.0SMDJ48A        | 5.0SMDJ48CA      | 5PFX    | 5BFX | 48.0                                    | 53.3                                       | 58.9  | 1                       | 77.4                                                                   | 64.7                                                             | 100.0                                                               | 485.3                                                         | 5                                                       | 0.101                                             | X                                                                                                   |
| 5.0SMDJ51A        | 5.0SMDJ51CA      | 5PFZ    | 5BFZ | 51.0                                    | 56.7                                       | 62.7  | 1                       | 82.4                                                                   | 60.7                                                             | 106.5                                                               | 455.3                                                         | 5                                                       | 0.101                                             | X                                                                                                   |
| 5.0SMDJ54A        | 5.0SMDJ54CA      | 5PGE    | 5BGE | 54.0                                    | 60.0                                       | 66.3  | 1                       | 87.1                                                                   | 57.5                                                             | 112.5                                                               | 431.3                                                         | 5                                                       | 0.102                                             | X                                                                                                   |
| 5.0SMDJ58A        | 5.0SMDJ58CA      | 5PGG    | 5BGG | 58.0                                    | 64.4                                       | 71.2  | 1                       | 93.6                                                                   | 53.5                                                             | 120.9                                                               | 401.3                                                         | 5                                                       | 0.103                                             | X                                                                                                   |
| 5.0SMDJ60A        | 5.0SMDJ60CA      | 5PGK    | 5BGK | 60.0                                    | 66.7                                       | 73.7  | 1                       | 96.8                                                                   | 51.7                                                             | 125.1                                                               | 387.8                                                         | 5                                                       | 0.103                                             | X                                                                                                   |
| 5.0SMDJ64A        | 5.0SMDJ64CA      | 5PGM    | 5BGM | 64.0                                    | 71.1                                       | 78.6  | 1                       | 103.0                                                                  | 48.6                                                             | 133.1                                                               | 364.5                                                         | 5                                                       | 0.104                                             | X                                                                                                   |
| 5.0SMDJ70A        | 5.0SMDJ70CA      | 5PGP    | 5BGP | 70.0                                    | 77.8                                       | 86.0  | 1                       | 113.0                                                                  | 44.3                                                             | 146.0                                                               | 332.3                                                         | 5                                                       | 0.105                                             | X                                                                                                   |
| 5.0SMDJ75A        | 5.0SMDJ75CA      | 5PGR    | 5BGR | 75.0                                    | 83.3                                       | 92.1  | 1                       | 121.0                                                                  | 41.4                                                             | 156.3                                                               | 310.5                                                         | 5                                                       | 0.106                                             | X                                                                                                   |
| 5.0SMDJ78A        | 5.0SMDJ78CA      | 5PGT    | 5BGT | 78.0                                    | 86.7                                       | 95.8  | 1                       | 126.0                                                                  | 39.7                                                             | 162.8                                                               | 297.8                                                         | 5                                                       | 0.106                                             | X                                                                                                   |
| 5.0SMDJ85A        | 5.0SMDJ85CA      | 5PGV    | 5BGV | 85.0                                    | 94.4                                       | 104.0 | 1                       | 137.0                                                                  | 36.5                                                             | 177.0                                                               | 273.8                                                         | 5                                                       | 0.106                                             | X                                                                                                   |
| 5.0SMDJ90A        | 5.0SMDJ90CA      | 5PGX    | 5BGX | 90.0                                    | 100.0                                      | 111.0 | 1                       | 146.0                                                                  | 34.3                                                             | 188.6                                                               | 257.3                                                         | 5                                                       | 0.107                                             | X                                                                                                   |
| 5.0SMDJ100A       | 5.0SMDJ100CA     | 5PGZ    | 5BGZ | 100.0                                   | 111.0                                      | 123.0 | 1                       | 162.0                                                                  | 30.9                                                             | 209.3                                                               | 231.8                                                         | 5                                                       | 0.107                                             | X                                                                                                   |
| 5.0SMDJ110A       | 5.0SMDJ110CA     | 5PHE    | 5BHE | 110.0                                   | 122.0                                      | 135.0 | 1                       | 177.0                                                                  | 28.3                                                             | 228.7                                                               | 212.3                                                         | 5                                                       | 0.107                                             | X                                                                                                   |
| 5.0SMDJ120A       | 5.0SMDJ120CA     | 5PHG    | 5BHG | 120.0                                   | 133.0                                      | 147.0 | 1                       | 193.0                                                                  | 26.0                                                             | 249.4                                                               | 195.0                                                         | 5                                                       | 0.108                                             | X                                                                                                   |
| 5.0SMDJ130A       | 5.0SMDJ130CA     | 5PHK    | 5BHK | 130.0                                   | 144.0                                      | 159.0 | 1                       | 209.0                                                                  | 24.0                                                             | 270.0                                                               | 180.0                                                         | 5                                                       | 0.108                                             | X                                                                                                   |
| 5.0SMDJ140A       | 5.0SMDJ140CA     | 5PHL    | 5BHL | 140.0                                   | 156.0                                      | 172.0 | 1                       | 226.1                                                                  | 22.2                                                             | 292.1                                                               | 166.5                                                         | 5                                                       | 0.108                                             | X                                                                                                   |
| 5.0SMDJ150A       | 5.0SMDJ150CA     | 5PHM    | 5BHM | 150.0                                   | 167.0                                      | 185.0 | 1                       | 243.0                                                                  | 20.6                                                             | 314.0                                                               | 154.5                                                         | 5                                                       | 0.108                                             | X                                                                                                   |
| 5.0SMDJ160A       | 5.0SMDJ160CA     | 5PHP    | 5BHB | 160.0                                   | 178.0                                      | 197.0 | 1                       | 259.0                                                                  | 19.3                                                             | 334.6                                                               | 144.8                                                         | 5                                                       | 0.108                                             | X                                                                                                   |
| 5.0SMDJ170A       | 5.0SMDJ170CA     | 5PHR    | 5BHR | 170.0                                   | 189.0                                      | 209.0 | 1                       | 275.0                                                                  | 18.2                                                             | 355.3                                                               | 136.5                                                         | 5                                                       | 0.108                                             | X                                                                                                   |

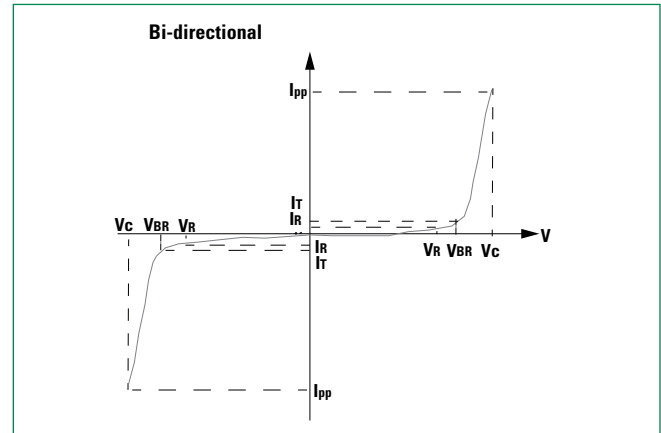
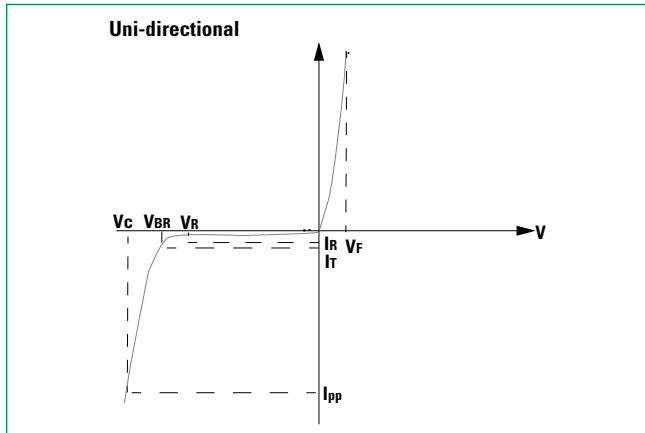
For bidirectional type having  $V_R$  of 20 volts and less, the  $I_R$  limit is double.

For parts without A, the  $V_{BR}$  is  $\pm 10\%$  and  $V_C$  is 5% higher than with A parts, the parts without A are currently available, but not recommended for new designs. The parts with A are preferred.

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## Surface Mount – 5000W

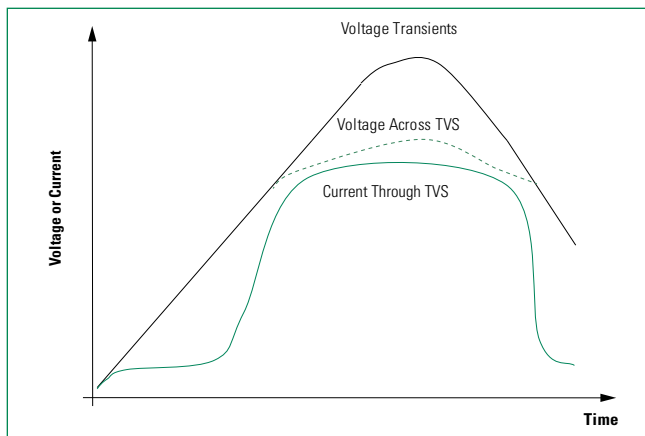
### I-V Curve Characteristics



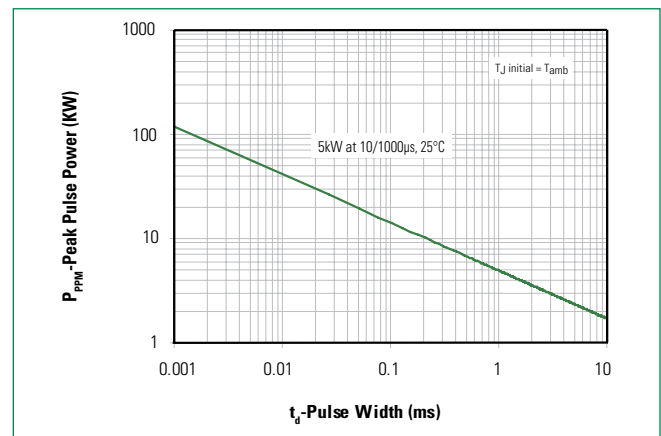
**$P_{PPM}$**  Peak Pulse Power Dissipation – Max power dissipation  
 **$V_R$**  Stand-off Voltage – Maximum voltage that can be applied to the TVS without operation  
 **$V_{BR}$**  Breakdown Voltage – Maximum voltage that flows through the TVS at a specified test current ( $I_R$ )  
 **$V_C$**  Clamping Voltage – Peak voltage measured across the TVS at a specified  $I_{PPM}$  (peak impulse current)  
 **$I_R$**  Reverse Leakage Current – Current measured at  $V_R$   
 **$V_F$**  Forward Voltage Drop for Uni-directional

### Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

**Figure 1:**  
TVS Transients Clamping Waveform



**Figure 2:**  
Peak Pulse Power Rating

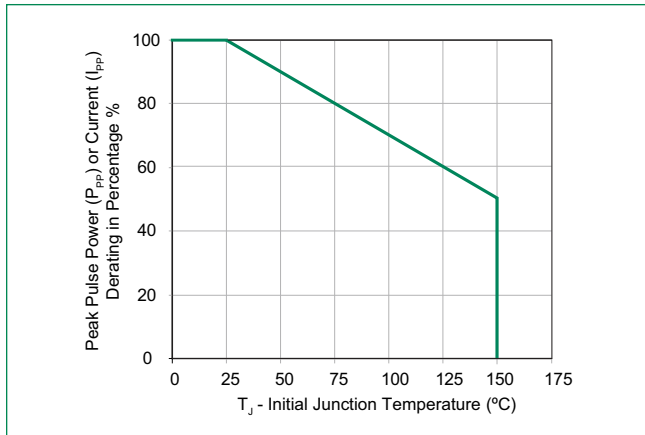


# 5.0SMDJ Series

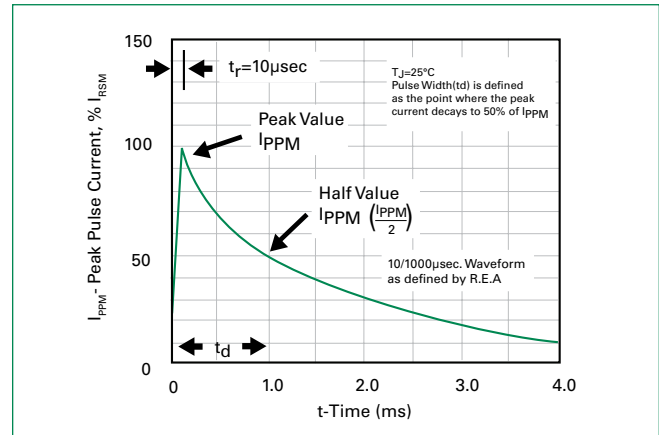
## Surface Mount – 5000W

### Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

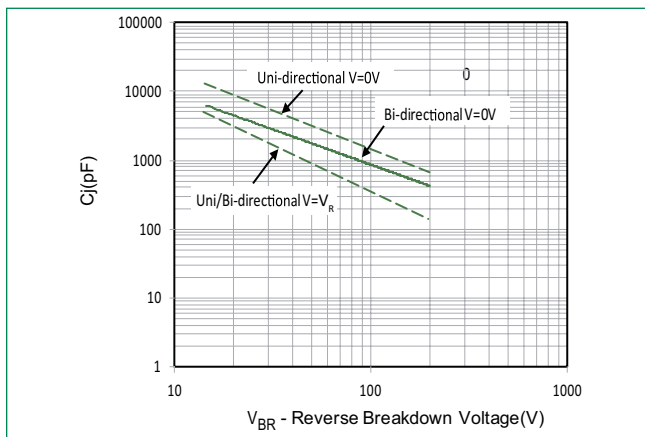
**Figure 3:**  
Peak Pulse Power Derating Curve



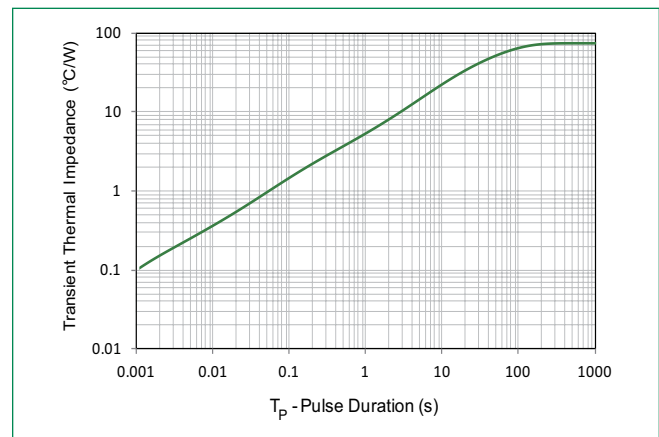
**Figure 4:**  
Pulse Waveform



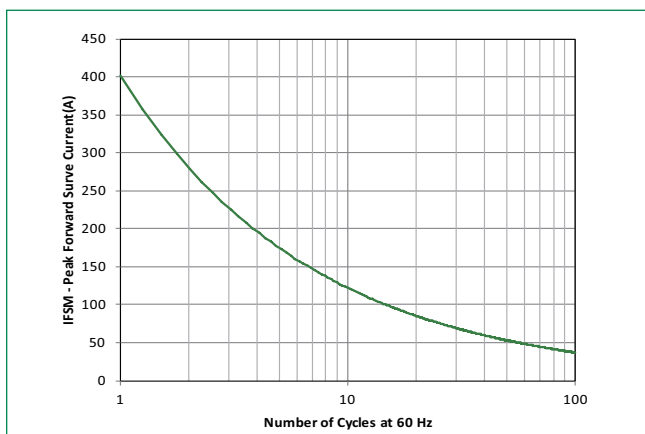
**Figure 5:**  
Typical Junction Capacitance



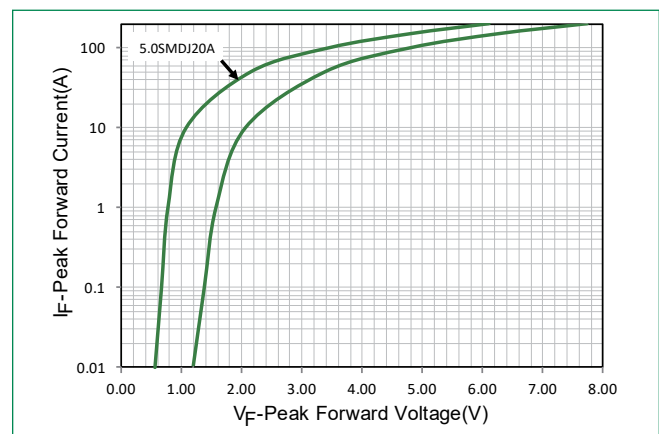
**Figure 6:**  
Typical Transient Thermal Impedance



**Figure 7:**  
Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only



**Figure 8:**  
Peak Forward Voltage Drop vs Peak Forward Current (Typical Values)

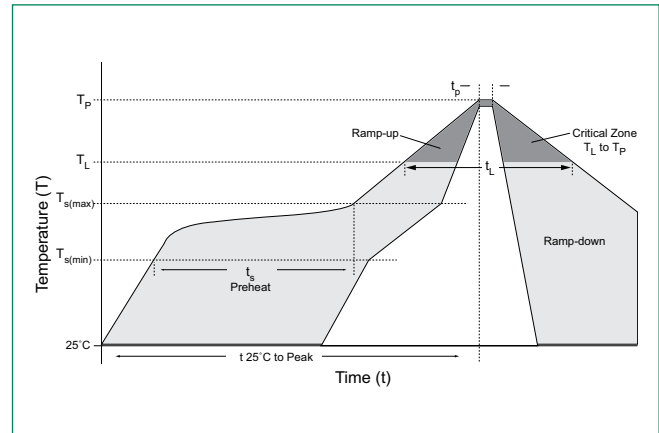


# 5.0SMDJ Series

## Surface Mount – 5000W

### Soldering Parameters

|                                                                       |                                    |                         |
|-----------------------------------------------------------------------|------------------------------------|-------------------------|
| <b>Reflow Condition</b>                                               |                                    | Lead-free assembly      |
| <b>Pre Heat</b>                                                       | - Temperature Min ( $T_{s(min)}$ ) | 150°C                   |
|                                                                       | - Temperature Max ( $T_{s(max)}$ ) | 200°C                   |
|                                                                       | - Time (min to max) ( $t_s$ )      | 60 – 180 secs           |
| <b>Average ramp up rate (Liquidus Temp (<math>T_A</math>) to peak</b> |                                    | 3°C/second max          |
| <b><math>T_{s(max)}</math> to <math>T_A</math> - Ramp-up Rate</b>     |                                    | 3°C/second max          |
| <b>Reflow</b>                                                         | - Temperature ( $T_L$ ) (Liquidus) | 217°C                   |
|                                                                       | - Time (min to max) ( $t_L$ )      | 60 – 150 seconds        |
| <b>Peak Temperature (<math>T_p</math>)</b>                            |                                    | 260 <sup>+0/-5</sup> °C |
| <b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>  |                                    | 20 – 40 seconds         |
| <b>Ramp-down Rate</b>                                                 |                                    | 6°C/second max          |
| <b>Time 25°C to peak Temperature (<math>T_p</math>)</b>               |                                    | 8 minutes Max.          |
| <b>Do not exceed</b>                                                  |                                    | 280°C                   |



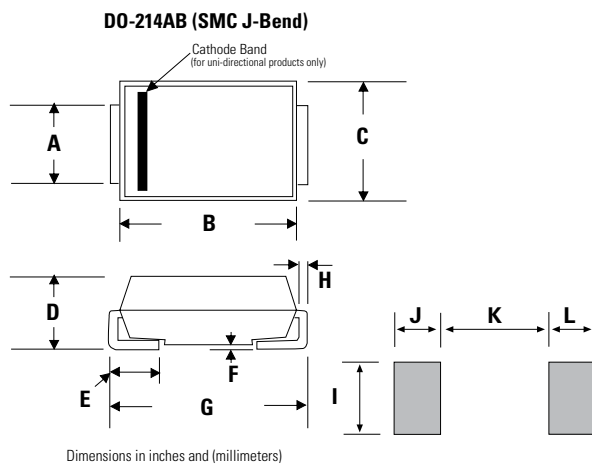
### Physical Specifications

|                 |                                                                 |
|-----------------|-----------------------------------------------------------------|
| <b>Weight</b>   | 0.007 ounce, 0.21 grams                                         |
| <b>Case</b>     | JEDEC DO214AB. Molded component over glass passivated junction  |
| <b>Polarity</b> | Color band denotes positive end (cathode) except Bidirectional. |
| <b>Terminal</b> | Matte Tin-plated leads, Solderable per JESD22-B102              |

### Environmental Specifications

|                            |                          |
|----------------------------|--------------------------|
| <b>High Temp. Storage</b>  | JESD22-A103              |
| <b>HTRB</b>                | JESD22-A108              |
| <b>Temperature Cycling</b> | JESD22-A104              |
| <b>MSL</b>                 | JEDEC-J-STD-020, Level 1 |
| <b>H3TRB</b>               | JESD22-A101              |
| <b>RSH</b>                 | JESD22-A111              |

### Dimensions

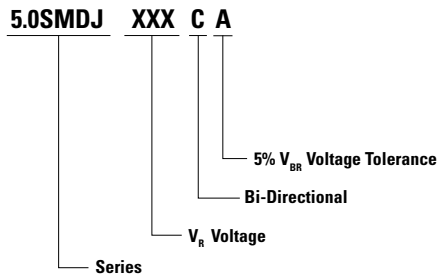


| Dimensions | Inches |       | Millimeters |       |
|------------|--------|-------|-------------|-------|
|            | Min    | Max   | Min         | Max   |
| <b>A</b>   | 0.114  | 0.126 | 2.900       | 3.200 |
| <b>B</b>   | 0.260  | 0.280 | 6.600       | 7.110 |
| <b>C</b>   | 0.220  | 0.245 | 5.590       | 6.220 |
| <b>D</b>   | 0.079  | 0.103 | 2.060       | 2.620 |
| <b>E</b>   | 0.030  | 0.060 | 0.760       | 1.520 |
| <b>F</b>   | -      | 0.008 | -           | 0.203 |
| <b>G</b>   | 0.305  | 0.320 | 7.750       | 8.130 |
| <b>H</b>   | 0.006  | 0.012 | 0.152       | 0.305 |
| <b>I</b>   | 0.129  | -     | 3.300       | -     |
| <b>J</b>   | 0.094  | -     | 2.400       | -     |
| <b>K</b>   | -      | 0.165 | -           | 4.200 |
| <b>L</b>   | 0.094  | -     | 2.400       | -     |

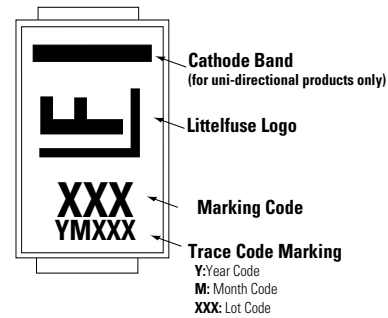
# 5.0SMDJ Series

## Surface Mount – 5000W

### Part Numbering System



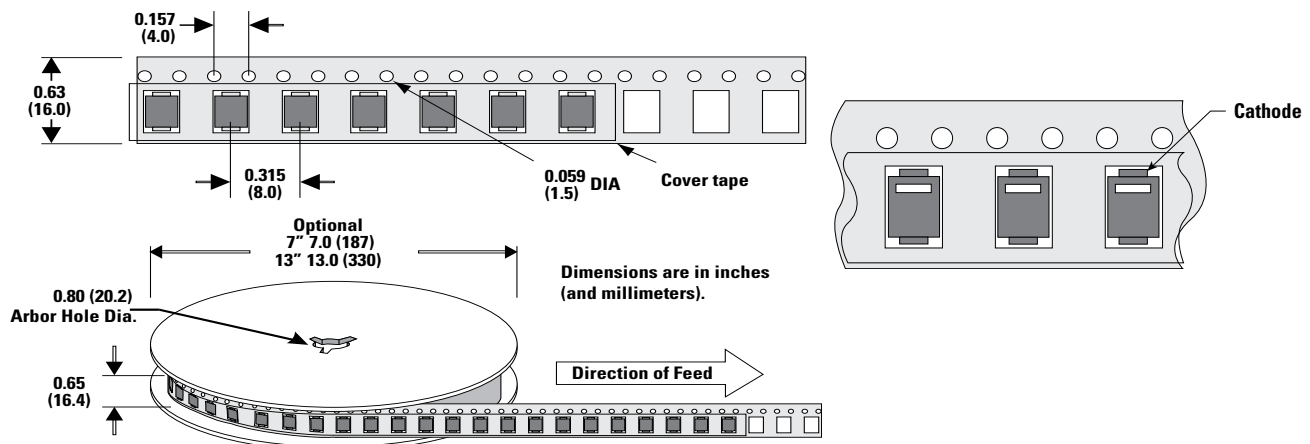
### Part Marking System



### Packaging Options

| Part number     | Component Package | Quantity | Packaging Option                 | Packaging Specification |
|-----------------|-------------------|----------|----------------------------------|-------------------------|
| 5.0SMDJxxxXX    | DO-214AB          | 3000     | Tape & Reel - 16mm tape/13" reel | EIA STD RS-481          |
| 5.0SMDJxxxXX-T7 | DO-214AB          | 500      | Tape & Reel - 16mm tape/7" reel  | EIA STD RS-481          |

### Tape and Reel Specification



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