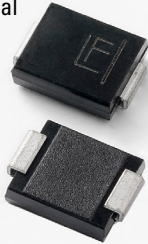


# 8.0SMDJ Series

## Surface Mount – 8000W



Uni-directional



Bi-directional



### Agency Recognitions

| Agency | Agency File Number |
|--------|--------------------|
|        | E230531            |

### Maximum Ratings and Thermal Characteristics

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

| Parameter                                                                                                            | Symbol          | Value      | Unit                 |
|----------------------------------------------------------------------------------------------------------------------|-----------------|------------|----------------------|
| Peak Pulse Power Dissipation at $T_L=25^{\circ}\text{C}$ by 10/1000 $\mu\text{s}$ Waveform (Fig.2)(Note 1), (Note 2) | $P_{PPM}$       | 8000       | W                    |
| Power Dissipation on Infinite Heat Sink at $T_L=50^{\circ}\text{C}$                                                  | $P_D$           | 6.5        | W                    |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)                                                     | $I_{FSM}$       | 300        | A                    |
| Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only                                                | $V_F$           | 5.0        | V                    |
| Operating Temperature Range                                                                                          | $T_J$           | -65 to 150 | $^{\circ}\text{C}$   |
| Storage Temperature Range                                                                                            | $T_{STG}$       | -65 to 175 | $^{\circ}\text{C}$   |
| Typical Thermal Resistance Junction to Lead                                                                          | $R_{\theta JL}$ | 15         | $^{\circ}\text{C/W}$ |
| Typical Thermal Resistance Junction to Ambient                                                                       | $R_{\theta JA}$ | 75         | $^{\circ}\text{C/W}$ |

#### Notes:

1. Non-repetitive current pulse, per Fig. 4 and derated above  $T_J$  (initial)  $=25^{\circ}\text{C}$  per Fig. 3.
2. Mounted on copper pad area of 0.31x0.31" (8.0 x 8.0mm) to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional component only, duty cycle=4 per minute maximum.

## Description

The 8.0SMDJ series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

## Features and Benefits

- For surface mounted applications to optimize board space
- Low profile package
- Typical failure mode is short from over-specified voltage or current
- Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c
- IEC-61000-4-2 ESD 30kV(Air), 30kV (Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2
- EFT protection of data lines in accordance with IEC 61000-4-4
- Built-in strain relief
- Glass passivated chip junction
- 8kW peak pulse power capability at 10/1000 $\mu\text{s}$  waveform, repetition rate (duty cycles):0.01 %
- Fast response time: typically less than 1.0ps from 0V to VBR min
- Excellent clamping capability
- Compact size with high power density in DO-214AB Package
- Low incremental surge resistance
- Typical IR less than 5 $\mu\text{A}$  when  $V_{BR\ min}>22\text{V}$
- High temperature reflow soldering guaranteed: 260 $^{\circ}\text{C}/40\text{sec}$
- $V_{BR} @ T_J = V_{BR} @ 25^{\circ}\text{C} \times (1 + \alpha T \times (T_J - 25))$  ( $\alpha T$ : Temperature Coefficient, typical value is 0.1%)
- UL Recognized compound meeting flammability rating V-0
- Meet MSL level1, per J-STD-020, LF maximum peak of 260 $^{\circ}\text{C}$
- Matte tin lead-free plated
- Halogen free and RoHS compliant
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD-609A.01)

## Applications

TVS components are ideal for the protection of I/O Interfaces, VCC bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

### Functional Diagram



Bi-directional



Uni-directional

# 8.0SMDJ Series

## Surface Mount – 8000W

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

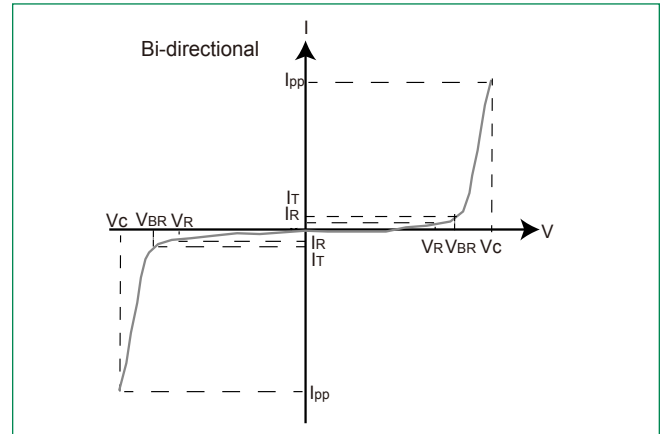
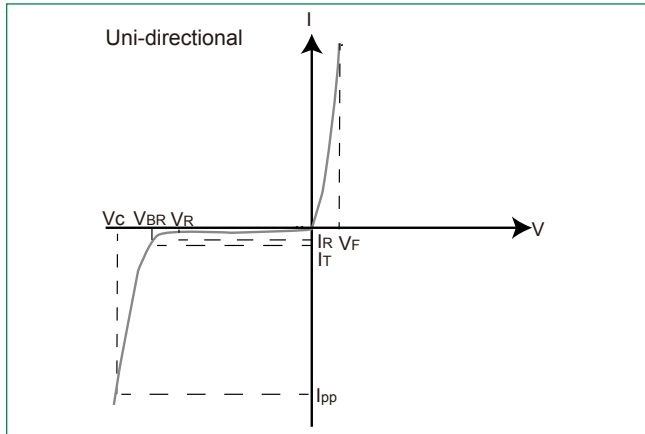
| Part Number (Uni) | Part Number (Bi) | Marking |      | Reverse Stand off Voltage $V_R$ (Volts) | Breakdown Voltage $V_{BR}$ (Volts) @ $I_T$ |       | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C$ @ $I_{PP}$ (10/1000 $\mu\text{s}$ ) (V) | Maximum Peak Pulse Current $I_{PP}$ (10/1000 $\mu\text{s}$ ) (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 $I_R$ @ $V_R$ ( $\mu\text{A}$ ) | Agency Approval  |
|-------------------|------------------|---------|------|-----------------------------------------|--------------------------------------------|-------|-------------------------|------------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|                   |                  | UNI     | BI   |                                         | MIN                                        | MAX   |                         |                                                                        |                                                                  |                                                                     |                                                               |                                                         |                                                                                                     |
| 8.0SMDJ12A        | 8.0SMDJ12CA      | 8PEP    | 8BEP | 12                                      | 13.3                                       | 14.7  | 10                      | 19.9                                                                   | 402.1                                                            | 25.7                                                                | 2613.7                                                        | 800                                                     | X                                                                                                   |
| 8.0SMDJ13A        | 8.0SMDJ13CA      | 8PEQ    | 8BEQ | 13                                      | 14.4                                       | 15.9  | 10                      | 21.5                                                                   | 372.1                                                            | 27.8                                                                | 2418.7                                                        | 500                                                     | X                                                                                                   |
| 8.0SMDJ14A        | 8.0SMDJ14CA      | 8PER    | 8BER | 14                                      | 15.6                                       | 17.2  | 10                      | 23.2                                                                   | 344.9                                                            | 30.0                                                                | 2241.9                                                        | 200                                                     | X                                                                                                   |
| 8.0SMDJ15A        | 8.0SMDJ15CA      | 8PES    | 8BES | 15                                      | 16.7                                       | 18.5  | 1                       | 24.4                                                                   | 327.9                                                            | 31.5                                                                | 2131.4                                                        | 100                                                     | X                                                                                                   |
| 8.0SMDJ16A        | 8.0SMDJ16CA      | 8PET    | 8BET | 16                                      | 17.8                                       | 19.7  | 1                       | 26.0                                                                   | 307.7                                                            | 33.6                                                                | 2000.1                                                        | 50                                                      | X                                                                                                   |
| 8.0SMDJ17A        | 8.0SMDJ17CA      | 8PEU    | 8BEU | 17                                      | 18.9                                       | 20.9  | 1                       | 27.6                                                                   | 290.0                                                            | 35.7                                                                | 1885.0                                                        | 20                                                      | X                                                                                                   |
| 8.0SMDJ18A        | 8.0SMDJ18CA      | 8PEV    | 8BEV | 18                                      | 20.0                                       | 22.1  | 1                       | 29.2                                                                   | 274.0                                                            | 37.7                                                                | 1781.0                                                        | 10                                                      | X                                                                                                   |
| 8.0SMDJ20A        | 8.0SMDJ20CA      | 8PEW    | 8BEW | 20                                      | 22.2                                       | 24.5  | 1                       | 32.4                                                                   | 247.0                                                            | 41.9                                                                | 1605.5                                                        | 5                                                       | X                                                                                                   |
| 8.0SMDJ22A        | 8.0SMDJ22CA      | 8PEX    | 8BEX | 22                                      | 24.4                                       | 26.9  | 1                       | 35.5                                                                   | 225.4                                                            | 45.9                                                                | 1464.8                                                        | 5                                                       | X                                                                                                   |
| 8.0SMDJ24A        | 8.0SMDJ24CA      | 8PEZ    | 8BEZ | 24                                      | 26.7                                       | 29.5  | 1                       | 38.9                                                                   | 205.7                                                            | 50.3                                                                | 1336.8                                                        | 5                                                       | X                                                                                                   |
| 8.0SMDJ26A        | 8.0SMDJ26CA      | 8PFE    | 8BFE | 26                                      | 28.9                                       | 31.9  | 1                       | 42.1                                                                   | 190.1                                                            | 54.4                                                                | 1235.7                                                        | 5                                                       | X                                                                                                   |
| 8.0SMDJ28A        | 8.0SMDJ28CA      | 8PFG    | 8BFG | 28                                      | 31.1                                       | 34.4  | 1                       | 45.4                                                                   | 176.2                                                            | 58.7                                                                | 1145.4                                                        | 5                                                       | X                                                                                                   |
| 8.0SMDJ30A        | 8.0SMDJ30CA      | 8PFK    | 8BFK | 30                                      | 33.3                                       | 36.8  | 1                       | 48.4                                                                   | 165.3                                                            | 62.5                                                                | 1074.5                                                        | 5                                                       | X                                                                                                   |
| 8.0SMDJ33A        | 8.0SMDJ33CA      | 8PFM    | 8BFM | 33                                      | 36.7                                       | 40.6  | 1                       | 53.3                                                                   | 150.1                                                            | 68.9                                                                | 975.7                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ36A        | 8.0SMDJ36CA      | 8PFP    | 8BFP | 36                                      | 40.0                                       | 44.2  | 1                       | 58.1                                                                   | 137.8                                                            | 75.1                                                                | 895.7                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ40A        | 8.0SMDJ40CA      | 8PFR    | 8BFR | 40                                      | 44.4                                       | 49.1  | 1                       | 64.5                                                                   | 124.1                                                            | 83.3                                                                | 806.7                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ43A        | 8.0SMDJ43CA      | 8PFT    | 8BFT | 43                                      | 47.8                                       | 52.8  | 1                       | 69.4                                                                   | 115.3                                                            | 89.7                                                                | 749.5                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ45A        | 8.0SMDJ45CA      | 8PFV    | 8BFV | 45                                      | 50.0                                       | 55.3  | 1                       | 72.7                                                                   | 110.1                                                            | 93.9                                                                | 715.7                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ48A        | 8.0SMDJ48CA      | 8PFX    | 8BFX | 48                                      | 53.3                                       | 58.9  | 1                       | 77.4                                                                   | 103.4                                                            | 100.0                                                               | 671.8                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ51A        | 8.0SMDJ51CA      | 8PFZ    | 8BFZ | 51                                      | 56.7                                       | 62.7  | 1                       | 82.4                                                                   | 97.1                                                             | 106.5                                                               | 631.2                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ54A        | 8.0SMDJ54CA      | 8PGE    | 8BGE | 54                                      | 60.0                                       | 66.3  | 1                       | 87.1                                                                   | 92.0                                                             | 112.5                                                               | 598.0                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ58A        | 8.0SMDJ58CA      | 8PGG    | 8BGG | 58                                      | 64.4                                       | 71.2  | 1                       | 93.6                                                                   | 85.5                                                             | 120.9                                                               | 555.8                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ60A        | 8.0SMDJ60CA      | 8PGK    | 8BGK | 60                                      | 66.7                                       | 73.7  | 1                       | 96.8                                                                   | 82.7                                                             | 125.1                                                               | 537.2                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ64A        | 8.0SMDJ64CA      | 8PGM    | 8BGM | 64                                      | 71.1                                       | 78.6  | 1                       | 103.0                                                                  | 77.7                                                             | 133.1                                                               | 504.9                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ70A        | 8.0SMDJ70CA      | 8PGP    | 8BGB | 70                                      | 77.8                                       | 86.0  | 1                       | 113.0                                                                  | 71.0                                                             | 146.0                                                               | 461.5                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ75A        | 8.0SMDJ75CA      | 8PGR    | 8BGR | 75                                      | 83.3                                       | 92.1  | 1                       | 121.0                                                                  | 66.2                                                             | 156.3                                                               | 430.3                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ78A        | 8.0SMDJ78CA      | 8PGT    | 8BGT | 78                                      | 86.7                                       | 95.8  | 1                       | 126.0                                                                  | 63.5                                                             | 162.8                                                               | 412.8                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ85A        | 8.0SMDJ85CA      | 8PGV    | 8BGV | 85                                      | 94.4                                       | 104.0 | 1                       | 137.0                                                                  | 58.4                                                             | 177.0                                                               | 379.6                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ90A        | 8.0SMDJ90CA      | 8PGX    | 8BGX | 90                                      | 100.0                                      | 111.0 | 1                       | 146.0                                                                  | 55.0                                                             | 188.6                                                               | 357.5                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ100A       | 8.0SMDJ100CA     | 8PGZ    | 8BGZ | 100                                     | 111.0                                      | 123.0 | 1                       | 162.0                                                                  | 49.4                                                             | 209.3                                                               | 321.1                                                         | 5                                                       | X                                                                                                   |
| 8.0SMDJ110A       | 8.0SMDJ110CA     | 8PHE    | 8BHE | 110                                     | 122.0                                      | 135.0 | 1                       | 177.0                                                                  | 45.2                                                             | 228.7                                                               | 293.8                                                         | 5                                                       | X                                                                                                   |

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

# 8.0SMDJ Series

## Surface Mount – 8000W

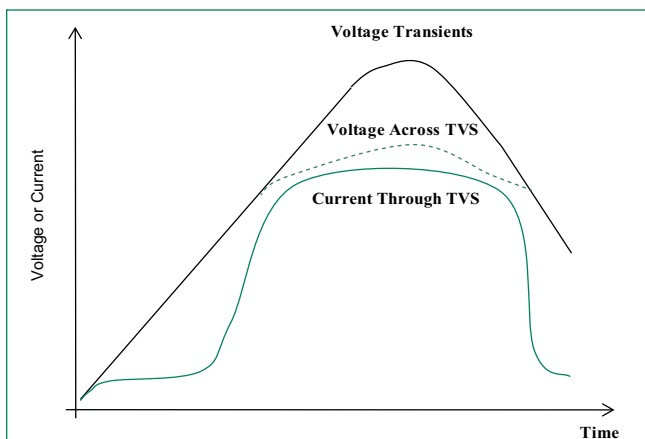
### I-V Curve Characteristics



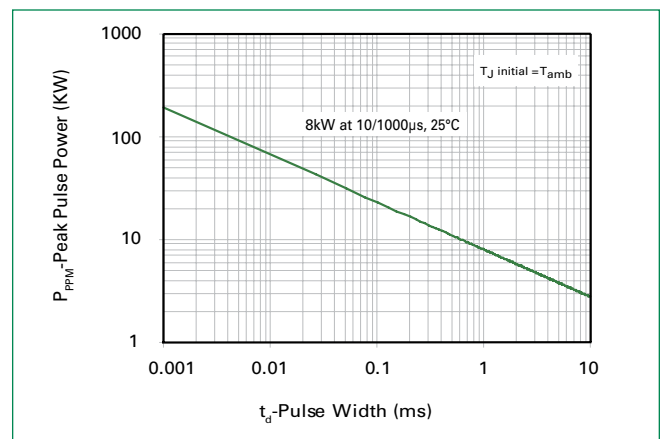
**P<sub>PPM</sub>** Peak Pulse Power Dissipation -- Max power dissipation  
**V<sub>R</sub>** Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation  
**V<sub>BR</sub>** Breakdown Voltage -- Maximum voltage that flows through the TVS at a specified test current (I<sub>T</sub>)  
**V<sub>C</sub>** Clamping Voltage -- Peak voltage measured across the TVS at a specified I<sub>PPM</sub> (peak impulse current)  
**I<sub>R</sub>** Reverse Leakage Current -- Current measured at V<sub>R</sub>  
**V<sub>F</sub>** Forward Voltage Drop for Uni-directional

### Ratings and Characteristic Curves (T<sub>A</sub> = 25°C unless otherwise noted)

**Figure 1:**  
TVS Transients Clamping Waveform



**Figure 2:**  
Peak Pulse Power Rating



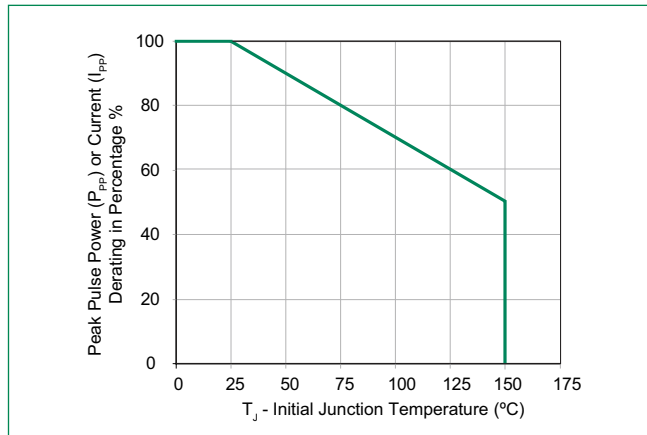
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# 8.0SMDJ Series

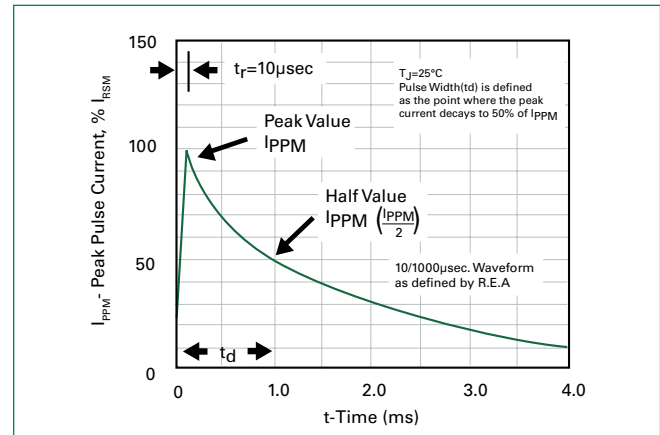
## Surface Mount – 8000W

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

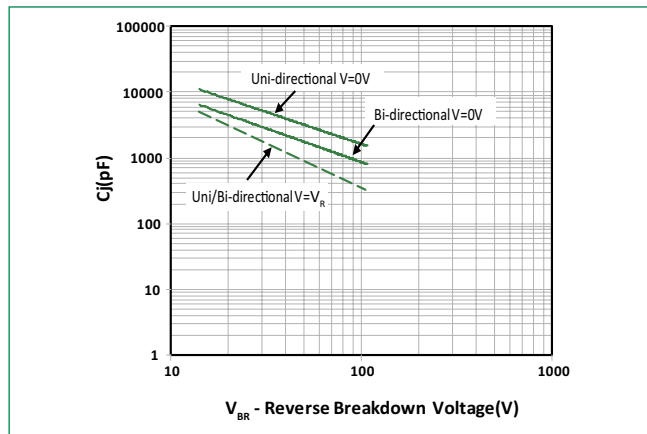
**Figure 3:**  
Peak Pulse Power Derating Curve



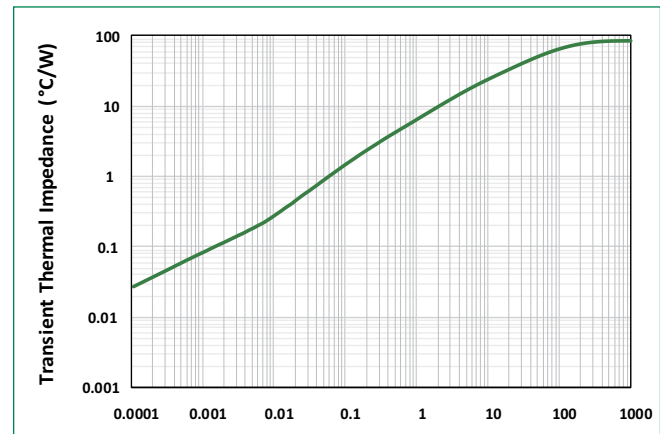
**Figure 4:**  
Pulse Waveform



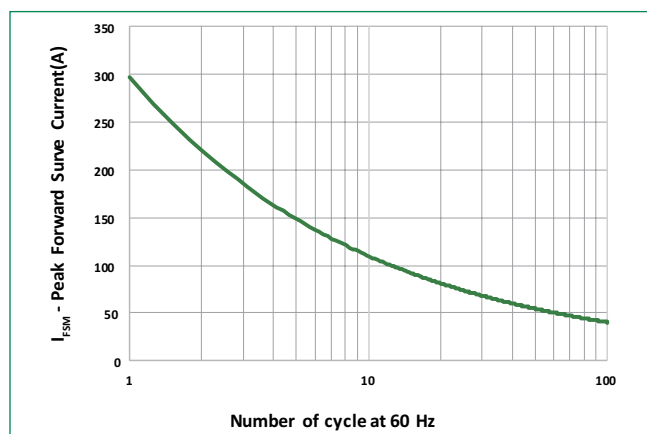
**Figure 5:**  
Typical Junction Capacitance



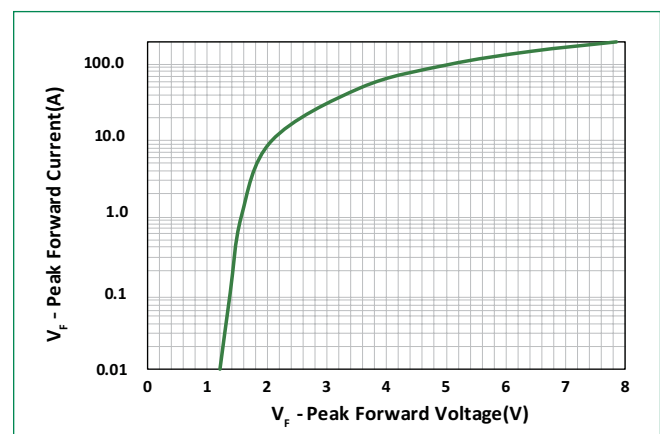
**Figure 6:**  
Typical Transient Thermal Impedance



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



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

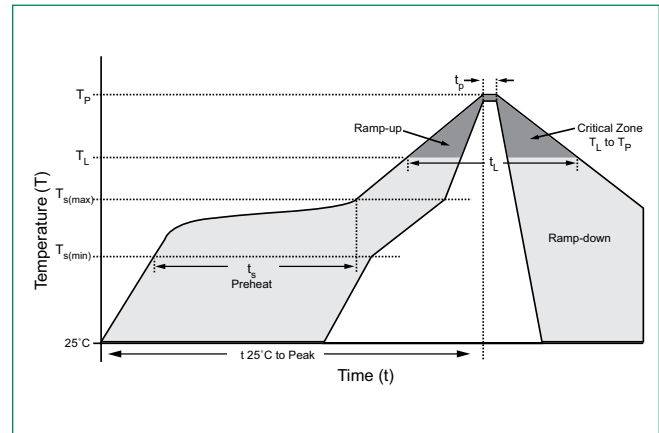


# 8.0SMDJ Series

## Surface Mount – 8000W

### Soldering Parameters

| Reflow Condition                                       |                                    | Lead-free assembly      |
|--------------------------------------------------------|------------------------------------|-------------------------|
| Pre Heat                                               | - Temperature Min ( $T_{s(min)}$ ) | 150°C                   |
|                                                        | - Temperature Max ( $T_{s(max)}$ ) | 200°C                   |
|                                                        | - Time (min to max) ( $t_s$ )      | 60 – 120 secs           |
| Average ramp up rate (Liquidus Temp ( $T_A$ ) to peak) |                                    | 3°C/second max          |
| $T_{s(max)}$ to $T_A$ - Ramp-up Rate                   |                                    | 3°C/second max          |
| Reflow                                                 | - Temperature ( $T_L$ ) (Liquidus) | 217°C                   |
|                                                        | - Time (min to max) ( $t_L$ )      | 60 – 150 seconds        |
| Peak Temperature ( $T_p$ )                             |                                    | 260 <sup>+0/-5</sup> °C |
| Time within 5°C of actual peak Temperature ( $t_p$ )   |                                    | 30 seconds              |
| Ramp-down Rate                                         |                                    | 6°C/second max          |
| Time 25°C to peak Temperature ( $T_p$ )                |                                    | 8 minutes Max.          |
| Do not exceed                                          |                                    | 260°C                   |



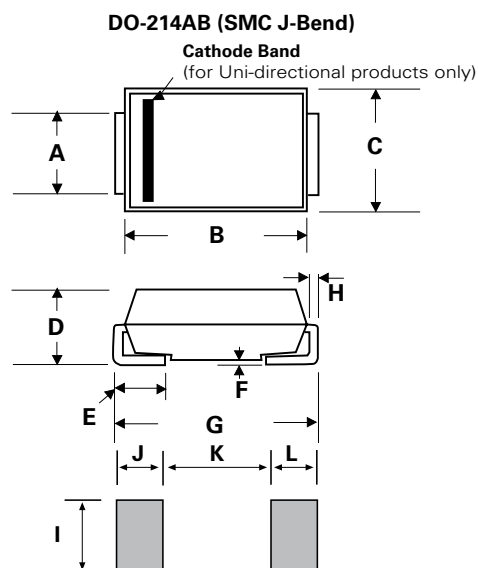
### Physical Specifications

|          |                                                                   |
|----------|-------------------------------------------------------------------|
| Weight   | 0.011 ounce ,0.3 grams                                            |
| Case     | JEDEC DO214AB. Molded plastic body over glass passivated junction |
| Polarity | Color band denotes positive end (cathode) except Bidirectional.   |
| Terminal | Matte Tin-plated leads, Solderable per JESD22-B102                |

### Environmental Specifications

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

### Dimensions

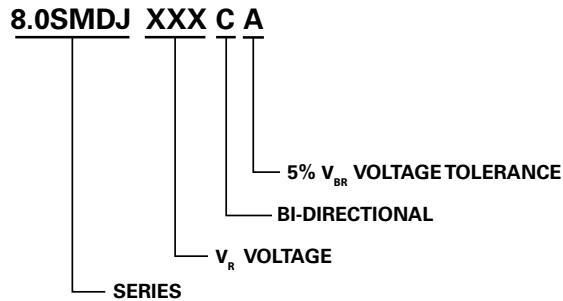


| Dimensions | Inches |       | Millimeters |       |
|------------|--------|-------|-------------|-------|
|            | Min    | Max   | Min         | Max   |
| A          | 0.114  | 0.126 | 2.900       | 3.200 |
| B          | 0.260  | 0.280 | 6.600       | 7.110 |
| C          | 0.220  | 0.245 |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

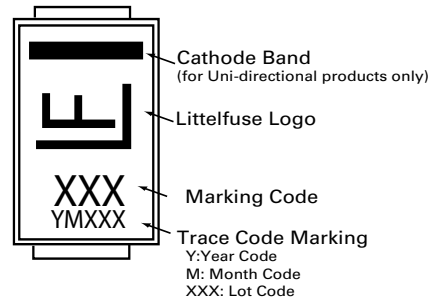
# 8.0SMDJ Series

## Surface Mount – 8000W

### Part Numbering System



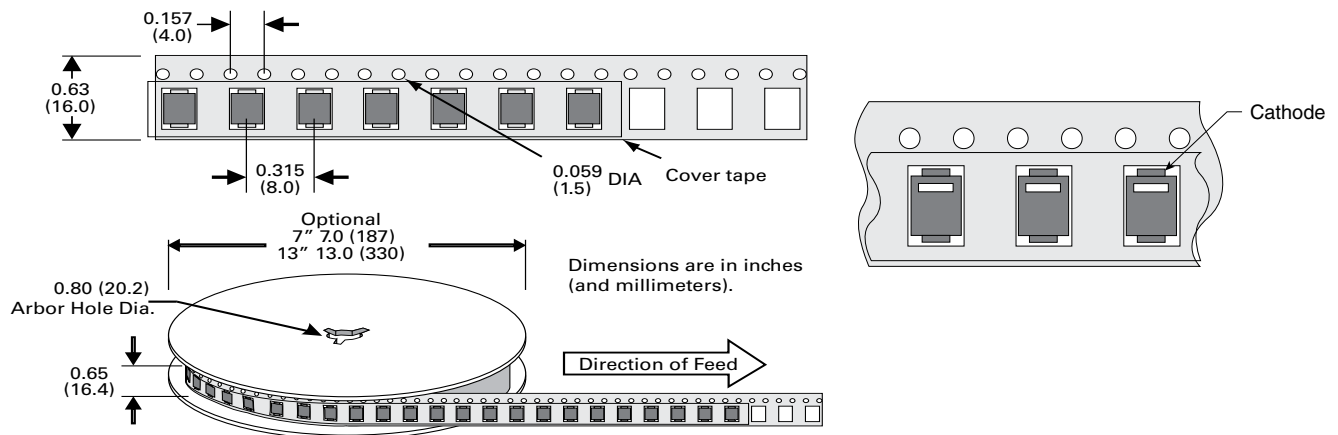
### Part Marking System



### Packaging Options

| Part number     | Component Package | Quantity | Packaging Option                 | Packaging Specification |
|-----------------|-------------------|----------|----------------------------------|-------------------------|
| 8.0SMDJxxxXX    | DO-214AB          | 3000     | Tape & Reel - 16mm tape/13" reel | EIA STD RS-481          |
| 8.0SMDJxxxXX-T7 | DO-214AB          | 500      | Tape & Reel - 16mm tape/7" reel  | EIA STD RS-481          |

### Tape and Reel Specification



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