

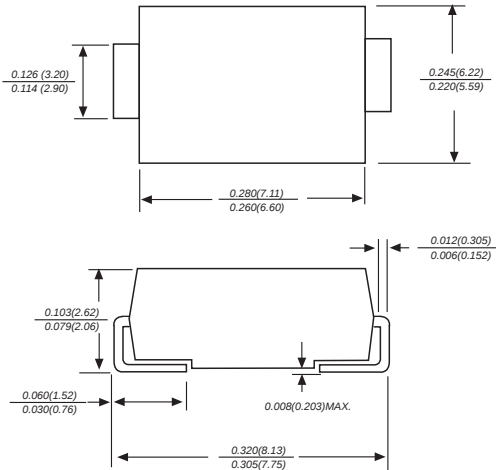


# SMDJ Series

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

Stand-off Voltage: 5.0-170 Volts Peak pulse power: 3000 Watts

### DO-214AB/SMC



Dimensions in inches and (millimeters)

### FEATURE

- ◆ 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
- ◆ 3000W peak pulse power capability at 10/1000 $\mu$ s waveform,
- ◆ repetition rate (duty cycle): 0.01%
- ◆ Fast response time
- ◆ Typical  $I_R$  less than 2 $\mu$ A above 12V
- ◆ High Temperature soldering: 260 $^{\circ}$ C/10 seconds at terminals
- ◆ Plastic package has underwriters laboratory flammability 94V-0

### MECHANICAL DATA

Case: JEDEC DO-214AB. Molded plastic over glass passivated junction  
Terminal: Solder plated, solderable per MIL-STD-750, Method 2026  
Polarity: Color band denotes cathode except bi-directional models  
Standard Packaging: 12mm tape (EIA STD RS-481)

### APPLICATIONS

- ◆ I/O interface
- ◆ AC/DC power supply
- ◆ Low frequency signal transmission line (RS232, RS485, etc.)

### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25 $^{\circ}$ C ambient temperature unless otherwise specified.

|                                                                                                                |                 |             |                |
|----------------------------------------------------------------------------------------------------------------|-----------------|-------------|----------------|
| Peak pulse power dissipation at 10/1000 $\mu$ s waveform<br>(Note1, Note2 )                                    | $P_{PPM}$       | 3000        | Watts          |
| Maximum Instantaneous Forward Voltage at<br>100A for Unidirectional only                                       | $V_F$           | 3.5         | Volts          |
| Steady state power dissipation at $T_A=50^{\circ}$ C                                                           | $P_{M(AV)}$     | 6.5         | Watts          |
| Peak forward surge current, 8.3ms single half sine-wave<br>superimposed on rated load, (JEDEC Method) (Note3 ) | $I_{FSM}$       | 300         | Amps           |
| Operating junction and Storage Temperature Range.                                                              | $T_J, T_{STG}$  | -65 to +150 | $^{\circ}$ C   |
| Typical thermal resistance junction to lead                                                                    | $R_{\theta JL}$ | 15          | $^{\circ}$ C/W |
| Typical thermal resistance junction to ambient                                                                 | $R_{\theta JA}$ | 75          | $^{\circ}$ C/W |

- Notes:
1. Non-repetitive current pulse , per Fig. 3 and derated above  $T_A = 25^{\circ}$ C per Fig. 2.
  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 device only, duty cycle=4 per minute maximum.



## Electrical Characteristics (TA=25°C)

| 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 $V_C$ @ $I_{CP}$ (V) | Maximum Peak Pulse Current $I_{PP}$ (A) | Maximum Reverse Leakage $I_R$ @ $V_R$ ( $\mu A$ ) | Agency Approval  |
|-------------------|------------------|---------|-----|-----------------------------------------|--------------------------------------------|--------|-------------------------|-----------------------------------------------|-----------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|                   |                  | UNI     | BI  |                                         | MIN                                        | MAX    |                         |                                               |                                         |                                                   |                                                                                                     |
| SMDJ5.0A          | SMDJ5.0CA        | RDE     | DDE | 5.0                                     | 6.40                                       | 7.00   | 10                      | 9.2                                           | 326.1                                   | 800                                               | X                                                                                                   |
| SMDJ6.0A          | SMDJ6.0CA        | RDG     | DDG | 6.0                                     | 6.67                                       | 7.37   | 10                      | 10.3                                          | 291.3                                   | 800                                               | X                                                                                                   |
| SMDJ6.5A          | SMDJ6.5CA        | RDK     | DDK | 6.5                                     | 7.22                                       | 7.98   | 10                      | 11.2                                          | 267.9                                   | 500                                               | X                                                                                                   |
| SMDJ7.0A          | SMDJ7.0CA        | PDM     | DDM | 7.0                                     | 7.78                                       | 8.60   | 10                      | 12.0                                          | 250.0                                   | 200                                               | X                                                                                                   |
| SMDJ7.5A          | SMDJ7.5CA        | PDP     | DDP | 7.5                                     | 8.33                                       | 9.21   | 1                       | 12.9                                          | 232.6                                   | 100                                               | X                                                                                                   |
| SMDJ8.0A          | SMDJ8.0CA        | PDR     | DDR | 8.0                                     | 8.89                                       | 9.83   | 1                       | 13.6                                          | 220.6                                   | 50                                                | X                                                                                                   |
| SMDJ8.5A          | SMDJ8.5CA        | PDT     | DDT | 8.5                                     | 9.44                                       | 10.40  | 1                       | 14.4                                          | 208.3                                   | 20                                                | X                                                                                                   |
| SMDJ9.0A          | SMDJ9.0CA        | PDV     | DDV | 9.0                                     | 10.00                                      | 11.10  | 1                       | 15.4                                          | 194.8                                   | 10                                                | X                                                                                                   |
| SMDJ10A           | SMDJ10CA         | PDX     | DDX | 10.0                                    | 11.10                                      | 12.30  | 1                       | 17.0                                          | 176.5                                   | 5                                                 | X                                                                                                   |
| SMDJ11A           | SMDJ11CA         | PDZ     | DDZ | 11.0                                    | 12.20                                      | 13.50  | 1                       | 18.2                                          | 164.8                                   | 2                                                 | X                                                                                                   |
| SMDJ12A           | SMDJ12CA         | PEE     | DEE | 12.0                                    | 13.30                                      | 14.70  | 1                       | 19.9                                          | 150.8                                   | 2                                                 | X                                                                                                   |
| SMDJ13A           | SMDJ13CA         | PEG     | DEG | 13.0                                    | 14.40                                      | 15.90  | 1                       | 21.5                                          | 139.5                                   | 2                                                 | X                                                                                                   |
| SMDJ14A           | SMDJ14CA         | PEK     | DEK | 14.0                                    | 15.60                                      | 17.20  | 1                       | 23.2                                          | 129.3                                   | 2                                                 | X                                                                                                   |
| SMDJ15A           | SMDJ15CA         | PEM     | DEM | 15.0                                    | 16.70                                      | 18.50  | 1                       | 24.4                                          | 123.0                                   | 2                                                 | X                                                                                                   |
| SMDJ16A           | SMDJ16CA         | PEP     | DEP | 16.0                                    | 17.80                                      | 19.70  | 1                       | 26.0                                          | 115.4                                   | 2                                                 | X                                                                                                   |
| SMDJ17A           | SMDJ17CA         | PER     | DER | 17.0                                    | 18.90                                      | 20.90  | 1                       | 27.6                                          | 108.7                                   | 2                                                 | X                                                                                                   |
| SMDJ18A           | SMDJ18CA         | PET     | DET | 18.0                                    | 20.00                                      | 22.10  | 1                       | 29.2                                          | 102.7                                   | 2                                                 | X                                                                                                   |
| SMDJ20A           | SMDJ20CA         | PEV     | DEV | 20.0                                    | 22.20                                      | 24.50  | 1                       | 32.4                                          | 92.6                                    | 2                                                 | X                                                                                                   |
| SMDJ22A           | SMDJ22CA         | PEX     | DEX | 22.0                                    | 24.40                                      | 26.90  | 1                       | 35.5                                          | 84.5                                    | 2                                                 | X                                                                                                   |
| SMDJ24A           | SMDJ24CA         | PEZ     | DEZ | 24.0                                    | 26.70                                      | 29.50  | 1                       | 38.9                                          | 77.1                                    | 2                                                 | X                                                                                                   |
| SMDJ26A           | SMDJ26CA         | PFE     | DFE | 26.0                                    | 28.90                                      | 31.90  | 1                       | 42.1                                          | 71.3                                    | 2                                                 | X                                                                                                   |
| SMDJ28A           | SMDJ28CA         | PFG     | DFG | 28.0                                    | 31.10                                      | 34.40  | 1                       | 45.4                                          | 66.1                                    | 2                                                 | X                                                                                                   |
| SMDJ30A           | SMDJ30CA         | PFK     | DFK | 30.0                                    | 33.30                                      | 36.80  | 1                       | 48.4                                          | 62.0                                    | 2                                                 | X                                                                                                   |
| SMDJ33A           | SMDJ33CA         | PFM     | DFM | 33.0                                    | 36.70                                      | 40.60  | 1                       | 53.3                                          | 56.3                                    | 2                                                 | X                                                                                                   |
| SMDJ36A           | SMDJ36CA         | PFP     | DFP | 36.0                                    | 40.00                                      | 44.20  | 1                       | 58.1                                          | 51.6                                    | 2                                                 | X                                                                                                   |
| SMDJ40A           | SMDJ40CA         | PFR     | DFR | 40.0                                    | 44.40                                      | 49.10  | 1                       | 64.5                                          | 46.5                                    | 2                                                 | X                                                                                                   |
| SMDJ43A           | SMDJ43CA         | PFT     | DFT | 43.0                                    | 47.80                                      | 52.80  | 1                       | 69.4                                          | 43.2                                    | 2                                                 | X                                                                                                   |
| SMDJ45A           | SMDJ45CA         | PFV     | DFV | 45.0                                    | 50.00                                      | 55.30  | 1                       | 72.7                                          | 41.3                                    | 2                                                 | X                                                                                                   |
| SMDJ48A           | SMDJ48CA         | PFX     | DFX | 48.0                                    | 53.30                                      | 58.90  | 1                       | 77.4                                          | 38.8                                    | 2                                                 | X                                                                                                   |
| SMDJ51A           | SMDJ51CA         | PFZ     | DFZ | 51.0                                    | 56.70                                      | 62.70  | 1                       | 82.4                                          | 36.4                                    | 2                                                 | X                                                                                                   |
| SMDJ54A           | SMDJ54CA         | RGE     | DGE | 54.0                                    | 60.00                                      | 66.30  | 1                       | 87.1                                          | 34.4                                    | 2                                                 | X                                                                                                   |
| SMDJ58A           | SMDJ58CA         | PGG     | DGG | 58.0                                    | 64.40                                      | 71.20  | 1                       | 93.6                                          | 32.1                                    | 2                                                 | X                                                                                                   |
| SMDJ60A           | SMDJ60CA         | PGK     | DGK | 60.0                                    | 66.70                                      | 73.70  | 1                       | 96.8                                          | 31.0                                    | 2                                                 | X                                                                                                   |
| SMDJ64A           | SMDJ64CA         | PGM     | DGM | 64.0                                    | 71.10                                      | 78.60  | 1                       | 103.0                                         | 29.1                                    | 2                                                 | X                                                                                                   |
| SMDJ70A           | SMDJ70CA         | PGP     | DGP | 70.0                                    | 77.80                                      | 86.00  | 1                       | 113.0                                         | 26.5                                    | 2                                                 | X                                                                                                   |
| SMDJ75A           | SMDJ75CA         | PGR     | DGR | 75.0                                    | 83.30                                      | 92.10  | 1                       | 121.0                                         | 24.8                                    | 2                                                 | X                                                                                                   |
| SMDJ78A           | SMDJ78CA         | PGT     | DGT | 78.0                                    | 86.70                                      | 95.80  | 1                       | 126.0                                         | 23.8                                    | 2                                                 | X                                                                                                   |
| SMDJ85A           | SMDJ85CA         | PGV     | DGV | 85.0                                    | 94.40                                      | 104.00 | 1                       | 137.0                                         | 21.9                                    | 2                                                 | X                                                                                                   |
| SMDJ90A           | SMDJ90CA         | PGX     | DGX | 90.0                                    | 100.00                                     | 111.00 | 1                       | 146.0                                         | 20.5                                    | 2                                                 | X                                                                                                   |
| SMDJ100A          | SMDJ100CA        | PGZ     | DGZ | 100.0                                   | 111.00                                     | 123.00 | 1                       | 162.0                                         | 18.5                                    | 2                                                 | X                                                                                                   |
| SMDJ110A          | SMDJ110CA        | PHE     | DHE | 110.0                                   | 122.00                                     | 135.00 | 1                       | 177.0                                         | 16.9                                    | 2                                                 | X                                                                                                   |
| SMDJ120A          | SMDJ120CA        | PHG     | DHG | 120.0                                   | 133.00                                     | 147.00 | 1                       | 193.0                                         | 15.5                                    | 2                                                 | X                                                                                                   |
| SMDJ130A          | SMDJ130CA        | PHK     | DHK | 130.0                                   | 144.00                                     | 159.00 | 1                       | 209.0                                         | 14.4                                    | 2                                                 | X                                                                                                   |
| SMDJ150A          | SMDJ150CA        | PHM     | DHM | 150.0                                   | 167.00                                     | 185.00 | 1                       | 243.0                                         | 12.3                                    | 2                                                 | X                                                                                                   |
| SMDJ160A          | SMDJ160CA        | PHP     | DHP | 160.0                                   | 178.00                                     | 197.00 | 1                       | 259.0                                         | 11.6                                    | 2                                                 | X                                                                                                   |
| SMDJ170A          | SMDJ170CA        | PHR     | DHR | 170.0                                   | 189.00                                     | 209.00 | 1                       | 275.0                                         | 10.9                                    | 2                                                 | X                                                                                                   |

For parts without A , the  $V_{BR}$  is  $\pm 10\%$ , and  $V_C$  is 5% higher than A parts.

For bidirectional type having  $V_R$  of 10 volts and less, the  $I_R$  limit is double.

# RATINGS AND CHARACTERISTIC CURVES SMDJ series

Figure 1 - Peak Pulse Power Rating Curve

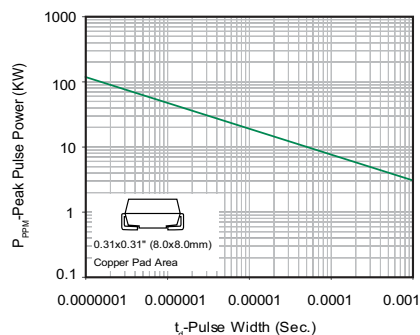


Figure 2 - Pulse Derating Curve

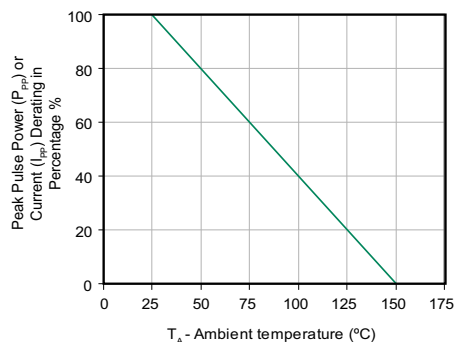


Figure 3 - Pulse Waveform

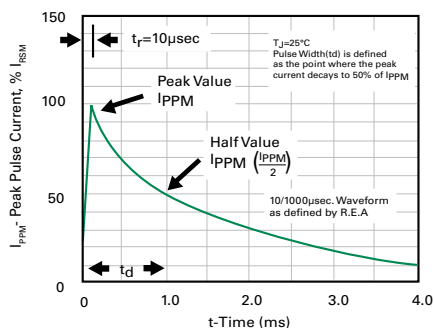


Figure 4 - Typical Junction Capacitance

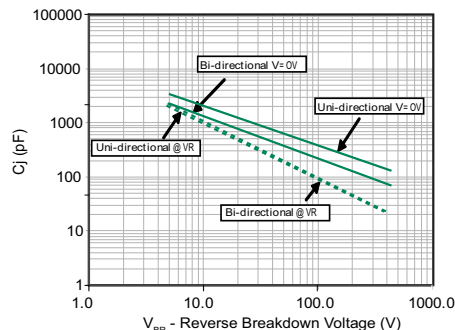


Figure 5 - Steady State Power Derating Curve

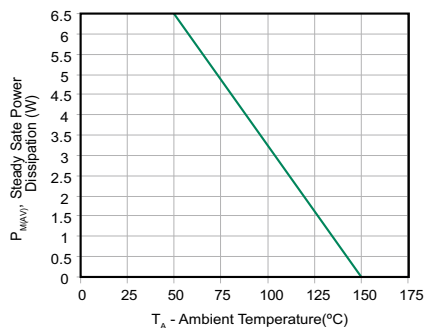
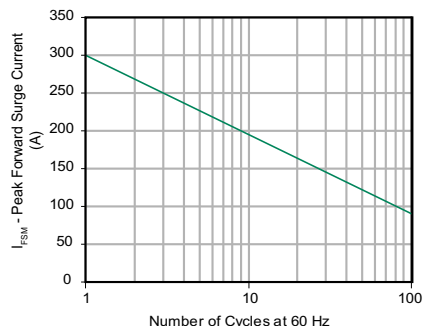


Figure 6 - Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional only



The cruve graph is for reference only, can't be the basis for judgment(曲线图仅供参考)!



Figure 5. Steady State Power Dissipation Derating Curve

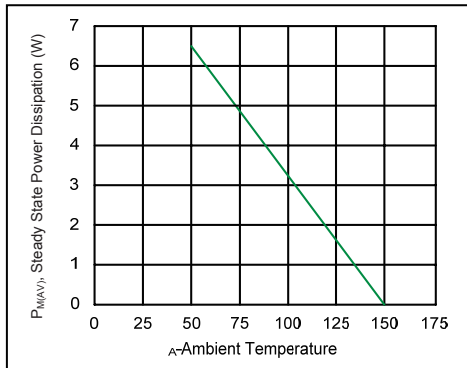
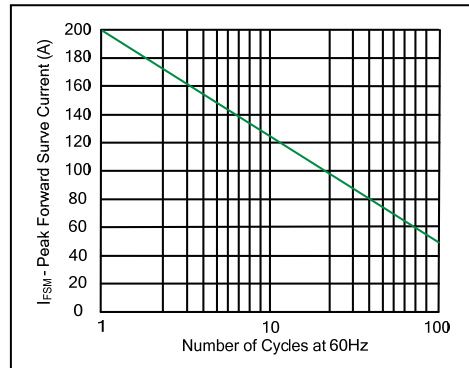
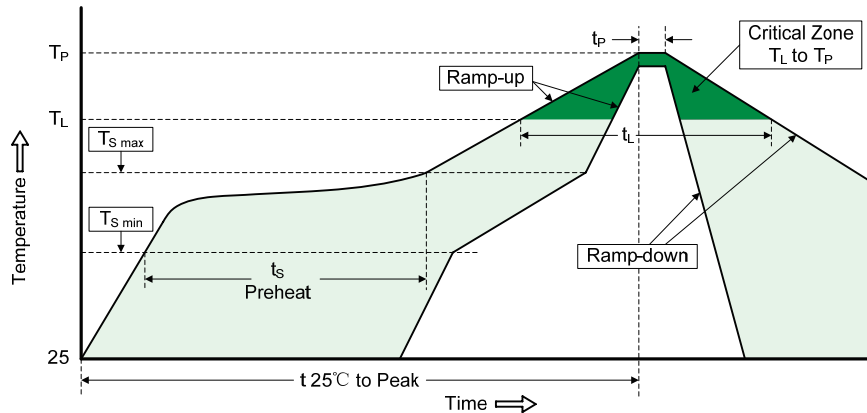


Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



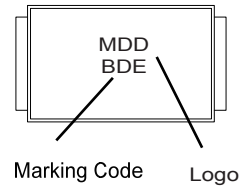
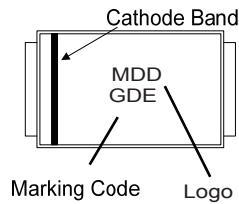
### Reflow Soldering



### Recommended Conditions

| Profile Feature                                                                                                                                                                                         | Pb-Free Assembly                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Average ramp-up rate ( $T_L$ to $T_P$ )                                                                                                                                                                 | 3°C/second max.                  |
| Preheat <ul style="list-style-type: none"> <li>-Temperature Min (<math>T_{S \min}</math>)</li> <li>-Temperature Max (<math>T_{S \max}</math>)</li> <li>-Time (min to max) (<math>t_s</math>)</li> </ul> | 150°C<br>200°C<br>60-180 seconds |
| $T_{S \max}$ to $T_L$ <ul style="list-style-type: none"> <li>-Ramp-up Rate</li> </ul>                                                                                                                   | 3°C/second max.                  |
| Time maintained above: <ul style="list-style-type: none"> <li>-Temperature (<math>T_L</math>)</li> <li>-Time (<math>t_L</math>)</li> </ul>                                                              | 217°C<br>60-150 seconds          |
| Peak Temperature ( $T_P$ )                                                                                                                                                                              | 260°C                            |
| Time within 5°C of actual Peak Temperature ( $t_p$ )                                                                                                                                                    | 20-40 seconds                    |
| Ramp-down Rate                                                                                                                                                                                          | 6°C/second max.                  |
| Time 25°C to Peak Temperature                                                                                                                                                                           | 8 minutes max.                   |

Marking Code



**SMCJ XXX C A**

5%  $V_{BR}$  Voltage Tolerance

Bidirectional

$R_{WM}$  Voltage

Series Code

Packaging

| Tape                                  |  | Symbol            | Dimension (mm) |
|---------------------------------------|--|-------------------|----------------|
| <p>SECTION A-A</p> <p>SECTION B-B</p> |  | W                 | 16.00±0.20     |
|                                       |  | P0                | 4.00±0.10      |
|                                       |  | P1                | 8.00±0.10      |
|                                       |  | P2                | 2.00±0.10      |
|                                       |  | D0                | Φ1.5±0.10      |
|                                       |  | D1                | Φ1.5±0.10      |
|                                       |  | E                 | 1.75±0.10      |
|                                       |  | F                 | 7.50±0.10      |
|                                       |  | A0                | 6.27±0.10      |
|                                       |  | B0                | 8.30±0.10      |
|                                       |  | K0                | 3.15±0.15      |
|                                       |  | T                 | 0.30±0.05      |
|                                       |  | D2                | Φ178.0±2.0     |
| 7" Reel                               |  | D3                | Φ50.0Min.      |
| <p>Quantity: 500PCS</p>               |  | D4                | Φ13.0±0.5      |
|                                       |  | W1                | 20.0±2.0       |
|                                       |  | D5                | Φ330.0±2.0     |
|                                       |  | D6                | Φ13.5±0.5      |
|                                       |  | H                 | 2.5±1.0        |
| 13" Reel                              |  | W2                | 20.0±2.0       |
| <p>Quantity: 3000PCS</p>              |  | Quantity: 3000PCS |                |