

## 600W Surface Mount Transient Voltage Suppressors

### Features

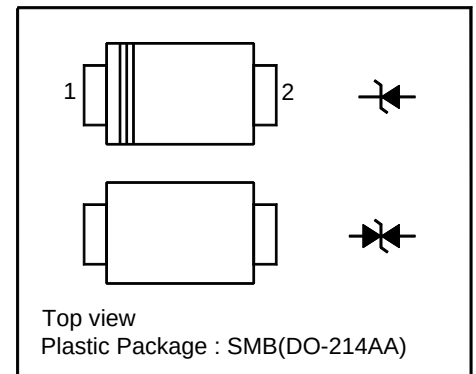
- AEC-Q101 Qualified
- 600W peak pulse power capability at 10/1000µs waveform,
- Repetition rate (duty cycle):0.01%
- For surface mounted applications to optimize board space
- Low incremental surge impedance
- Excellent clamping capability
- Photo Glass and LPCVD process
- Fast response time: typically less than 1ps from 0V to BV min.
- Typical IR less than 1µA above 12V.
- High Temperature soldering guaranteed: 260°C/40 seconds at terminals
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020.
- Meet Halogen free and RoHS compliant.



SMB (DO-214AA)

### PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1   | Cathode     |
| 2   | Anode       |



| PRIMARY CHARACTERISTICS |                     |
|-------------------------|---------------------|
| V <sub>BR</sub>         | 6.4V to 247V        |
| V <sub>WM</sub>         | 5.0V to 200V        |
| PPPM (10 x 1000 us)     | 600 W               |
| T <sub>j</sub> max.     | 150 °C              |
| Polarity                | Uni & bidirectional |
| Package                 | SMB (DO-214AA)      |

### Description

- Devices for bidirectional applications
- Electrical characteristics apply in both directions

### Typical Applications

Use is sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, telecommunication and automotive.

### Absolute Maximum Ratings (T<sub>a</sub> = 25°C unless otherwise specified)

|                                                                                                                          | Symbol                            | Value         | Unit |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------|------|
| Peak Pulse Power Dissipation with a 10/1000 µs Waveform <sup>1) 2)</sup> , Fig.1                                         | P <sub>PPM</sub>                  | Min. 600      | W    |
| Peak Pulse Current with a 10/1000 µs Waveform <sup>1)</sup> Fig.3                                                        | I <sub>PPM</sub>                  | See Table     | A    |
| Steady state power dissipation at T <sub>A</sub> =50°C (Fig.5)                                                           | P <sub>M(AV)</sub>                | 5.0           | W    |
| Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only                                                     | V <sub>F</sub>                    | 3.5           | V    |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) <sup>3)</sup> , Fig.6 | I <sub>FSM</sub>                  | 100           | A    |
| Typical Thermal Resistance Junction to Lead                                                                              | R <sub>θJL</sub>                  | 20            | °C/W |
| Typical Thermal Resistance Junction to Ambient                                                                           | R <sub>θJA</sub>                  | 100           | °C/W |
| Operating Junction and Storage Temperature Range                                                                         | T <sub>j</sub> , T <sub>stg</sub> | - 55 to + 150 | °C   |

1) Non-repetitive current pulse, per Fig.3 and derated above T<sub>A</sub>=25°C per Fig.2.

2) Mounted on 5.0mm×5.0mm copper pads to each terminal

3) 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

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

| Uni-directional / Bi-directional Type | Marking |     | Stand-off Voltage VWM | Breakdown Voltage <sup>1)</sup> |          | Test Current IT | Maximum Clamping Voltage | Maximum Peak Pulse Current IPPM | Maximum Reverse Leakage IR at VR |
|---------------------------------------|---------|-----|-----------------------|---------------------------------|----------|-----------------|--------------------------|---------------------------------|----------------------------------|
|                                       | UNI     | BI  | (V)                   | Min. (V)                        | Max. (V) | (mA)            | Vc (V) at IPPM           | (A)                             | ( $\mu\text{A}$ )                |
| SMBJ5.0A / CA                         | AKE     | AAE | 5.0                   | 6.40                            | 7.00     | 10              | 9.2                      | 65.3                            | 800                              |
| SMBJ6.0A / CA                         | AKG     | AAG | 6.0                   | 6.67                            | 7.37     | 10              | 10.3                     | 58.3                            | 800                              |
| SMBJ6.5A / CA                         | AKK     | AAK | 6.5                   | 7.22                            | 7.98     | 10              | 11.2                     | 53.6                            | 500                              |
| SMBJ7.0A / CA                         | AKM     | AAM | 7.0                   | 7.78                            | 8.60     | 10              | 12.0                     | 50.0                            | 200                              |
| SMBJ7.5A / CA                         | AKP     | AAP | 7.5                   | 8.33                            | 9.21     | 1               | 12.9                     | 46.6                            | 100                              |
| SMBJ8.0A / CA                         | AKR     | AAR | 8.0                   | 8.89                            | 9.83     | 1               | 13.6                     | 44.2                            | 50                               |
| SMBJ8.5A / CA                         | AKT     | AAT | 8.5                   | 9.44                            | 10.4     | 1               | 14.4                     | 41.7                            | 20                               |
| SMBJ9.0A / CA                         | AKV     | AAV | 9.0                   | 10.0                            | 11.1     | 1               | 15.4                     | 39.0                            | 10                               |
| SMBJ10A / CA                          | AKX     | AAX | 10.0                  | 11.1                            | 12.3     | 1               | 17.0                     | 35.3                            | 5                                |
| SMBJ11A / CA                          | AKZ     | AAZ | 11                    | 12.2                            | 13.5     | 1               | 18.2                     | 33.0                            | 1                                |
| SMBJ12A / CA                          | ALE     | ABE | 12                    | 13.3                            | 14.7     | 1               | 19.9                     | 30.2                            | 1                                |
| SMBJ13A / CA                          | ALG     | ABG | 13                    | 14.4                            | 15.9     | 1               | 21.5                     | 27.9                            | 1                                |
| SMBJ14A / CA                          | ALK     | ABK | 14                    | 15.6                            | 17.2     | 1               | 23.2                     | 25.9                            | 1                                |
| SMBJ15A / CA                          | ALM     | ABM | 15                    | 16.7                            | 18.5     | 1               | 24.4                     | 24.6                            | 1                                |
| SMBJ16A / CA                          | ALP     | ABP | 16                    | 17.8                            | 19.7     | 1               | 26.0                     | 23.1                            | 1                                |
| SMBJ17A / CA                          | ALR     | ABR | 17                    | 18.9                            | 20.9     | 1               | 27.6                     | 21.7                            | 1                                |
| SMBJ18A / CA                          | ALT     | ABT | 18                    | 20.0                            | 22.1     | 1               | 29.2                     | 20.5                            | 1                                |
| SMBJ20A / CA                          | ALV     | ABV | 20                    | 22.2                            | 24.5     | 1               | 32.4                     | 18.5                            | 1                                |
| SMBJ22A / CA                          | ALX     | ABX | 22                    | 24.4                            | 26.9     | 1               | 35.5                     | 16.9                            | 1                                |
| SMBJ24A / CA                          | ALZ     | ABZ | 24                    | 26.7                            | 29.5     | 1               | 38.9                     | 15.4                            | 1                                |
| SMBJ26A / CA                          | AME     | ACE | 26                    | 28.9                            | 31.9     | 1               | 42.1                     | 14.3                            | 1                                |
| SMBJ28A / CA                          | AMG     | ACG | 28                    | 31.1                            | 34.4     | 1               | 45.4                     | 13.2                            | 1                                |
| SMBJ30A / CA                          | AMK     | ACK | 30                    | 33.3                            | 36.8     | 1               | 48.4                     | 12.4                            | 1                                |
| SMBJ33A / CA                          | AMM     | ACM | 33                    | 36.7                            | 40.6     | 1               | 53.3                     | 11.3                            | 1                                |
| SMBJ36A / CA                          | AMP     | ACP | 36                    | 40.0                            | 44.2     | 1               | 58.1                     | 10.3                            | 1                                |
| SMBJ40A / CA                          | AMR     | ACR | 40                    | 44.4                            | 49.1     | 1               | 64.5                     | 9.3                             | 1                                |
| SMBJ43A / CA                          | AMT     | ACT | 43                    | 47.8                            | 52.8     | 1               | 69.4                     | 8.6                             | 1                                |
| SMBJ45A / CA                          | AMV     | ACV | 45                    | 50.0                            | 55.3     | 1               | 72.7                     | 8.3                             | 1                                |
| SMBJ48A / CA                          | AMX     | ACX | 48                    | 53.3                            | 58.9     | 1               | 77.4                     | 7.8                             | 1                                |
| SMBJ51A / CA                          | AMZ     | ACZ | 51                    | 56.7                            | 62.7     | 1               | 82.4                     | 7.3                             | 1                                |
| SMBJ54A / CA                          | ANE     | ADE | 54                    | 60.0                            | 66.3     | 1               | 87.1                     | 6.9                             | 1                                |
| SMBJ58A / CA                          | ANG     | ADG | 58                    | 64.4                            | 71.2     | 1               | 93.0                     | 6.4                             | 1                                |
| SMBJ60A / CA                          | ANK     | ADK | 60.0                  | 66.7                            | 73.7     | 1               | 96.8                     | 6.2                             | 1                                |
| SMBJ64A / CA                          | ANM     | ADM | 64.0                  | 71.1                            | 78.6     | 1               | 103                      | 5.9                             | 1                                |
| SMBJ70A / CA                          | ANP     | ADP | 70.0                  | 77.8                            | 86.0     | 1               | 113                      | 5.3                             | 1                                |
| SMBJ75A / CA                          | ANR     | ADR | 75.0                  | 83.3                            | 92.1     | 1               | 121                      | 5.0                             | 1                                |
| SMBJ78A / CA                          | ANT     | ADT | 78.0                  | 86.7                            | 95.8     | 1               | 126.0                    | 4.8                             | 1                                |

## Electrical Characteristics (Ta = 25°C unless otherwise specified)

| Uni-directional / Bi-directional Type | Marking |     | Stand-off Voltage VWM | Breakdown Voltage <sup>1)</sup> |          | Test Current IT | Maximum Clamping Voltage | Maximum Peak Pulse Current IPPM | Maximum Reverse Leakage IR at VR |
|---------------------------------------|---------|-----|-----------------------|---------------------------------|----------|-----------------|--------------------------|---------------------------------|----------------------------------|
|                                       | UNI     | BI  |                       | Min. (V)                        | Max. (V) |                 |                          |                                 |                                  |
|                                       |         |     | (V)                   |                                 |          | (mA)            | Vc (V) at IPPM           | (A)                             | (μA)                             |
| SMBJ85A / CA                          | ANV     | ADV | 85.0                  | 94.4                            | 104.0    | 1               | 137.0                    | 4.4                             | 1                                |
| SMBJ90A / CA                          | ANX     | ADX | 90.0                  | 100.0                           | 111.0    | 1               | 146.0                    | 4.1                             | 1                                |
| SMBJ100A / CA                         | ANZ     | ADZ | 100.0                 | 111.0                           | 123.0    | 1               | 162.0                    | 3.7                             | 1                                |
| SMBJ110A / CA                         | APE     | AEE | 110.0                 | 122.0                           | 135.0    | 1               | 177.0                    | 3.4                             | 1                                |
| SMBJ120A / CA                         | APG     | AEG | 120.0                 | 133.0                           | 147.0    | 1               | 193.0                    | 3.1                             | 1                                |
| SMBJ130A / CA                         | APK     | AEK | 130.0                 | 144.0                           | 159.0    | 1               | 209.0                    | 2.9                             | 1                                |
| SMBJ150A / CA                         | APM     | AEM | 150.0                 | 167.0                           | 185.0    | 1               | 243.0                    | 2.5                             | 1                                |
| SMBJ160A / CA                         | APP     | AEP | 160.0                 | 178.0                           | 197.0    | 1               | 259.0                    | 2.3                             | 1                                |
| SMBJ170A / CA                         | APR     | AER | 170.0                 | 189.0                           | 209.0    | 1               | 275.0                    | 2.2                             | 1                                |
| SMBJ180A / CA                         | APT     | AET | 180.0                 | 201.0                           | 222.0    | 1               | 292.0                    | 2.1                             | 1                                |
| SMBJ190A / CA                         | APA     | AEC | 190.0                 | 211.0                           | 233.0    | 1               | 308.0                    | 2.0                             | 1                                |
| SMBJ200A / CA                         | APV     | AEV | 200.0                 | 224.0                           | 247.0    | 1               | 324.0                    | 1.9                             | 1                                |

1)For bidirectional type having VRWM of 10V and less, the IR limit is double.

## Electrical Characteristics Curves

Figure 1. Peak Pulse Power Rating Curve

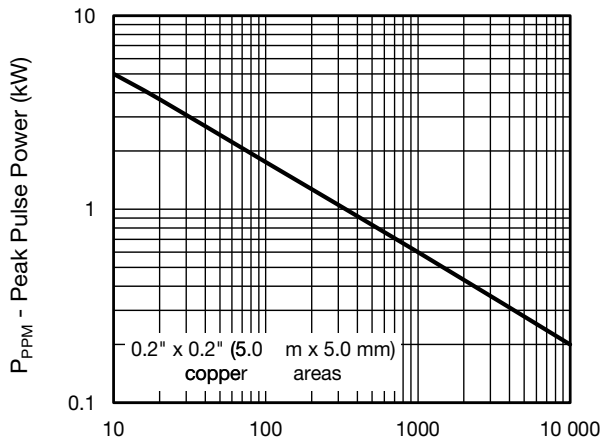


Figure 2. Pulse Derating Curve

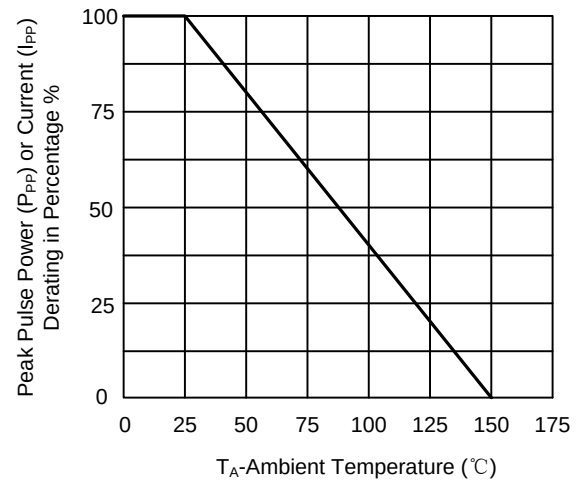


Figure 3. Pulse Waveform

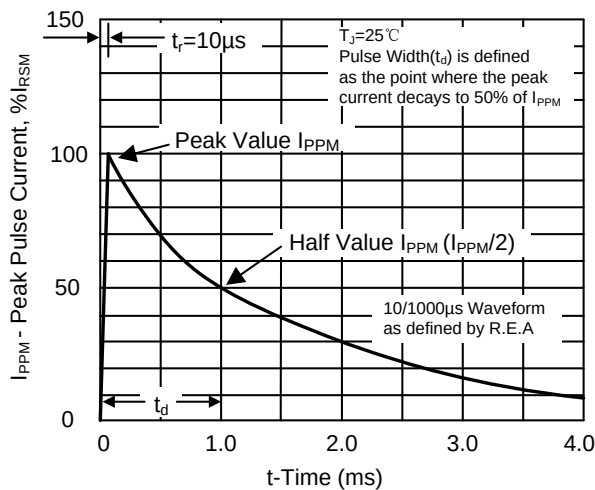


Figure 4. Typical Junction Capacitance

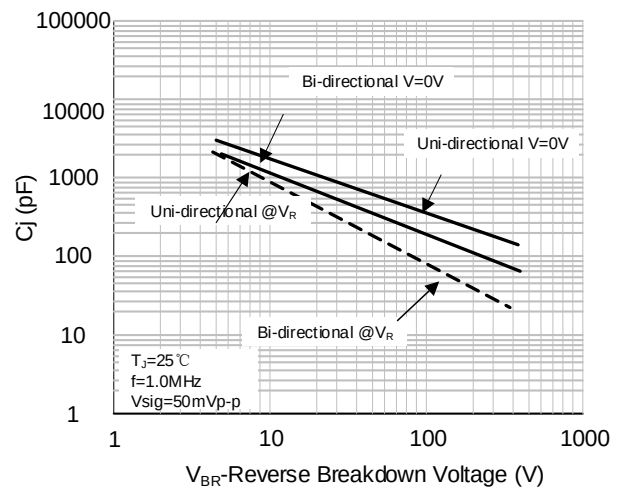


Figure 5. Steady State Power Dissipation

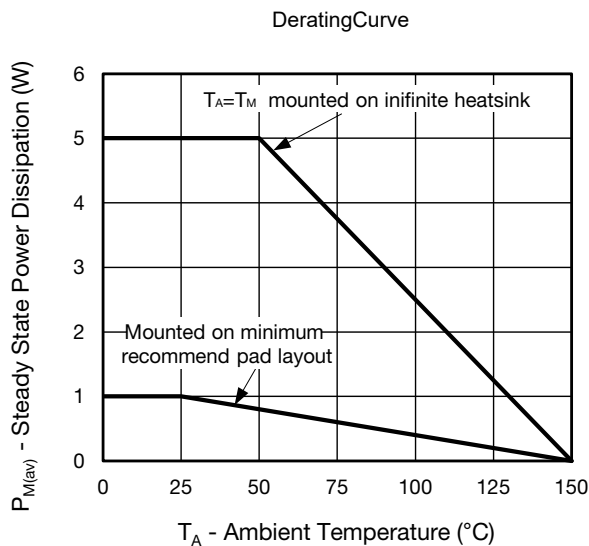
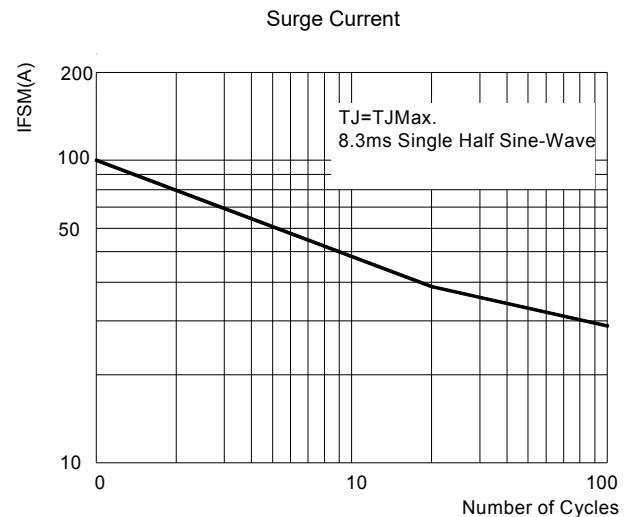
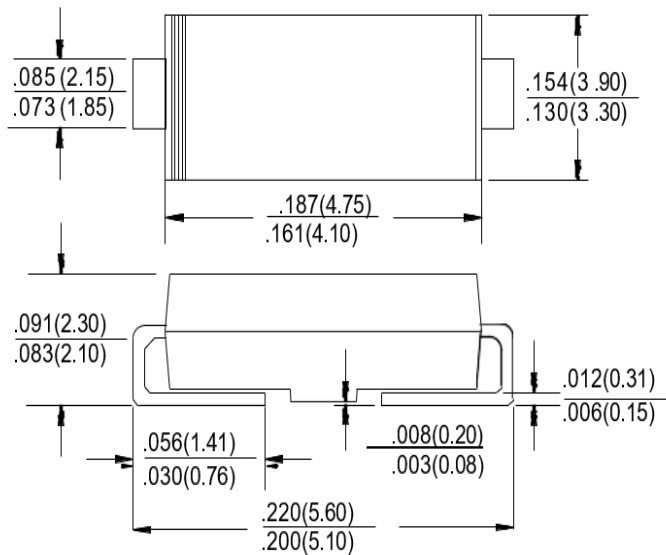


Figure 6. Maximum Non-Repetitive Forward

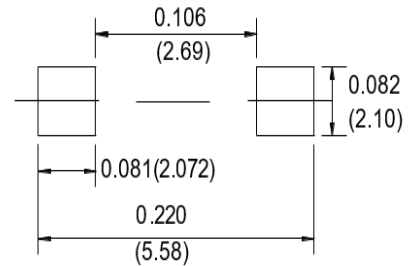


## Package Outline Dimensions in inches (millimeters)

## SMB(DO-214AA)



## Mounting Pad Layout



## Packing Information

| Package | Tape Width (mm) | Pitch |             | Reel Size |      | Per Reel Packing Quantity |
|---------|-----------------|-------|-------------|-----------|------|---------------------------|
|         |                 | mm    | inch        | mm        | inch |                           |
| SMB     | 12              | 8±0.1 | 0.315±0.004 | 330       | 13   | 3000                      |

## Marking information

" AKE " = Part No.

" YWW " = Date Code Marking

" Y " = Last digit of year (ex: 2 = 2022)

" WW " = Week Code (ex: 24 = the 24th week of the year)

Font type: Arial



↑  
Cathode band for Uni-directional products only