# 1.5SMBJ Series

## 1500W Transient Voltage Suppressors

### Features

- AEC-Q101 Qualified
- Glass passivated chip
- 1500 W peak pulse power capability with a 10/1000 us waveform, repetitive rate (duty cycle):0.01 %
- Excellent clamping capability
- Low reverse leakage
- Very fast response time
- Lead and body according with RoHS standard

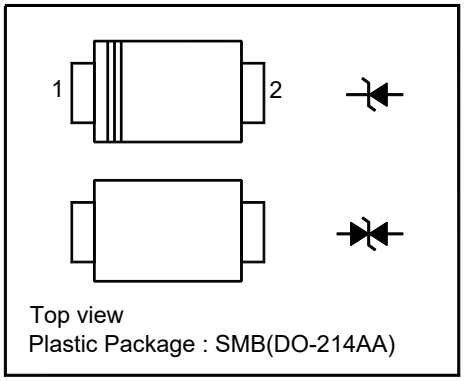
**SMB (DO-214AA)**

### 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

PINNING

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




Top view
Plastic Package : SMB(DO-214AA)

### Mechanical Data

- Case: DO214AA/(SMB) Molded plastic
- Lead: Solderable per MIL-STD-750, method 2026
- Epoxy: UL 94V-0 rate flame retardant
- Polarity: Color band denotes cathode end except Bipolar
- Mounting position: Any

| PRIMARY CHARACTERISTICS | |
|---|---|
| $V_{RWM}$ | 6.4V to 222V |
| PPP (10 x 1000 us) | 1500 W |
| $T_J$ max. | 150 °C |
| Polarity | Uni & bidirectional |
| Package | SMB (DO-214AA) |

### Absolute Maximum Ratings ($T_a$ = 25℃ unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Peak Pulse Power Dissipation with a 10/1000 μs Waveform [1] | $P_{PP}$ | 1500 | W |
| Peak Pulse Current with a 10/1000 μs Waveform [1] | $I_{PP}$ | See Table 1 | A |
| Power Dissiation On infinite heat sink at $T_L$=75℃ | $P_D$ | 5.0 | W |
| Peak Forward Surge Current, 8.3 ms Single Half Sine-wave unidirectional only [2] | $I_{FSM}$ | 100 | A |
| Operating Junction and Storage Temperature Range | $T_j$, $T_{stg}$ | - 55 to + 150 | ℃ |
| Maximum instantaneous forward Voltage [3] At 50A for unidirection only | $V_F$ | 3.5/6.5 | V |

1) Non-repetitive current pulse, per Fig.5 and derated above TA = 25°C per Fig. 1.

2) Mounted on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

3) VF<3.5V for devices of VBR<200V and VF<6.5V for devices of VBR>201V

**Characteristics at $T_a$ = 25℃ unless otherwise specified**

| Uni-directional Type | Bi-directional Type | Device Marking Code | | Reverse Stand-off Voltage | Breakdown Voltage | | | Maximum Clamping Voltage | Peak Pulse Currnet | Max. Reverse Leakage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $V_{BR}$ | | at $I_T$ | $V_C$ | $I_{PP}$ | $V_{RWM}$ |
| | | UNI | BI | $V_{RWM}$ (V) | Min. (V) | Max. (V) | (mA) | Max. (V) | Max. (A) | $I_R$(uA) |
| 1.5SMBJ5.0A | 1.5SMBJ5.0CA | GDE | BDE | 5.0 | 6.40 | 7.00 | 10 | 9.2 | 163.0 | 800 |
| 1.5SMBJ6.0A | 1.5SMBJ6.0CA | GDG | BDG | 6.0 | 6.67 | 7.37 | 10 | 10.3 | 145.7 | 800 |
| 1.5SMBJ6.5A | 1.5SMBJ6.5CA | GDK | BDK | 6.5 | 7.22 | 7.98 | 10 | 11.2 | 134.0 | 500 |
| 1.5SMBJ7.0A | 1.5SMBJ7.0CA | GDM | BDM | 7.0 | 7.78 | 8.60 | 10 | 12.0 | 125.0 | 200 |
| 1.5SMBJ7.5A | 1.5SMBJ7.5CA | GDP | BDP | 7.5 | 8.33 | 9.21 | 1 | 12.9 | 116.3 | 100 |
| 1.5SMBJ8.0A | 1.5SMBJ8.0CA | GDR | BDR | 8.0 | 8.89 | 9.83 | 1 | 13.6 | 110.3 | 50 |
| 1.5SMBJ8.5A | 1.5SMBJ8.5CA | GDT | BDT | 8.5 | 9.44 | 10.40 | 1 | 14.4 | 104.2 | 20 |
| 1.5SMBJ9.0A | 1.5SMBJ9.0CA | GDV | BDV | 9.0 | 10.00 | 11.10 | 1 | 15.4 | 97.4 | 10 |
| 1.5SMBJ10A | 1.5SMBJ10CA | GDX | BDX | 10.0 | 11.10 | 12.30 | 1 | 17.0 | 88.3 | 5 |
| 1.5SMBJ11A | 1.5SMBJ11CA | GDZ | BDZ | 11.0 | 12.20 | 13.50 | 1 | 18.2 | 82.5 | 1 |
| 1.5SMBJ12A | 1.5SMBJ12CA | GEE | BEE | 12.0 | 13.30 | 14.70 | 1 | 19.9 | 75.4 | 1 |
| 1.5SMBJ13A | 1.5SMBJ13CA | GEG | BEG | 13.0 | 14.40 | 15.90 | 1 | 21.5 | 69.8 | 1 |
| 1.5SMBJ14A | 1.5SMBJ14CA | GEK | BEK | 14.0 | 15.60 | 17.20 | 1 | 23.2 | 64.7 | 1 |
| 1.5SMBJ15A | 1.5SMBJ15CA | GEM | BEM | 15.0 | 16.70 | 18.50 | 1 | 24.4 | 61.5 | 1 |
| 1.5SMBJ16A | 1.5SMBJ16CA | GEP | BEP | 16.0 | 17.80 | 19.70 | 1 | 26.0 | 57.7 | 1 |
| 1.5SMBJ17A | 1.5SMBJ17CA | GER | BER | 17.0 | 18.90 | 20.90 | 1 | 27.6 | 54.4 | 1 |
| 1.5SMBJ18A | 1.5SMBJ18CA | GET | BET | 18.0 | 20.00 | 22.10 | 1 | 29.2 | 51.4 | 1 |
| 1.5SMBJ20A | 1.5SMBJ20CA | GEV | BEV | 20.0 | 22.20 | 24.50 | 1 | 32.4 | 46.3 | 1 |
| 1.5SMBJ22A | 1.5SMBJ22CA | GEX | BEX | 22.0 | 24.40 | 26.90 | 1 | 35.5 | 42.3 | 1 |
| 1.5SMBJ24A | 1.5SMBJ24CA | GEZ | BEZ | 24.0 | 26.70 | 29.50 | 1 | 38.9 | 38.6 | 1 |
| 1.5SMBJ26A | 1.5SMBJ26CA | GFE | BFE | 26.0 | 28.90 | 31.90 | 1 | 42.1 | 35.7 | 1 |
| 1.5SMBJ28A | 1.5SMBJ28CA | GFG | BFG | 28.0 | 31.10 | 34.40 | 1 | 45.4 | 33.1 | 1 |
| 1.5SMBJ30A | 1.5SMBJ30CA | GFK | BFK | 30.0 | 33.50 | 36.80 | 1 | 48.4 | 31.0 | 1 |
| 1.5SMBJ33A | 1.5SMBJ33CA | GFM | BFM | 33.0 | 36.70 | 40.60 | 1 | 53.3 | 28.2 | 1 |
| 1.5SMBJ36A | 1.5SMBJ36CA | GFP | BFP | 36.0 | 40.00 | 44.20 | 1 | 58.1 | 25.9 | 1 |
| 1.5SMBJ40A | 1.5SMBJ40CA | GFR | BFR | 40.0 | 44.40 | 49.10 | 1 | 64.5 | 23.3 | 1 |
| 1.5SMBJ43A | 1.5SMBJ43CA | GFT | BFT | 43.0 | 47.80 | 52.80 | 1 | 69.4 | 21.7 | 1 |
| 1.5SMBJ45A | 1.5SMBJ45CA | GFV | BFV | 45.0 | 50.00 | 55.30 | 1 | 72.7 | 20.6 | 1 |
| 1.5SMBJ48A | 1.5SMBJ48CA | GFX | BFX | 48.0 | 53.30 | 58.90 | 1 | 77.4 | 19.4 | 1 |
| 1.5SMBJ51A | 1.5SMBJ51CA | GFZ | BFZ | 51.0 | 56.70 | 62.70 | 1 | 82.4 | 18.2 | 1 |
| 1.5SMBJ54A | 1.5SMBJ54CA | GGE | BGE | 54.0 | 60.00 | 66.30 | 1 | 87.1 | 17.3 | 1 |
| 1.5SMBJ58A | 1.5SMBJ58CA | GGG | BGG | 58.0 | 64.40 | 71.20 | 1 | 93.6 | 16.1 | 1 |
| 1.5SMBJ60A | 1.5SMBJ60CA | GGK | BGK | 60.0 | 66.70 | 73.70 | 1 | 96.8 | 15.5 | 1 |
| 1.5SMBJ64A | 1.5SMBJ64CA | GGM | BGM | 64.0 | 71.10 | 78.60 | 1 | 103.0 | 14.6 | 1 |
| 1.5SMBJ70A | 1.5SMBJ70CA | GGP | BGP | 70.0 | 77.80 | 86.00 | 1 | 113.0 | 13.3 | 1 |
| 1.5SMBJ75A | 1.5SMBJ75CA | GGR | BGR | 75.0 | 83.30 | 92.10 | 1 | 121.0 | 12.4 | 1 |

**Characteristics at $T_a$ = 25℃ unless otherwise specified**

| Uni-directional Type | Bi-directional Type | Device Marking Code | | Reverse Stand-off Voltage | Breakdown Voltage | | | Maximum Clamping Voltage | Peak Pulse Currnet | Max. Reverse Leakage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $V_{BR}$ | | at $I_T$ | $I_{PP}$ | $I_{PP}$ | $V_{RWM}$ |
| | | UNI | BI | $V_{RWM}$ (V) | Min. (V) | Max. (V) | Max. (A) | Max. (V) | Max. (A) | $I_R$(uA) |
| 1.5SMBJ78A | 1.5SMBJ78CA | GGT | BGT | 78.0 | 86.70 | 95.80 | 1 | 126.0 | 11.9 | 1 |
| 1.5SMBJ85A | 1.5SMBJ85CA | GGV | BGV | 85.0 | 94.4 | 104.0 | 1 | 137.0 | 11.0 | 1 |
| 1.5SMBJ90A | 1.5SMBJ90CA | GGX | BGX | 90.0 | 100.0 | 111.0 | 1 | 146.0 | 10.3 | 1 |
| 1.5SMBJ100A | 1.5SMBJ100CA | GGZ | BGZ | 100.0 | 111.0 | 123.0 | 1 | 162.0 | 9.3 | 1 |
| 1.5SMBJ110A | 1.5SMBJ110CA | GHE | BHE | 110.0 | 122.0 | 135.0 | 1 | 177.0 | 8.5 | 1 |
| 1.5SMBJ120A | 1.5SMBJ120CA | GHG | BHG | 120.0 | 133.0 | 147.0 | 1 | 193.0 | 7.8 | 1 |
| 1.5SMBJ130A | 1.5SMBJ130CA | GHK | BHK | 130.0 | 144.0 | 159.0 | 1 | 209.0 | 7.2 | 1 |
| 1.5SMBJ150A | 1.5SMBJ150CA | GHM | BHM | 150.0 | 167.0 | 185.0 | 1 | 243.0 | 6.2 | 1 |
| 1.5SMBJ160A | 1.5SMBJ160CA | GHP | BHP | 160.0 | 178.0 | 197.0 | 1 | 259.0 | 5.8 | 1 |
| 1.5SMBJ170A | 1.5SMBJ170CA | GHR | BHR | 170.0 | 189.0 | 209.0 | 1 | 275.0 | 5.5 | 1 |
| 1.5SMBJ180A | 1.5SMBJ180CA | GHT | BHT | 180.0 | 201.0 | 222.0 | 1 | 292.0 | 5.1 | 1 |

## Electrical Characteristics Curves

Fig 1. Pulse Derating Curve

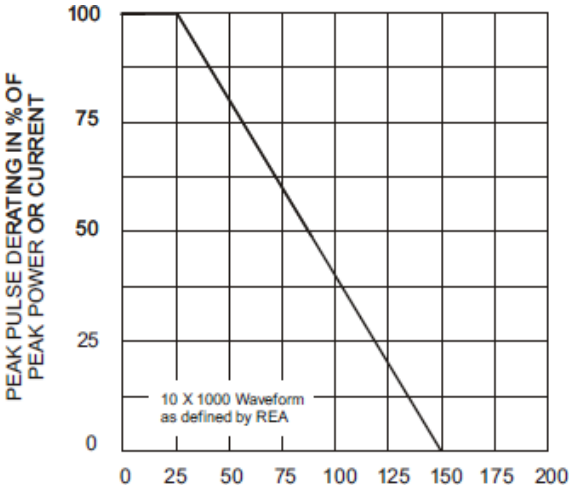



Fig 2. Maximum Non-Repetitive Surge Current

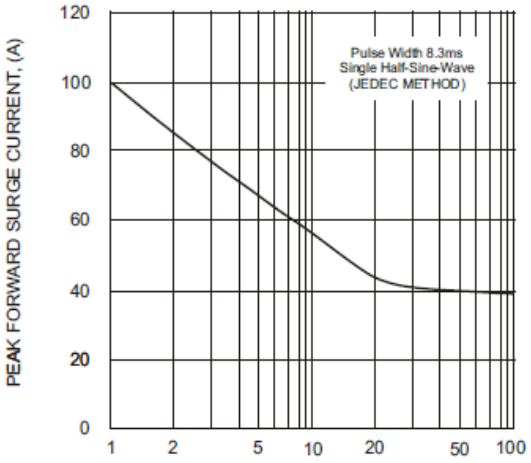



Fig 3. Steady State Power Derating Current

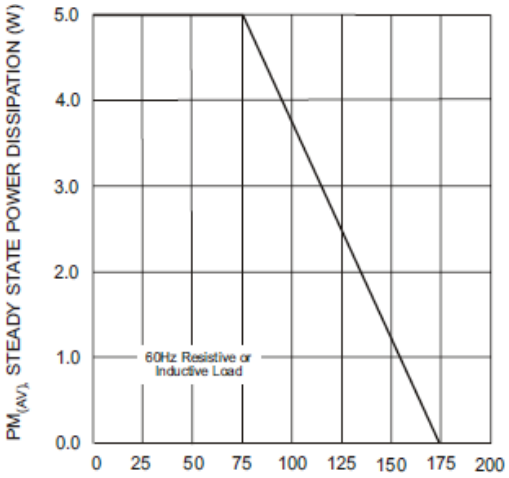



Fig 4. Peak Pulse Power Rating Curves

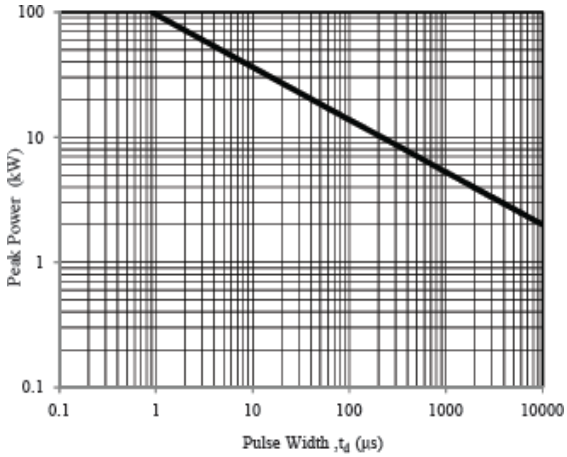



Fig 5. Pulse Waveform

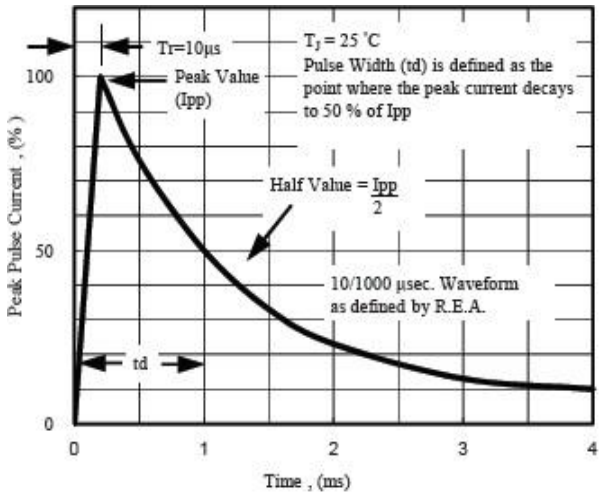
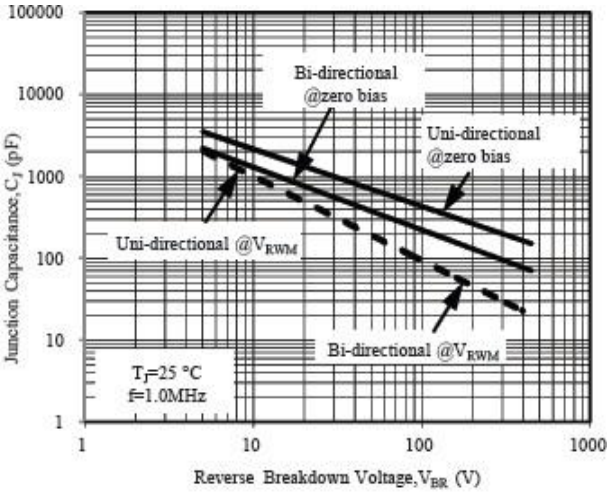
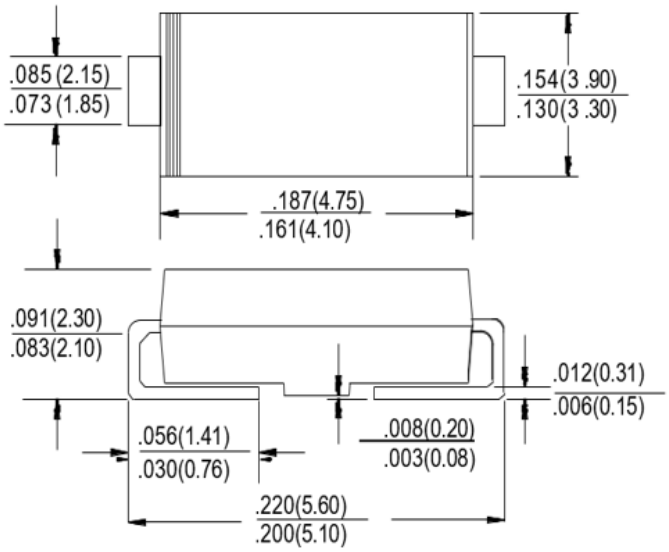


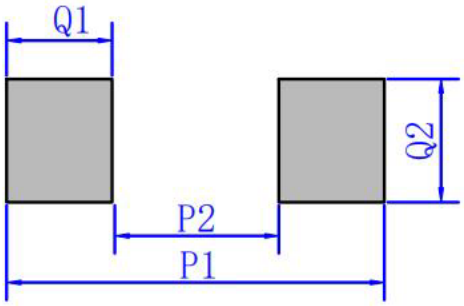

Fig 6. Typical Junction Capacitance



## Package Outline Dimensions in inches (millimeters) SMB(DO-214AA)




## Mounting Pad Layout




| UNIT | P1 | P2 | Q1 | Q2 |
|---|---|---|---|---|
| mm | 6.80 | 1.80 | 2.50 | 2.30 |

## 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

" GHT " = 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)

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