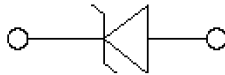
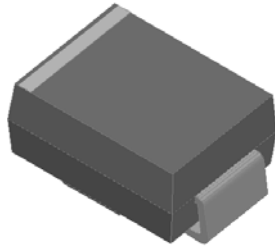


## Surface Mount Transient Voltage Suppressors

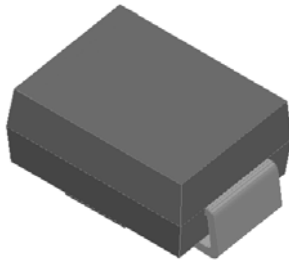
### Uni-directional



### Features

- For surface mounted applications
- Low-profile package
- Ideal for automated placement
- Available in Unidirectional and Bidirectional
- 1000W peak pulse power capability with a 10/1000  $\mu$ s waveform
- Low incremental surge resistance, excellent clamping capability
- Very fast response time
- Meets MSL level 1, per J-STD-020C, LF maximum peak of 260 °C
- ESD protection of data lines in accordance with IEC 61000-4-2, 30kV(Air),30kV (Contact)
- Part no. with suffix "Q" means AEC-Q101 qualified

### Bi-directional



### Typical Applications

For use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, automotive, and telecommunication

### Mechanical Data

- **Package:** DO-214AA (SMB)  
Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- **Terminals:** Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D
- **Polarity:** For uni-directional types the band denotes cathode end, no marking on bi-directional types

### ■Maximum Ratings ( $T_a=25^\circ\text{C}$ Unless otherwise specified)

| PARAMETER   | SYMBOL    | UNIT             | Max            |
|---|-----------|------------------|----------------|
| Peak power dissipation, with a 10/1000us waveform <sup>(1)</sup> <sup>(2)</sup> (Fig.1)     | $P_{PPM}$ | W                | 1000           |
| Peak pulse current, with a 10/1000us waveform <sup>(1)</sup>                                | $I_{PPM}$ | A                | See Next Table |
| Power dissipation, on infinite heat sink at $T_L=75^\circ\text{C}$                          | $P_D$     | W                | 5.0            |
| Peak forward surge current, 8.3 ms single half sine-wave unidirectional only <sup>(2)</sup> | $I_{FSM}$ | A                | 100            |
| Operating junction  | $T_J$     | $^\circ\text{C}$ | -55 to +175    |
| Storage temperature range   | $T_{STG}$ | $^\circ\text{C}$ | -55 to +175    |

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

| PARAMETER   | SYMBOL | UNIT | VALUE |
|---|--------|------|-------|
| Maximum instantaneous forward voltage<br>@ at 50A for unidirectional only | $V_F$  | V    | 3.5   |



# SMB10J SERIES

## ■ Thermal Characteristics (T<sub>a</sub>=25°C Unless otherwise specified)

| PARAMETER                   | SYMBOL           | UNIT | Conditions          | VALUE |
|-----------------------------|------------------|------|---------------------|-------|
| Thermal resistance(Typical) | R <sub>θJL</sub> | °C/W | junction to lead    | 20    |
|                             | R <sub>θJA</sub> | °C/W | junction to ambient | 100   |

Notes:

- (1) Non-repetitive current pulse, per Fig. 3 and derated above T<sub>A</sub>= 25°C per Fig.2.
- (2) Mounted on 0.2 x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal.

## ■ Electrical Characteristics (T<sub>a</sub>=25°C Unless otherwise specified)

| Part Number (Uni) | Part Number (Bi) | Breakdown Voltage V <sub>BR@IT</sub> |         |                                    | Maximum Reverse Leakage I <sub>R</sub> <sup>(4)</sup> @ V <sub>RWM</sub> (μA) | Working Peak Reverse Voltage V <sub>RWM</sub> (V) | Maximum Reverse Surge Current I <sub>PP</sub> <sup>(5)</sup> (A) | Maximum Clamping Voltage V <sub>c</sub> @ I <sub>PP</sub> (V) |
|-------------------|------------------|--------------------------------------|---------|------------------------------------|---|---|--|---|
|                   |                  | Min(V)                               | Max (V) | I <sub>T</sub> <sup>(3)</sup> (mA) |   |   |  |   |
| SMB10J5.0AQ       | SMB10J5.0CAQ     | 6.4                                  | 7.07    | 10                                 | 1000  | 5   | 108.70   | 9.2   |
| SMB10J6.0AQ       | SMB10J6.0CAQ     | 6.67                                 | 7.37    | 10                                 | 1000  | 6   | 97.09  | 10.3  |
| SMB10J6.5AQ       | SMB10J6.5CAQ     | 7.22                                 | 7.98    | 10                                 | 500   | 6.5   | 89.29  | 11.2  |
| SMB10J7.0AQ       | SMB10J7.0CAQ     | 7.78                                 | 8.6     | 10                                 | 200   | 7   | 83.33  | 12  |
| SMB10J7.5AQ       | SMB10J7.5CAQ     | 8.33                                 | 9.21    | 1                                  | 100   | 7.5   | 77.52  | 12.9  |
| SMB10J8.0AQ       | SMB10J8.0CAQ     | 8.89                                 | 9.83    | 1                                  | 50  | 8   | 73.53  | 13.6  |
| SMB10J8.5AQ       | SMB10J8.5CAQ     | 9.44                                 | 10.4    | 1                                  | 20  | 8.5   | 69.44  | 14.4  |
| SMB10J9.0AQ       | SMB10J9.0CAQ     | 10                                   | 11.1    | 1                                  | 10  | 9   | 64.94  | 15.4  |
| SMB10J10AQ        | SMB10J10CAQ      | 11.1                                 | 12.3    | 1                                  | 5   | 10  | 58.82  | 17  |
| SMB10J11AQ        | SMB10J11CAQ      | 12.2                                 | 13.5    | 1                                  | 5   | 11  | 54.95  | 18.2  |
| SMB10J12AQ        | SMB10J12CAQ      | 13.3                                 | 14.7    | 1                                  | 5   | 12  | 50.25  | 19.9  |
| SMB10J13AQ        | SMB10J13CAQ      | 14.4                                 | 15.9    | 1                                  | 1   | 13  | 46.51  | 21.5  |
| SMB10J14AQ        | SMB10J14CAQ      | 15.6                                 | 17.2    | 1                                  | 1   | 14  | 43.10  | 23.2  |
| SMB10J15AQ        | SMB10J15CAQ      | 16.7                                 | 18.5    | 1                                  | 1   | 15  | 40.98  | 24.4  |
| SMB10J16AQ        | SMB10J16CAQ      | 17.8                                 | 19.7    | 1                                  | 1   | 16  | 38.46  | 26  |
| SMB10J17AQ        | SMB10J17CAQ      | 18.9                                 | 20.9    | 1                                  | 1   | 17  | 36.23  | 27.6  |
| SMB10J18AQ        | SMB10J18CAQ      | 20                                   | 22.1    | 1                                  | 1   | 18  | 34.25  | 29.2  |
| SMB10J19AQ        | SMB10J19CAQ      | 21.1                                 | 23.3    | 1                                  | 1   | 19  | 32.47  | 30.8  |
| SMB10J20AQ        | SMB10J20CAQ      | 22.2                                 | 24.5    | 1                                  | 1   | 20  | 30.86  | 32.4  |
| SMB10J22AQ        | SMB10J22CAQ      | 24.4                                 | 26.9    | 1                                  | 1   | 22  | 28.17  | 35.5  |
| SMB10J24AQ        | SMB10J24CAQ      | 26.7                                 | 29.5    | 1                                  | 1   | 24  | 25.71  | 38.9  |
| SMB10J26AQ        | SMB10J26CAQ      | 28.9                                 | 31.9    | 1                                  | 1   | 26  | 23.75  | 42.1  |
| SMB10J28AQ        | SMB10J28CAQ      | 31.1                                 | 34.4    | 1                                  | 1   | 28  | 22.03  | 45.4  |
| SMB10J30AQ        | SMB10J30CAQ      | 33.3                                 | 36.8    | 1                                  | 1   | 30  | 20.66  | 48.4  |
| SMB10J33AQ        | SMB10J33CAQ      | 36.7                                 | 40.6    | 1                                  | 1   | 33  | 18.76  | 53.3  |
| SMB10J36AQ        | SMB10J36CAQ      | 40                                   | 44.2    | 1                                  | 1   | 36  | 17.21  | 58.1  |
| SMB10J40AQ        | SMB10J40CAQ      | 44.4                                 | 49.1    | 1                                  | 1   | 40  | 15.50  | 64.5  |
| SMB10J43AQ        | SMB10J43CAQ      | 47.8                                 | 52.8    | 1                                  | 1   | 43  | 14.41  | 69.4  |
| SMB10J45AQ        | SMB10J45CAQ      | 50                                   | 55.3    | 1                                  | 1   | 45  | 13.76  | 72.7  |
| SMB10J48AQ        | SMB10J48CAQ      | 53.3                                 | 58.9    | 1                                  | 1   | 48  | 12.92  | 77.4  |
| SMB10J51AQ        | SMB10J51CAQ      | 56.7                                 | 62.7    | 1                                  | 1   | 51  | 12.14  | 82.4  |
| SMB10J54AQ        | SMB10J54CAQ      | 60                                   | 66.3    | 1                                  | 1   | 54  | 11.48  | 87.1  |
| SMB10J58AQ        | SMB10J58CAQ      | 64.4                                 | 71.2    | 1                                  | 1   | 58  | 10.68  | 93.6  |
| SMB10J60AQ        | SMB10J60CAQ      | 66.7                                 | 73.7    | 1                                  | 1   | 60  | 10.33  | 96.8  |
| SMB10J64AQ        | SMB10J64CAQ      | 71.1                                 | 78.6    | 1                                  | 1   | 64  | 9.71   | 103   |
| SMB10J70AQ        | SMB10J70CAQ      | 77.8                                 | 86      | 1                                  | 1   | 70  | 8.85   | 113   |
| SMB10J75AQ        | SMB10J75CAQ      | 83.3                                 | 92.1    | 1                                  | 1   | 75  | 8.26   | 121   |
| SMB10J78AQ        | SMB10J78CAQ      | 86.7                                 | 95.8    | 1                                  | 1   | 78  | 7.94   | 126   |
| SMB10J80AQ        | SMB10J80CAQ      | 88.8                                 | 97.6    | 1                                  | 1   | 80  | 7.72   | 129.6   |
| SMB10J85AQ        | SMB10J85CAQ      | 94.4                                 | 104     | 1                                  | 1   | 85  | 7.30   | 137   |

Notes:

- (3) Pulse test: t<sub>p</sub>≤50ms.
- (4) For bi-directional types having V<sub>RWM</sub> of 10 V and less, the IR limit is doubled.
- (5) Surge current waveform per Fig. 3 and derated per Fig.2.



# SMB10J SERIES

## ■ Characteristics (Typical)

Fig.1 Peak Pulse Power Rating Curve

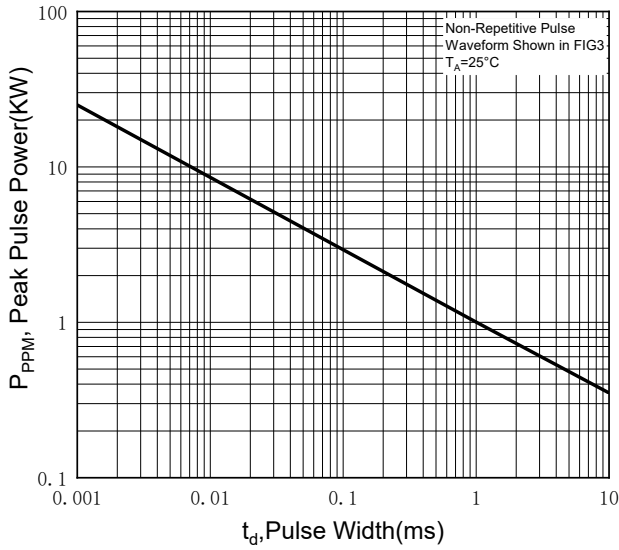


Fig.2 Pulse Power or Current vs. Initial Junction Temperature

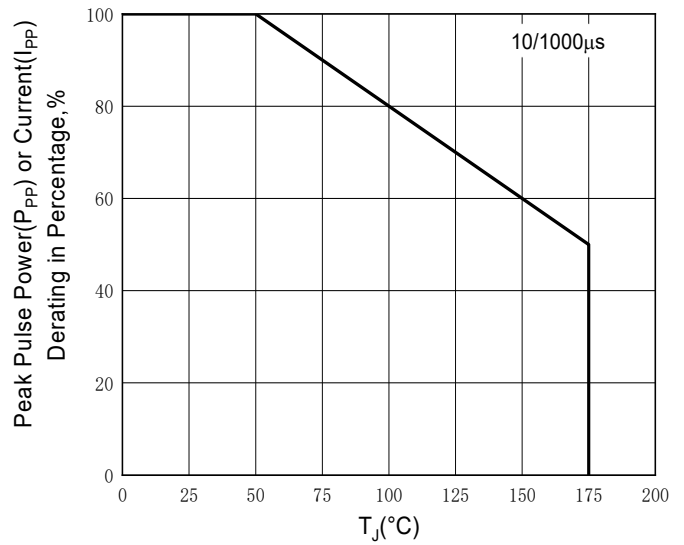


Fig.3 Pulse Waveform

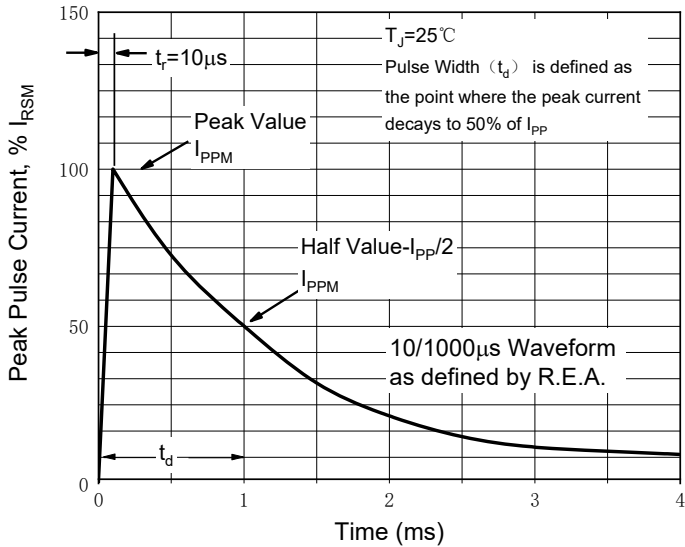


Fig.4 Typical Transient Thermal Impedance

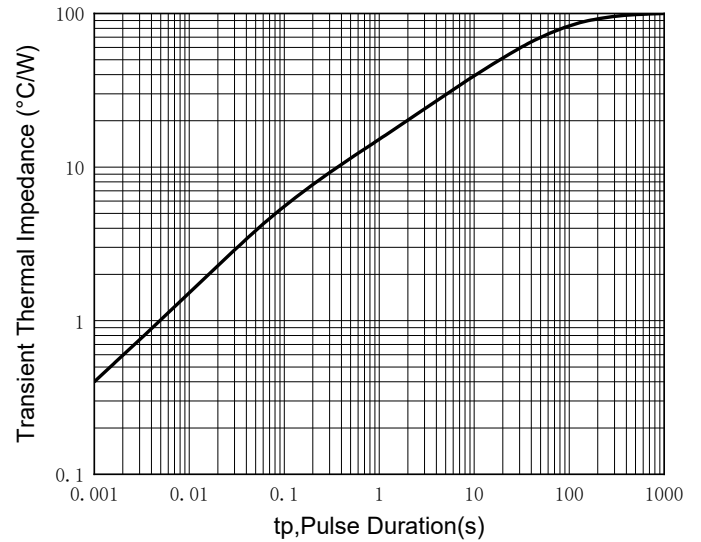


Fig.5 Maximum Non-Repetitive Forward Surge Current

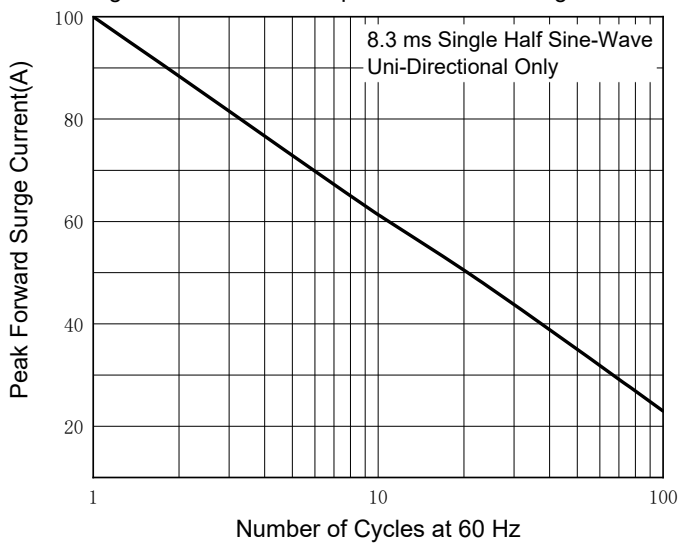
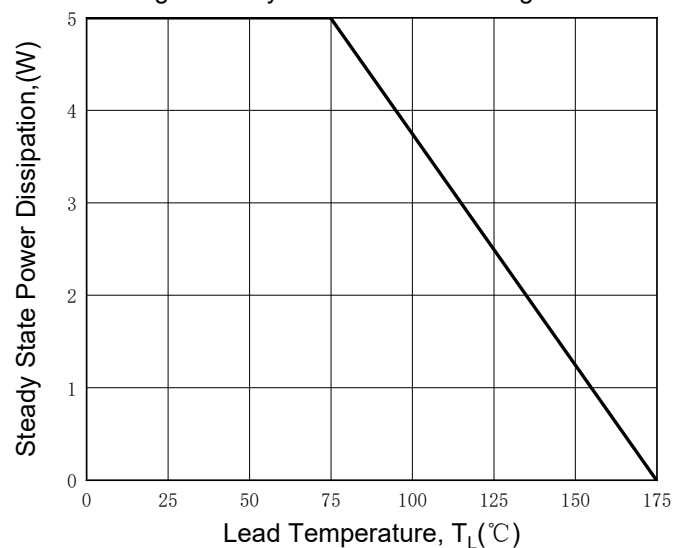


Fig.6 Steady State Power Derating Curve



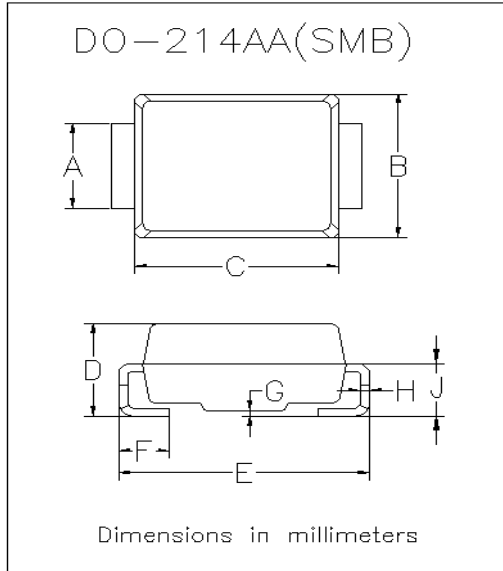


# SMB10J SERIES

## Ordering Information (Example)

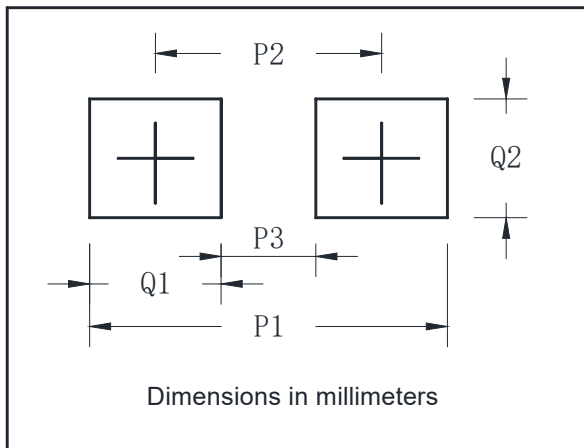
| REFERED P/N   | PACKING CODE | UNIT WEIGHT(g) | MINIMUM PACKAGE(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|--------------|----------------|----------------------|----------------------------|---------------|
| SMB10J SERIES | F1           | 0.0975         | 3000                 | 48000                      | 13" reel      |

## Outline Dimensions



| DO-214AA(SMB) |      |      |
|---------------|------|------|
| Dim           | Min  | Max  |
| A             | 1.85 | 2.15 |
| B             | 3.30 | 3.94 |
| C             | 4.05 | 4.75 |
| D             | 1.99 | 2.61 |
| E             | 5.21 | 5.59 |
| F             | 0.90 | 1.41 |
| G             | 0.05 | 0.20 |
| H             | 0.15 | 0.31 |
| J             | 1.05 | 1.55 |

## Suggested pad layout



| DO-214AA(SMB) |             |
|---------------|-------------|
| Dim           | Millimeters |
| P1            | 6.8         |
| P2            | 4.3         |
| P3            | 1.8         |
| Q1            | 2.5         |
| Q2            | 2.3         |



## SMB10J SERIES

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