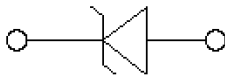
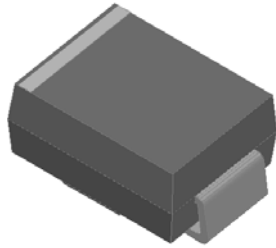
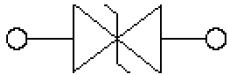
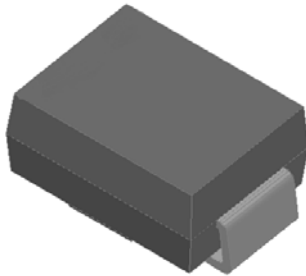


## Surface Mount Transient Voltage Suppressors

### Uni-directional



### Bi-directional



### Features

- For surface mounted applications
- Low-profile package
- Ideal for automated placement
- Available in Unidirectional and Bidirectional
- 600 W peak pulse power capability with a 10/1000  $\mu$ s waveform
- Low incremental surge resistance, excellent clamping capability
- Very fast response time
- High temperature soldering guaranteed: 260 °C/10 s at terminals
- Meets MSL level 1
- Component in accordance to RoHS

### Typical Applications

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, computer, industrial, 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                | 600            |
| 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 and storage temperature range  | $T_J, T_{STG}$ | $^\circ\text{C}$ | -55 to +150    |

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

| PARAMETER   | SYMBOL | UNIT | VALUE   |
|---|--------|------|---------|
| Maximum instantaneous forward voltage @ at 50A for unidirectional only <sup>(3)</sup> | $V_F$  | V    | 3.5/5.0 |



# SMBJ 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 x 5.0 mm) copper pads to each terminal.
- (3) V<sub>F</sub><3.5V for devices of V<sub>BR</sub><200V and V<sub>F</sub><5.0V for devices of V<sub>BR</sub>>201V.

## ■ Ordering Information (Example)

| PREFERRED P/N      | PACKING CODE | UNIT WEIGHT(g)     | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|--------------------|--------------|--------------------|----------------------|-------------------------|----------------------------|---------------|
| SMBJ5.0A-SMBJ400CA | F1           | Approximate 0.0975 | 3000                 | /                       | 48000                      | 13" reel      |
| SMBJ5.0A-SMBJ400CA | F2           | Approximate 0.0975 | 750                  | 3000                    | 24000                      | 7" reel       |
| SMBJ5.0A-SMBJ400CA | F3           | Approximate 0.0975 | 500                  | 2000                    | 16000                      | 7" reel       |

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

| Part Number (Uni) | Part Number (Bi)         | Breakdown Voltage V <sub>BR</sub> @I <sub>T</sub> |         |                                    | Maximum Reverse Leakage I <sub>R</sub> <sup>(6)</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>(4)</sup> (mA) |   |   |  |   |
| SMBJ5.0A          | SMBJ5.0CA <sup>(4)</sup> | 6.4   | 7.07    | 10                                 | 800   | 5   | 65.22  | 9.2   |
| SMBJ6.0A          | SMBJ6.0CA                | 6.67  | 7.37    | 10                                 | 800   | 6   | 58.25  | 10.3  |
| SMBJ6.5A          | SMBJ6.5CA                | 7.22  | 7.98    | 10                                 | 500   | 6.5   | 53.57  | 11.2  |
| SMBJ7.0A          | SMBJ7.0CA                | 7.78  | 8.6     | 10                                 | 200   | 7   | 50   | 12  |
| SMBJ7.5A          | SMBJ7.5CA                | 8.33  | 9.21    | 1                                  | 100   | 7.5   | 46.51  | 12.9  |
| SMBJ8.0A          | SMBJ8.0CA                | 8.89  | 9.83    | 1                                  | 50  | 8   | 44.12  | 13.6  |
| SMBJ8.5A          | SMBJ8.5CA                | 9.44  | 10.4    | 1                                  | 10  | 8.5   | 41.67  | 14.4  |
| SMBJ9.0A          | SMBJ9.0CA                | 10  | 11.1    | 1                                  | 5   | 9   | 38.96  | 15.4  |
| SMBJ10A           | SMBJ10CA                 | 11.1  | 12.3    | 1                                  | 5   | 10  | 35.29  | 17  |
| SMBJ11A           | SMBJ11CA                 | 12.2  | 13.5    | 1                                  | 5   | 11  | 32.97  | 18.2  |
| SMBJ12A           | SMBJ12CA                 | 13.3  | 14.7    | 1                                  | 5   | 12  | 30.15  | 19.9  |
| SMBJ13A           | SMBJ13CA                 | 14.4  | 15.9    | 1                                  | 1   | 13  | 27.91  | 21.5  |
| SMBJ14A           | SMBJ14CA                 | 15.6  | 17.2    | 1                                  | 1   | 14  | 25.86  | 23.2  |
| SMBJ15A           | SMBJ15CA                 | 16.7  | 18.5    | 1                                  | 1   | 15  | 24.59  | 24.4  |
| SMBJ16A           | SMBJ16CA                 | 17.8  | 19.7    | 1                                  | 1   | 16  | 23.08  | 26  |
| SMBJ17A           | SMBJ17CA                 | 18.9  | 20.9    | 1                                  | 1   | 17  | 21.74  | 27.6  |
| SMBJ18A           | SMBJ18CA                 | 20  | 22.1    | 1                                  | 1   | 18  | 20.55  | 29.2  |
| SMBJ19A           | SMBJ19CA                 | 21.1  | 23.3    | 1                                  | 1   | 19  | 19.49  | 30.8  |
| SMBJ20A           | SMBJ20CA                 | 22.2  | 24.5    | 1                                  | 1   | 20  | 18.52  | 32.4  |
| SMBJ22A           | SMBJ22CA                 | 24.4  | 26.9    | 1                                  | 1   | 22  | 16.9   | 35.5  |
| SMBJ24A           | SMBJ24CA                 | 26.7  | 29.5    | 1                                  | 1   | 24  | 15.42  | 38.9  |
| SMBJ26A           | SMBJ26CA                 | 28.9  | 31.9    | 1                                  | 1   | 26  | 14.25  | 42.1  |
| SMBJ28A           | SMBJ28CA                 | 31.1  | 34.4    | 1                                  | 1   | 28  | 13.22  | 45.4  |
| SMBJ30A           | SMBJ30CA                 | 33.3  | 36.8    | 1                                  | 1   | 30  | 12.4   | 48.4  |
| SMBJ33A           | SMBJ33CA                 | 36.7  | 40.6    | 1                                  | 1   | 33  | 11.26  | 53.3  |



# SMBJ SERIES

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

| Part Number (Uni) | Part Number (Bi) | Breakdown Voltage V <sub>BR</sub> @I <sub>T</sub> |         |                                    | Maximum Reverse Leakage I <sub>R</sub> <sup>(6)</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>(4)</sup> (mA) |   |   |  |   |
| SMBJ36A           | SMBJ36CA         | 40  | 44.2    | 1                                  | 1   | 36  | 10.33  | 58.1  |
| SMBJ40A           | SMBJ40CA         | 44.4  | 49.1    | 1                                  | 1   | 40  | 9.3  | 64.5  |
| SMBJ43A           | SMBJ43CA         | 47.8  | 52.8    | 1                                  | 1   | 43  | 8.65   | 69.4  |
| SMBJ45A           | SMBJ45CA         | 50  | 55.3    | 1                                  | 1   | 45  | 8.25   | 72.7  |
| SMBJ48A           | SMBJ48CA         | 53.3  | 58.9    | 1                                  | 1   | 48  | 7.75   | 77.4  |
| SMBJ51A           | SMBJ51CA         | 56.7  | 62.7    | 1                                  | 1   | 51  | 7.28   | 82.4  |
| SMBJ54A           | SMBJ54CA         | 60  | 66.3    | 1                                  | 1   | 54  | 6.89   | 87.1  |
| SMBJ58A           | SMBJ58CA         | 64.4  | 71.2    | 1                                  | 1   | 58  | 6.41   | 93.6  |
| SMBJ60A           | SMBJ60CA         | 66.7  | 73.7    | 1                                  | 1   | 60  | 6.2  | 96.8  |
| SMBJ64A           | SMBJ64CA         | 71.1  | 78.6    | 1                                  | 1   | 64  | 5.83   | 103   |
| SMBJ70A           | SMBJ70CA         | 77.8  | 86      | 1                                  | 1   | 70  | 5.31   | 113   |
| SMBJ75A           | SMBJ75CA         | 83.3  | 92.1    | 1                                  | 1   | 75  | 4.96   | 121   |
| SMBJ78A           | SMBJ78CA         | 86.7  | 95.8    | 1                                  | 1   | 78  | 4.76   | 126   |
| SMBJ80A           | SMBJ80CA         | 88.8  | 97.6    | 1                                  | 1   | 80  | 4.63   | 129.6   |
| SMBJ85A           | SMBJ85CA         | 94.4  | 104     | 1                                  | 1   | 85  | 4.38   | 137   |
| SMBJ90A           | SMBJ90CA         | 100   | 111     | 1                                  | 1   | 90  | 4.11   | 146   |
| SMBJ100A          | SMBJ100CA        | 111   | 123     | 1                                  | 1   | 100   | 3.7  | 162   |
| SMBJ110A          | SMBJ110CA        | 122   | 135     | 1                                  | 1   | 110   | 3.39   | 177   |
| SMBJ120A          | SMBJ120CA        | 133   | 147     | 1                                  | 1   | 120   | 3.11   | 193   |
| SMBJ130A          | SMBJ130CA        | 144   | 159     | 1                                  | 1   | 130   | 2.87   | 209   |
| SMBJ140A          | SMBJ140CA        | 155   | 171     | 1                                  | 1   | 140   | 2.65   | 226.8   |
| SMBJ150A          | SMBJ150CA        | 167   | 185     | 1                                  | 1   | 150   | 2.47   | 243   |
| SMBJ160A          | SMBJ160CA        | 178   | 197     | 1                                  | 1   | 160   | 2.32   | 259   |
| SMBJ170A          | SMBJ170CA        | 189   | 209     | 1                                  | 1   | 170   | 2.18   | 275   |
| SMBJ180A          | SMBJ180CA        | 200   | 220     | 1                                  | 1   | 180   | 2.06   | 291.6   |
| SMBJ190A          | SMBJ190CA        | 211   | 232     | 1                                  | 1   | 190   | 1.95   | 307.8   |
| SMBJ200A          | SMBJ200CA        | 224   | 247     | 1                                  | 1   | 200   | 1.85   | 324   |
| SMBJ220A          | SMBJ220CA        | 246   | 272     | 1                                  | 1   | 220   | 1.69   | 356   |
| SMBJ250A          | SMBJ250CA        | 279   | 309     | 1                                  | 1   | 250   | 1.48   | 405   |
| SMBJ300A          | SMBJ300CA        | 335   | 371     | 1                                  | 1   | 300   | 1.23   | 486   |
| SMBJ350A          | SMBJ350CA        | 391   | 432     | 1                                  | 1   | 350   | 1.06   | 567   |
| SMBJ400A          | SMBJ400CA        | 447   | 494     | 1                                  | 1   | 400   | 0.93   | 648   |
| SMBJ440A          | SMBJ440CA        | 492   | 543     | 1                                  | 1   | 440   | 0.84   | 713   |

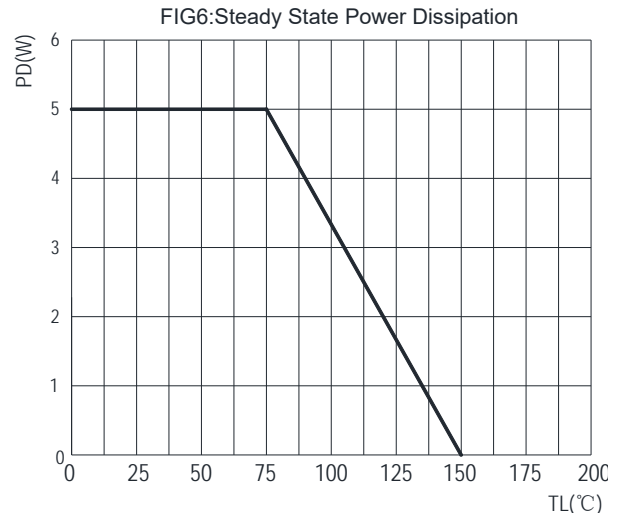
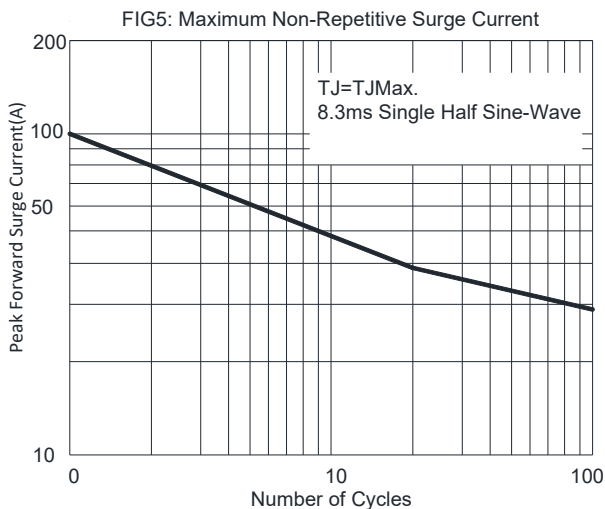
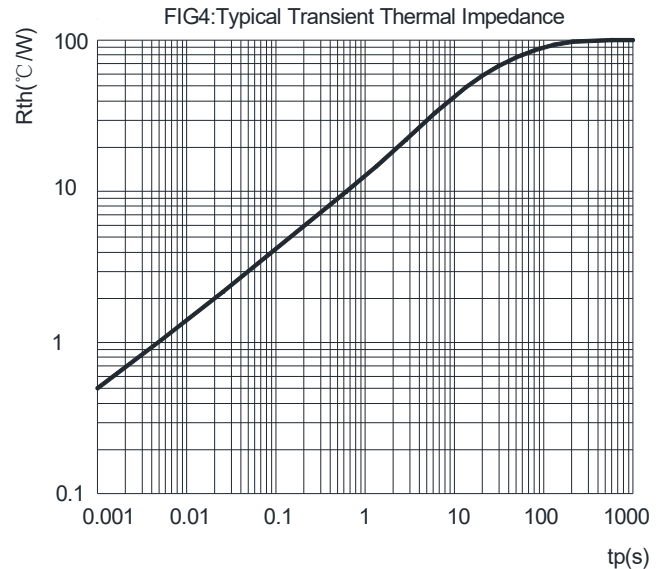
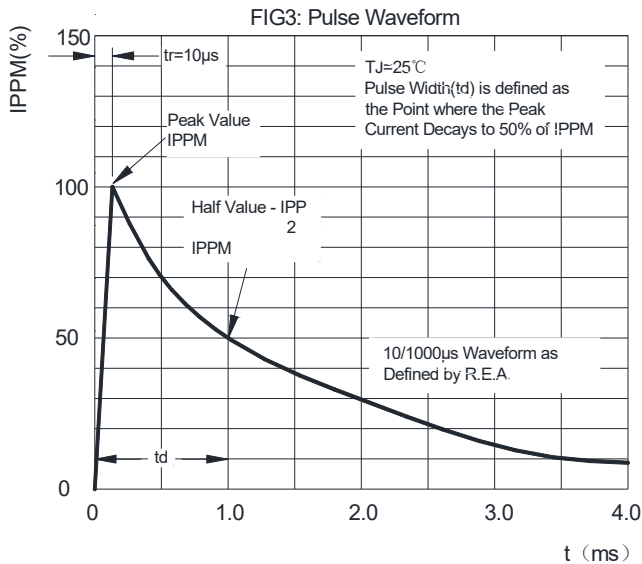
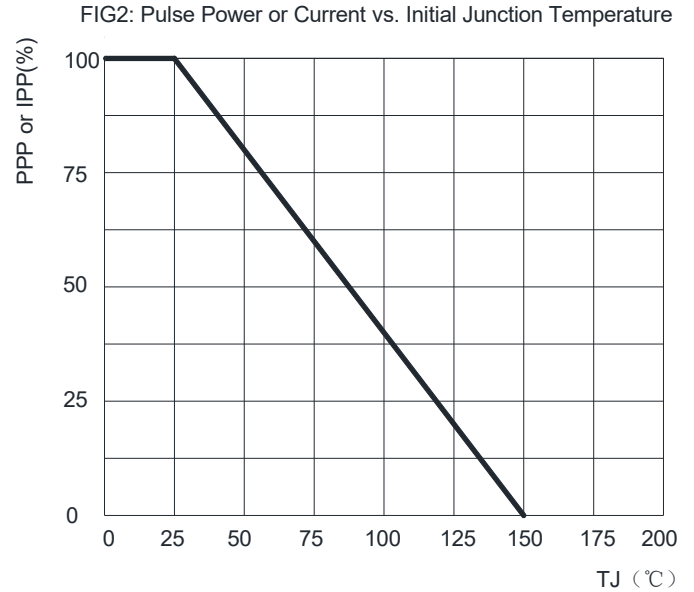
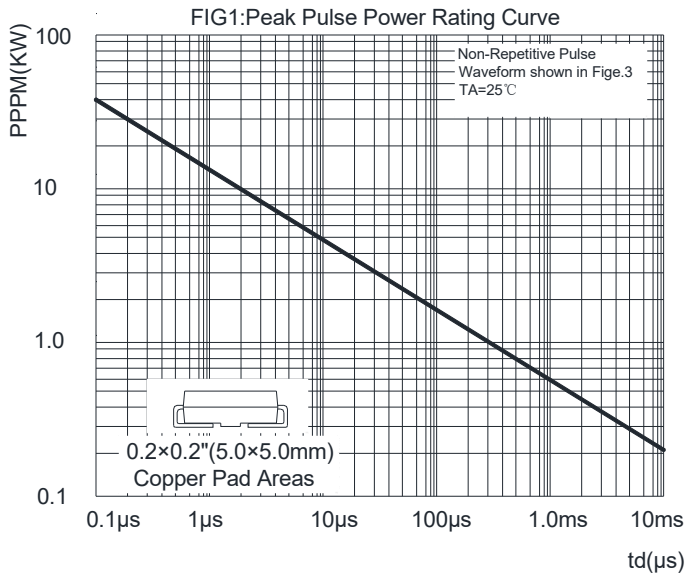
Notes:

- (4) Pulse test: t<sub>p</sub>≤50ms.
- (5) Surge current waveform per Fig. 3 and derated per Fig.2.
- (6) For bi-directional types having V<sub>RWM</sub> of 10 V and less, the I<sub>R</sub> limit is doubled.
- (7) For the bi-directional SMBJ5.0CA, the maximum V<sub>BR</sub> is 7.25 V.



# SMBJ SERIES

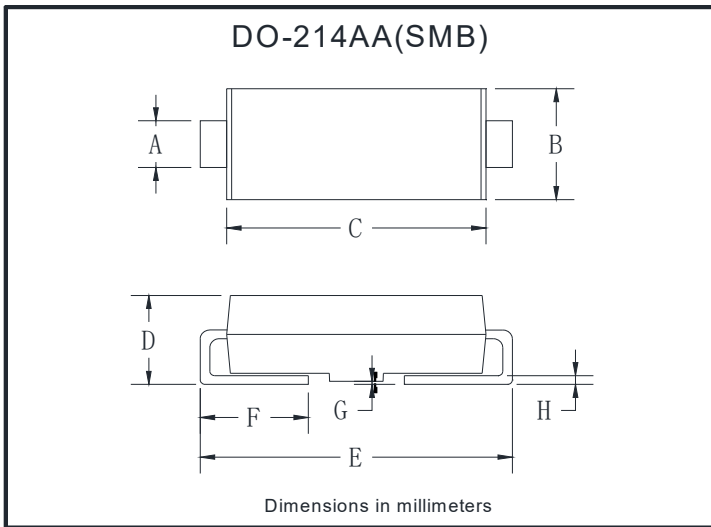
## ■ Characteristics (Typical)





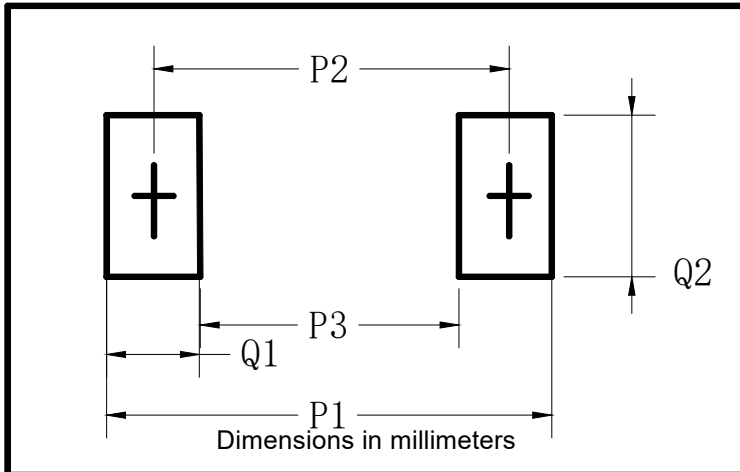
# SMBJ SERIES

## ■ 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 |

## ■ Suggested pad layout



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



## SMBJ SERIES

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