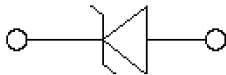
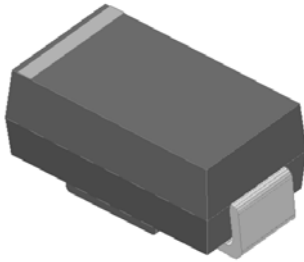
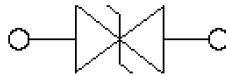
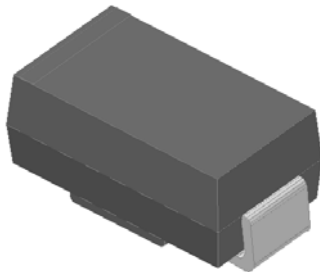


## Surface Mount Transient Voltage Suppressor Diodes

### 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-214AC (SMA)  
Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **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) (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                | 3.0            |
| Peak forward surge current, 8.3 ms single half sine-wave unidirectional only <sup>(2)</sup> | $I_{FSM}$      | A                | 60             |
| 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 @ 25A for unidirectional only | $V_F$  | V    | 3.5   |



# SMA6J 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    | 30    |
|                             | R <sub>θJA</sub> | °C/W | junction to ambient | 120   |

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

## ■ 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@VRWM</sub> (μA) | Working Peak Reverse Voltage V <sub>RWM</sub> (V) | Maximum Reverse Surge Current I <sub>PP</sub> <sup>(4)</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) |  |   |  |   |
| SMA6J5.0A         | /                | 6.40                                 | 7.07    | 10                                 | 800  | 5.0   | 65.22  | 9.2   |
| SMA6J6.0A         | /                | 6.67                                 | 7.37    | 10                                 | 800  | 6.0   | 58.25  | 10.3  |
| SMA6J6.5A         | /                | 7.22                                 | 7.98    | 10                                 | 500  | 6.5   | 53.57  | 11.2  |
| SMA6J7.0A         | /                | 7.78                                 | 8.60    | 10                                 | 200  | 7.0   | 50.00  | 12.0  |
| SMA6J7.5A         | /                | 8.33                                 | 9.21    | 1                                  | 100  | 7.5   | 46.51  | 12.9  |
| SMA6J8.0A         | /                | 8.89                                 | 9.83    | 1                                  | 50   | 8.0   | 44.12  | 13.6  |
| SMA6J8.5A         | /                | 9.44                                 | 10.40   | 1                                  | 10   | 8.5   | 41.67  | 14.4  |
| SMA6J9.0A         | /                | 10.00                                | 11.10   | 1                                  | 5  | 9.0   | 38.96  | 15.4  |
| SMA6J10A          | /                | 11.10                                | 12.30   | 1                                  | 5  | 10.0  | 35.29  | 17.0  |
| SMA6J11A          | SMA6J11CA        | 12.20                                | 13.50   | 1                                  | 5  | 11.0  | 32.97  | 18.2  |
| SMA6J12A          | SMA6J12CA        | 13.30                                | 14.70   | 1                                  | 5  | 12.0  | 30.15  | 19.9  |
| SMA6J13A          | SMA6J13CA        | 14.40                                | 15.90   | 1                                  | 1  | 13.0  | 27.91  | 21.5  |
| SMA6J14A          | SMA6J14CA        | 15.60                                | 17.20   | 1                                  | 1  | 14.0  | 25.86  | 23.2  |
| SMA6J15A          | SMA6J15CA        | 16.70                                | 18.50   | 1                                  | 1  | 15.0  | 24.59  | 24.4  |
| SMA6J16A          | SMA6J16CA        | 17.80                                | 19.70   | 1                                  | 1  | 16.0  | 23.08  | 26.0  |
| SMA6J17A          | SMA6J17CA        | 18.90                                | 20.90   | 1                                  | 1  | 17.0  | 21.74  | 27.6  |
| SMA6J18A          | SMA6J18CA        | 20.00                                | 22.10   | 1                                  | 1  | 18.0  | 20.55  | 29.2  |
| SMA6J19A          | SMA6J19CA        | 21.10                                | 23.30   | 1                                  | 1  | 19.0  | 19.49  | 30.8  |
| SMA6J20A          | SMA6J20CA        | 22.20                                | 24.50   | 1                                  | 1  | 20.0  | 18.52  | 32.4  |
| SMA6J22A          | SMA6J22CA        | 24.40                                | 26.90   | 1                                  | 1  | 22.0  | 16.90  | 35.5  |
| SMA6J24A          | SMA6J24CA        | 26.70                                | 29.50   | 1                                  | 1  | 24.0  | 15.42  | 38.9  |
| SMA6J26A          | SMA6J26CA        | 28.90                                | 31.90   | 1                                  | 1  | 26.0  | 14.25  | 42.1  |



# SMA6J 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>(6)</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) |   |   |  |   |
| SMA6J28A          | SMA6J28CA        | 31.10   | 34.40   | 1                                  | 1   | 28.0  | 13.22  | 45.4  |
| SMA6J30A          | SMA6J30CA        | 33.30   | 36.80   | 1                                  | 1   | 30.0  | 12.40  | 48.4  |
| SMA6J33A          | SMA6J33CA        | 36.70   | 40.60   | 1                                  | 1   | 33.0  | 11.26  | 53.3  |
| SMA6J36A          | SMA6J36CA        | 40.00   | 44.20   | 1                                  | 1   | 36.0  | 10.33  | 58.1  |
| SMA6J40A          | SMA6J40CA        | 44.40   | 49.10   | 1                                  | 1   | 40.0  | 9.30   | 64.5  |
| SMA6J43A          | SMA6J43CA        | 47.80   | 52.80   | 1                                  | 1   | 43.0  | 8.65   | 69.4  |
| SMA6J45A          | SMA6J45CA        | 50.00   | 55.30   | 1                                  | 1   | 45.0  | 8.25   | 72.7  |
| SMA6J48A          | SMA6J48CA        | 53.30   | 58.90   | 1                                  | 1   | 48.0  | 7.75   | 77.4  |
| SMA6J51A          | SMA6J51CA        | 56.70   | 62.70   | 1                                  | 1   | 51.0  | 7.28   | 82.4  |
| SMA6J54A          | SMA6J54CA        | 60.00   | 66.30   | 1                                  | 1   | 54.0  | 6.89   | 87.1  |
| SMA6J58A          | SMA6J58CA        | 64.40   | 71.20   | 1                                  | 1   | 58.0  | 6.41   | 93.6  |
| SMA6J60A          | SMA6J60CA        | 66.70   | 73.70   | 1                                  | 1   | 60.0  | 6.20   | 96.8  |
| SMA6J64A          | SMA6J64CA        | 71.10   | 78.60   | 1                                  | 1   | 64.0  | 5.83   | 103.0   |
| SMA6J70A          | SMA6J70CA        | 77.80   | 86.00   | 1                                  | 1   | 70.0  | 5.31   | 113.0   |
| SMA6J75A          | SMA6J75CA        | 83.30   | 92.10   | 1                                  | 1   | 75.0  | 4.96   | 121.0   |
| SMA6J78A          | SMA6J78CA        | 86.70   | 95.80   | 1                                  | 1   | 78.0  | 4.76   | 126.0   |
| SMA6J80A          | SMA6J80CA        | 88.80   | 97.60   | 1                                  | 1   | 80.0  | 4.63   | 129.6   |
| SMA6J85A          | SMA6J85CA        | 94.40   | 104.00  | 1                                  | 1   | 85.0  | 4.38   | 137.0   |
| SMA6J90A          | /                | 100.00  | 111.00  | 1                                  | 1   | 90.0  | 4.11   | 146.0   |
| SMA6J100A         | /                | 111.00  | 123.00  | 1                                  | 1   | 100.0   | 3.70   | 162.0   |
| SMA6J110A         | /                | 122.00  | 135.00  | 1                                  | 1   | 110.0   | 3.39   | 177.0   |
| SMA6J120A         | /                | 133.00  | 147.00  | 1                                  | 1   | 120.0   | 3.11   | 193.0   |
| SMA6J130A         | /                | 144.00  | 159.00  | 1                                  | 1   | 130.0   | 2.87   | 209.0   |

Notes:

(3) Pulse test: t<sub>p</sub>≤50ms.

(4) Surge current waveform per Fig. 3 and derated per Fig.2.

## ■ Characteristics (Typical)

FIG1: Peak Pulse Power Rating Curve

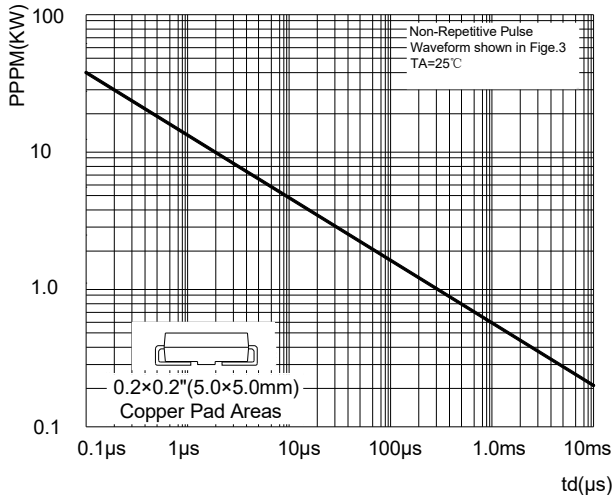
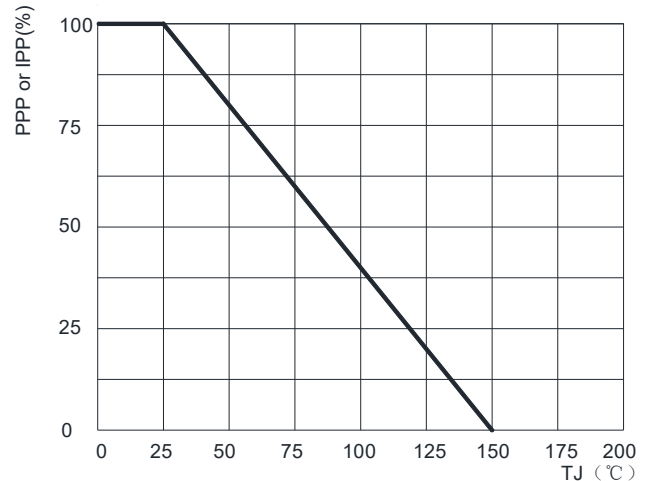


FIG2: Pulse Power or Current vs. Initial Junction Temperature





# SMA6J SERIES

## ■ Characteristics (Typical)

FIG3: Pulse Waveform

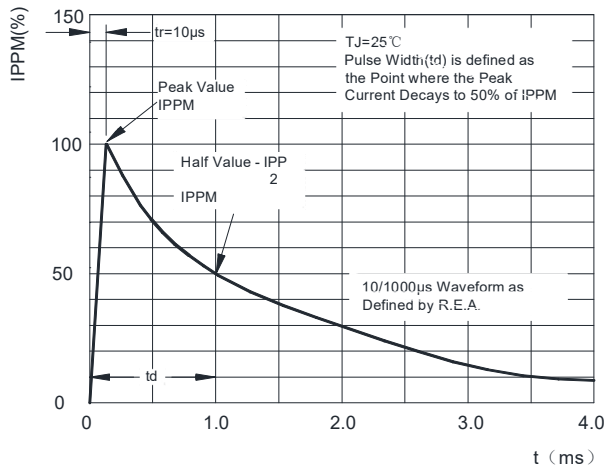


FIG4: Typical Transient Thermal Impedance

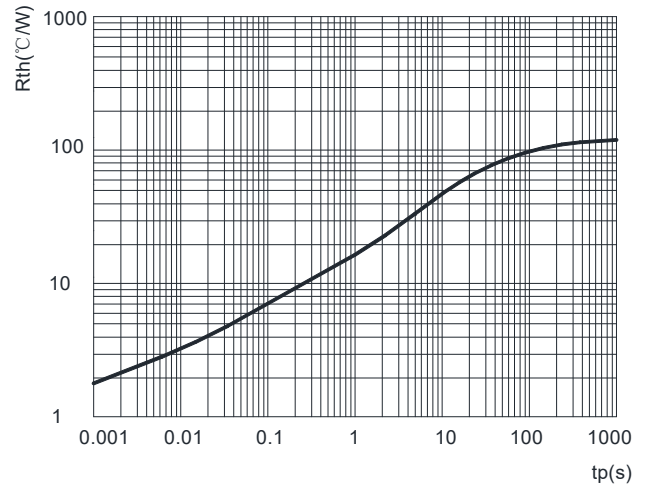


FIG5: Maximum Non-Repetitive Surge Current

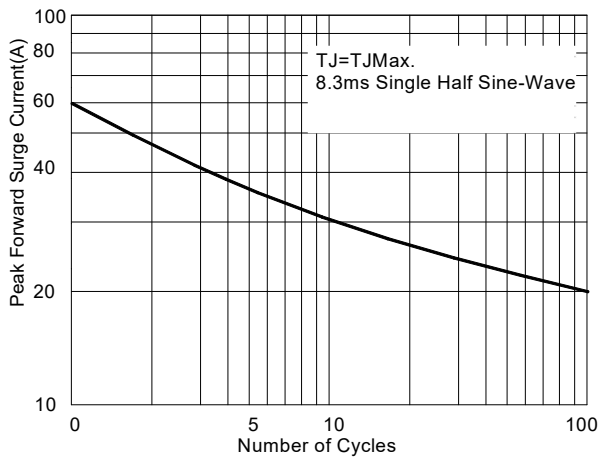
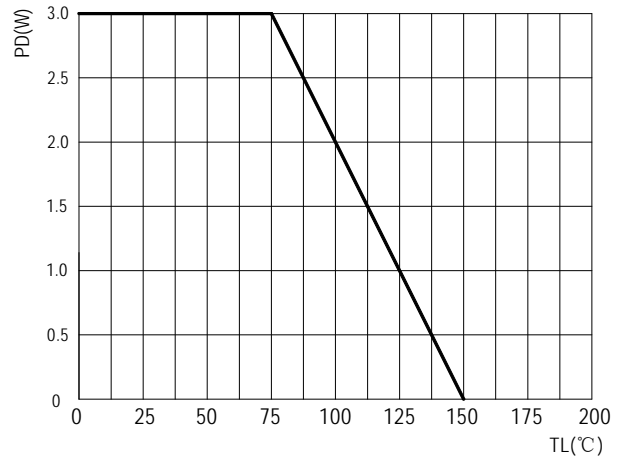


FIG6: Steady State Power Dissipation



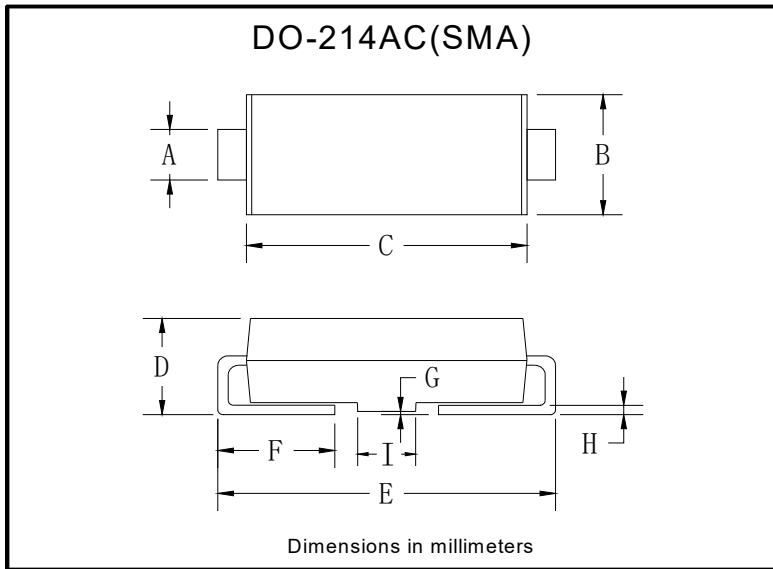
## ■ Ordering Information (Example)

| PREFERRED P/N | PACKAGE CODE | UNIT WEIGHT(g)    | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|--------------|-------------------|----------------------|-------------------------|----------------------------|---------------|
| SMA6J SERIES  | F1           | Approximate 0.059 | 5000                 | /                       | 80000                      | 13" reel      |
| SMA6J SERIES  | F2           | Approximate 0.059 | 7500                 | /                       | 120000                     | 13" reel      |
| SMA6J SERIES  | F3           | Approximate 0.059 | 7500                 | /                       | 60000                      | 13" reel      |
| SMA6J SERIES  | F4           | Approximate 0.059 | 1800                 | 7200                    | 57600                      | 7" reel       |
| SMA6J SERIES  | F5           | Approximate 0.059 | 2000                 | 8000                    | 64000                      | 7" reel       |
| SMA6J SERIES  | F6           | Approximate 0.059 | 5000                 | /                       | 100000                     | 13" reel      |



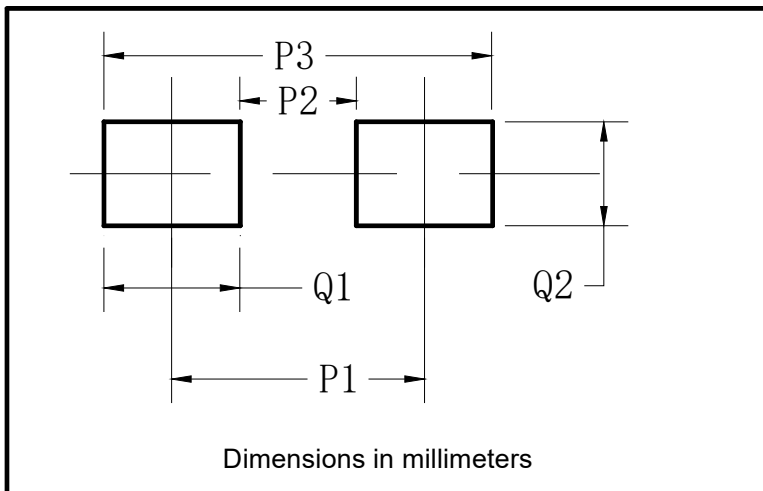
# SMA6J SERIES

## ■ Outline Dimensions



| DO-214AC(SMA) |      |      |
|---------------|------|------|
| Dim           | Min  | Max  |
| A             | 1.25 | 1.58 |
| B             | 2.40 | 2.83 |
| C             | 4.00 | 4.75 |
| D             | 1.90 | 2.30 |
| E             | 4.93 | 5.28 |
| F             | 0.76 | 1.41 |
| G             | 0.05 | 0.20 |
| H             | 0.15 | 0.31 |
| I             | 1.70 | 2.10 |

## ■ Suggested Pad Layout



| DO-214AC(SMA) |             |
|---------------|-------------|
| Dim           | Millimeters |
| P1            | 4.00        |
| P2            | 1.50        |
| P3            | 6.50        |
| Q1            | 2.50        |
| Q2            | 1.70        |



## SMA6J SERIES

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