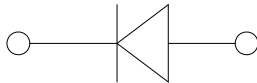
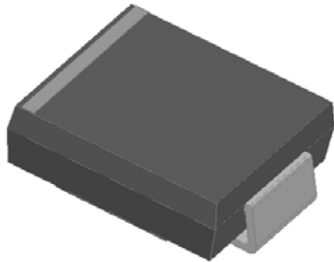


## Surface Mount Transient Voltage Suppressor Diodes

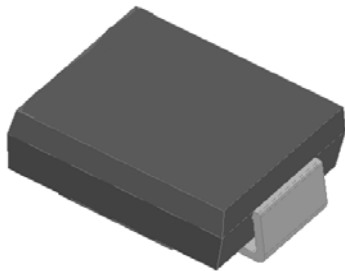
### Uni-directional



### Features

- Low profile package
- Ideal for automated placement
- Available in Uni-directional and Bi-directional
- 3000W peak pulse power capability with a 10/1000  $\mu$ s waveform
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- 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

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, automotive,telecommunication.

### Mechanical Data

- **Package:** DO-214AB (SMC)  
Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- **Terminals:** Matte 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)</sup> <sup>(2)</sup> (Fig.1)     | $P_{PPM}$ | W                | 3000           |
| Peak pulse current, with a 10/1000us waveform <sup>(1)</sup>                                | $I_{PPM}$ | A                | See Next Table |
| Power dissipation, on infinite heat sink at $T_L=75^\circ\text{C}$ <sup>(2)</sup>           | $P_D$     | W                | 6.5            |
| Peak forward surge current, 8.3 ms single half sine-wave unidirectional only <sup>(3)</sup> | $I_{FSM}$ | A                | 300            |
| 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 @at 100A for unidirectional only | $V_F$  | V    | 3.5   |



# SMDJ5.0AQ THRU SMDJ85CAQ

## ■ Thermal Characteristics (Ta=25°C Unless otherwise specified)

| PARAMETER                   | SYMBOL           | UNIT | Conditions          | VALUE |
|-----------------------------|------------------|------|---------------------|-------|
| Thermal Resistance(Typical) | R <sub>θJA</sub> | °C/W | junction to ambient | 75    |
|                             | R <sub>θJL</sub> | °C/W | junction to lead    | 15    |

Notes:

- (1) Non-repetitive current pulse, per Fig.3 and derated above T<sub>J</sub>= 25°C per Fig.2.
- (2) Mounted on 0.31 x 0.31" (8.0 x 8.0 mm) copper pads to each terminal.
- (3) Measured on 8.3ms single half sine-wave or equivalent square wave,duty cycle=4 pulses per minute maximum.

## ■ Ordering Information (Example)

| PREFERRED P/N | PACKAGE CODE | UNIT WEIGHT(g)    | MINIMUM PACKAGE(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|--------------|-------------------|----------------------|----------------------------|---------------|
| SMDJ SERIES   | F1           | Approximate 0.257 | 3000                 | 42000                      | 13" reel      |

## ■ Electrical Characteristics (Ta=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>(5)</sup><br>@ 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) |  |   |  |   |
| SMDJ5.0AQ         | SMDJ5.0CA <sup>(7)</sup> | 6.4   | 7.07    | 10                                 | 1000   | 5   | 326.09   | 9.2   |
| SMDJ6.0AQ         | SMDJ6.0CAQ               | 6.67  | 7.37    | 10                                 | 1000   | 6   | 291.26   | 10.3  |
| SMDJ6.5AQ         | SMDJ6.5CAQ               | 7.22  | 7.98    | 10                                 | 500  | 6.5   | 267.86   | 11.2  |
| SMDJ7.0AQ         | SMDJ7.0CAQ               | 7.78  | 8.6     | 10                                 | 200  | 7   | 250  | 12  |
| SMDJ7.5AQ         | SMDJ7.5CAQ               | 8.33  | 9.21    | 1                                  | 100  | 7.5   | 232.56   | 12.9  |
| SMDJ8.0AQ         | SMDJ8.0CAQ               | 8.89  | 9.83    | 1                                  | 50   | 8   | 220.59   | 13.6  |
| SMDJ8.5AQ         | SMDJ8.5CAQ               | 9.44  | 10.4    | 1                                  | 25   | 8.5   | 208.33   | 14.4  |
| SMDJ9.0AQ         | SMDJ9.0CAQ               | 10  | 11.1    | 1                                  | 10   | 9   | 194.81   | 15.4  |
| SMDJ10AQ          | SMDJ10CAQ                | 11.1  | 12.3    | 1                                  | 5  | 10  | 176.47   | 17  |
| SMDJ11AQ          | SMDJ11CAQ                | 12.20   | 13.50   | 1                                  | 5  | 11.0  | 164.84   | 18.2  |
| SMDJ12AQ          | SMDJ12CAQ                | 13.30   | 14.70   | 1                                  | 2  | 12.0  | 150.75   | 19.9  |
| SMDJ13AQ          | SMDJ13CAQ                | 14.40   | 15.90   | 1                                  | 2  | 13.0  | 139.53   | 21.5  |
| SMDJ14AQ          | SMDJ14CAQ                | 15.60   | 17.20   | 1                                  | 1  | 14.0  | 129.31   | 23.2  |
| SMDJ15AQ          | SMDJ15CAQ                | 16.70   | 18.50   | 1                                  | 1  | 15.0  | 122.95   | 24.4  |
| SMDJ16AQ          | SMDJ16CAQ                | 17.80   | 19.70   | 1                                  | 1  | 16.0  | 115.38   | 26.0  |
| SMDJ17AQ          | SMDJ17CAQ                | 18.90   | 20.90   | 1                                  | 1  | 17.0  | 108.70   | 27.6  |
| SMDJ18AQ          | SMDJ18CAQ                | 20.00   | 22.10   | 1                                  | 1  | 18.0  | 102.74   | 29.2  |
| SMDJ19AQ          | SMDJ19CAQ                | 21.10   | 23.30   | 1                                  | 1  | 19.0  | 97.47  | 30.8  |
| SMDJ20AQ          | SMDJ20CAQ                | 22.20   | 24.50   | 1                                  | 1  | 20.0  | 92.59  | 32.4  |
| SMDJ22AQ          | SMDJ22CAQ                | 24.40   | 26.90   | 1                                  | 1  | 22.0  | 84.51  | 35.5  |
| SMDJ24AQ          | SMDJ24CAQ                | 26.70   | 29.50   | 1                                  | 1  | 24.0  | 77.12  | 38.9  |
| SMDJ26AQ          | SMDJ26CAQ                | 28.90   | 31.90   | 1                                  | 1  | 26.0  | 71.26  | 42.1  |
| SMDJ28AQ          | SMDJ28CAQ                | 31.10   | 34.40   | 1                                  | 1  | 28.0  | 66.08  | 45.4  |
| SMDJ30AQ          | SMDJ30CAQ                | 33.30   | 36.80   | 1                                  | 1  | 30.0  | 61.98  | 48.4  |
| SMDJ33AQ          | SMDJ33CAQ                | 36.70   | 40.60   | 1                                  | 1  | 33.0  | 56.29  | 53.3  |
| SMDJ36AQ          | SMDJ36CAQ                | 40.00   | 44.20   | 1                                  | 1  | 36.0  | 51.64  | 58.1  |
| SMDJ40AQ          | SMDJ40CAQ                | 44.40   | 49.10   | 1                                  | 1  | 40.0  | 46.51  | 64.5  |
| SMDJ43AQ          | SMDJ43CAQ                | 47.80   | 52.80   | 1                                  | 1  | 43.0  | 43.23  | 69.4  |
| SMDJ45AQ          | SMDJ45CAQ                | 50.00   | 55.30   | 1                                  | 1  | 45.0  | 41.27  | 72.7  |
| SMDJ48AQ          | SMDJ48CAQ                | 53.30   | 58.90   | 1                                  | 1  | 48.0  | 38.76  | 77.4  |
| SMDJ51AQ          | SMDJ51CAQ                | 56.7  | 62.7    | 1                                  | 1  | 51  | 36.41  | 82.4  |
| SMDJ54AQ          | SMDJ54CAQ                | 60  | 66.3    | 1                                  | 1  | 54  | 34.44  | 87.1  |
| SMDJ58AQ          | SMDJ58CAQ                | 64.4  | 71.2    | 1                                  | 1  | 58  | 32.05  | 93.6  |
| SMDJ60AQ          | SMDJ60CAQ                | 66.7  | 73.7    | 1                                  | 1  | 60  | 30.99  | 96.8  |
| SMDJ64AQ          | SMDJ64CAQ                | 71.1  | 78.6    | 1                                  | 1  | 64  | 29.13  | 103   |
| SMDJ70AQ          | SMDJ70CAQ                | 77.8  | 86      | 1                                  | 1  | 70  | 26.55  | 113   |
| SMDJ75AQ          | SMDJ75CAQ                | 83.3  | 92.1    | 1                                  | 1  | 75  | 24.79  | 121   |
| SMDJ78AQ          | SMDJ78CAQ                | 86.7  | 95.8    | 1                                  | 1  | 78  | 23.81  | 126   |
| SMDJ80AQ          | SMDJ80CAQ                | 88.8  | 97.6    | 1                                  | 1  | 80  | 23.15  | 129.6   |
| SMDJ85AQ          | SMDJ85CAQ                | 94.4  | 104     | 1                                  | 1  | 85  | 21.9   | 137   |

Notes:

- (4) Pulse Test: t<sub>p</sub>≤50ms
- (5) For bi-directional types having V<sub>RWM</sub> of 10 V and less, the I<sub>R</sub> limit is doubled.
- (6) Surge current waveform per Fig.3 and derated per Fig.2.
- (7) For the bi-directional SMDJ5.0CA, the maximum V<sub>BR</sub> is 7.25 V.



# SMDJ5.0AQ THRU SMDJ85CAQ

## ■ Characteristics(Typical)

Fig.1 Peak Pulse Power Rating Curve

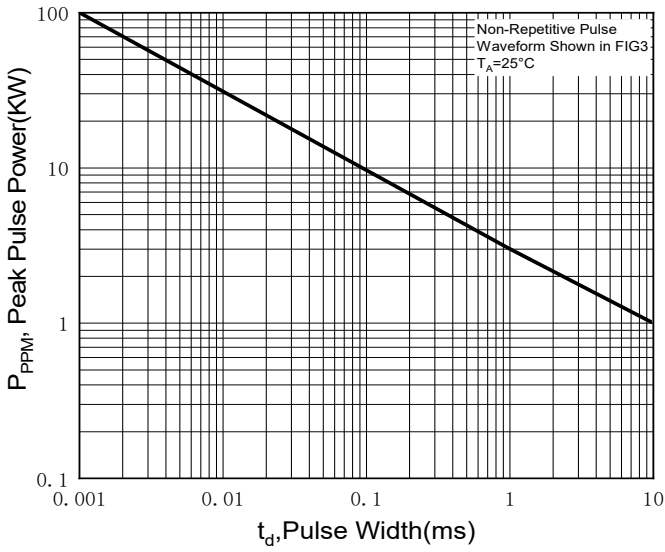


Fig.2 Pulse Power or Current vs. Initial Junction Temperature

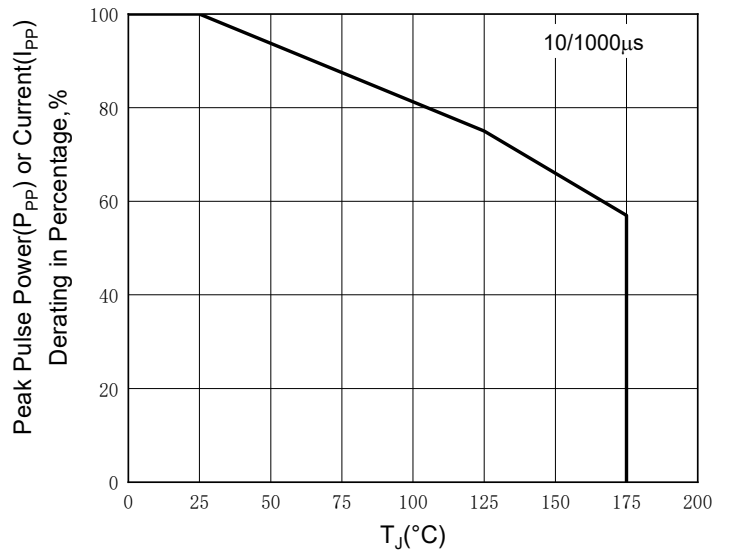


Fig.3 Pulse Waveform

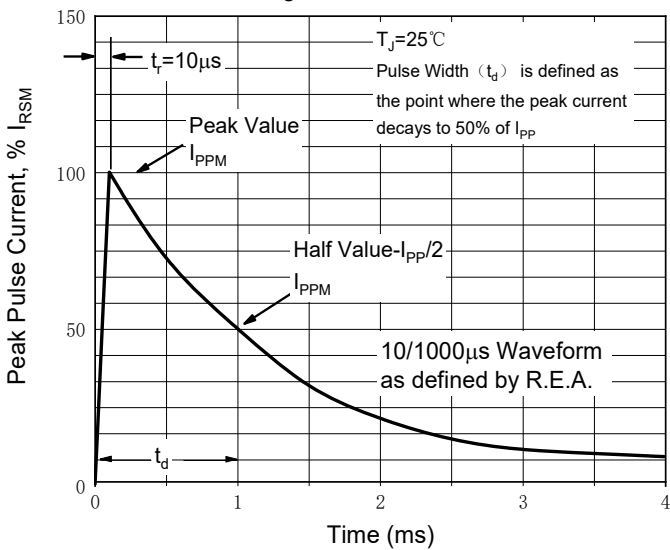


Fig.4 Typical Transient Thermal Impedance

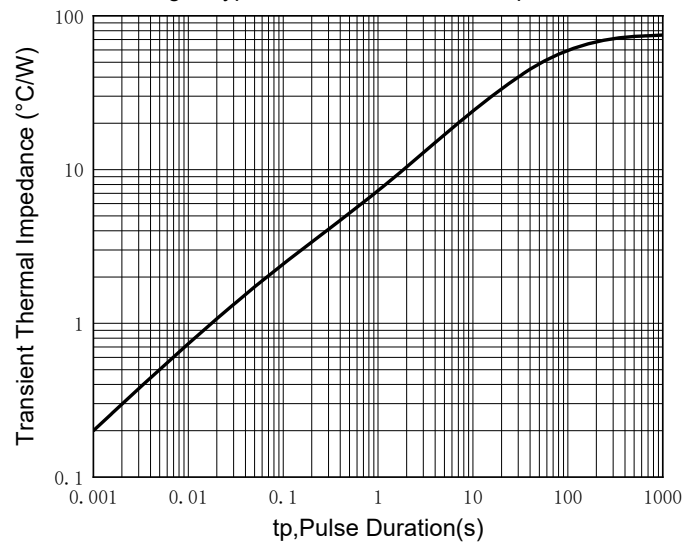


Fig.5 Maximum Non-Repetitive Forward Surge Current

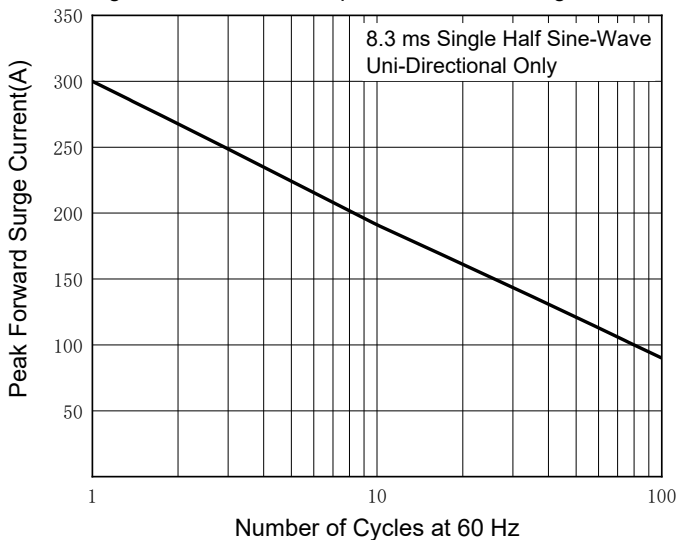
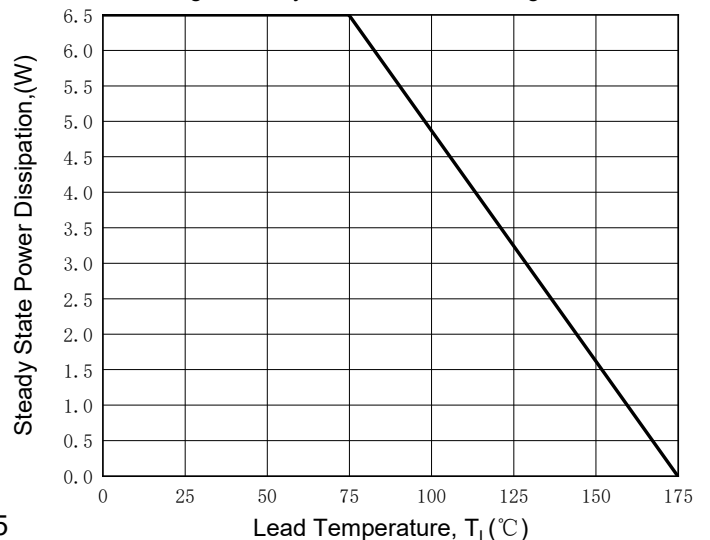


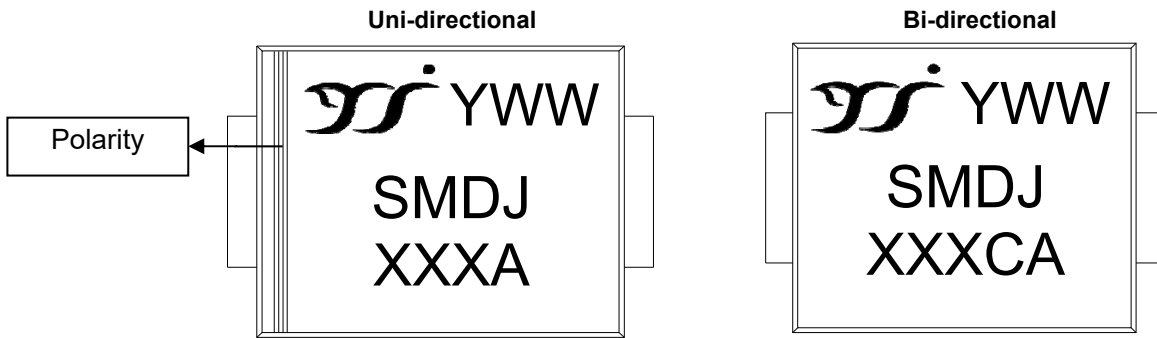
Fig.6 Steady State Power Derating Curve





# SMDJ5.0AQ THRU SMDJ85CAQ

## ■ Marking Information

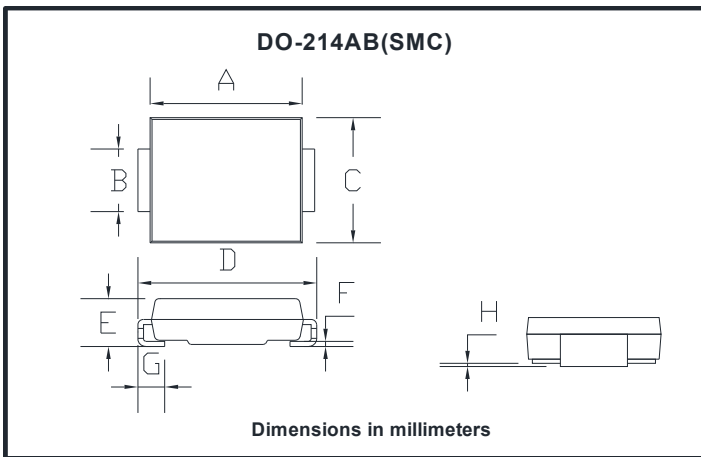


Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. XXX is marking code, like 48A/48C marking code is 48
4. Body color: Black
5. YWW is date code, "Y" is year. "WW" is week.

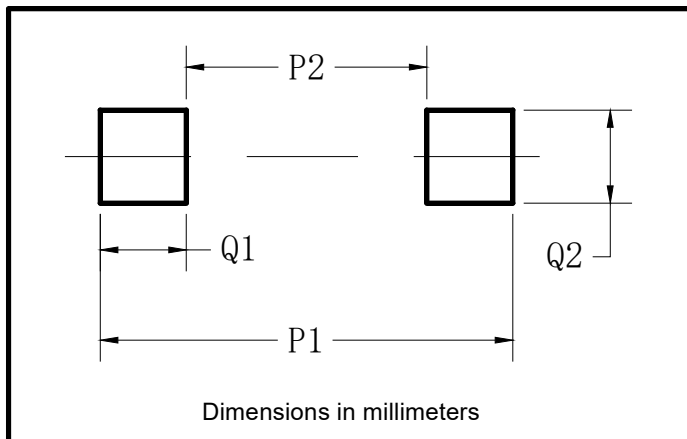
For instance:  
 The 17<sup>th</sup> week of 2021, date code is 117  
 The 17<sup>th</sup> week of 2022, date code is 217

## ■ Outline Dimensions



| DO-214AB (SMC) |      |      |
|----------------|------|------|
| Dim            | Min  | Max  |
| A              | 6.60 | 7.11 |
| B              | 2.85 | 3.27 |
| C              | 5.59 | 6.22 |
| D              | 7.75 | 8.13 |
| E              | 1.99 | 2.61 |
| F              | 0.15 | 0.31 |
| G              | 0.76 | 1.52 |
| H              | 0.05 | 0.20 |

## ■ Suggested pad layout



| Dim | Typ  |
|-----|------|
| P1  | 9.9  |
| P2  | 3.84 |
| Q1  | 3.03 |
| Q2  | 3.82 |



## SMDJ5.0AQ THRU SMDJ85CAQ

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