

## Features

- Surface Mount SMC package
- Standoff Voltage: 12 to 58 volts
- Power Dissipation: 3000 watts
- RoHS compliant\*
- AEC-Q101 compliant\*\*

## Applications

- Protection of power buses
- Protection of I/O interfaces
- Overvoltage transient protection
- Automotive
  - Entertainment applications
  - Comfort applications
- Telecom, computer, industrial and consumer electronics applications

# SMLJ-Q Transient Voltage Suppressor Diode Series

## General Information

Bourns offers Transient Voltage Suppressor Diodes for surge and ESD protection applications, in compact chip package DO-214AB (SMC) size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 12 V up to 58 V. Typical fast response times are less than 1.0 picosecond from 0 V to Breakdown Voltage.

Bourns® Chip Diodes conform to JEDEC standards, are easy to handle with standard pick and place equipment and the flat configuration minimizes roll away.

## Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

| Parameter  | Symbol           | Value       | Unit  |
|--|------------------|-------------|-------|
| Minimum Peak Pulse Power Dissipation (T <sub>P</sub> = 1 ms) (Note 1,2)  | P <sub>PK</sub>  | 3000        | Watts |
| Peak Forward Surge Current<br>8.3 ms Single Half Sine Wave Superimposed on Rated Load<br>(JEDEC Method) (Note 3) | I <sub>FSM</sub> | 300         | Amps  |
| Operating Temperature Range  | T <sub>J</sub>   | -55 to +150 | °C    |
| Storage Temperature Range  | T <sub>STG</sub> | -55 to +150 | °C    |

1. Non-repetitive current pulse, per Pulse Waveform graph and derated above T<sub>A</sub> = 25 °C per Pulse Derating Curve.
2. Mounted on 5.0 mm<sup>2</sup> (0.03 mm thick) copper pads to each terminal.
3. 8.3 ms Single Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).

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\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

\*\*"Q" part number suffix indicates AEC-Q101 compliance.

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## Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

| Unidirectional Device |              | Bidirectional Device |              | Breakdown Voltage V <sub>BR</sub> (Volts) |      |                       | Working Peak Reverse Voltage | Maximum Reverse Leakage @ V <sub>RWM</sub> | Maximum Reverse Voltage @ I <sub>RSM</sub> | Maximum Reverse Surge Current |
|-----------------------|--------------|----------------------|--------------|---|------|-----------------------|------------------------------|--|--|-------------------------------|
| Part Number           | Part Marking | Part Number          | Part Marking | Min.                                      | Max. | @ I <sub>T</sub> (mA) | V <sub>RWM</sub> (Volts)     | I <sub>R</sub> (μA)                        | V <sub>RSM</sub> (Volts)                   | I <sub>RSM</sub> (Amps)       |
| SMLJ12A-Q             | HEEQ         | SMLJ12CA-Q           | IEEQ         | 13.3                                      | 14.7 | 1                     | 12                           | 2  | 19.9                                       | 150.60                        |
| SMLJ13A-Q             | HEGQ         | SMLJ13CA-Q           | IEGQ         | 14.4                                      | 15.9 | 1                     | 13                           | 2  | 21.5                                       | 139.40                        |
| SMLJ14A-Q             | HEKQ         | SMLJ14CA-Q           | IEKQ         | 15.6                                      | 17.2 | 1                     | 14                           | 2  | 23.2                                       | 129.40                        |
| SMLJ15A-Q             | HEMQ         | SMLJ15CA-Q           | IEMQ         | 16.7                                      | 18.5 | 1                     | 15                           | 2  | 24.4                                       | 123.00                        |
| SMLJ16A-Q             | HEPQ         | SMLJ16CA-Q           | IEPQ         | 17.8                                      | 19.7 | 1                     | 16                           | 2  | 26.0                                       | 115.40                        |
| SMLJ17A-Q             | HERQ         | SMLJ17CA-Q           | IERQ         | 18.9                                      | 20.9 | 1                     | 17                           | 2  | 27.6                                       | 106.60                        |
| SMLJ18A-Q             | HETQ         | SMLJ18CA-Q           | IETQ         | 20.0                                      | 22.1 | 1                     | 18                           | 2  | 29.2                                       | 102.80                        |
| SMLJ20A-Q             | HEVQ         | SMLJ20CA-Q           | IEVQ         | 22.2                                      | 24.5 | 1                     | 20                           | 2  | 32.4                                       | 92.60                         |
| SMLJ22A-Q             | HEXQ         | SMLJ22CA-Q           | IEXQ         | 24.4                                      | 26.9 | 1                     | 22                           | 2  | 35.5                                       | 84.40                         |
| SMLJ24A-Q             | HEZQ         | SMLJ24CA-Q           | IEZQ         | 26.7                                      | 29.5 | 1                     | 24                           | 2  | 38.9                                       | 77.20                         |
| SMLJ26A-Q             | HFEQ         | SMLJ26CA-Q           | IFEQ         | 28.9                                      | 31.9 | 1                     | 26                           | 2  | 42.1                                       | 71.20                         |
| SMLJ28A-Q             | HFGQ         | SMLJ28CA-Q           | IFGQ         | 31.1                                      | 34.4 | 1                     | 28                           | 2  | 45.4                                       | 66.00                         |
| SMLJ30A-Q             | HFQK         | SMLJ30CA-Q           | IFKQ         | 33.3                                      | 36.8 | 1                     | 30                           | 2  | 48.4                                       | 62.00                         |
| SMLJ33A-Q             | HFMQ         | SMLJ33CA-Q           | IFMQ         | 36.7                                      | 40.6 | 1                     | 33                           | 2  | 53.3                                       | 56.20                         |
| SMLJ36A-Q             | HFPQ         | SMLJ36CA-Q           | IFPQ         | 40.0                                      | 44.2 | 1                     | 36                           | 2  | 58.1                                       | 51.60                         |
| SMLJ40A-Q             | HFRQ         | SMLJ40CA-Q           | IFRQ         | 44.4                                      | 49.1 | 1                     | 40                           | 2  | 64.5                                       | 46.40                         |
| SMLJ43A-Q             | HFTQ         | SMLJ43CA-Q           | IFTQ         | 47.8                                      | 52.8 | 1                     | 43                           | 2  | 69.4                                       | 43.20                         |
| SMLJ45A-Q             | HFVQ         | SMLJ45CA-Q           | IFVQ         | 50.0                                      | 55.3 | 1                     | 45                           | 2  | 72.7                                       | 41.20                         |
| SMLJ48A-Q             | HFXQ         | SMLJ48CA-Q           | IFXQ         | 53.3                                      | 58.9 | 1                     | 48                           | 2  | 77.4                                       | 38.80                         |
| SMLJ51A-Q             | HFZQ         | SMLJ51CA-Q           | IFZQ         | 56.7                                      | 62.7 | 1                     | 51                           | 2  | 82.4                                       | 36.40                         |
| SMLJ54A-Q             | HGEQ         | SMLJ54CA-Q           | IGEQ         | 60.0                                      | 66.3 | 1                     | 54                           | 2  | 87.1                                       | 34.40                         |
| SMLJ58A-Q             | HGGQ         | SMLJ58CA-Q           | IGGQ         | 64.4                                      | 71.2 | 1                     | 58                           | 2  | 93.6                                       | 32.00                         |

### Notes:

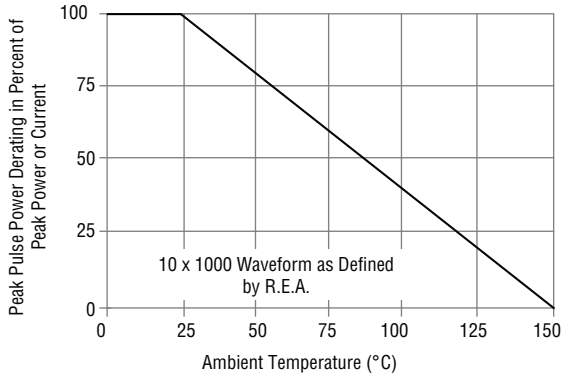
1. Suffix 'A' denotes a 5 % tolerance unidirectional device.
2. Suffix 'CA' denotes a 5 % tolerance bidirectional device.

# SMLJ-Q Transient Voltage Suppressor Diode Series

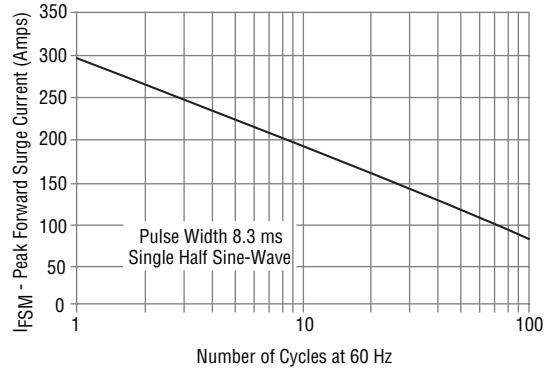
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## Performance Graphs

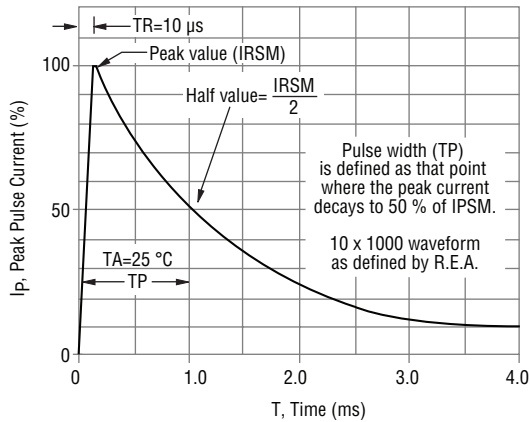
### Peak Pulse Power Derating Curve



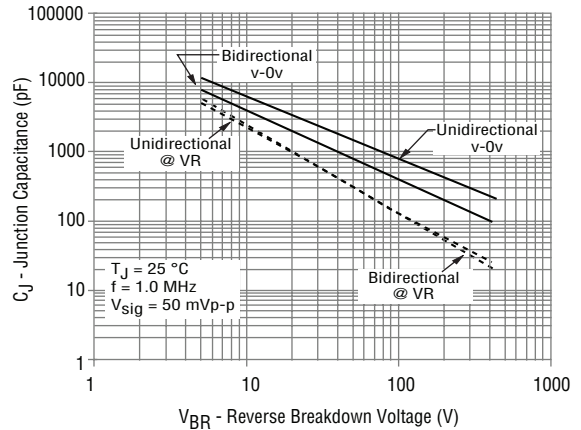
### Maximum Non-Repetitive Surge Current



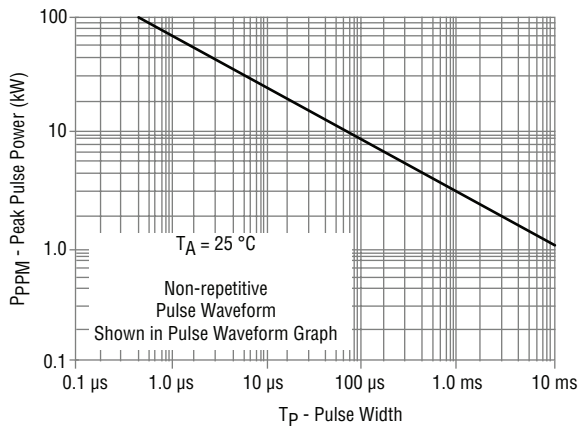
### Pulse Waveform



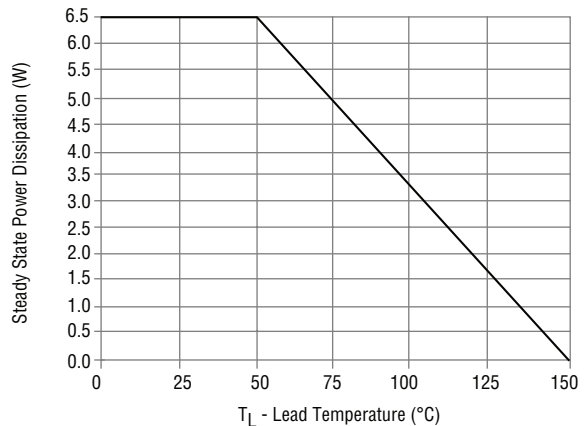
### Typical Junction Capacitance



### Pulse Rating Curve



### Steady State Power Derating Curve

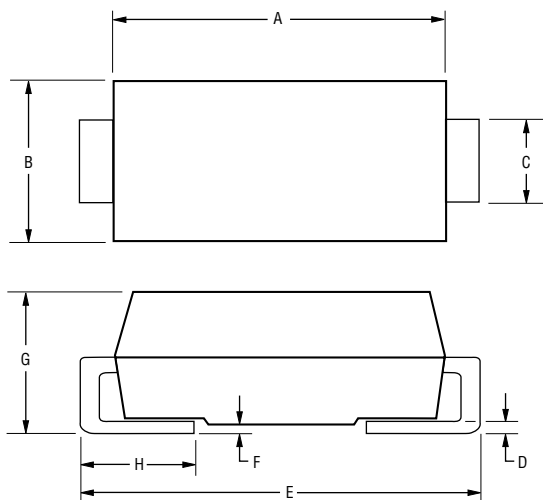


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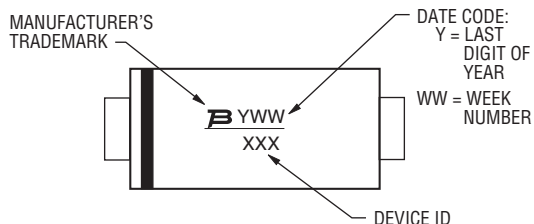
## Product Dimensions



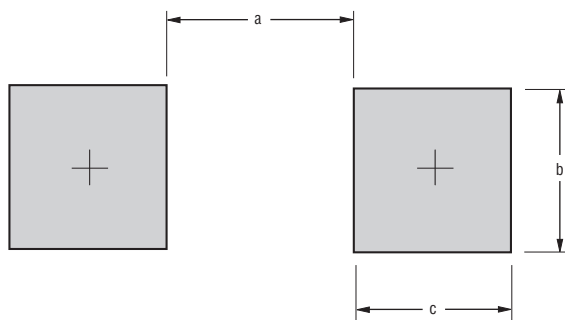
| Dimension | SMC (DO-214AB)                        |
|-----------|---------------------------------------|
| A         | $\frac{6.60 - 7.11}{(0.260 - 0.280)}$ |
| B         | $\frac{5.59 - 6.22}{(0.220 - 0.245)}$ |
| C         | $\frac{2.90 - 3.20}{(0.114 - 0.126)}$ |
| D         | $\frac{0.15 - 0.31}{(0.006 - 0.112)}$ |
| E         | $\frac{7.75 - 8.13}{(0.305 - 0.320)}$ |
| F         | $\frac{0.203}{(0.008)}$ MAX.          |
| G         | $\frac{2.00 - 2.62}{(0.079 - 0.103)}$ |
| H         | $\frac{0.76 - 1.52}{(0.030 - 0.060)}$ |

DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

## Typical Part Marking



## Recommended Footprint



| Dimension | SMC (DO-214AB)         |
|-----------|------------------------|
| a (Max.)  | $\frac{4.69}{(0.185)}$ |
| b (Min.)  | $\frac{3.07}{(0.121)}$ |
| c (Min.)  | $\frac{1.52}{(0.060)}$ |

DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

## Physical Specifications

Case ..... Molded plastic per UL Class 94V-0  
 Polarity..... Cathode band indicates unidirectional device  
 No cathode band indicates bidirectional device

## How to Order

Package **SMLJ 12 CA - Q**

SMLJ = SMC/DO-214AB  
 Working Peak Reverse Voltage 12 = 12 V<sub>RWM</sub> (Volts)  
 Suffix CA = 5 % Tolerance Bidirectional Device  
 AEC-Q101 Suffix Q = AEC-Q101 Compliant, 13-inch Reel  
 QH = AEC-Q101 Compliant, 7-inch Reel

## Environmental Specifications

Moisture Sensitivity Level .....1  
 ESD Classification (HBM).....3B

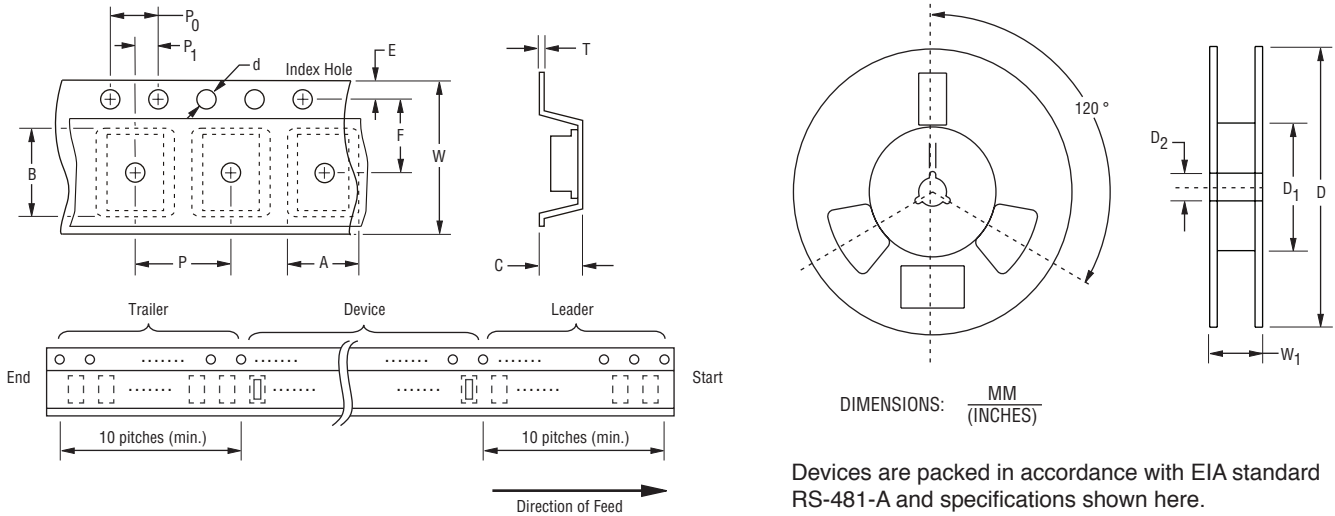
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## Packaging Information

The product will be dispensed in tape and reel format (see diagram below).



Devices are packed in accordance with EIA standard RS-481-A and specifications shown here.

| Item                   | Symbol         | SMC (DO-214AB)   |                        |
|------------------------|----------------|--|------------------------|
|                        |                | 7-Inch Reel  | 13-Inch Reel           |
| Carrier Width          | A              | $6.0 \pm 2.0$<br>(0.236 - 0.079)                         |                        |
| Carrier Length         | B              | $8.3 \pm 0.20$<br>(0.327 ± 0.008)                        |                        |
| Carrier Depth          | C              | $2.5 \pm 0.20$<br>(0.098 ± 0.008)                        |                        |
| Sprocket Hole          | d              | $1.50 \pm 0.10$<br>(0.059 ± 0.004)                       |                        |
| Reel Outside Diameter  | D              | $\frac{178}{(7.008)}$                                    | $\frac{330}{(12.992)}$ |
| Reel Inner Diameter    | D <sub>1</sub> | $\frac{50.0}{(1.969)}$ MIN.                              |                        |
| Feed Hole Diameter     | D <sub>2</sub> | $\frac{13.0 + 0.50 / - 0.20}{(0.512 + 0.020 / - 0.008)}$ |                        |
| Sprocket Hole Position | E              | $1.75 \pm 0.10$<br>(0.069 ± 0.004)                       |                        |
| Punch Hole Position    | F              | $7.50 \pm 0.10$<br>(0.295 ± 0.004)                       |                        |
| Punch Hole Pitch       | P              | $8.00 \pm 0.10$<br>(0.315 ± 0.004)                       |                        |
| Sprocket Hole Pitch    | P <sub>0</sub> | $4.00 \pm 0.10$<br>(0.157 ± 0.004)                       |                        |
| Embossment Center      | P <sub>1</sub> | $2.00 \pm 0.10$<br>(0.079 ± 0.004)                       |                        |
| Overall Tape Thickness | T              | $0.30 \pm 0.10$<br>(0.012 ± 0.004)                       |                        |
| Tape Width             | W              | $16.00 \pm 0.30$<br>(0.630 ± 0.012)                      |                        |
| Reel Width             | W <sub>1</sub> | $\frac{22.4}{(0.882)}$ MAX.                              |                        |
| Quantity per Reel      | --             | 500  | 3000                   |

REV. 02/18

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