



**THE DATASHEET OF
SMCJ54CA-QH**





Features

- Surface Mount SMC package
- Standoff Voltage: 5 to 120 volts
- Power Dissipation: 1500 watts
- RoHS compliant*
- AEC-Q101 compliant**

Applications

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

SMCJ-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 5 V up to 120 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 their flat configuration minimizes roll away.

Additional Information

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Agency Recognition

| Description | |
|-------------|--------------------------------------|
| UL | File Number: E153537 |

Electrical Characteristics (@ T_A = 25 °C Unless Otherwise Noted)

| Parameter | Symbol | Value | Unit |
|--|------------------|-------------|-------|
| Minimum Peak Pulse Power Dissipation (T _P = 1 ms) (Note 1,2) | P _{PK} | 1500 | Watts |
| Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3) | I _{FSM} | 200 | Amps |
| Operating Temperature Range | T _J | -55 to +150 | °C |
| Storage Temperature Range | T _{STG} | -55 to +150 | °C |

1. Non-repetitive current pulse, per Pulse Waveform graph and derated above T_A = 25 °C per Pulse Derating Curve.
2. Mounted on 5.0 mm² (0.03 mm thick) copper pads to each terminal.
3. 8.3 ms Single Half-Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).

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WARNING Cancer and Reproductive Harm - www.P65Warnings.ca.gov

* RoHS Directive 2015/863, Mar 31, 2015 and Annex.

**Q* part number suffix for automotive and other applications requiring appropriate AEC-Q101 compliance.

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Electrical Characteristics (@ T_A = 25 °C Unless Otherwise Noted)

| Unidirectional Device | | Bidirectional Device | | Breakdown Voltage V _{BR} (Volts) | | | Working Peak Reverse Voltage | Maximum Reverse Leakage @ V _{RWM} | Maximum Clamping Voltage @ I _{pp} (10/1000 μs) | Maximum Peak Pulse Current (10/1000 μs) | Maximum Clamping Voltage @ I _{pp} (8/20 μs) | Maximum Peak Pulse Current (8/20 μs) |
|-----------------------|---------|----------------------|---------|---|------|-----------------------|------------------------------|--|---|---|--|--------------------------------------|
| Part No. | Marking | Part No. | Marking | Min. | Max. | @ I _T (mA) | V _{RWM} (V) | I _R (μA) | V _C (V) | I _{pp} (A) | V _C (V) | I _{pp} (A) |
| SMCJ5.0A-Q | GDEQ | SMCJ5.0CA-Q | BDEQ | 6.40 | 7.00 | 10 | 5 | 800 | 9.2 | 163 | 12.0 | 815.0 |
| SMCJ6.0A-Q | GDGQ | SMCJ6.0CA-Q | BDGQ | 6.67 | 7.37 | 10 | 6 | 800 | 10.3 | 145.7 | 13.4 | 728.5 |
| SMCJ6.5A-Q | GDKQ | SMCJ6.5CA-Q | BDKQ | 7.22 | 7.98 | 10 | 6.5 | 500 | 11.2 | 134 | 15.0 | 670.0 |
| SMCJ7.0A-Q | GDMQ | SMCJ7.0CA-Q | BDMQ | 7.78 | 8.60 | 10 | 7 | 200 | 12 | 125 | 16.0 | 625.0 |
| SMCJ7.5A-Q | GDPQ | SMCJ7.5CA-Q | BDPQ | 8.33 | 9.21 | 1 | 7.5 | 100 | 12.9 | 116.3 | 16.8 | 581.5 |
| SMCJ8.0A-Q | GDRQ | SMCJ8.0CA-Q | BDRQ | 8.89 | 9.83 | 1 | 8 | 50 | 13.6 | 110.3 | 17.7 | 551.5 |
| SMCJ8.5A-Q | GDTQ | SMCJ8.5CA-Q | BDTQ | 9.44 | 10.4 | 1 | 8.5 | 20 | 14.4 | 104.2 | 18.7 | 521.0 |
| SMCJ9.0A-Q | GDVQ | SMCJ9.0CA-Q | BDVQ | 10.0 | 11.1 | 1 | 9 | 10 | 15.4 | 97.4 | 20.0 | 487.0 |
| SMCJ10A-Q | GDXQ | SMCJ10CA-Q | BDXQ | 11.1 | 12.3 | 1 | 10 | 5 | 17 | 88.3 | 22.1 | 441.5 |
| SMCJ11A-Q | GDZQ | SMCJ11CA-Q | BDZQ | 12.2 | 13.5 | 1 | 11 | 1 | 18.2 | 82.5 | 23.7 | 412.5 |
| SMCJ12A-Q | GEEQ | SMCJ12CA-Q | BEEQ | 13.3 | 14.7 | 1 | 12 | 1 | 19.9 | 75.4 | 25.9 | 377.0 |
| SMCJ13A-Q | GEGQ | SMCJ13CA-Q | BEGQ | 14.4 | 15.9 | 1 | 13 | 1 | 21.5 | 69.8 | 28.0 | 349.0 |
| SMCJ14A-Q | GEKQ | SMCJ14CA-Q | BEKQ | 15.6 | 17.2 | 1 | 14 | 1 | 23.2 | 64.7 | 30.2 | 323.5 |
| SMCJ15A-Q | GEMQ | SMCJ15CA-Q | BEMQ | 16.7 | 18.5 | 1 | 15 | 1 | 24.4 | 61.5 | 31.7 | 307.5 |
| SMCJ16A-Q | GEPQ | SMCJ16CA-Q | BEPQ | 17.8 | 19.7 | 1 | 16 | 1 | 26 | 57.7 | 33.8 | 288.5 |
| SMCJ17A-Q | GERQ | SMCJ17CA-Q | BERQ | 18.9 | 20.9 | 1 | 17 | 1 | 27.6 | 54.4 | 35.9 | 272.0 |
| SMCJ18A-Q | GETQ | SMCJ18CA-Q | BETQ | 20.0 | 22.1 | 1 | 18 | 1 | 29.2 | 51.4 | 38.0 | 257.0 |
| SMCJ20A-Q | GEVQ | SMCJ20CA-Q | BEVQ | 22.2 | 24.5 | 1 | 20 | 1 | 32.4 | 46.3 | 42.1 | 231.5 |
| SMCJ22A-Q | GEXQ | SMCJ22CA-Q | BEXQ | 24.4 | 26.9 | 1 | 22 | 1 | 35.5 | 42.3 | 46.2 | 211.5 |
| SMCJ24A-Q | GEZQ | SMCJ24CA-Q | BEZQ | 26.7 | 29.5 | 1 | 24 | 1 | 38.9 | 38.6 | 50.6 | 193.0 |
| SMCJ26A-Q | GFEQ | SMCJ26CA-Q | BFEQ | 28.9 | 31.9 | 1 | 26 | 1 | 42.1 | 35.7 | 54.7 | 178.5 |
| SMCJ28A-Q | GFGQ | SMCJ28CA-Q | BFGQ | 31.1 | 34.4 | 1 | 28 | 1 | 45.4 | 33.1 | 59.0 | 165.5 |
| SMCJ30A-Q | GFKQ | SMCJ30CA-Q | BFKQ | 33.3 | 36.8 | 1 | 30 | 1 | 48.4 | 31 | 63 | 155 |
| SMCJ33A-Q | GFMQ | SMCJ33CA-Q | BFMQ | 36.7 | 40.6 | 1 | 33 | 1 | 53.3 | 28.1 | 69.3 | 141.0 |
| SMCJ36A-Q | GFPQ | SMCJ36CA-Q | BFPQ | 40 | 44.2 | 1 | 36 | 1 | 58.1 | 25.9 | 75.5 | 129.5 |
| SMCJ40A-Q | GFRQ | SMCJ40CA-Q | BFRQ | 44.4 | 49.1 | 1 | 40 | 1 | 64.5 | 23.3 | 83.9 | 116.5 |
| SMCJ43A-Q | GFTQ | SMCJ43CA-Q | BFTQ | 47.8 | 52.8 | 1 | 43 | 1 | 69.4 | 21.7 | 90.2 | 108.5 |
| SMCJ45A-Q | GFVQ | SMCJ45CA-Q | BFVQ | 50 | 55.3 | 1 | 45 | 1 | 72.7 | 20.6 | 94.5 | 103.0 |
| SMCJ48A-Q | GFXQ | SMCJ48CA-Q | BFXQ | 53.3 | 58.9 | 1 | 48 | 1 | 77.4 | 19.4 | 100.6 | 97.0 |
| SMCJ51A-Q | GFZQ | SMCJ51CA-Q | BFZQ | 56.7 | 62.7 | 1 | 51 | 1 | 82.4 | 18.2 | 107.1 | 91.0 |
| SMCJ54A-Q | GGEQ | SMCJ54CA-Q | BGEQ | 60 | 66.3 | 1 | 54 | 1 | 87.1 | 17.3 | 113.2 | 86.5 |
| SMCJ58A-Q | GGGQ | SMCJ58CA-Q | BGGQ | 64.4 | 71.2 | 1 | 58 | 1 | 93.6 | 16.1 | 121.7 | 80.5 |
| SMCJ60A-Q | GGKQ | SMCJ60CA-Q | BGKQ | 66.7 | 73.7 | 1 | 60 | 1 | 96.8 | 15.5 | 125.8 | 77.5 |
| SMCJ64A-Q | GGMQ | SMCJ64CA-Q | BGMQ | 71.1 | 78.6 | 1 | 64 | 1 | 103 | 14.6 | 133.9 | 73.0 |
| SMCJ70A-Q | GGPQ | SMCJ70CA-Q | BGPQ | 77.8 | 86.0 | 1 | 70 | 1 | 113 | 13.3 | 146.9 | 66.5 |
| SMCJ75A-Q | GGRQ | SMCJ75CA-Q | BGRQ | 83.3 | 92.1 | 1 | 75 | 1 | 121 | 12.4 | 157.3 | 62.0 |
| SMCJ78A-Q | GGTQ | SMCJ78CA-Q | BGTQ | 86.7 | 95.8 | 1 | 78 | 1 | 126 | 11.9 | 163.8 | 59.5 |
| SMCJ85A-Q | GGVQ | SMCJ85CA-Q | BGVQ | 94.4 | 104 | 1 | 85 | 1 | 137 | 11 | 178 | 55 |
| SMCJ90A-Q | GGXQ | SMCJ90CA-Q | BGXQ | 100 | 111 | 1 | 90 | 1 | 146 | 10.3 | 189.8 | 51.5 |
| SMCJ100A-Q | GGZQ | SMCJ100CA-Q | BGZQ | 111 | 123 | 1 | 100 | 1 | 162 | 9.3 | 210.6 | 46.5 |
| SMCJ110A-Q | GHEQ | SMCJ110CA-Q | BHEQ | 122 | 135 | 1 | 110 | 1 | 177 | 8.4 | 230.1 | 42.5 |
| SMCJ120A-Q | GHGQ | SMCJ120CA-Q | BHGQ | 133 | 147 | 1 | 120 | 1 | 193 | 7.9 | 250.9 | 39.0 |

Notes:

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

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NEW!

NEW!

SMCJ-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 | $\frac{2.90 - 3.20}{(0.115 - 0.125)}$ |
| D | $\frac{0.15 - 0.31}{(0.006 - 0.012)}$ |
| 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 SMCJ 5 CA - Q
 SMCJ-Q = SMC/DO-214AB
 Working Peak Reverse Voltage 5 ~ 120 = 5 ~ 120 V_{RWM} (Volts)
 Suffix A = 5 % Tolerance Unidirectional Device
CA = 5 % Tolerance Bidirectional Device
 AEC-Q101 Suffix Q = AEC-Q101 Compliant, 13-inch Reel
QH = AEC-Q101 Compliant, 7-inch Reel

Environmental Specifications

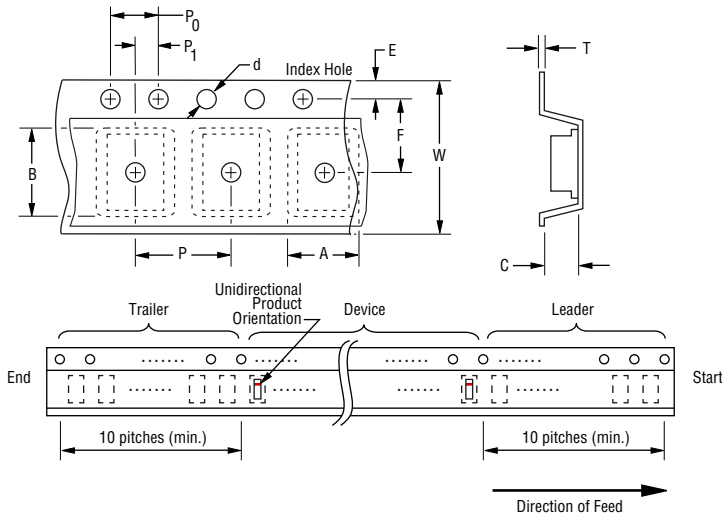
Moisture Sensitivity Level 1
 ESD Classification (HBM)..... 3B

SMCJ-Q Transient Voltage Suppressor Diode Series

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Packaging Information

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



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

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

REV. 07/21

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