



**THE DATASHEET OF
SMLJ45CA-QH**





Features

- Surface Mount SMC package
- Standoff Voltage: 12 to 58 volts
- Power Dissipation: 3000 watts
- RoHS compliant*
- AEC-Q101 compliant**
- Typical temperature coefficient:
 $\Delta V_{BR} = 0.1 \% \times V_{BR} @ 25\text{ }^{\circ}\text{C} \times \Delta T$

Applications

- Protection of power buses
- Protection of I/O interfaces
- Overvoltage transient protection
- 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.

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} | 3000 | Watts |
| Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3) | I _{FSM} | 300 | 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 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.

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

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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 Number | Part Marking | Part Number | Part Marking | Min. | Max. | @ I _T (mA) | V _{RWM} (Volts) | I _R (μA) | V _C (V) | I _{pp} (A) | V _C (V) | I _{pp} (A) |
| SMLJ12A-Q | HEEQ | SMLJ12CA-Q | IEEQ | 13.3 | 14.7 | 1 | 12 | 2 | 19.9 | 150.60 | 25.90 | 754.00 |
| SMLJ13A-Q | HEGQ | SMLJ13CA-Q | IEGQ | 14.4 | 15.9 | 1 | 13 | 2 | 21.5 | 139.40 | 28.00 | 697.50 |
| SMLJ14A-Q | HEKQ | SMLJ14CA-Q | IEKQ | 15.6 | 17.2 | 1 | 14 | 2 | 23.2 | 129.40 | 30.20 | 646.50 |
| SMLJ15A-Q | HEMQ | SMLJ15CA-Q | IEMQ | 16.7 | 18.5 | 1 | 15 | 2 | 24.4 | 123.00 | 31.70 | 615.00 |
| SMLJ16A-Q | HEPQ | SMLJ16CA-Q | IEPQ | 17.8 | 19.7 | 1 | 16 | 2 | 26.0 | 115.40 | 33.80 | 577.00 |
| SMLJ17A-Q | HERQ | SMLJ17CA-Q | IERQ | 18.9 | 20.9 | 1 | 17 | 2 | 27.6 | 106.60 | 35.90 | 543.50 |
| SMLJ18A-Q | HETQ | SMLJ18CA-Q | IETQ | 20.0 | 22.1 | 1 | 18 | 2 | 29.2 | 102.80 | 38.00 | 513.50 |
| SMLJ20A-Q | HEVQ | SMLJ20CA-Q | IEVQ | 22.2 | 24.5 | 1 | 20 | 2 | 32.4 | 92.60 | 42.10 | 463.00 |
| SMLJ22A-Q | HEXQ | SMLJ22CA-Q | IEXQ | 24.4 | 26.9 | 1 | 22 | 2 | 35.5 | 84.40 | 46.20 | 422.50 |
| SMLJ24A-Q | HEZQ | SMLJ24CA-Q | IEZQ | 26.7 | 29.5 | 1 | 24 | 2 | 38.9 | 77.20 | 50.60 | 385.50 |
| SMLJ26A-Q | HFEQ | SMLJ26CA-Q | IFEQ | 28.9 | 31.9 | 1 | 26 | 2 | 42.1 | 71.20 | 54.70 | 356.50 |
| SMLJ28A-Q | HFGQ | SMLJ28CA-Q | IFGQ | 31.1 | 34.4 | 1 | 28 | 2 | 45.4 | 66.00 | 59.00 | 330.50 |
| SMLJ30A-Q | HFKQ | SMLJ30CA-Q | IFKQ | 33.3 | 36.8 | 1 | 30 | 2 | 48.4 | 62.00 | 62.90 | 310.00 |
| SMLJ33A-Q | HFMQ | SMLJ33CA-Q | IFMQ | 36.7 | 40.6 | 1 | 33 | 2 | 53.3 | 56.20 | 69.30 | 281.50 |
| SMLJ36A-Q | HFPQ | SMLJ36CA-Q | IFPQ | 40.0 | 44.2 | 1 | 36 | 2 | 58.1 | 51.60 | 75.50 | 258.00 |
| SMLJ40A-Q | HFRQ | SMLJ40CA-Q | IFRQ | 44.4 | 49.1 | 1 | 40 | 2 | 64.5 | 46.40 | 83.90 | 232.50 |
| SMLJ43A-Q | HFTQ | SMLJ43CA-Q | IFTQ | 47.8 | 52.8 | 1 | 43 | 2 | 69.4 | 43.20 | 90.20 | 216.00 |
| SMLJ45A-Q | HFVQ | SMLJ45CA-Q | IFVQ | 50.0 | 55.3 | 1 | 45 | 2 | 72.7 | 41.20 | 94.50 | 206.50 |
| SMLJ48A-Q | HFXQ | SMLJ48CA-Q | IFXQ | 53.3 | 58.9 | 1 | 48 | 2 | 77.4 | 38.80 | 100.60 | 194.00 |
| SMLJ51A-Q | HFZQ | SMLJ51CA-Q | IFZQ | 56.7 | 62.7 | 1 | 51 | 2 | 82.4 | 36.40 | 107.10 | 182.00 |
| SMLJ54A-Q | HGEQ | SMLJ54CA-Q | IGEQ | 60.0 | 66.3 | 1 | 54 | 2 | 87.1 | 34.40 | 113.20 | 172.00 |
| SMLJ58A-Q | HGGQ | SMLJ58CA-Q | IGGQ | 64.4 | 71.2 | 1 | 58 | 2 | 93.6 | 32.00 | 121.70 | 160.50 |

Notes:

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

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SMLJ-Q Transient Voltage Suppressor Diode Series



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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Packaging Information

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



| 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 | $\frac{50.0}{(1.969)}$ 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 | $\frac{22.4}{(0.882)}$ MAX. | |
| Quantity per Reel | -- | 500 | 3000 |

REV. 02/21

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