



**THE DATASHEET OF
SMA6J8.5CA-Q**





Features

- Surface Mount SMA package
- Standoff Voltage: 5 to 130 volts
- Power Dissipation: 600 watts
- RoHS compliant*
- AEC-Q101 compliant**

Applications

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

SMA6J-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-214AC (SMA) size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 5 V up to 130 V. Typical fast response times are less than 1.0 picosecond from 0 V to Breakdown Voltage.

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

Additional Information

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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} | 600 | Watts |
| Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3) | I _{FSM} | 40 | 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 indicates AEC-Q101 compliance.

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SMA6J-Q Transient Voltage Suppressor Diode Series

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

| Unidirectional Device | | Bidirectional Device | | Breakdown Voltage V _{BR} (Volts) | | | Working Peak Reverse Voltage | Maximum Reverse Leakage @ V _{RWM} | Maximum Reverse Voltage @ I _{RSM} | Maximum Reverse Surge Current |
|-----------------------|---------|----------------------|---------|---|-------|-----------------------|------------------------------|--|--|-------------------------------|
| Part No. | Marking | Part No. | Marking | Min. | Max. | @ I _T (mA) | V _{RWM} (V) | I _R (μA) | V _{RSM} (V) | I _{RSM} (A) |
| SMA6J5.0A-Q | 6HEQ | SMA6J5.0CA-Q | 6TEQ | 6.40 | 7.00 | 10 | 5.0 | 800 | 9.2 | 65.3 |
| SMA6J6.0A-Q | 6HGQ | SMA6J6.0CA-Q | 6TGQ | 6.67 | 7.37 | 10 | 6.0 | 800 | 10.3 | 58.3 |
| SMA6J6.5A-Q | 6HKQ | SMA6J6.5CA-Q | 6TKQ | 7.22 | 7.98 | 10 | 6.5 | 500 | 11.2 | 53.6 |
| SMA6J7.0A-Q | 6HMQ | SMA6J7.0CA-Q | 6TMQ | 7.78 | 8.60 | 10 | 7.0 | 200 | 12.0 | 50.0 |
| SMA6J7.5A-Q | 6HPQ | SMA6J7.5CA-Q | 6TPQ | 8.33 | 9.21 | 1.0 | 7.5 | 100 | 12.9 | 46.6 |
| SMA6J8.0A-Q | 6HRQ | SMA6J8.0CA-Q | 6TRQ | 8.89 | 9.83 | 1.0 | 8.0 | 50 | 13.6 | 44.2 |
| SMA6J8.5A-Q | 6HTQ | SMA6J8.5CA-Q | 6TTQ | 9.44 | 10.4 | 1.0 | 8.5 | 20 | 14.4 | 41.7 |
| SMA6J9.0A-Q | 6HVQ | SMA6J9.0CA-Q | 6TVQ | 10.0 | 11.1 | 1.0 | 9.0 | 10 | 15.4 | 39.0 |
| SMA6J10A-Q | 6HXQ | SMA6J10CA-Q | 6TXQ | 11.1 | 12.3 | 1.0 | 10 | 5 | 17.0 | 35.3 |
| SMA6J11A-Q | 6HZQ | SMA6J11CA-Q | 6TZQ | 12.2 | 13.5 | 1.0 | 11 | 1.0 | 18.2 | 33.0 |
| SMA6J12A-Q | 6IEQ | SMA6J12CA-Q | 6UEQ | 13.3 | 14.7 | 1.0 | 12 | 1.0 | 19.9 | 30.2 |
| SMA6J13A-Q | 6IGQ | SMA6J13CA-Q | 6UGQ | 14.4 | 15.9 | 1.0 | 13 | 1.0 | 21.5 | 28.0 |
| SMA6J14A-Q | 6IKQ | SMA6J14CA-Q | 6UKQ | 15.6 | 17.2 | 1.0 | 14 | 1.0 | 23.2 | 25.9 |
| SMA6J15A-Q | 6IMQ | SMA6J15CA-Q | 6UMQ | 16.7 | 18.5 | 1.0 | 15 | 1.0 | 24.4 | 24.6 |
| SMA6J16A-Q | 6IPQ | SMA6J16CA-Q | 6UPQ | 17.8 | 19.7 | 1.0 | 16 | 1.0 | 26.0 | 23.1 |
| SMA6J17A-Q | 6IRQ | SMA6J17CA-Q | 6URQ | 18.9 | 20.9 | 1.0 | 17 | 1.0 | 27.6 | 21.8 |
| SMA6J18A-Q | 6ITQ | SMA6J18CA-Q | 6UTQ | 20.0 | 22.1 | 1.0 | 18 | 1.0 | 29.2 | 20.6 |
| SMA6J20A-Q | 6IVQ | SMA6J20CA-Q | 6UVQ | 22.2 | 24.5 | 1.0 | 20 | 1.0 | 32.4 | 18.6 |
| SMA6J22A-Q | 6IXQ | SMA6J22CA-Q | 6UXQ | 24.4 | 26.9 | 1.0 | 22 | 1.0 | 35.5 | 16.9 |
| SMA6J24A-Q | 6IZQ | SMA6J24CA-Q | 6UZQ | 26.7 | 29.5 | 1.0 | 24 | 1.0 | 38.9 | 15.5 |
| SMA6J26A-Q | 6JEQ | SMA6J26CA-Q | 6VEQ | 28.9 | 31.9 | 1.0 | 26 | 1.0 | 42.1 | 14.3 |
| SMA6J28A-Q | 6JGQ | SMA6J28CA-Q | 6VGQ | 31.1 | 34.4 | 1.0 | 28 | 1.0 | 45.4 | 13.3 |
| SMA6J30A-Q | 6JKQ | SMA6J30CA-Q | 6VKQ | 33.3 | 36.8 | 1.0 | 30 | 1.0 | 48.4 | 12.4 |
| SMA6J33A-Q | 6JMQ | SMA6J33CA-Q | 6VMQ | 36.7 | 40.6 | 1.0 | 33 | 1.0 | 53.3 | 11.3 |
| SMA6J36A-Q | 6JPQ | SMA6J36CA-Q | 6VPQ | 40.0 | 44.2 | 1.0 | 36 | 1.0 | 58.1 | 10.4 |
| SMA6J40A-Q | 6JRQ | SMA6J40CA-Q | 6VRQ | 44.4 | 49.1 | 1.0 | 40 | 1.0 | 64.5 | 9.3 |
| SMA6J43A-Q | 6JTB | SMA6J43CA-Q | 6VTQ | 47.8 | 52.8 | 1.0 | 43 | 1.0 | 69.4 | 8.7 |
| SMA6J45A-Q | 6JVQ | SMA6J45CA-Q | 6VVQ | 50.0 | 55.3 | 1.0 | 45 | 1.0 | 72.7 | 8.3 |
| SMA6J48A-Q | 6JXQ | SMA6J48CA-Q | 6VXQ | 53.3 | 58.9 | 1.0 | 48 | 1.0 | 77.4 | 7.8 |
| SMA6J51A-Q | 6JZQ | SMA6J51CA-Q | 6VZQ | 56.7 | 62.7 | 1.0 | 51 | 1.0 | 82.4 | 7.3 |
| SMA6J54A-Q | 6KEQ | SMA6J54CA-Q | 6WEQ | 60.0 | 66.3 | 1.0 | 54 | 1.0 | 87.1 | 6.9 |
| SMA6J58A-Q | 6KGQ | SMA6J58CA-Q | 6WGQ | 64.4 | 71.2 | 1.0 | 58 | 1.0 | 93.6 | 6.5 |
| SMA6J60A-Q | 6KKQ | SMA6J60CA-Q | 6WKQ | 66.7 | 73.7 | 1.0 | 60 | 1.0 | 96.8 | 6.2 |
| SMA6J64A-Q | 6KMQ | SMA6J64CA-Q | 6WMQ | 71.1 | 78.6 | 1.0 | 64 | 1.0 | 103.0 | 5.9 |
| SMA6J70A-Q | 6KPQ | SMA6J70CA-Q | 6WPQ | 77.8 | 86.0 | 1.0 | 70 | 1.0 | 113.0 | 5.3 |
| SMA6J75A-Q | 6KRQ | SMA6J75CA-Q | 6WRQ | 83.3 | 92.1 | 1.0 | 75 | 1.0 | 121.0 | 5.0 |
| SMA6J78A-Q | 6KTQ | SMA6J78CA-Q | 6WTQ | 86.7 | 95.8 | 1.0 | 78 | 1.0 | 126.0 | 4.8 |
| SMA6J85A-Q | 6KVQ | SMA6J85CA-Q | 6WVQ | 94.4 | 104.0 | 1.0 | 85 | 1.0 | 137.0 | 4.4 |
| SMA6J90A-Q | 6KXQ | SMA6J90CA-Q | 6WXQ | 100.0 | 111.0 | 1.0 | 90 | 1.0 | 146.0 | 4.1 |
| SMA6J100A-Q | 6KZQ | | | 111.0 | 123.0 | 1.0 | 100 | 1.0 | 162.0 | 3.7 |
| SMA6J110A-Q | 6LEQ | | | 122.0 | 135.0 | 1.0 | 110 | 1.0 | 177.0 | 3.4 |
| SMA6J120A-Q | 6LGQ | | | 133.0 | 147.0 | 1.0 | 120 | 1.0 | 193.0 | 3.1 |
| SMA6J130A-Q | 6LKQ | | | 144.0 | 159.0 | 1.0 | 130 | 1.0 | 209.0 | 2.9 |

- Notes:
1. Suffix 'A' denotes a 5 % tolerance unidirectional device.
 2. Suffix 'CA' denotes a 5 % tolerance bidirectional device.
 3. For bidirectional devices with a V_{RWM} of 10 volts or less, the I_R limit is double.

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Performance Graphs

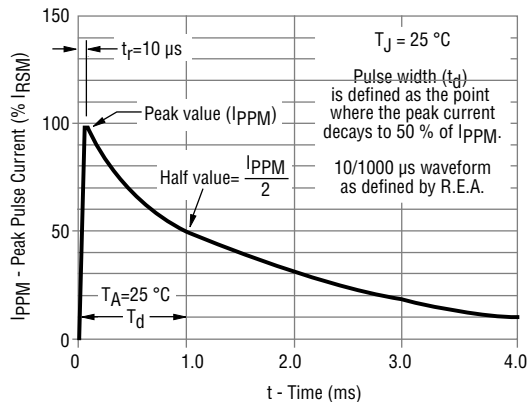
Peak Pulse Power Rating



Pulse Derating Curve



Pulse Waveform



Typical Junction Capacitance



Steady State Power Derating Curve



Maximum Non-repetitive Forward Surge Current



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SMA6J-Q Transient Voltage Suppressor Diode Series



Product Dimensions



| Dimension | SMA (DO-214AC) |
|-----------|---------------------------------------|
| A | $\frac{3.99 - 4.50}{(0.157 - 0.177)}$ |
| B | $\frac{2.54 - 2.79}{(0.100 - 0.110)}$ |
| C | $\frac{1.25 - 1.65}{(0.049 - 0.065)}$ |
| D | $\frac{0.15 - 0.31}{(0.006 - 0.012)}$ |
| E | $\frac{4.93 - 5.28}{(0.194 - 0.208)}$ |
| F | $\frac{0.203}{(0.008)}$ MAX. |
| G | $\frac{1.98 - 2.29}{(0.078 - 0.090)}$ |
| H | $\frac{0.76 - 1.52}{(0.030 - 0.060)}$ |

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

Typical Part Marking



Recommended Footprint



| Dimension | SMA (DO-214AC) |
|-----------|------------------------|
| A (Max.) | $\frac{2.70}{(0.106)}$ |
| B (Min.) | $\frac{2.10}{(0.083)}$ |
| C (Min.) | $\frac{1.27}{(0.050)}$ |

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 **SMA6J 5.0 CA - Q**
 SMA6J = 600 W, SMA/DO-214AC
 Working Peak Reverse Voltage 5.0 - 130 = 5.0 - 130 V_{RWM} (Volts)
 Suffix
 A = 5 % Tolerance Unidirectional Device
 CA = 5 % Tolerance Bidirectional Device
 AEC-Q101 Suffix
 Q = AEC-Q101 Compliant, 13-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).



| Item | Symbol | SMA (DO-214AC) |
|------------------------|----------------|--|
| | | 13-Inch Reel |
| Carrier Width | A | $\frac{2.90 \pm 0.20}{(0.114 \pm 0.008)}$ |
| Carrier Length | B | $\frac{5.50 \pm 0.20}{(0.217 \pm 0.008)}$ |
| Carrier Depth | C | $\frac{2.26 \pm 0.20}{(0.089 \pm 0.008)}$ |
| Sprocket Hole | d | $\frac{1.50 \pm 0.10}{(0.061 \pm 0.004)}$ |
| Reel Outside Diameter | D | $\frac{330}{(12.992)}$ |
| Reel Inner Diameter | D ₁ | $\frac{50.0}{(1.969)}$ MIN. |
| Feed Hole Diameter | D ₂ | $\frac{13.0 \pm 0.20}{(0.512 \pm 0.008)}$ |
| Sprocket Hole Position | E | $\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$ |
| Punch Hole Position | F | $\frac{5.50 \pm 0.05}{(0.217 \pm 0.002)}$ |
| Punch Hole Pitch | P | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$ |
| Sprocket Hole Pitch | P ₀ | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$ |
| Embossment Center | P ₁ | $\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$ |
| Overall Tape Thickness | T | $\frac{0.30 \pm 0.10}{(0.012 \pm 0.004)}$ |
| Tape Width | W | $\frac{12.00 \pm 0.30}{(0.472 \pm 0.012)}$ |
| Reel Width | W ₁ | $\frac{18.4}{(0.724)}$ MAX. |
| Quantity per Reel | -- | 5,000 |

REV. 10/20

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