

Features

- Surface Mount SMB package
- Standoff Voltage: 5 to 220 volts
- Power Dissipation: 600 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

SMBJ-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-214AA (SMB) size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 5 V up to 220 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.

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} | 600 | Watts |
| Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3) | I _{FSM} | 100 | 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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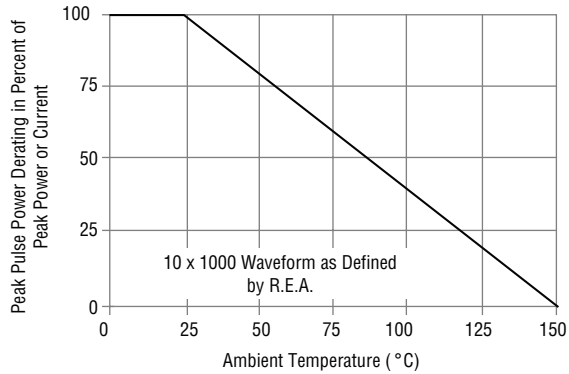
| Unidirectional Device | | Bidirectional Device | | Breakdown Voltage V _{BR} (Volts) | | | Working Peak Reverse Voltage | Maximum Reverse Leakage @ V _{RWM} | Maximum Clamping Voltage @ I _{pp} (10/1000 μs) | Maximum Peak Pulse Current (10/1000 μs) | Maximum Clamping Voltage @ I _{pp} (8/20 μs) | Maximum 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) |
| SMBJ5.0A-Q | KEQ | SMBJ5.0CA-Q | AEQ | 6.40 | 7.00 | 10 | 5.0 | 800 | 9.2 | 65.3 | 12.0 | 326.5 |
| SMBJ6.0A-Q | KGQ | SMBJ6.0CA-Q | AGQ | 6.67 | 7.37 | 10 | 6.0 | 800 | 10.3 | 58.3 | 13.4 | 291.5 |
| SMBJ6.5A-Q | KKQ | SMBJ6.5CA-Q | AKQ | 7.22 | 7.98 | 10 | 6.5 | 500 | 11.2 | 53.6 | 14.6 | 268.0 |
| SMBJ7.0A-Q | KMQ | SMBJ7.0CA-Q | AMQ | 7.78 | 8.60 | 10 | 7.0 | 200 | 12.0 | 50.0 | 15.6 | 250.0 |
| SMBJ7.5A-Q | KPQ | SMBJ7.5CA-Q | APQ | 8.33 | 9.21 | 1.0 | 7.5 | 100 | 12.9 | 46.6 | 16.8 | 233.0 |
| SMBJ8.0A-Q | KRQ | SMBJ8.0CA-Q | ARQ | 8.89 | 9.83 | 1.0 | 8.0 | 50 | 13.6 | 44.2 | 17.7 | 221.0 |
| SMBJ8.5A-Q | KTQ | SMBJ8.5CA-Q | ATQ | 9.44 | 10.4 | 1.0 | 8.5 | 20 | 14.4 | 41.7 | 18.7 | 208.5 |
| SMBJ9.0A-Q | KVQ | SMBJ9.0CA-Q | AVQ | 10.0 | 11.1 | 1.0 | 9.0 | 10 | 15.4 | 39.0 | 20.0 | 195.0 |
| SMBJ10A-Q | KXQ | SMBJ10CA-Q | AXQ | 11.1 | 12.3 | 1.0 | 10 | 5.0 | 17.0 | 35.3 | 22.1 | 176.5 |
| SMBJ11A-Q | KZQ | SMBJ11CA-Q | AZQ | 12.2 | 13.5 | 1.0 | 11 | 1.0 | 18.2 | 33.0 | 23.7 | 165.0 |
| SMBJ12A-Q | LEQ | SMBJ12CA-Q | BEQ | 13.3 | 14.7 | 1.0 | 12 | 1.0 | 19.9 | 30.2 | 25.9 | 151.0 |
| SMBJ13A-Q | LGQ | SMBJ13CA-Q | BGQ | 14.4 | 15.9 | 1.0 | 13 | 1.0 | 21.5 | 28.0 | 28.0 | 140.0 |
| SMBJ14A-Q | LKQ | SMBJ14CA-Q | BKQ | 15.6 | 17.2 | 1.0 | 14 | 1.0 | 23.2 | 25.9 | 30.2 | 129.5 |
| SMBJ15A-Q | LMQ | SMBJ15CA-Q | BMQ | 16.7 | 18.5 | 1.0 | 15 | 1.0 | 24.4 | 24.6 | 31.7 | 123.0 |
| SMBJ16A-Q | LPQ | SMBJ16CA-Q | BPQ | 17.8 | 19.7 | 1.0 | 16 | 1.0 | 26.0 | 23.1 | 33.8 | 115.5 |
| SMBJ17A-Q | LRQ | SMBJ17CA-Q | BRQ | 18.9 | 20.9 | 1.0 | 17 | 1.0 | 27.6 | 21.8 | 35.9 | 109.0 |
| SMBJ18A-Q | LTQ | SMBJ18CA-Q | BTQ | 20.0 | 22.1 | 1.0 | 18 | 1.0 | 29.2 | 20.6 | 38.0 | 103.0 |
| SMBJ20A-Q | LVQ | SMBJ20CA-Q | BVQ | 22.2 | 24.5 | 1.0 | 20 | 1.0 | 32.4 | 18.6 | 42.1 | 93.0 |
| SMBJ22A-Q | LXQ | SMBJ22CA-Q | BXQ | 24.4 | 26.9 | 1.0 | 22 | 1.0 | 35.5 | 16.9 | 46.2 | 84.5 |
| SMBJ24A-Q | LZQ | SMBJ24CA-Q | BZQ | 26.7 | 29.5 | 1.0 | 24 | 1.0 | 38.9 | 15.5 | 50.6 | 77.5 |
| SMBJ26A-Q | MEQ | SMBJ26CA-Q | CEQ | 28.9 | 31.9 | 1.0 | 26 | 1.0 | 42.1 | 14.3 | 54.7 | 71.5 |
| SMBJ28A-Q | MGQ | SMBJ28CA-Q | CGQ | 31.1 | 34.4 | 1.0 | 28 | 1.0 | 45.4 | 13.3 | 59.0 | 66.5 |
| SMBJ30A-Q | MKQ | SMBJ30CA-Q | CKQ | 33.3 | 36.8 | 1.0 | 30 | 1.0 | 48.4 | 12.4 | 62.9 | 62.0 |
| SMBJ33A-Q | MMQ | SMBJ33CA-Q | CMQ | 36.7 | 40.6 | 1.0 | 33 | 1.0 | 53.3 | 11.3 | 69.3 | 56.5 |
| SMBJ36A-Q | MPQ | SMBJ36CA-Q | CPQ | 40 | 44.2 | 1.0 | 36 | 1.0 | 58.1 | 10.4 | 75.5 | 52.0 |
| SMBJ40A-Q | MRQ | SMBJ40CA-Q | CRQ | 44.4 | 49.1 | 1.0 | 40 | 1.0 | 64.5 | 9.3 | 83.9 | 46.5 |
| SMBJ43A-Q | MTQ | SMBJ43CA-Q | CTQ | 47.8 | 52.8 | 1.0 | 43 | 1.0 | 69.4 | 8.7 | 90.2 | 43.5 |
| SMBJ45A-Q | MVQ | SMBJ45CA-Q | CVQ | 50 | 55.3 | 1.0 | 45 | 1.0 | 72.7 | 8.3 | 94.5 | 41.5 |
| SMBJ48A-Q | MXQ | SMBJ48CA-Q | CXQ | 53.3 | 58.9 | 1.0 | 48 | 1.0 | 77.4 | 7.8 | 100.6 | 39.0 |
| SMBJ51A-Q | MZQ | SMBJ51CA-Q | CZQ | 56.7 | 62.7 | 1.0 | 51 | 1.0 | 82.4 | 7.3 | 107.1 | 36.5 |
| SMBJ54A-Q | NEQ | SMBJ54CA-Q | DEQ | 60 | 66.3 | 1.0 | 54 | 1.0 | 87.1 | 6.9 | 113.2 | 34.5 |
| SMBJ58A-Q | NGQ | SMBJ58CA-Q | DGQ | 64.4 | 71.2 | 1.0 | 58 | 1.0 | 93.6 | 6.5 | 121.7 | 32.5 |
| SMBJ60A-Q | NKQ | SMBJ60CA-Q | DKQ | 66.7 | 73.7 | 1.0 | 60 | 1.0 | 96.8 | 6.2 | 125.8 | 31.0 |
| SMBJ64A-Q | NMQ | SMBJ64CA-Q | DMQ | 71.1 | 78.6 | 1.0 | 64 | 1.0 | 103 | 5.9 | 133.9 | 29.5 |
| SMBJ70A-Q | NPQ | SMBJ70CA-Q | DPQ | 77.8 | 86.0 | 1.0 | 70 | 1.0 | 113 | 5.3 | 146.9 | 26.5 |
| SMBJ75A-Q | NRQ | SMBJ75CA-Q | DRQ | 83.3 | 92.1 | 1.0 | 75 | 1.0 | 121 | 5.0 | 157.3 | 25.0 |
| SMBJ78A-Q | NTQ | SMBJ78CA-Q | DTQ | 86.7 | 95.8 | 1.0 | 78 | 1.0 | 126 | 4.8 | 163.8 | 24.0 |
| SMBJ85A-Q | NVQ | SMBJ85CA-Q | DVQ | 94.4 | 104 | 1.0 | 85 | 1.0 | 137 | 4.4 | 178.1 | 22.0 |
| SMBJ90A-Q | NXQ | SMBJ90CA-Q | DXQ | 100 | 111 | 1.0 | 90 | 1.0 | 146 | 4.1 | 189.8 | 20.5 |
| SMBJ100A-Q | NZQ | SMBJ100CA-Q | DZQ | 111 | 123 | 1.0 | 100 | 1.0 | 162 | 3.7 | 210.6 | 18.5 |
| SMBJ110A-Q | PEQ | SMBJ110CA-Q | EEQ | 122 | 135 | 1.0 | 110 | 1.0 | 177 | 3.4 | 230.1 | 17.0 |
| SMBJ120A-Q | PGQ | SMBJ120CA-Q | EGQ | 133 | 147 | 1.0 | 120 | 1.0 | 193 | 3.1 | 250.9 | 15.5 |
| SMBJ130A-Q | PKQ | SMBJ130CA-Q | EKQ | 144 | 159 | 1.0 | 130 | 1.0 | 209 | 2.9 | 271.7 | 14.5 |
| SMBJ150A-Q | PMQ | SMBJ150CA-Q | EMQ | 167 | 185 | 1.0 | 150 | 1.0 | 243 | 2.5 | 315.9 | 12.5 |
| SMBJ160A-Q | PPQ | SMBJ160CA-Q | EPQ | 178 | 197 | 1.0 | 160 | 1.0 | 259 | 2.3 | 336.7 | 11.5 |
| SMBJ170A-Q | PRQ | SMBJ170CA-Q | ERQ | 189 | 209 | 1.0 | 170 | 1.0 | 275 | 2.2 | 357.5 | 11.0 |
| SMBJ180A-Q | PTQ | SMBJ180CA-Q | ETQ | 201 | 222 | 1.0 | 180 | 1.0 | 292 | 2.1 | 379.6 | 10.5 |
| SMBJ200A-Q | PVQ | SMBJ200CA-Q | EVQ | 224 | 247 | 1.0 | 200 | 1.0 | 324 | 1.9 | 421.2 | 9.5 |
| SMBJ220A-Q | PXQ | SMBJ220CA-Q | EXQ | 246 | 272 | 1.0 | 220 | 1.0 | 356 | 1.7 | 462.8 | 8.5 |

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

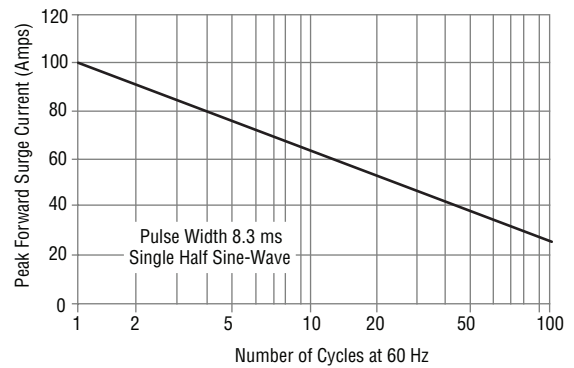
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Performance Graphs

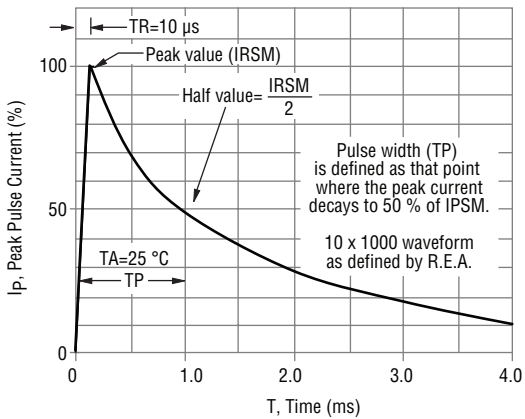
Peak Pulse Power Derating Curve



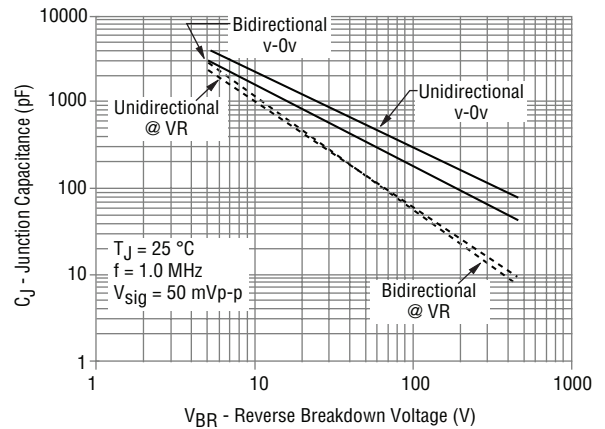
Maximum Non-Repetitive Surge Current



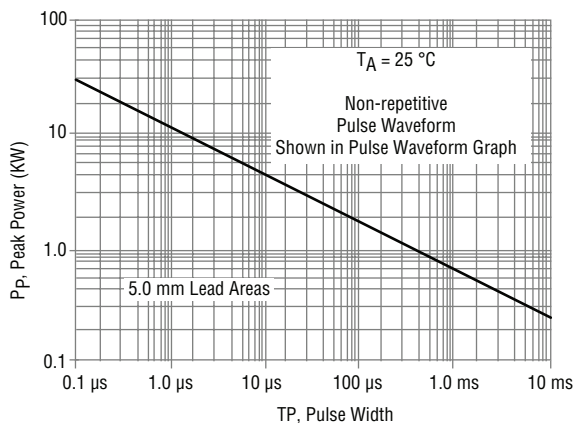
Pulse Waveform



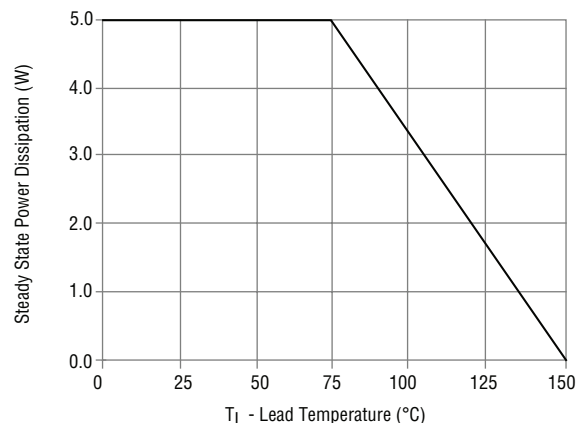
Typical Junction Capacitance



Pulse Rating Curve



Steady State Power Derating Curve



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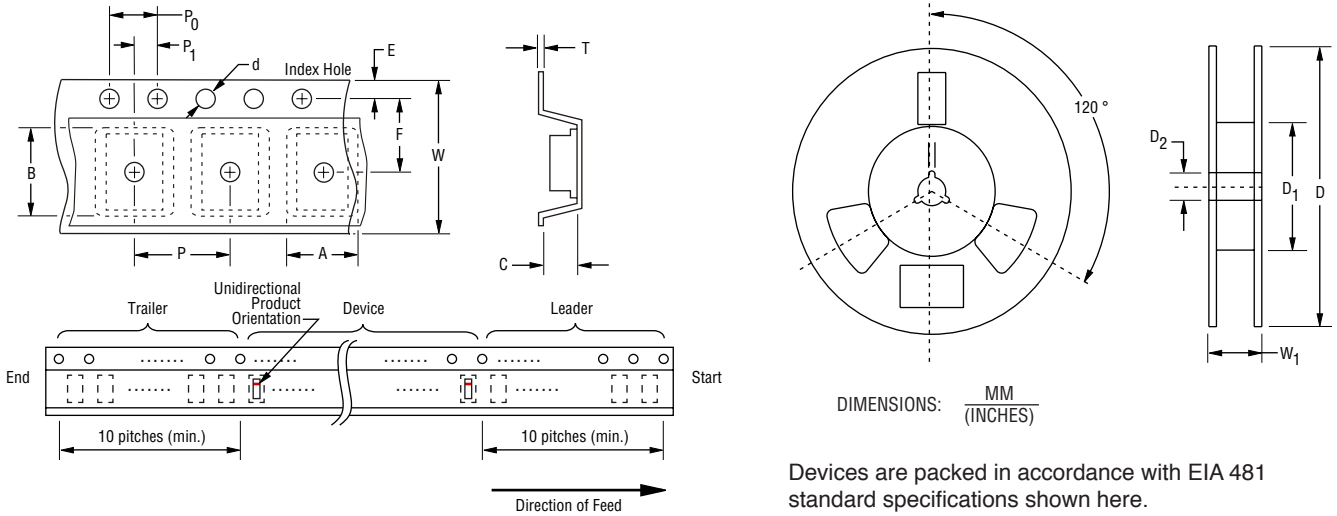
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Packaging Information

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



Devices are packed in accordance with EIA 481 standard specifications shown here.

| Item | Symbol | SMB (DO-214AA) | |
|------------------------|----------------|-------------------------------------|------------------------|
| | | 7-Inch Reel | 13-Inch Reel |
| Carrier Width | A | 3.67 ± 0.20 (0.144 ± 0.008) | |
| Carrier Length | B | 5.60 ± 0.20 (0.220 ± 0.008) | |
| Carrier Depth | C | 2.57 ± 0.20 (0.101 ± 0.008) | |
| Sprocket Hole | d | 1.50 ± 0.10 (0.059 ± 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 | 13.0 ± 0.20 (0.512 ± 0.008) | |
| Sprocket Hole Position | E | 1.75 ± 0.10 (0.069 ± 0.004) | |
| Punch Hole Position | F | 5.50 ± 0.05 (0.217 ± 0.002) | |
| Punch Hole Pitch | P | 8.00 ± 0.10 (0.315 ± 0.004) | |
| Sprocket Hole Pitch | P ₀ | 4.00 ± 0.10 (0.157 ± 0.004) | |
| Embossment Center | P ₁ | 2.00 ± 0.05 (0.079 ± 0.002) | |
| Overall Tape Thickness | T | 0.30 ± 0.10 (0.012 ± 0.004) | |
| Tape Width | W | 12.00 ± 0.30 (0.472 ± 0.012) | |
| Reel Width | W ₁ | $\frac{18.4}{(0.724)}$ MAX. | |
| Quantity per Reel | -- | 500 | 3,000 |

REV. 10/20

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