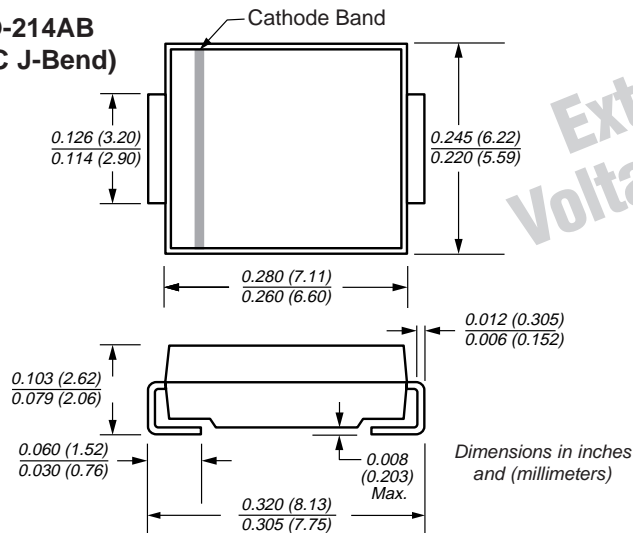




Surface Mount TRANSZORB® Transient Voltage Suppressors

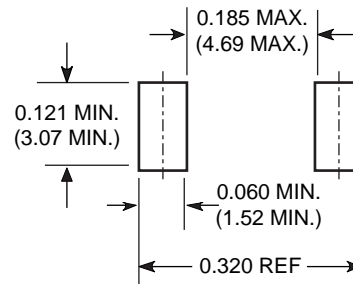
Stand-off Voltage 5.0 to 188V
Peak Pulse Power 1500W

DO-214AB
(SMC J-Bend)



Extended
Voltage Range

Mounting Pad Layout



Features

- Underwriters Laboratory Recognition under UL standard for safety 497B: Isolated Loop Circuit Protection
- Low profile package with built-in strain relief for surface mounted applications
- Glass passivated junction
- Low incremental surge resistance, excellent clamping capability
- 1500W peak pulse power capability with a 10/1000µs waveform, repetition rate (duty cycle): 0.01%
- Very fast response time
- High temperature soldering guaranteed: 250°C/10 seconds at terminals

Mechanical Data

Case: JEDEC DO-214AB molded plastic over passivated junction

Terminals: Solder plated, solderable per MIL-STD-750, Method 2026

Polarity: For unidirectional types the band denotes the cathode, which is positive with respect to the anode under normal TVS operation

Weight: 0.007 oz., 0.21 g

Flammability: Epoxy is rated UL 94V-0

Packaging Codes – Options (Antistatic):

51 – 1K per Bulk box, 10K/carton

57 – 850 per 7" plastic Reel (16mm tape), 8.5K/carton

9A – 3.5K per 13" plastic Reel (16mm tape), 35K/carton

Devices for Bidirectional Applications

For bi-directional devices, use suffix C or CA (e.g. SMCJ10C, SMCJ10CA). Electrical characteristics apply in both directions.

Maximum Ratings & Thermal Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter | Symbol | Value | Unit |
|--|-----------------------------------|----------------|------|
| Peak pulse power dissipation with a 10/1000µs waveform ⁽¹⁾⁽²⁾ | PPPM | Minimum 1500 | W |
| Peak pulse current with a 10/1000µs waveform ⁽¹⁾ | IPPM | See Next Table | A |
| Peak forward surge current 8.3ms single half sine-wave ⁽²⁾ uni-directional only | IFSM | 200 | A |
| Typical thermal resistance, junction to ambient ⁽³⁾ | R _{θJA} | 75 | °C/W |
| Typical thermal resistance, junction to lead | R _{θJL} | 15 | °C/W |
| Operating junction and storage temperature range | T _J , T _{STG} | -55 to +150 | °C |

Notes: (1) Non-repetitive current pulse, per Fig.3 and derated above T_A = 25°C per Fig. 2

(2) Mounted on 0.31 x 0.31" (8.0 x 8.0mm) copper pads to each terminal

(3) Mounted on minimum recommended pad layout

SMCJ5.0 thru 188CA

Vishay Semiconductors
formerly General Semiconductor



Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified. $V_F = 3.5V$ at $I_F = 100A$ (uni-directional only)

| Device Type Modified "J" Bend Lead | Device Marking Code | | Breakdown Voltage $V_{(BR)}$ at $I_T^{(1)}$ (V) | | Test Current I_T (mA) | Stand-off Voltage V_{WM} (V) | Maximum Reverse Leakage at V_{WM} I_D (μA) ⁽³⁾ | Maximum Peak Pulse Surge Current I_{PPM} (A) ⁽²⁾ | Maximum Clamping Voltage at I_{PPM} V_C (V) |
|---------------------------------------|---------------------|-----|---|------|-------------------------|--------------------------------|--|---|---|
| | UNI | BI | Min | Max | | | | | |
| +SMCJ5.0 | GDD | GDD | 6.40 | 7.82 | 10.0 | 5.0 | 1000 | 156.3 | 9.6 |
| +SMCJ5.0A ⁽⁵⁾ | GDE | GDE | 6.40 | 7.07 | 10.0 | 5.0 | 1000 | 163.0 | 9.2 |
| +SMCJ6.0 | GDF | GDF | 6.67 | 8.15 | 10.0 | 6.0 | 1000 | 131.6 | 11.4 |
| +SMCJ6.0A | GDG | GDG | 6.67 | 7.37 | 10.0 | 6.0 | 1000 | 145.6 | 10.3 |
| +SMCJ6.5 | GDH | BDH | 7.22 | 8.82 | 10.0 | 6.5 | 500 | 122.0 | 12.3 |
| +SMCJ6.5A | GDK | BDK | 7.22 | 7.98 | 10.0 | 6.5 | 500 | 133.9 | 11.2 |
| +SMCJ7.0 | GDL | GDL | 7.78 | 9.51 | 10.0 | 7.0 | 200 | 112.8 | 13.3 |
| +SMCJ7.0A | GDM | GDM | 7.78 | 8.60 | 10.0 | 7.0 | 200 | 125.0 | 12.0 |
| +SMCJ7.5 | GDN | BDN | 8.33 | 10.2 | 1.0 | 7.5 | 100 | 104.9 | 14.3 |
| +SMCJ7.5A | GDP | BDP | 8.33 | 9.21 | 1.0 | 7.5 | 100 | 116.3 | 12.9 |
| +SMCJ8.0 | GDQ | BDG | 8.89 | 10.9 | 1.0 | 8.0 | 50 | 100.0 | 15.0 |
| +SMCJ8.0A | GDR | BDR | 8.89 | 9.83 | 1.0 | 8.0 | 50 | 110.3 | 13.6 |
| +SMCJ8.5 | GDS | BDS | 9.44 | 11.5 | 1.0 | 8.5 | 20 | 94.3 | 15.9 |
| +SMCJ8.5A | GDT | BDT | 9.44 | 10.4 | 1.0 | 8.5 | 20 | 104.2 | 14.4 |
| +SMCJ9.0 | GDU | BDU | 10.0 | 12.2 | 1.0 | 9.0 | 10 | 88.8 | 16.9 |
| +SMCJ9.0A | GDV | BDV | 10.0 | 11.1 | 1.0 | 9.0 | 10 | 97.4 | 15.4 |
| +SMCJ10 | GDW | BDW | 11.1 | 13.6 | 1.0 | 10 | 5.0 | 79.8 | 18.8 |
| +SMCJ10A | GDX | BDX | 11.1 | 12.3 | 1.0 | 10 | 5.0 | 88.2 | 17.0 |
| +SMCJ11 | GDY | GDY | 12.2 | 14.9 | 1.0 | 11 | 5.0 | 74.6 | 20.1 |
| +SMCJ11A | GDZ | GDZ | 12.2 | 13.5 | 1.0 | 11 | 5.0 | 82.4 | 18.2 |
| +SMCJ12 | GED | BED | 13.3 | 16.3 | 1.0 | 12 | 5.0 | 68.2 | 22.0 |
| +SMCJ12A | GEE | BEE | 13.3 | 14.7 | 1.0 | 12 | 5.0 | 75.4 | 19.9 |
| +SMCJ13 | GEF | GEF | 14.4 | 17.6 | 1.0 | 13 | 1.0 | 63.0 | 23.8 |
| +SMCJ13A | GEG | GEG | 14.4 | 15.9 | 1.0 | 13 | 1.0 | 69.8 | 21.5 |
| +SMCJ14 | GEH | BEH | 15.6 | 19.1 | 1.0 | 14 | 1.0 | 58.1 | 25.8 |
| +SMCJ14A | GEK | BEK | 15.6 | 17.2 | 1.0 | 14 | 1.0 | 64.7 | 23.2 |
| +SMCJ15 | GEL | BEL | 16.7 | 20.4 | 1.0 | 15 | 1.0 | 55.8 | 26.9 |
| +SMCJ15A | GEM | BEM | 16.7 | 18.5 | 1.0 | 15 | 1.0 | 61.5 | 24.4 |
| +SMCJ16 | GEN | GEN | 17.8 | 21.8 | 1.0 | 16 | 1.0 | 52.1 | 28.8 |
| +SMCJ16A | GEP | GEP | 17.8 | 19.7 | 1.0 | 16 | 1.0 | 57.7 | 26.0 |
| +SMCJ17 | GEQ | GEQ | 18.9 | 23.1 | 1.0 | 17 | 1.0 | 49.2 | 30.5 |
| +SMCJ17A | GER | GER | 18.9 | 20.9 | 1.0 | 17 | 1.0 | 54.3 | 27.6 |
| +SMCJ18 | GES | BES | 20.0 | 24.4 | 1.0 | 18 | 1.0 | 46.6 | 32.2 |
| +SMCJ18A | GET | BET | 20.0 | 22.1 | 1.0 | 18 | 1.0 | 51.4 | 29.2 |
| +SMCJ20 | GEU | BEU | 22.2 | 27.1 | 1.0 | 20 | 1.0 | 41.9 | 35.8 |
| +SMCJ20A | GEV | BEV | 22.2 | 24.5 | 1.0 | 20 | 1.0 | 46.3 | 32.4 |
| +SMCJ22 | GEW | BEW | 24.4 | 29.8 | 1.0 | 22 | 1.0 | 38.1 | 39.4 |
| +SMCJ22A | GEX | BEX | 24.4 | 26.9 | 1.0 | 22 | 1.0 | 42.3 | 35.5 |
| +SMCJ24 | GEY | BEY | 26.7 | 32.6 | 1.0 | 24 | 1.0 | 34.9 | 43.0 |
| +SMCJ24A | GEZ | BEZ | 26.7 | 29.5 | 1.0 | 24 | 1.0 | 38.6 | 38.9 |
| +SMCJ26 | GFD | BFD | 28.9 | 35.3 | 1.0 | 26 | 1.0 | 32.2 | 46.6 |
| +SMCJ26A | GFE | BFE | 28.9 | 31.9 | 1.0 | 26 | 1.0 | 35.6 | 42.1 |
| +SMCJ28 | GFF | BFF | 31.1 | 38.0 | 1.0 | 28 | 1.0 | 30.0 | 50.0 |
| +SMCJ28A | GFG | BFG | 31.1 | 34.4 | 1.0 | 28 | 1.0 | 33.0 | 45.4 |
| +SMCJ30 | GFH | BFH | 33.3 | 40.7 | 1.0 | 30 | 1.0 | 28.0 | 53.5 |
| +SMCJ30A | GFK | BFK | 33.3 | 36.8 | 1.0 | 30 | 1.0 | 31.0 | 48.4 |

Notes: (1) Pulse test: $t_p \leq 50ms$

(2) Surge current waveform per Fig. 3 and derate per Fig. 2

(3) For bi-directional types having V_{WM} of 10 Volts and less, the I_D limit is doubled

(4) All terms and symbols are consistent with ANSI/IEEE C62.35

(5) For the bi-directional SMCJ/SMCJ5.0CA, the maximum $V_{(BR)}$ is 7.25V

+ Underwriters Laboratory Recognition for the classification of protectors (QVQG2) under the UL standard for safety 497B and file number E136766 for both uni-directional and bi-directional devices



Electrical Characteristics Ratings at 25°C ambient temperature unless otherwise specified. Vf = 3.5V at If = 100A (uni-directional only)

| Device Type Modified "J" Bend Lead | Device Marking Code | | Breakdown Voltage V _(BR) at I _T ⁽¹⁾ (V) | | Test Current I _T (mA) | Stand-off Voltage V _{WM} (V) | Maximum Reverse Leakage at V _{WM} I _D (μA) ⁽³⁾ | Maximum Peak Pulse Surge Current I _{PPM} (A) ⁽²⁾ | Maximum Clamping Voltage at I _{PPM} V _C (V) |
|---------------------------------------|---------------------|-----|--|------|----------------------------------|---------------------------------------|---|--|---|
| | UNI | BI | Min | Max | | | | | |
| +SMCJ33 | GFL | BFL | 36.7 | 44.9 | 1.0 | 33 | 1.0 | 25.4 | 59.0 |
| +SMCJ33A | GFM | BFM | 36.7 | 40.6 | 1.0 | 33 | 1.0 | 28.1 | 53.3 |
| +SMCJ36 | GFN | BFN | 40.0 | 48.9 | 1.0 | 36 | 1.0 | 23.3 | 64.3 |
| +SMCJ36A | GFP | BFP | 40.0 | 44.2 | 1.0 | 36 | 1.0 | 25.8 | 58.1 |
| +SMCJ40 | GFQ | BFQ | 44.4 | 54.3 | 1.0 | 40 | 1.0 | 21.0 | 71.4 |
| +SMCJ40A | GFR | BFR | 44.4 | 49.1 | 1.0 | 40 | 1.0 | 23.3 | 64.5 |
| +SMCJ43 | GFS | BFS | 47.8 | 58.4 | 1.0 | 43 | 1.0 | 19.6 | 76.7 |
| +SMCJ43A | GFT | BFT | 47.8 | 52.8 | 1.0 | 43 | 1.0 | 21.6 | 69.4 |
| +SMCJ45 | GFU | GFU | 50.0 | 61.1 | 1.0 | 45 | 1.0 | 18.7 | 80.3 |
| +SMCJ45A | GFV | GFV | 50.0 | 55.3 | 1.0 | 45 | 1.0 | 20.6 | 72.7 |
| +SMCJ48 | GFW | GFW | 53.3 | 65.1 | 1.0 | 48 | 1.0 | 17.5 | 85.5 |
| +SMCJ48A | GFX | GFX | 53.3 | 58.9 | 1.0 | 48 | 1.0 | 19.4 | 77.4 |
| +SMCJ51 | GFY | GFY | 56.7 | 69.3 | 1.0 | 51 | 1.0 | 16.5 | 91.1 |
| +SMCJ51A | GFZ | GFZ | 56.7 | 62.7 | 1.0 | 51 | 1.0 | 18.2 | 82.4 |
| +SMCJ54 | GGD | GGD | 60.0 | 73.3 | 1.0 | 54 | 1.0 | 15.6 | 96.3 |
| +SMCJ54A | GGE | GGE | 60.0 | 66.3 | 1.0 | 54 | 1.0 | 17.2 | 87.1 |
| +SMCJ58 | GGF | GGF | 64.4 | 78.7 | 1.0 | 58 | 1.0 | 14.6 | 103 |
| +SMCJ58A | GGG | GGG | 64.4 | 71.2 | 1.0 | 58 | 1.0 | 16.0 | 93 |
| +SMCJ60 | GGH | GGH | 66.7 | 81.5 | 1.0 | 60 | 1.0 | 14.0 | 107 |
| +SMCJ60A | GGK | GGK | 66.7 | 73.7 | 1.0 | 60 | 1.0 | 15.5 | 96 |
| +SMCJ64 | GGL | GGL | 71.1 | 86.9 | 1.0 | 64 | 1.0 | 13.2 | 114 |
| +SMCJ64A | GGM | GGM | 71.1 | 78.6 | 1.0 | 64 | 1.0 | 14.6 | 103 |
| +SMCJ70 | GGN | GGN | 77.8 | 95.1 | 1.0 | 70 | 1.0 | 12.0 | 125 |
| +SMCJ70A | GGP | GGP | 77.8 | 86.0 | 1.0 | 70 | 1.0 | 13.3 | 113 |
| +SMCJ75 | GGQ | GGQ | 83.3 | 102 | 1.0 | 75 | 1.0 | 11.2 | 134 |
| +SMCJ75A | GGR | GGR | 83.3 | 92.1 | 1.0 | 75 | 1.0 | 12.4 | 121 |
| +SMCJ78 | GGS | GGS | 86.7 | 106 | 1.0 | 78 | 1.0 | 10.8 | 139 |
| +SMCJ78A | GGT | GGT | 86.7 | 95.8 | 1.0 | 78 | 1.0 | 11.9 | 126 |
| +SMCJ85 | GGU | GGU | 94.4 | 115 | 1.0 | 85 | 1.0 | 9.9 | 151 |
| +SMCJ85A | GGV | GGV | 94.4 | 104 | 1.0 | 85 | 1.0 | 10.9 | 137 |
| +SMCJ90 | GGW | GGW | 100 | 122 | 1.0 | 90 | 1.0 | 9.4 | 160 |
| +SMCJ90A | GGX | GGX | 100 | 111 | 1.0 | 90 | 1.0 | 10.3 | 146 |
| +SMCJ100 | GGY | GGY | 111 | 136 | 1.0 | 100 | 1.0 | 8.4 | 179 |
| +SMCJ100A | GGZ | GGZ | 111 | 123 | 1.0 | 100 | 1.0 | 9.3 | 162 |
| +SMCJ110 | GHD | GHD | 122 | 149 | 1.0 | 110 | 1.0 | 7.7 | 196 |
| +SMCJ110A | GHE | GHE | 122 | 135 | 1.0 | 110 | 1.0 | 8.5 | 177 |
| +SMCJ120 | GHF | GHF | 133 | 163 | 1.0 | 120 | 1.0 | 7.0 | 214 |
| +SMCJ120A | GHG | GHG | 133 | 147 | 1.0 | 120 | 1.0 | 7.8 | 193 |
| +SMCJ130 | GHH | GHH | 144 | 176 | 1.0 | 130 | 1.0 | 6.5 | 231 |
| +SMCJ130A | GHK | GHK | 144 | 159 | 1.0 | 130 | 1.0 | 7.2 | 209 |
| +SMCJ150 | GHL | GHL | 167 | 204 | 1.0 | 150 | 1.0 | 5.6 | 268 |
| +SMCJ150A | GHM | GHM | 167 | 185 | 1.0 | 150 | 1.0 | 6.2 | 243 |
| +SMCJ160 | GHN | GHN | 178 | 218 | 1.0 | 160 | 1.0 | 5.2 | 287 |
| +SMCJ160A | GHP | GHP | 178 | 197 | 1.0 | 160 | 1.0 | 5.8 | 259 |
| +SMCJ170 | GHQ | GHQ | 189 | 231 | 1.0 | 170 | 1.0 | 4.9 | 304 |
| +SMCJ170A | GHR | GHR | 189 | 209 | 1.0 | 170 | 1.0 | 5.5 | 275 |
| SMCJ188 | GHT | GHT | 209 | 255 | 1.0 | 188 | 1.0 | 4.4 | 344 |
| SMCJ188A | GHS | GHS | 209 | 231 | 1.0 | 188 | 1.0 | 4.6 | 328 |

- Notes:** (1) Pulse test: t_p ≤ 50ms
 (2) Surge current waveform per Fig. 3 and derate per Fig. 2
 (3) For bi-directional types having V_{WM} of 10 Volts and less, the I_D limit is doubled
 (4) All terms and symbols are consistent with ANSI/IEEE C62.35
 + Underwriters Laboratory Recognition for the classification of protectors (QVQG2) under the UL standard for safety 497B and file number E136766 for both uni-directional and bi-directional devices

Ratings and Characteristic Curves ($T_A = 25^\circ\text{C}$ unless otherwise noted)

