

**Working Voltage: 5.0 to 440 V**  
**Peak Pulse Power: 1500 W**

## Surface Mount Transient Voltage Suppressors

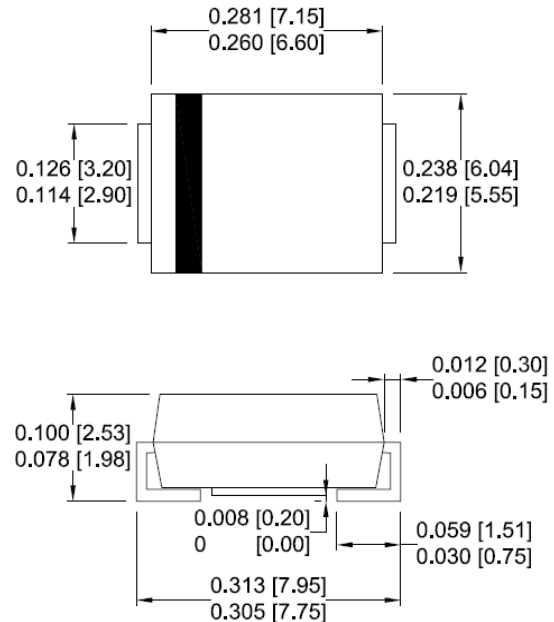
### Features

- Glass passivated chip
- 1500 W peak pulse power capability with a 10/1000  $\mu$ s waveform, repetitive rate (duty cycle):0.01 %
- Low leakage
- Uni and Bidirectional unit
- Excellent clamping capability
- Very fast response time
- RoHS compliant
- IEC-61000-4-2 ESD 15kV(Air), 8kV (Contact)

### Mechanical Data

- Case: Molded plastic
- Epoxy: UL 94V-0 rate flame retardant
- Lead: Solderable per MIL-STD-750, method 2026
- Polarity: Color band denotes cathode end except Bipolar
- Mounting position: Any

SMC/ DO-214AB



Dimensions: inch[mm]

### Maximum Ratings( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter   | Symbol          | Value          | Unit                      |
|---|-----------------|----------------|---------------------------|
| Peak power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)</sup>                       | $P_{PP}$        | 1500           | W                         |
| Peak pulse current with a 10/1000 $\mu$ s waveform <sup>(1)</sup>                           | $I_{PP}$        | See Next Table | A                         |
| Power dissipation on infinite heatsink at $T_L = 75^\circ\text{C}$                          | $P_D$           | 6.5            | W                         |
| Peak forward surge current, 8.3 ms single half sine-wave unidirectional only <sup>(2)</sup> | $I_{FSM}$       | 200            | A                         |
| Maximum instantaneous forward voltage at 100 A for unidirectional only <sup>(3)</sup>       | $V_F$           | 3.5/5.0        | V                         |
| Operating junction and storage temperature range  | $T_J, T_{STG}$  | - 55 to +150   | $^\circ\text{C}$          |
| Typical thermal resistance, Junction to Ambient   | $R_{\theta JA}$ | 75             | $^\circ\text{C}/\text{W}$ |
| Typical thermal resistance, junction to lead  | $R_{\theta JL}$ | 15             |                           |

**Note:**

(1)Non-repetitive current pulse per Fig.5 and derated above  $T_A = 25^\circ\text{C}$  per Fig.1

(2)Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

(3) $V_F < 3.5\text{V}$  for devices of  $V_{BR} < 200\text{V}$  and  $V_F < 5.0\text{V}$  for devices of  $V_{BR} > 201\text{V}$



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

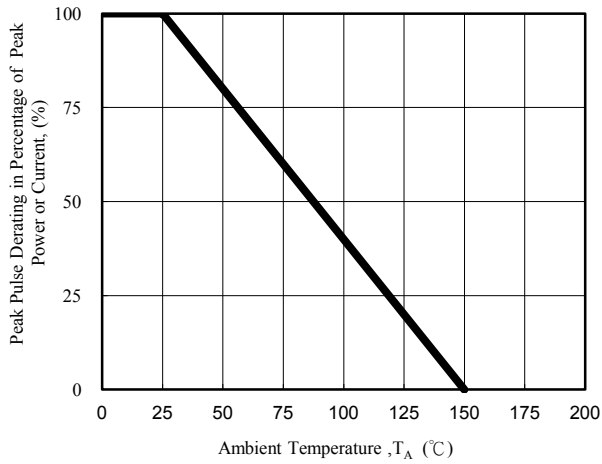


Fig. 1 - Pulse Derating Curve

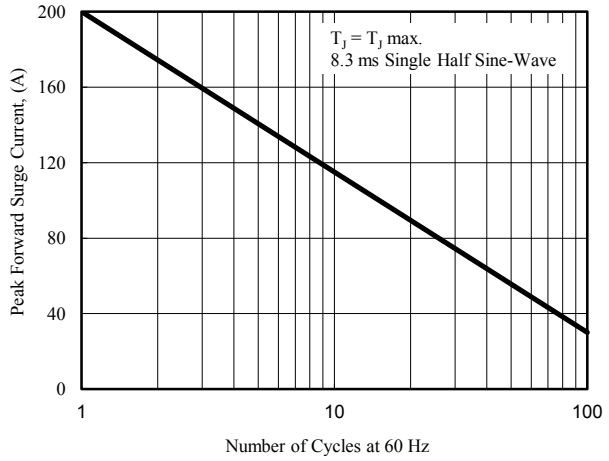


Fig. 2 - Maximum Non-Repetitive Surge Current

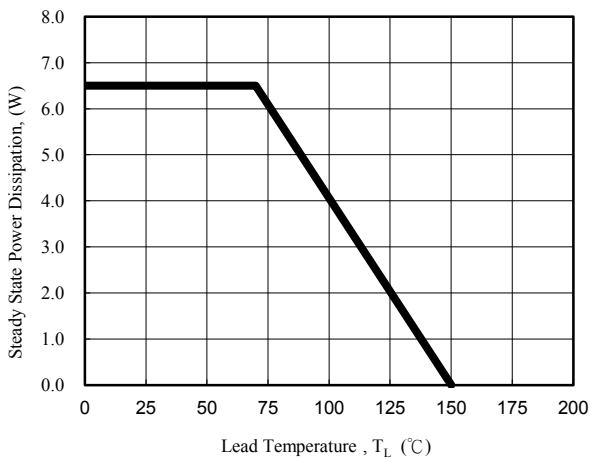


Fig. 3 - Steady State Power Derating Curve

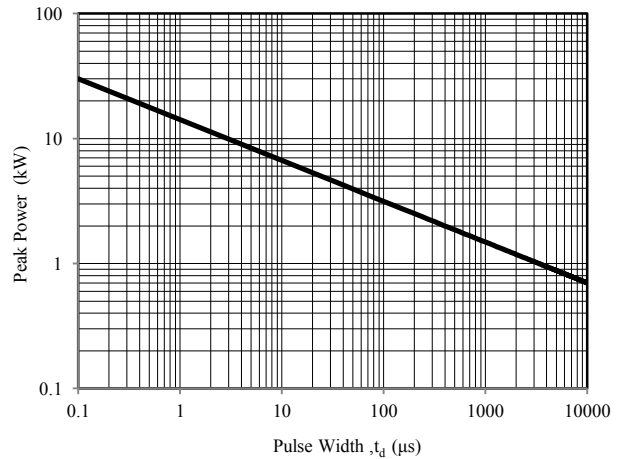


Fig. 4 - Peak Pulse Power Rating Curve

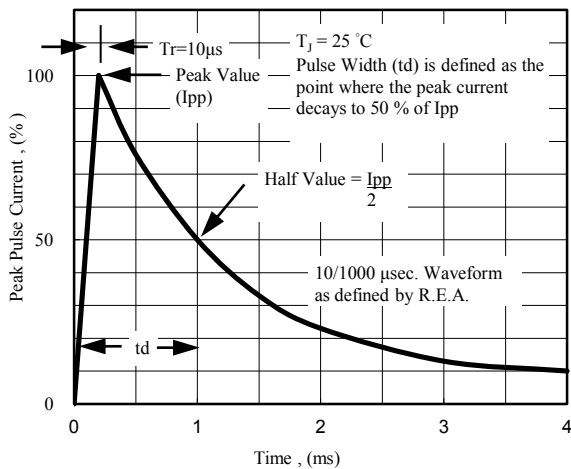


Fig. 5 - Pulse Waveform

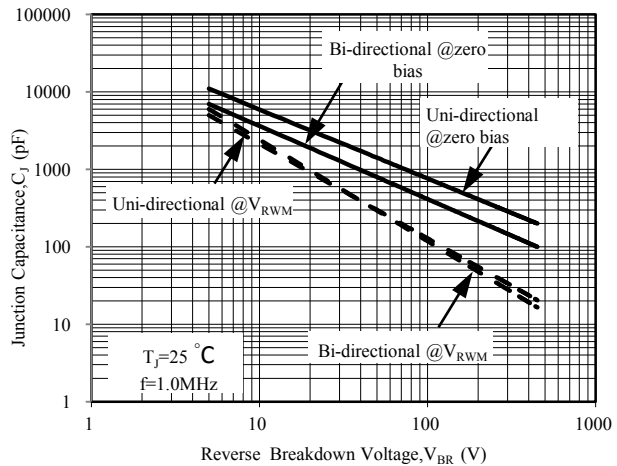


Fig. 6 - Typical Junction Capacitance



Electrical Characteristics( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

| Part Number (Uni) | Part Number (Bi) | Device Marking Code |     | Breakdown Voltage $V_{BR}$ @ $I_T$ |         |            | Maximum Reverse Leakage $I_R$ @ $V_{RWM}$ (uA) | Working Peak Reverse Voltage $V_{RWM}$ (V) | Maximum Reverse Surge Current $I_{PP}$ (A) | Maximum Clamping Voltage $V_C$ @ $I_{PP}$ (V) |
|-------------------|------------------|---------------------|-----|------------------------------------|---------|------------|--|--|--|---|
|                   |                  | Uni                 | Bi  | Min (V)                            | Max (V) | $I_T$ (mA) |  |  |  |   |
| SMCJ5.0           | SMCJ5.0C         | GDD                 | BDD | 6.40                               | 7.30    | 10         | 800  | 5.0  | 156.25                                     | 9.6   |
| SMCJ5.0A          | SMCJ5.0CA        | GDE                 | BDE | 6.40                               | 7.00    | 10         | 800  | 5.0  | 163.04                                     | 9.2   |
| SMCJ6.0           | SMCJ6.0C         | GDF                 | BDF | 6.67                               | 8.15    | 10         | 800  | 6.0  | 131.58                                     | 11.4  |
| SMCJ6.0A          | SMCJ6.0CA        | GDG                 | BDG | 6.67                               | 7.37    | 10         | 800  | 6.0  | 145.63                                     | 10.3  |
| SMCJ6.5           | SMCJ6.5C         | GDH                 | BDH | 7.22                               | 8.82    | 10         | 500  | 6.5  | 121.95                                     | 12.3  |
| SMCJ6.5A          | SMCJ6.5CA        | GDK                 | BDK | 7.22                               | 7.98    | 10         | 500  | 6.5  | 133.93                                     | 11.2  |
| SMCJ7.0           | SMCJ7.0C         | GDL                 | BDL | 7.78                               | 9.51    | 10         | 200  | 7.0  | 112.78                                     | 13.3  |
| SMCJ7.0A          | SMCJ7.0CA        | GDM                 | BDM | 7.78                               | 8.60    | 10         | 200  | 7.0  | 125.00                                     | 12.0  |
| SMCJ7.5           | SMCJ7.5C         | GDN                 | BDN | 8.33                               | 10.20   | 1          | 100  | 7.5  | 104.90                                     | 14.3  |
| SMCJ7.5A          | SMCJ7.5CA        | GDP                 | BDP | 8.33                               | 9.21    | 1          | 100  | 7.5  | 116.28                                     | 12.9  |
| SMCJ8.0           | SMCJ8.0C         | GDQ                 | BDQ | 8.89                               | 10.90   | 1          | 50   | 8.0  | 100.00                                     | 15.0  |
| SMCJ8.0A          | SMCJ8.0CA        | GDR                 | BDR | 8.89                               | 9.83    | 1          | 50   | 8.0  | 110.29                                     | 13.6  |
| SMCJ8.5           | SMCJ8.5C         | GDS                 | BDS | 9.44                               | 11.50   | 1          | 20   | 8.5  | 94.34                                      | 15.9  |
| SMCJ8.5A          | SMCJ8.5CA        | GDT                 | BDT | 9.44                               | 10.40   | 1          | 20   | 8.5  | 104.17                                     | 14.4  |
| SMCJ9.0           | SMCJ9.0C         | GDU                 | BDU | 10.00                              | 12.20   | 1          | 10   | 9.0  | 88.76                                      | 16.9  |
| SMCJ9.0A          | SMCJ9.0CA        | GDV                 | BDV | 10.00                              | 11.10   | 1          | 10   | 9.0  | 97.40                                      | 15.4  |
| SMCJ10            | SMCJ10C          | GDW                 | BDW | 11.10                              | 13.60   | 1          | 5  | 10.0                                       | 79.79                                      | 18.8  |
| SMCJ10A           | SMCJ10CA         | GDX                 | BDX | 11.10                              | 12.30   | 1          | 5  | 10.0                                       | 88.24                                      | 17.0  |
| SMCJ11            | SMCJ11C          | GDY                 | BDY | 12.20                              | 14.90   | 1          | 1  | 11.0                                       | 74.63                                      | 20.1  |
| SMCJ11A           | SMCJ11CA         | GDZ                 | BDZ | 12.20                              | 13.50   | 1          | 1  | 11.0                                       | 82.42                                      | 18.2  |
| SMCJ12            | SMCJ12C          | GED                 | BED | 13.30                              | 16.30   | 1          | 1  | 12.0                                       | 68.18                                      | 22.0  |
| SMCJ12A           | SMCJ12CA         | GEE                 | BEE | 13.30                              | 14.70   | 1          | 1  | 12.0                                       | 75.38                                      | 19.9  |
| SMCJ13            | SMCJ13C          | GEF                 | BEF | 14.40                              | 17.60   | 1          | 1  | 13.0                                       | 63.03                                      | 23.8  |
| SMCJ13A           | SMCJ13CA         | GEG                 | BEG | 14.40                              | 15.90   | 1          | 1  | 13.0                                       | 69.77                                      | 21.5  |
| SMCJ14            | SMCJ14C          | GEH                 | BEH | 15.60                              | 19.10   | 1          | 1  | 14.0                                       | 58.14                                      | 25.8  |
| SMCJ14A           | SMCJ14CA         | GEK                 | BEK | 15.60                              | 17.20   | 1          | 1  | 14.0                                       | 64.66                                      | 23.2  |
| SMCJ15            | SMCJ15C          | GEL                 | BEL | 16.70                              | 20.40   | 1          | 1  | 15.0                                       | 55.76                                      | 26.9  |
| SMCJ15A           | SMCJ15CA         | GEM                 | BEM | 16.70                              | 18.50   | 1          | 1  | 15.0                                       | 61.48                                      | 24.4  |
| SMCJ16            | SMCJ16C          | GEN                 | BEN | 17.80                              | 21.80   | 1          | 1  | 16.0                                       | 52.08                                      | 28.8  |
| SMCJ16A           | SMCJ16CA         | GEP                 | BEP | 17.80                              | 19.70   | 1          | 1  | 16.0                                       | 57.69                                      | 26.0  |
| SMCJ17            | SMCJ17C          | GEQ                 | BEQ | 18.90                              | 23.10   | 1          | 1  | 17.0                                       | 49.18                                      | 30.5  |
| SMCJ17A           | SMCJ17CA         | GER                 | BER | 18.90                              | 20.90   | 1          | 1  | 17.0                                       | 54.35                                      | 27.6  |
| SMCJ18            | SMCJ18C          | GES                 | BES | 20.00                              | 24.40   | 1          | 1  | 18.0                                       | 46.58                                      | 32.2  |
| SMCJ18A           | SMCJ18CA         | GET                 | BET | 20.00                              | 22.10   | 1          | 1  | 18.0                                       | 51.37                                      | 29.2  |
| SMCJ19            | SMCJ19C          | GEA                 | BEA | 21.13                              | 25.76   | 1          | 1  | 19.0                                       | 44.10                                      | 34.0  |
| SMCJ19A           | SMCJ19CA         | GEB                 | BEB | 21.10                              | 23.30   | 1          | 1  | 19.0                                       | 48.73                                      | 30.8  |
| SMCJ20            | SMCJ20C          | GEU                 | BEU | 22.20                              | 27.10   | 1          | 1  | 20.0                                       | 41.90                                      | 35.8  |
| SMCJ20A           | SMCJ20CA         | GEV                 | BEV | 22.20                              | 24.50   | 1          | 1  | 20.0                                       | 46.30                                      | 32.4  |
| SMCJ22            | SMCJ22C          | GEW                 | BEW | 24.40                              | 29.80   | 1          | 1  | 22.0                                       | 38.07                                      | 39.4  |
| SMCJ22A           | SMCJ22CA         | GEX                 | BEX | 24.40                              | 26.90   | 1          | 1  | 22.0                                       | 42.25                                      | 35.5  |
| SMCJ24            | SMCJ24C          | GEY                 | BEY | 26.70                              | 32.60   | 1          | 1  | 24.0                                       | 34.88                                      | 43.0  |
| SMCJ24A           | SMCJ24CA         | GEZ                 | BEZ | 26.70                              | 29.50   | 1          | 1  | 24.0                                       | 38.56                                      | 38.9  |
| SMCJ26            | SMCJ26C          | GFD                 | BFD | 28.90                              | 35.30   | 1          | 1  | 26.0                                       | 32.19                                      | 46.6  |
| SMCJ26A           | SMCJ26CA         | GFE                 | BFE | 28.90                              | 31.90   | 1          | 1  | 26.0                                       | 35.63                                      | 42.1  |
| SMCJ28            | SMCJ28C          | GFF                 | BFF | 31.10                              | 38.00   | 1          | 1  | 28.0                                       | 30.00                                      | 50.0  |
| SMCJ28A           | SMCJ28CA         | GFG                 | BFG | 31.10                              | 34.40   | 1          | 1  | 28.0                                       | 33.04                                      | 45.4  |
| SMCJ30            | SMCJ30C          | GFH                 | BFH | 33.30                              | 40.70   | 1          | 1  | 30.0                                       | 28.04                                      | 53.5  |
| SMCJ30A           | SMCJ30CA         | GFK                 | BFK | 33.30                              | 36.80   | 1          | 1  | 30.0                                       | 30.99                                      | 48.4  |
| SMCJ33            | SMCJ33C          | GFL                 | BFL | 36.70                              | 44.90   | 1          | 1  | 33.0                                       | 25.42                                      | 59.0  |
| SMCJ33A           | SMCJ33CA         | GFM                 | BFM | 36.70                              | 40.60   | 1          | 1  | 33.0                                       | 28.14                                      | 53.3  |
| SMCJ36            | SMCJ36C          | GFN                 | BFN | 40.00                              | 48.90   | 1          | 1  | 36.0                                       | 23.33                                      | 64.3  |
| SMCJ36A           | SMCJ36CA         | GFP                 | BFP | 40.00                              | 44.20   | 1          | 1  | 36.0                                       | 25.82                                      | 58.1  |



Electrical Characteristics( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

| Part Number<br>(Uni) | Part Number<br>(Bi) | Device Marking Code |     | Breakdown Voltage $V_{BR}$ @ $I_T$ |         |            | Maximum Reverse Leakage $I_R$ @ $V_{RWM}$ (uA) | Working Peak Reverse Voltage $V_{RWM}$ (V) | Maximum Reverse Surge Current $I_{PP}$ (A) | Maximum Clamping Voltage $V_C$ @ $I_{PP}$ (V) |
|----------------------|---------------------|---------------------|-----|------------------------------------|---------|------------|--|--|--|---|
|                      |                     | Uni                 | Bi  | Min (V)                            | Max (V) | $I_T$ (mA) |  |  |  |   |
| SMCJ40               | SMCJ40C             | GFQ                 | BFQ | 44.40                              | 54.30   | 1          | 1  | 40.0                                       | 21.01                                      | 71.4  |
| SMCJ40A              | SMCJ40CA            | GFR                 | BFR | 44.40                              | 49.10   | 1          | 1  | 40.0                                       | 23.26                                      | 64.5  |
| SMCJ43               | SMCJ43C             | GFS                 | BFS | 47.80                              | 58.40   | 1          | 1  | 43.0                                       | 19.56                                      | 76.7  |
| SMCJ43A              | SMCJ43CA            | GFT                 | BFT | 47.80                              | 52.80   | 1          | 1  | 43.0                                       | 21.61                                      | 69.4  |
| SMCJ45               | SMCJ45C             | GFU                 | BFU | 50.00                              | 61.10   | 1          | 1  | 45.0                                       | 18.68                                      | 80.3  |
| SMCJ45A              | SMCJ45CA            | GFV                 | BFV | 50.00                              | 55.30   | 1          | 1  | 45.0                                       | 20.63                                      | 72.7  |
| SMCJ48               | SMCJ48C             | GFW                 | BFW | 53.30                              | 65.10   | 1          | 1  | 48.0                                       | 17.54                                      | 85.5  |
| SMCJ48A              | SMCJ48CA            | GFX                 | BFX | 53.30                              | 58.90   | 1          | 1  | 48.0                                       | 19.38                                      | 77.4  |
| SMCJ51               | SMCJ51C             | GFY                 | BFY | 56.70                              | 69.30   | 1          | 1  | 51.0                                       | 16.47                                      | 91.1  |
| SMCJ51A              | SMCJ51CA            | GFZ                 | BFZ | 56.70                              | 62.70   | 1          | 1  | 51.0                                       | 18.20                                      | 82.4  |
| SMCJ54               | SMCJ54C             | GGD                 | BGD | 60.00                              | 73.30   | 1          | 1  | 54.0                                       | 15.58                                      | 96.3  |
| SMCJ54A              | SMCJ54CA            | GGE                 | BGE | 60.00                              | 66.30   | 1          | 1  | 54.0                                       | 17.22                                      | 87.1  |
| SMCJ58               | SMCJ58C             | GGF                 | BGF | 64.40                              | 78.70   | 1          | 1  | 58.0                                       | 14.56                                      | 103.0   |
| SMCJ58A              | SMCJ58CA            | GGG                 | BGG | 64.40                              | 71.20   | 1          | 1  | 58.0                                       | 16.03                                      | 93.6  |
| SMCJ60               | SMCJ60C             | GGH                 | BGH | 66.70                              | 81.50   | 1          | 1  | 60.0                                       | 14.02                                      | 107.0   |
| SMCJ60A              | SMCJ60CA            | GGK                 | BGK | 66.70                              | 73.70   | 1          | 1  | 60.0                                       | 15.50                                      | 96.8  |
| SMCJ64               | SMCJ64C             | GGL                 | BGL | 71.10                              | 86.90   | 1          | 1  | 64.0                                       | 13.16                                      | 114.0   |
| SMCJ64A              | SMCJ64CA            | GGM                 | BGM | 71.10                              | 78.60   | 1          | 1  | 64.0                                       | 14.56                                      | 103.0   |
| SMCJ70               | SMCJ70C             | GGN                 | BGN | 77.80                              | 95.10   | 1          | 1  | 70.0                                       | 12.00                                      | 125.0   |
| SMCJ70A              | SMCJ70CA            | GGP                 | BGP | 77.80                              | 86.00   | 1          | 1  | 70.0                                       | 13.27                                      | 113.0   |
| SMCJ75               | SMCJ75C             | GGQ                 | BGQ | 83.30                              | 102.00  | 1          | 1  | 75.0                                       | 11.19                                      | 134.0   |
| SMCJ75A              | SMCJ75CA            | GGR                 | BGR | 83.30                              | 92.10   | 1          | 1  | 75.0                                       | 12.40                                      | 121.0   |
| SMCJ78               | SMCJ78C             | GGS                 | BGS | 86.70                              | 106.00  | 1          | 1  | 78.0                                       | 10.79                                      | 139.0   |
| SMCJ78A              | SMCJ78CA            | GGT                 | BGT | 86.70                              | 95.80   | 1          | 1  | 78.0                                       | 11.90                                      | 126.0   |
| SMCJ80               | SMCJ80C             | GGA                 | BGA | 88.96                              | 108.80  | 1          | 1  | 80.0                                       | 10.47                                      | 143.2   |
| SMCJ80A              | SMCJ80CA            | GGB                 | BGB | 88.80                              | 97.60   | 1          | 1  | 80.0                                       | 11.57                                      | 129.6   |
| SMCJ85               | SMCJ85C             | GGU                 | BGU | 94.40                              | 115.00  | 1          | 1  | 85.0                                       | 9.93                                       | 151.0   |
| SMCJ85A              | SMCJ85CA            | GGV                 | BGV | 94.40                              | 104.00  | 1          | 1  | 85.0                                       | 10.95                                      | 137.0   |
| SMCJ90               | SMCJ90C             | GGW                 | BGW | 100.00                             | 122.00  | 1          | 1  | 90.0                                       | 9.38                                       | 160.0   |
| SMCJ90A              | SMCJ90CA            | GGX                 | BGX | 100.00                             | 111.00  | 1          | 1  | 90.0                                       | 10.27                                      | 146.0   |
| SMCJ100              | SMCJ100C            | GGY                 | BGY | 111.00                             | 136.00  | 1          | 1  | 100.0                                      | 8.38                                       | 179.0   |
| SMCJ100A             | SMCJ100CA           | GGZ                 | BGZ | 111.00                             | 123.00  | 1          | 1  | 100.0                                      | 9.26                                       | 162.0   |
| SMCJ110              | SMCJ110C            | GHD                 | BHD | 122.00                             | 149.00  | 1          | 1  | 110.0                                      | 7.65                                       | 196.0   |
| SMCJ110A             | SMCJ110CA           | GHE                 | BHE | 122.00                             | 135.00  | 1          | 1  | 110.0                                      | 8.47                                       | 177.0   |
| SMCJ120              | SMCJ120C            | GHF                 | BHF | 133.00                             | 163.00  | 1          | 1  | 120.0                                      | 7.01                                       | 214.0   |
| SMCJ120A             | SMCJ120CA           | GHG                 | BHG | 133.00                             | 147.00  | 1          | 1  | 120.0                                      | 7.77                                       | 193.0   |
| SMCJ130              | SMCJ130C            | GHH                 | BHH | 144.00                             | 176.00  | 1          | 1  | 130.0                                      | 6.49                                       | 231.0   |
| SMCJ130A             | SMCJ130CA           | GHK                 | BHK | 144.00                             | 159.00  | 1          | 1  | 130.0                                      | 7.18                                       | 209.0   |
| SMCJ140              | SMCJ140C            | GHA                 | BHA | 155.68                             | 190.40  | 1          | 1  | 140.0                                      | 5.99                                       | 250.6   |
| SMCJ140A             | SMCJ140CA           | GHB                 | BHB | 155.00                             | 171.00  | 1          | 1  | 140.0                                      | 6.61                                       | 226.8   |
| SMCJ150              | SMCJ150C            | GHL                 | BHL | 167.00                             | 204.00  | 1          | 1  | 150.0                                      | 5.60                                       | 268.0   |
| SMCJ150A             | SMCJ150CA           | GHM                 | BHM | 167.00                             | 185.00  | 1          | 1  | 150.0                                      | 6.17                                       | 243.0   |
| SMCJ160              | SMCJ160C            | GHN                 | BHN | 178.00                             | 218.00  | 1          | 1  | 160.0                                      | 5.23                                       | 287.0   |
| SMCJ160A             | SMCJ160CA           | GHP                 | BHP | 178.00                             | 197.00  | 1          | 1  | 160.0                                      | 5.79                                       | 259.0   |
| SMCJ170              | SMCJ170C            | GHQ                 | BHQ | 189.00                             | 231.00  | 1          | 1  | 170.0                                      | 4.93                                       | 304.0   |
| SMCJ170A             | SMCJ170CA           | GHR                 | BHR | 189.00                             | 209.00  | 1          | 1  | 170.0                                      | 5.45                                       | 275.0   |
| SMCJ180              | SMCJ180C            | GHS                 | BHS | 200.16                             | 244.80  | 1          | 1  | 180.0                                      | 4.66                                       | 322.2   |
| SMCJ180A             | SMCJ180CA           | GHT                 | BHT | 200.00                             | 220.00  | 1          | 1  | 180.0                                      | 5.14                                       | 291.6   |
| SMCJ190              | SMCJ190C            | GHU                 | BHU | 211.28                             | 258.40  | 1          | 1  | 190.0                                      | 4.41                                       | 340.1   |
| SMCJ190A             | SMCJ190CA           | GHV                 | BHV | 211.00                             | 232.00  | 1          | 1  | 190.0                                      | 4.87                                       | 307.8   |
| SMCJ200A             | SMCJ200CA           | GHW                 | BHW | 224.00                             | 247.00  | 1          | 1  | 200.0                                      | 4.60                                       | 324.0   |
| SMCJ220A             | SMCJ220CA           | GHX                 | BHX | 246.00                             | 272.00  | 1          | 1  | 220.0                                      | 4.20                                       | 356.0   |
| SMCJ250A             | SMCJ250CA           | GHZ                 | BHZ | 279.00                             | 309.00  | 1          | 1  | 250.0                                      | 3.70                                       | 405.0   |
| SMCJ300A             | SMCJ300CA           | GJE                 | BJE | 335.00                             | 371.00  | 1          | 1  | 300.0                                      | 3.10                                       | 486.0   |
| SMCJ350A             | SMCJ350CA           | GJG                 | BJG | 391.00                             | 432.00  | 1          | 1  | 350.0                                      | 2.60                                       | 567.0   |
| SMCJ400A             | SMCJ400CA           | GJK                 | BJK | 447.00                             | 494.00  | 1          | 1  | 400.0                                      | 2.30                                       | 648.0   |
| SMCJ440A             | SMCJ440CA           | GJM                 | BJM | 492.00                             | 543.00  | 1          | 1  | 440.0                                      | 2.10                                       | 713.0   |

Note:

1. Suffix 'A' denotes 5% tolerance device. Without 'A' denotes 10% tolerance device
2. Add suffix 'C' or 'CA' after part number to specify Bi-directional devices
3. For Bi-Directional devices having  $V_R$  of 10 volts and under, the  $I_R$  limit is double