



# SMCJ SERIES

## Surface Mount Transient Voltage Suppressor



Voltage Range  
5.0 to 170 Volts  
1500 Watts Peak Power

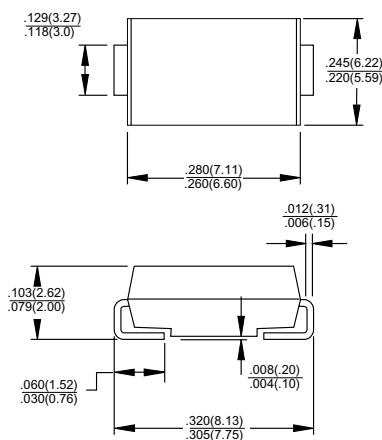
### Features

- ✧ For surface mounted application
- ✧ Low profile package
- ✧ Built-in strain relief
- ✧ Glass passivated junction
- ✧ Excellent clamping capability
- ✧ Fast response time: Typically less than 1.0ps from 0 volt to BV min.
- ✧ Typical  $I_R$  less than 1 A above 10V
- ✧ High temperature soldering guaranteed:  
250°C / 10 seconds at terminals
- ✧ Plastic material used carries Underwriters Laboratory  
Flammability Classification 94V-0
- ✧ 1500 watts peak pulse power capability with a 10 X 1000 us  
waveform by 0.01% duty cycle

### Mechanical Data

- ✧ Case: Molded plastic
- ✧ Terminals: Solder plated
- ✧ Polarity: Indicated by cathode band
- ✧ Standard packaging: 16mm tape (EIA STD RS-481)
- ✧ Weight: 0.21gram

### SMC/DO-214AB



Dimensions in inches and (millimeters)

### Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

| Type Number                                                                                                                          | Symbol            | Value        | Units              |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------|--------------------|
| Peak Power Dissipation at $T_A=25^{\circ}\text{C}$ , $T_p=1\text{ms}$ (Note 1)                                                       | $P_{PK}$          | Minimum 1500 | Watts              |
| Peak Forward Surge Current, 8.3 ms Single Half Sine-wave Superimposed on Rated Load (JEDEC method) (Note 2, 3) - Unidirectional Only | $I_{FSM}$         | 100          | Amps               |
| Maximum Instantaneous Forward Voltage at 100.0A for Unidirectional Only (Note 4)                                                     | $V_F$             | 3.5 / 5.0    | Volts              |
| Operating and Storage Temperature Range                                                                                              | $T_J$ , $T_{STG}$ | -55 to + 150 | $^{\circ}\text{C}$ |

Notes: 1. Non-repetitive Current Pulse Per Fig. 3 and Derated above  $T_A=25^{\circ}\text{C}$  Per Fig. 2.

2. Mounted on 8.0mm<sup>2</sup> (.013mm Thick) Copper Pads to Each Terminal.

3. 8.3ms Single Half Sine-wave or Equivalent Square Wave, Duty Cycle=4 Pulses Per Minute Maximum.

4.  $V_F=3.5\text{V}$  on SMCJ5.0 thru SMCJ90 Devices and  $V_F=5.0\text{V}$  on SMCJ100 thru SMCJ170 Devices.

Devices for Bipolar Applications

1. For Bidirectional Use C or CA Suffix for Types SMCJ5.0 through Types SMCJ170.

2. Electrical Characteristics Apply in Both Directions.

## RATINGS AND CHARACTERISTIC CURVES (SMCJ SERIES)

FIG.1- PEAK PULSE POWER RATING CURVE

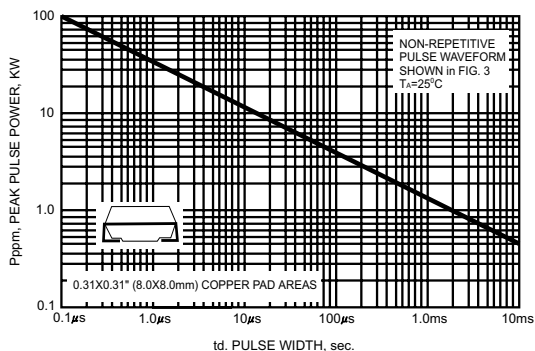


FIG.2- PULSE DERATING CURVE

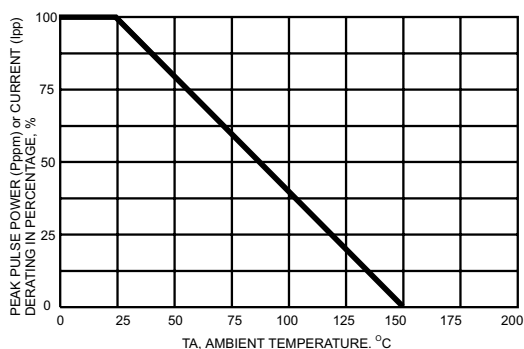


FIG.3- PULSE WAVEFORM

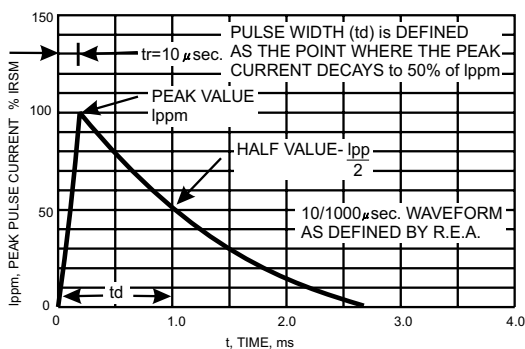


FIG.4- MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

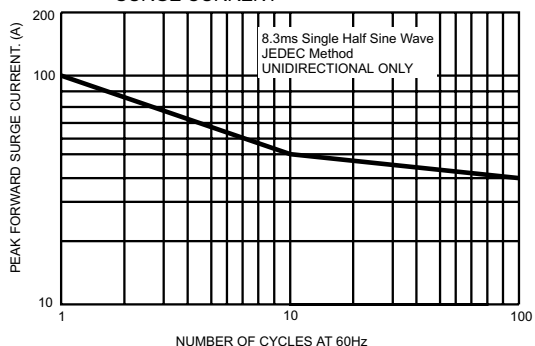


FIG.5- TYPICAL JUNCTION CAPACITANCE BIDIRECTIONAL

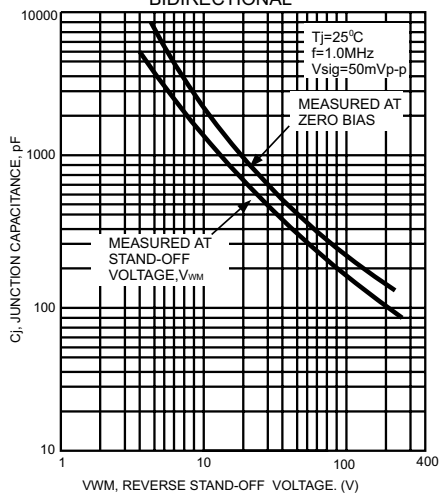
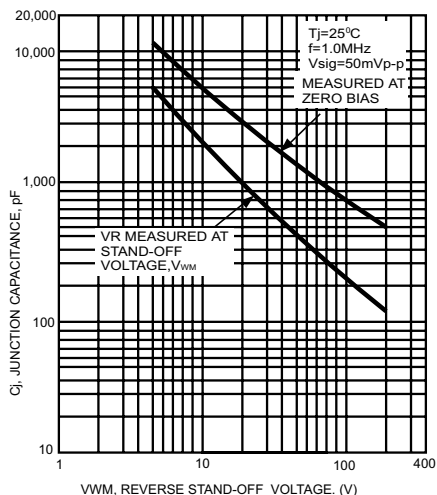


FIG.6- TYPICAL JUNCTION CAPACITANCE



## ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

| Device Type<br>Modified<br>"J" Bend Lead | Device<br>Marking<br>Code | Breakdown<br>Voltage<br>V(BR) (Volts)<br>(Note 1)<br>(MIN / MAX) | Test<br>Current<br>at I <sub>r</sub> (mA) | Stand-off<br>voltage<br>V <sub>WM</sub> (Volts) | Maximum<br>Reverse<br>Leakage<br>at V <sub>WM</sub><br>(Note 3) I <sub>b</sub> (uA) | Maximum<br>Peak Pulse<br>Surge<br>Current I <sub>PPM</sub><br>(Note 2) (Amps) | Maximum<br>Clamping<br>Voltage at I <sub>PPM</sub><br>V <sub>c</sub> (Volts) |
|------------------------------------------|---------------------------|------------------------------------------------------------------|-------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| SMCJ5.0                                  | GDD                       | 6.40 / 7.3                                                       | 10.0                                      | 5.0                                             | 1000                                                                                | 164.0                                                                         | 9.6                                                                          |
| SMCJ5.0A                                 | GDE                       | 6.40 / 7.0                                                       | 10.0                                      | 5.0                                             | 1000                                                                                | 171.0                                                                         | 9.2                                                                          |
| SMCJ6.0                                  | GDF                       | 6.67 / 8.15                                                      | 10.0                                      | 6.0                                             | 1000                                                                                | 138.0                                                                         | 11.4                                                                         |
| SMCJ6.0A                                 | GDG                       | 6.67 / 7.37                                                      | 10.0                                      | 6.0                                             | 1000                                                                                | 152.0                                                                         | 10.3                                                                         |
| SMCJ6.5                                  | GDH                       | 7.22 / 8.82                                                      | 10.0                                      | 6.5                                             | 500                                                                                 | 128.0                                                                         | 12.3                                                                         |
| SMCJ6.5A                                 | GDK                       | 7.22 / 7.98                                                      | 10.0                                      | 6.5                                             | 500                                                                                 | 140.0                                                                         | 11.2                                                                         |
| SMCJ7.0                                  | GDL                       | 7.78 / 9.51                                                      | 10.0                                      | 7.0                                             | 200                                                                                 | 118.0                                                                         | 13.3                                                                         |
| SMCJ7.0A                                 | GDM                       | 7.78 / 8.60                                                      | 10.0                                      | 7.0                                             | 200                                                                                 | 131.0                                                                         | 12.0                                                                         |
| SMCJ7.5                                  | GDN                       | 8.33 / 10.3                                                      | 1.0                                       | 7.5                                             | 100                                                                                 | 110.0                                                                         | 14.3                                                                         |
| SMCJ7.5A                                 | GDP                       | 8.33 / 9.21                                                      | 1.0                                       | 7.5                                             | 100                                                                                 | 122.0                                                                         | 12.9                                                                         |
| SMCJ8.0                                  | GDQ                       | 8.89 / 10.9                                                      | 1.0                                       | 8.0                                             | 50                                                                                  | 105.0                                                                         | 15.0                                                                         |
| SMCJ8.0A                                 | GDR                       | 8.89 / 9.83                                                      | 1.0                                       | 8.0                                             | 50                                                                                  | 115.0                                                                         | 13.6                                                                         |
| SMCJ8.5                                  | GDS                       | 9.44 / 11.5                                                      | 1.0                                       | 8.5                                             | 20                                                                                  | 99.0                                                                          | 15.9                                                                         |
| SMCJ8.5A                                 | GDT                       | 9.44 / 10.4                                                      | 1.0                                       | 8.5                                             | 20                                                                                  | 109.0                                                                         | 14.4                                                                         |
| SMCJ9.0                                  | GDU                       | 10.0 / 12.2                                                      | 1.0                                       | 9.0                                             | 10                                                                                  | 93.0                                                                          | 16.9                                                                         |
| SMCJ9.0A                                 | GDV                       | 10.0 / 11.1                                                      | 1.0                                       | 9.0                                             | 10                                                                                  | 102.0                                                                         | 15.4                                                                         |
| SMCJ10                                   | GDW                       | 11.1 / 13.6                                                      | 1.0                                       | 10.0                                            | 5.0                                                                                 | 83.0                                                                          | 18.8                                                                         |
| SMCJ10A                                  | GDX                       | 11.1 / 12.3                                                      | 1.0                                       | 10.0                                            | 5.0                                                                                 | 92.0                                                                          | 17.0                                                                         |
| SMCJ11                                   | GDY                       | 12.2 / 14.9                                                      | 1.0                                       | 11.0                                            | 5.0                                                                                 | 78.0                                                                          | 20.1                                                                         |
| SMCJ11A                                  | GDZ                       | 12.2 / 13.5                                                      | 1.0                                       | 11.0                                            | 5.0                                                                                 | 86.0                                                                          | 18.2                                                                         |
| SMCJ12                                   | GED                       | 13.3 / 16.3                                                      | 1.0                                       | 12.0                                            | 5.0                                                                                 | 71.0                                                                          | 22.0                                                                         |
| SMCJ12A                                  | GEE                       | 13.3 / 14.7                                                      | 1.0                                       | 12.0                                            | 5.0                                                                                 | 79.0                                                                          | 19.9                                                                         |
| SMCJ13                                   | GEF                       | 14.4 / 17.6                                                      | 1.0                                       | 13.0                                            | 5.0                                                                                 | 66.0                                                                          | 23.8                                                                         |
| SMCJ13A                                  | GEG                       | 14.4 / 15.9                                                      | 1.0                                       | 13.0                                            | 5.0                                                                                 | 73.0                                                                          | 21.5                                                                         |
| SMCJ14                                   | GEH                       | 15.6 / 19.1                                                      | 1.0                                       | 14.0                                            | 5.0                                                                                 | 61.0                                                                          | 25.8                                                                         |
| SMCJ14A                                  | GEK                       | 15.6 / 17.2                                                      | 1.0                                       | 14.0                                            | 5.0                                                                                 | 67.0                                                                          | 23.2                                                                         |
| SMCJ15                                   | GEL                       | 16.7 / 20.4                                                      | 1.0                                       | 15.0                                            | 5.0                                                                                 | 58.0                                                                          | 26.9                                                                         |
| SMCJ15A                                  | GEM                       | 16.7 / 18.5                                                      | 1.0                                       | 15.0                                            | 5.0                                                                                 | 64.0                                                                          | 24.4                                                                         |
| SMCJ16                                   | GEN                       | 17.8 / 21.8                                                      | 1.0                                       | 16.0                                            | 5.0                                                                                 | 54.0                                                                          | 28.8                                                                         |
| SMCJ16A                                  | GEP                       | 17.8 / 19.7                                                      | 1.0                                       | 16.0                                            | 5.0                                                                                 | 60.0                                                                          | 26.0                                                                         |
| SMCJ17                                   | GEQ                       | 18.9 / 23.1                                                      | 1.0                                       | 17.0                                            | 5.0                                                                                 | 51.0                                                                          | 30.5                                                                         |
| SMCJ17A                                  | GER                       | 18.9 / 20.9                                                      | 1.0                                       | 17.0                                            | 5.0                                                                                 | 57.0                                                                          | 27.6                                                                         |
| SMCJ18                                   | GES                       | 20.0 / 24.4                                                      | 1.0                                       | 18.0                                            | 5.0                                                                                 | 48.0                                                                          | 32.2                                                                         |
| SMCJ18A                                  | GET                       | 20.0 / 22.1                                                      | 1.0                                       | 18.0                                            | 5.0                                                                                 | 53.0                                                                          | 29.2                                                                         |
| SMCJ20                                   | GEU                       | 22.2 / 27.1                                                      | 1.0                                       | 20.0                                            | 5.0                                                                                 | 43.0                                                                          | 35.8                                                                         |
| SMCJ20A                                  | GEV                       | 22.2 / 24.5                                                      | 1.0                                       | 20.0                                            | 5.0                                                                                 | 48.0                                                                          | 32.4                                                                         |
| SMCJ22                                   | GEW                       | 24.4 / 29.8                                                      | 1.0                                       | 22.0                                            | 5.0                                                                                 | 39.0                                                                          | 39.4                                                                         |
| SMCJ22A                                  | GEX                       | 24.4 / 26.9                                                      | 1.0                                       | 22.0                                            | 5.0                                                                                 | 44.0                                                                          | 35.5                                                                         |
| SMCJ24                                   | GEY                       | 26.7 / 32.6                                                      | 1.0                                       | 24.0                                            | 5.0                                                                                 | 36.0                                                                          | 43.0                                                                         |
| SMCJ24A                                  | GEZ                       | 26.7 / 29.5                                                      | 1.0                                       | 24.0                                            | 5.0                                                                                 | 40.0                                                                          | 38.9                                                                         |
| SMCJ26                                   | GFD                       | 28.9 / 35.3                                                      | 1.0                                       | 26.0                                            | 5.0                                                                                 | 33.0                                                                          | 46.6                                                                         |
| SMCJ26A                                  | GFE                       | 28.9 / 31.9                                                      | 1.0                                       | 26.0                                            | 5.0                                                                                 | 37.0                                                                          | 42.1                                                                         |
| SMCJ28                                   | GFF                       | 31.1 / 38.0                                                      | 1.0                                       | 28.0                                            | 5.0                                                                                 | 31.0                                                                          | 50.0                                                                         |
| SMCJ28A                                  | GFG                       | 31.1 / 34.4                                                      | 1.0                                       | 28.0                                            | 5.0                                                                                 | 34.0                                                                          | 45.4                                                                         |
| SMCJ30                                   | GFH                       | 33.3 / 40.7                                                      | 1.0                                       | 30.0                                            | 5.0                                                                                 | 29.0                                                                          | 53.5                                                                         |
| SMCJ30A                                  | GFK                       | 33.3 / 36.8                                                      | 1.0                                       | 30.0                                            | 5.0                                                                                 | 32.0                                                                          | 48.4                                                                         |
| SMCJ33                                   | GFL                       | 36.7 / 44.9                                                      | 1.0                                       | 33.0                                            | 5.0                                                                                 | 26.0                                                                          | 59.0                                                                         |
| SMCJ33A                                  | GFM                       | 36.7 / 40.6                                                      | 1.0                                       | 33.0                                            | 5.0                                                                                 | 29.0                                                                          | 53.3                                                                         |
| SMCJ36                                   | GFN                       | 40.0 / 48.9                                                      | 1.0                                       | 36.0                                            | 5.0                                                                                 | 24.0                                                                          | 64.3                                                                         |
| SMCJ36A                                  | GFP                       | 40.0 / 44.2                                                      | 1.0                                       | 36.0                                            | 5.0                                                                                 | 27.0                                                                          | 58.1                                                                         |
| SMCJ40                                   | GFQ                       | 44.4 / 54.3                                                      | 1.0                                       | 40.0                                            | 5.0                                                                                 | 22.0                                                                          | 71.4                                                                         |
| SMCJ40A                                  | GFR                       | 44.4 / 49.1                                                      | 1.0                                       | 40.0                                            | 5.0                                                                                 | 24.0                                                                          | 64.5                                                                         |
| SMCJ43                                   | GFS                       | 47.8 / 58.4                                                      | 1.0                                       | 43.0                                            | 5.0                                                                                 | 20.0                                                                          | 76.7                                                                         |
| SMCJ43A                                  | GFT                       | 47.8 / 52.8                                                      | 1.0                                       | 43.0                                            | 5.0                                                                                 | 22.0                                                                          | 69.4                                                                         |

# ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

| Device Type<br>Modified<br>"J" Bend Lead | Device<br>Marking<br>Code | Breakdown<br>Voltage<br>V <sub>BR</sub> (Volts)<br>(Note 1)<br>(MIN / MAX) | Test<br>Current<br>at I <sub>r</sub> (mA) | Stand-off<br>voltage<br>V <sub>WM</sub> (Volts) | Maximum<br>Reverse<br>Leakage<br>at V <sub>WM</sub><br>(Note 3) I <sub>0</sub> (uA) | Maximum<br>Peak Pulse<br>Surge<br>Current I <sub>PPM</sub><br>(Note 2) (Amps) | Maximum<br>Clamping<br>Voltage at I <sub>PPM</sub><br>V <sub>C</sub> (Volts) |
|------------------------------------------|---------------------------|----------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| SMCJ45                                   | GFU                       | 50.0 / 61.1                                                                | 1.0                                       | 45.0                                            | 5.0                                                                                 | 19.0                                                                          | 80.3                                                                         |
| SMCJ45A                                  | GFV                       | 50.0 / 55.3                                                                | 1.0                                       | 45.0                                            | 5.0                                                                                 | 21.0                                                                          | 72.7                                                                         |
| SMCJ48                                   | GFW                       | 53.3 / 65.1                                                                | 1.0                                       | 48.0                                            | 5.0                                                                                 | 18.0                                                                          | 85.5                                                                         |
| SMCJ48A                                  | GFX                       | 53.3 / 58.9                                                                | 1.0                                       | 48.0                                            | 5.0                                                                                 | 20.0                                                                          | 77.4                                                                         |
| SMCJ51                                   | GFY                       | 56.7 / 69.3                                                                | 1.0                                       | 51.0                                            | 5.0                                                                                 | 17.0                                                                          | 91.1                                                                         |
| SMCJ51A                                  | GFZ                       | 56.7 / 62.7                                                                | 1.0                                       | 51.0                                            | 5.0                                                                                 | 19.0                                                                          | 82.4                                                                         |
| SMCJ54                                   | GGD                       | 60.0 / 73.3                                                                | 1.0                                       | 54.0                                            | 5.0                                                                                 | 16.0                                                                          | 96.3                                                                         |
| SMCJ54A                                  | GGE                       | 60.0 / 66.3                                                                | 1.0                                       | 54.0                                            | 5.0                                                                                 | 18.0                                                                          | 87.1                                                                         |
| SMCJ58                                   | GGF                       | 64.4 / 78.7                                                                | 1.0                                       | 58.0                                            | 5.0                                                                                 | 15.0                                                                          | 103.0                                                                        |
| SMCJ58A                                  | GGG                       | 64.4 / 71.2                                                                | 1.0                                       | 58.0                                            | 5.0                                                                                 | 16.0                                                                          | 93.6                                                                         |
| SMCJ60                                   | GGH                       | 66.7 / 81.5                                                                | 1.0                                       | 60.0                                            | 5.0                                                                                 | 14.0                                                                          | 107.0                                                                        |
| SMCJ60A                                  | G GK                      | 66.7 / 73.7                                                                | 1.0                                       | 60.0                                            | 5.0                                                                                 | 16.0                                                                          | 96.8                                                                         |
| SMCJ64                                   | GGL                       | 71.1 / 86.9                                                                | 1.0                                       | 64.0                                            | 5.0                                                                                 | 13.8                                                                          | 114.0                                                                        |
| SMCJ64A                                  | GGM                       | 71.1 / 78.6                                                                | 1.0                                       | 64.0                                            | 5.0                                                                                 | 15.0                                                                          | 103.0                                                                        |
| SMCJ70                                   | GGN                       | 77.8 / 95.1                                                                | 1.0                                       | 70.0                                            | 5.0                                                                                 | 12.6                                                                          | 125.0                                                                        |
| SMCJ70A                                  | GGP                       | 77.8 / 86.0                                                                | 1.0                                       | 70.0                                            | 5.0                                                                                 | 13.9                                                                          | 113.0                                                                        |
| SMCJ75                                   | GGQ                       | 83.3 / 102                                                                 | 1.0                                       | 75.0                                            | 5.0                                                                                 | 11.7                                                                          | 134.0                                                                        |
| SMCJ75A                                  | GGR                       | 83.3 / 92.1                                                                | 1.0                                       | 75.0                                            | 5.0                                                                                 | 13.0                                                                          | 121.0                                                                        |
| MSJC78                                   | GS                        | 86.7 / 106                                                                 | 1.0                                       | 78.0                                            | 5.0                                                                                 | 11.3                                                                          | 139.0                                                                        |
| SMCJ78A                                  | GGT                       | 86.7 / 95.8                                                                | 1.0                                       | 78.0                                            | 5.0                                                                                 | 12.5                                                                          | 126.0                                                                        |
| SMCJ85                                   | GGU                       | 94.4 / 115                                                                 | 1.0                                       | 85.0                                            | 5.0                                                                                 | 10.4                                                                          | 151.0                                                                        |
| SMCJ85A                                  | GGV                       | 94.4 / 104                                                                 | 1.0                                       | 85.0                                            | 5.0                                                                                 | 11.5                                                                          | 137.0                                                                        |
| SMCJ90                                   | GGW                       | 100 / 122                                                                  | 1.0                                       | 90.0                                            | 5.0                                                                                 | 9.8                                                                           | 160.0                                                                        |
| SMCJ90A                                  | GGX                       | 100 / 111                                                                  | 1.0                                       | 90.0                                            | 5.0                                                                                 | 10.7                                                                          | 146.0                                                                        |
| SMCJ100                                  | GGY                       | 111 / 136                                                                  | 1.0                                       | 100.0                                           | 5.0                                                                                 | 8.8                                                                           | 179.0                                                                        |
| SMCJ100A                                 | GGZ                       | 111 / 123                                                                  | 1.0                                       | 100.0                                           | 5.0                                                                                 | 9.7                                                                           | 162.0                                                                        |
| SMCJ110                                  | GHD                       | 122 / 149                                                                  | 1.0                                       | 110.0                                           | 5.0                                                                                 | 8.0                                                                           | 196.0                                                                        |
| SMCJ110A                                 | GHE                       | 122 / 135                                                                  | 1.0                                       | 110.0                                           | 5.0                                                                                 | 8.9                                                                           | 177.0                                                                        |
| SMCJ120                                  | GHF                       | 133 / 163                                                                  | 1.0                                       | 120.0                                           | 5.0                                                                                 | 7.3                                                                           | 214.0                                                                        |
| SMCJ120A                                 | GHG                       | 133 / 147                                                                  | 1.0                                       | 120.0                                           | 5.0                                                                                 | 8.1                                                                           | 193.0                                                                        |
| SMCJ130                                  | GHH                       | 144 / 176                                                                  | 1.0                                       | 130.0                                           | 5.0                                                                                 | 6.8                                                                           | 231.0                                                                        |
| SMCJ130A                                 | GHK                       | 144 / 159                                                                  | 1.0                                       | 130.0                                           | 5.0                                                                                 | 7.5                                                                           | 209.0                                                                        |
| SMCJ150                                  | GHL                       | 167 / 204                                                                  | 1.0                                       | 150.0                                           | 5.0                                                                                 | 5.8                                                                           | 268.0                                                                        |
| SMCJ150A                                 | GHM                       | 167 / 185                                                                  | 1.0                                       | 150.0                                           | 5.0                                                                                 | 6.4                                                                           | 243.0                                                                        |
| SMCJ160                                  | GHN                       | 178 / 218                                                                  | 1.0                                       | 160.0                                           | 5.0                                                                                 | 5.4                                                                           | 287.0                                                                        |
| SMCJ160A                                 | GHP                       | 178 / 197                                                                  | 1.0                                       | 160.0                                           | 5.0                                                                                 | 6.0                                                                           | 259.0                                                                        |
| SMCJ170                                  | GHQ                       | 189 / 231                                                                  | 1.0                                       | 170.0                                           | 5.0                                                                                 | 5.1                                                                           | 304.0                                                                        |
| SMCJ170A                                 | GHR                       | 189 / 209                                                                  | 1.0                                       | 170.0                                           | 5.0                                                                                 | 5.7                                                                           | 275.0                                                                        |

## Notes:

1. V<sub>BR</sub> measured after I<sub>r</sub> applied for 300us, I<sub>r</sub>=Square wave pulse or equivalent.
2. Surge current waveform per Fig. 3 and derate per Figure 2.
3. For bidirectional types having V<sub>WM</sub> of 10 Volts and less, the I<sub>0</sub> limit is doubled
4. all terms and symbols are consistent with ANSI/IEEE C62.35