

## 1500W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS, 5.0V – 440V

| Value Inch[mm] |             |             |
|----------------|-------------|-------------|
| Dim.           | Min.        | Max.        |
| A              | 0.305[7.75] | 0.320[8.13] |
| B              | 0.260[6.60] | 0.280[7.11] |
| C              | 0.220[5.59] | 0.245[6.22] |
| D              | 0.079[2.01] | 0.111[2.82] |
| E              | 0.030[0.76] | 0.060[1.52] |
| F              | 0.114[2.90] | 0.126[3.20] |

### PRODUCT FEATURES

1. FLAMMABILITY CLASSIFICATION 94V-0
2. GLASS PASSIVATED CHIP JUNCTION
3. 1500W PEAK PULSE POWER CAPABILITY WITH A 10/1000  $\mu$ S WAVEFORM, REPETITION RATE (DUTY CYCLE): 0.01%.
4. EXCELLENT CLAMPING CAPABILITY
5. FAST RESPONSE TIME FROM 0V TO  $V_{BR}$ , TYPICALLY <1 pS FOR UNI-DIRECTIONAL & <5 nS FOR BI-DIRECTIONAL
6. POLARITY: INDICATED BY CATHODE BAND
7. MOLDED PLASTIC CASE DO-214AB (SMC)
8. DIMENSIONS IN INCHES AND (MILLIMETERS)
9. LEADS: SOLDERABILITY PER MIL-STD-750 METHOD 2026
10. WEIGHT: 0.23 GRAMS
11. RoHS COMPLIANT.

## ELECTRICAL CHARACTERISTICS

MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)

| PARAMETER                             | CONDITIONS                                             | SYMBOL      |             | UNIT             |
|---------------------------------------|--------------------------------------------------------|-------------|-------------|------------------|
| PEAK POWER DISSIPATION                | WITH A 10/1000 $\mu$ S WAVEFORM, SEE NOTE 1 & FIG.1    | $P_{PPM}$   | 1500        | W                |
| PEAK PULSE CURRENT                    | WITH A 10/1000 $\mu$ S WAVEFORM, SEE NOTE 1 & FIG.1    | $I_{PPM}$   | SEE TABLE   | A                |
| STEADY STATE POWER DISSIPATION        | AT $T_L = 75^\circ\text{C}$ , SEE NOTE 2               | $P_{M(AV)}$ | 6.5         | W                |
| PEAK FORWARD SURGE CURRENT            | 8.3ms SINGLE HALF SINE-WAVE (JEDEC METHOD), SEE NOTE 3 | $I_{FSM}$   | 200         | A                |
| MAXIMUM INSTANTANEOUS FORWARD VOLTAGE | AT 50A FOR UNI-DIRECTIONAL TYPES ONLY, SEE NOTE 4      | $V_F$       | 3.5/5.0     | V                |
| OPERATING JUNCTION TEMPERATURE RANGE  |                                                        | $T_J$       | -55 TO +150 | $^\circ\text{C}$ |
| STORAGE TEMPERATURE RANGE             |                                                        | $T_{STG}$   | -55 TO +150 | $^\circ\text{C}$ |

- Note : 1. Non-repetitive current pulse, per fig. 3 and derated above  $T_A = 25^\circ\text{C}$  per fig. 2  
2. Mounted on copper pad area of 0.31"x0.31" (8.0x8.0 mm) per fig. 5  
3. Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum  
4.  $V_F < 3.5\text{V}$  for device with  $V_{BR} \leq 200\text{V}$  and  $V_F < 5.0\text{V}$  for device with  $V_{BR} > 200\text{V}$



# SMCJ\_SERIES SPECIFICATION

Rev. A

| Part No.    | Reverse Stand-off Voltage | Breakdown Voltage @I <sub>T</sub> |                     | Test Current   | Maximum Clamping Voltage @I <sub>PP</sub> |                 | Maximum Reverse Leakage Current  | Marking Code |     |
|-------------|---------------------------|-----------------------------------|---------------------|----------------|-------------------------------------------|-----------------|----------------------------------|--------------|-----|
|             | V <sub>RWM</sub>          | V <sub>BR</sub> Min               | V <sub>BR</sub> Max | I <sub>T</sub> | V <sub>C</sub>                            | I <sub>PP</sub> | I <sub>R</sub> @V <sub>RWM</sub> |              |     |
|             | Volts                     | Volts                             | Volts               | mA             | Volts                                     | A               | μA                               | UNI          | BI  |
| SMCJ5.0(C)A | 5.0                       | 6.40                              | 7.00                | 10             | 9.2                                       | 163.0           | 800                              | GDE          | BDE |
| SMCJ6.0(C)A | 6.0                       | 6.67                              | 7.37                | 10             | 10.3                                      | 145.6           | 800                              | GDG          | BDG |
| SMCJ6.5(C)A | 6.5                       | 7.22                              | 7.98                | 10             | 11.2                                      | 133.9           | 500                              | GDK          | BDK |
| SMCJ7.0(C)A | 7.0                       | 7.78                              | 8.60                | 10             | 12.0                                      | 125.0           | 200                              | GDM          | BDM |
| SMCJ7.5(C)A | 7.5                       | 8.33                              | 9.21                | 1.0            | 12.9                                      | 116.3           | 100                              | GDP          | BDP |
| SMCJ8.0(C)A | 8.0                       | 8.89                              | 9.83                | 1.0            | 13.6                                      | 110.3           | 50                               | GDR          | BDR |
| SMCJ8.5(C)A | 8.5                       | 9.44                              | 10.4                | 1.0            | 14.4                                      | 104.2           | 20                               | GDT          | BDT |
| SMCJ9.0(C)A | 9.0                       | 10.0                              | 11.1                | 1.0            | 15.4                                      | 97.4            | 10                               | GDV          | BDV |
| SMCJ10(C)A  | 10                        | 11.1                              | 12.3                | 1.0            | 17.0                                      | 88.2            | 5                                | GDX          | BDX |
| SMCJ11(C)A  | 11                        | 12.2                              | 13.5                | 1.0            | 18.2                                      | 82.4            | 5                                | GDZ          | BDZ |
| SMCJ12(C)A  | 12                        | 13.3                              | 14.7                | 1.0            | 19.9                                      | 75.3            | 5                                | GEE          | BEE |
| SMCJ13(C)A  | 13                        | 14.4                              | 15.9                | 1.0            | 21.5                                      | 69.7            | 5                                | GEG          | BEG |
| SMCJ14(C)A  | 14                        | 15.6                              | 17.2                | 1.0            | 23.2                                      | 64.7            | 5                                | GEK          | BEK |
| SMCJ15(C)A  | 15                        | 16.7                              | 18.5                | 1.0            | 24.4                                      | 61.5            | 5                                | GEM          | BEM |
| SMCJ16(C)A  | 16                        | 17.8                              | 19.7                | 1.0            | 26.0                                      | 57.7            | 5                                | GEP          | BEP |
| SMCJ17(C)A  | 17                        | 18.9                              | 20.9                | 1.0            | 27.6                                      | 54.4            | 5                                | GER          | BER |
| SMCJ18(C)A  | 18                        | 20.0                              | 22.1                | 1.0            | 29.2                                      | 51.4            | 5                                | GET          | BET |
| SMCJ20(C)A  | 20                        | 22.2                              | 24.5                | 1.0            | 32.4                                      | 46.3            | 5                                | GEV          | BEV |
| SMCJ22(C)A  | 22                        | 24.4                              | 26.9                | 1.0            | 35.5                                      | 42.2            | 5                                | GEX          | BEX |
| SMCJ24(C)A  | 24                        | 26.7                              | 29.5                | 1.0            | 38.9                                      | 38.6            | 5                                | GEZ          | BEZ |
| SMCJ26(C)A  | 26                        | 28.9                              | 31.9                | 1.0            | 42.1                                      | 35.6            | 5                                | GFE          | BFE |
| SMCJ28(C)A  | 28                        | 31.1                              | 34.4                | 1.0            | 45.4                                      | 33.0            | 5                                | GFG          | BFG |
| SMCJ30(C)A  | 30                        | 33.3                              | 36.8                | 1.0            | 48.4                                      | 31.0            | 5                                | GFK          | BFK |
| SMCJ33(C)A  | 33                        | 36.7                              | 40.6                | 1.0            | 53.3                                      | 28.1            | 5                                | GFM          | BFM |
| SMCJ36(C)A  | 36                        | 40.0                              | 44.2                | 1.0            | 58.1                                      | 25.8            | 5                                | GFP          | BFP |
| SMCJ40(C)A  | 40                        | 44.4                              | 49.1                | 1.0            | 64.5                                      | 23.2            | 5                                | GFR          | BFR |
| SMCJ43(C)A  | 43                        | 47.8                              | 52.8                | 1.0            | 69.4                                      | 21.6            | 5                                | GFT          | BFT |
| SMCJ45(C)A  | 45                        | 50.0                              | 55.3                | 1.0            | 72.7                                      | 20.6            | 5                                | GFV          | BFV |
| SMCJ48(C)A  | 48                        | 53.3                              | 58.9                | 1.0            | 77.4                                      | 19.4            | 5                                | GFX          | BFX |
| SMCJ51(C)A  | 51                        | 56.7                              | 62.7                | 1.0            | 82.4                                      | 18.2            | 5                                | GFZ          | BFZ |
| SMCJ54(C)A  | 54                        | 60.0                              | 66.3                | 1.0            | 87.1                                      | 17.2            | 5                                | GGE          | BGE |
| SMCJ58(C)A  | 58                        | 64.4                              | 71.2                | 1.0            | 93.6                                      | 16.0            | 5                                | GGG          | BGG |
| SMCJ60(C)A  | 60                        | 66.7                              | 73.7                | 1.0            | 96.8                                      | 15.5            | 5                                | GGK          | BGK |
| SMCJ64(C)A  | 64                        | 71.1                              | 78.6                | 1.0            | 103.0                                     | 14.6            | 5                                | GGM          | BGM |
| SMCJ70(C)A  | 70                        | 77.8                              | 86.0                | 1.0            | 113.0                                     | 13.3            | 5                                | GGP          | BGP |
| SMCJ75(C)A  | 75                        | 83.3                              | 92.1                | 1.0            | 121.0                                     | 12.4            | 5                                | GGR          | BGR |
| SMCJ78(C)A  | 78                        | 86.7                              | 95.8                | 1.0            | 126.0                                     | 11.9            | 5                                | GGT          | BGT |
| SMCJ85(C)A  | 85                        | 94.4                              | 104                 | 1.0            | 137.0                                     | 11.0            | 5                                | GGV          | BGV |



# SMCJ\_SERIES SPECIFICATION

Rev. A

| Part No.    | Reverse Stand-off Voltage | Breakdown Voltage @ $I_T$ |              | Test Current | Maximum Clamping Voltage @ $I_{PP}$ |          | Maximum Reverse Leakage Current | Marking Code |         |
|-------------|---------------------------|---------------------------|--------------|--------------|-------------------------------------|----------|---------------------------------|--------------|---------|
|             | $V_{RWM}$                 | $V_{BR}$ Min              | $V_{BR}$ Max | $I_T$        | $V_C$                               | $I_{PP}$ | $I_R@V_{RWM}$                   |              |         |
|             | Volts                     | Volts                     | Volts        | mA           | Volts                               | A        | $\mu A$                         | UNI          | BI      |
| SMCJ90(C)A  | 90                        | 100                       | 111          | 1.0          | 146.0                               | 10.3     | 5                               | GGX          | BGX     |
| SMCJ100(C)A | 100                       | 111                       | 123          | 1.0          | 162.0                               | 9.3      | 5                               | GGZ          | BGZ     |
| SMCJ110(C)A | 110                       | 122                       | 135          | 1.0          | 177.0                               | 8.4      | 5                               | GHE          | BHE     |
| SMCJ120(C)A | 120                       | 133                       | 147          | 1.0          | 193.0                               | 7.8      | 5                               | GHG          | BHG     |
| SMCJ130(C)A | 130                       | 144                       | 159          | 1.0          | 209.0                               | 7.2      | 5                               | GHK          | BHK     |
| SMCJ150(C)A | 150                       | 167                       | 185          | 1.0          | 243.0                               | 6.2      | 5                               | GHM          | BHM     |
| SMCJ160(C)A | 160                       | 178                       | 197          | 1.0          | 259.0                               | 5.8      | 5                               | GHP          | BHP     |
| SMCJ170(C)A | 170                       | 189                       | 209          | 1.0          | 275.0                               | 5.5      | 5                               | GHR          | BHR     |
| SMCJ180(C)A | 180                       | 201                       | 222          | 1.0          | 292.0                               | 5.1      | 5                               | GHT          | BHT     |
| SMCJ200(C)A | 200                       | 224                       | 247          | 1.0          | 324.0                               | 4.6      | 5                               | GHW,GHV      | BHW,BHV |
| SMCJ220(C)A | 220                       | 246                       | 272          | 1.0          | 356.0                               | 4.2      | 5                               | GHX          | BHX     |
| SMCJ250(C)A | 250                       | 279                       | 309          | 1.0          | 405.0                               | 3.7      | 5                               | GHZ          | BHZ     |
| SMCJ300(C)A | 300                       | 335                       | 371          | 1.0          | 486.0                               | 3.1      | 5                               | GJE          | BJE     |
| SMCJ350(C)A | 350                       | 391                       | 432          | 1.0          | 567.0                               | 2.6      | 5                               | GJG          | BJG     |
| SMCJ400(C)A | 400                       | 447                       | 494          | 1.0          | 648.0                               | 2.3      | 5                               | GJK          | BJK     |
| SMCJ440(C)A | 440                       | 492                       | 543          | 1.0          | 713.0                               | 2.1      | 5                               | GJM          | BJM     |

Note 1.  $V_{BR}$  measured after  $I_T$  applied for 300us,  $I_T$ =square wave pulse or equivalent

2. Surge current waveform per Fig. 3 and derated per Fig. 2

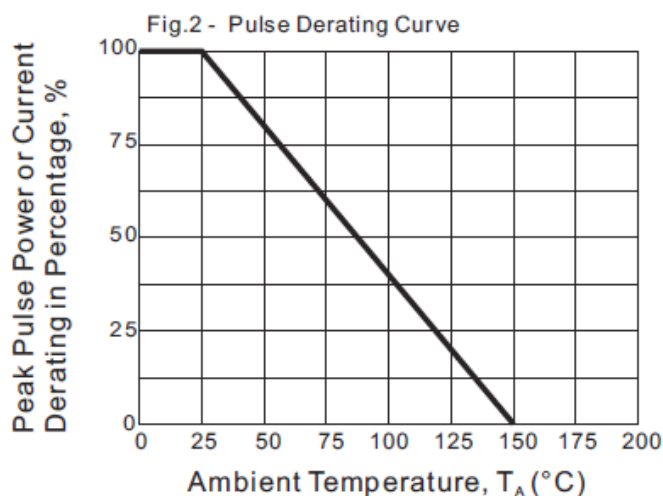
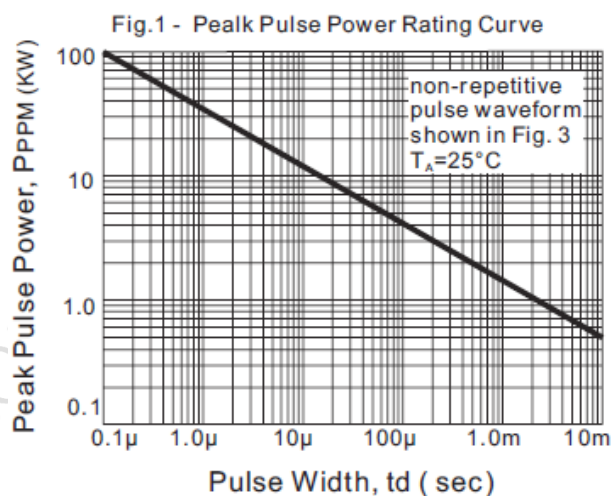
3. For bi-directional types having  $V_{RWM}$  of 10 volts and less, the  $I_R$  limit is doubled

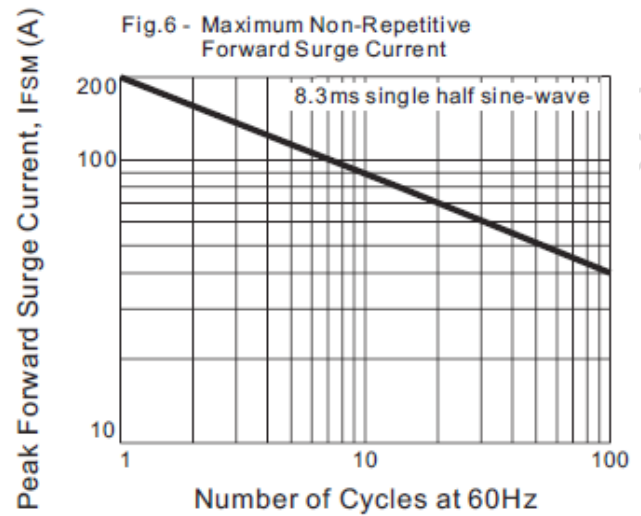
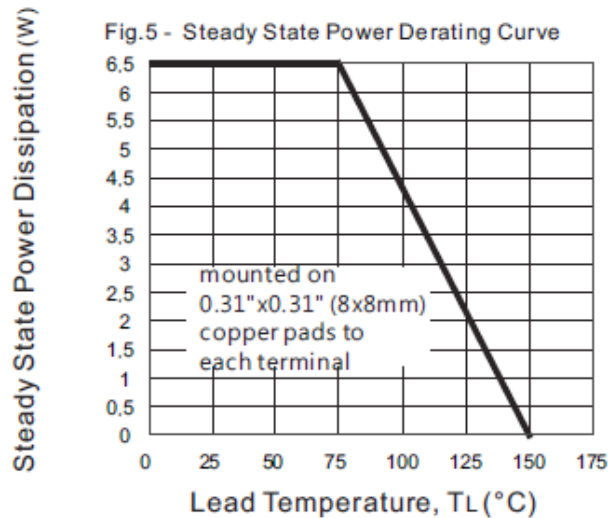
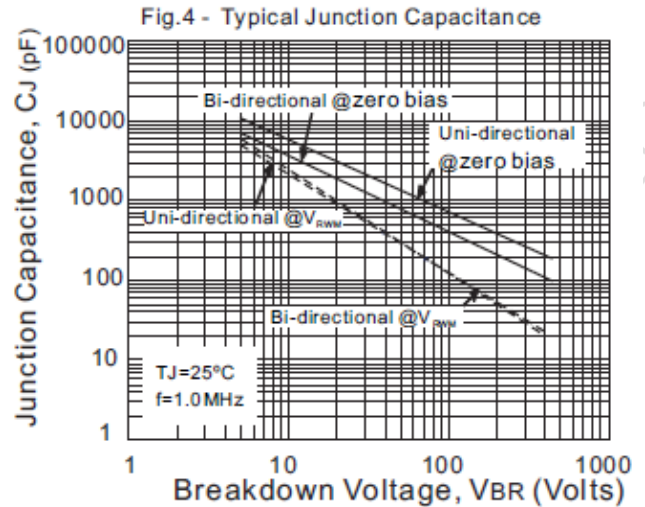
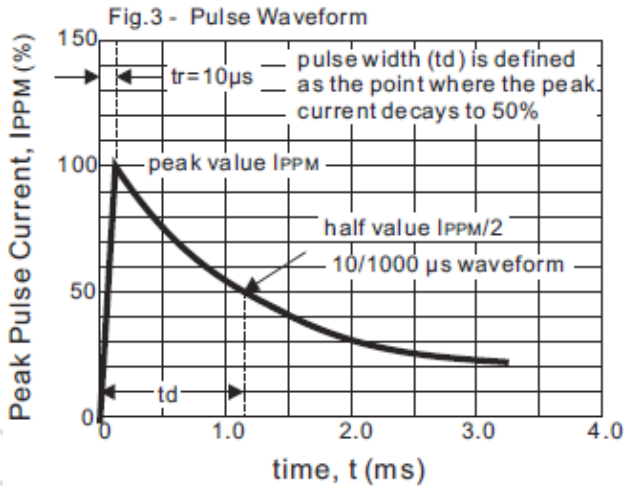
4. Suffix 'C' denotes bi-directional devices. Suffix 'A' denotes 5% tolerance devices, no suffix denotes 10% tolerance devices.

5. All terms and symbols are consistent with ANS/IEEE C62.35

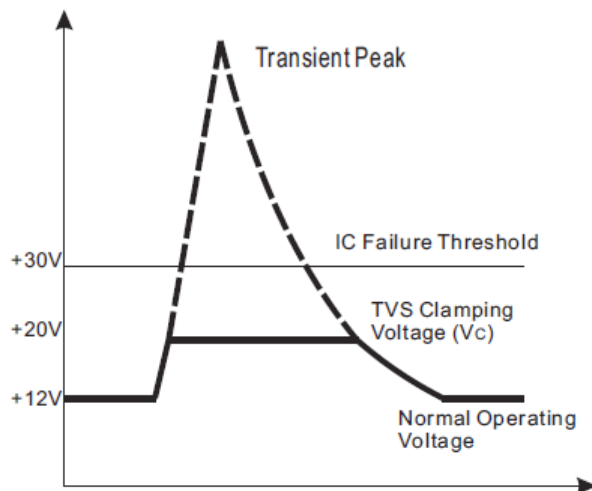
6. Transient Voltage Suppressors (TVS) are devices used to protect vulnerable circuits from electrical overstress such as that caused by electrostatic discharge, inductive load switching and induced lightning. Within the TVS, damaging voltage spikes are limited by clamping or avalanche action of a rugged silicon PN junction which reduces the amplitude of the transient to a nondestructive level. See Fig. 7 & Fig. 8

## RATINGS AND CHARACTERISTIC CURVES





**Fig. 7 - Transients of several thousand volts can be clamped to a safe level by the TVS**



**Fig. 8 - Transient current is diverted to ground thru TVS; the voltage seen by the protected load is limited to the clamping voltage level**

