

# SMBJ5.0 - SMBJ170CA series

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS

Protect sensitive electronics against voltage transients induced by electro-static discharge (ESD), inductive load switching, and lightning. Ideal for the protection of I/O interfaces, Vcc bus and other integrated circuits.

### FEATURES

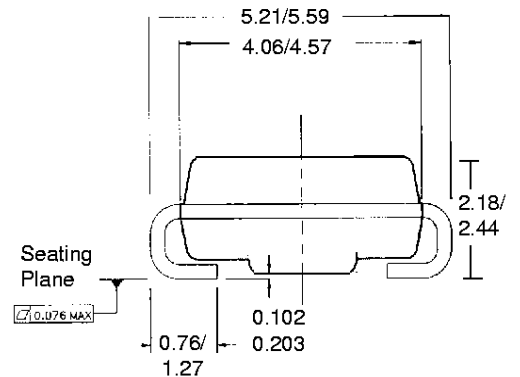
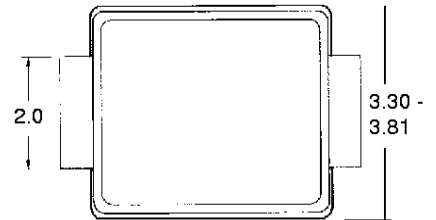
- Stand-off Voltage Range 5.0 to 170 Volts
- Uni-directional and Bi-directional
- Glass Passivated Junction
- Jedec package designed to meet SM assembly needs
- Low lead inductance
- Each device 100% surge tested

### MAXIMUM RATINGS

- Peak Pulse Power (Ppk) 600 Watts (10 X 1000µs)  
(see diagram on page 6 for wave form)
- 1.5 Watt Steady State
- Response time: 1 X 10<sup>-12</sup> secs (theoretical)
- Forward surge rating: 100A, 8.3 ms single half sine-wave  
(Uni-directional only)
- Operating & storage Temp.: -55°C to + 150°C

### MECHANICAL DATA

- CASE: D0214AA moulded plastic over glass passivated junction UL94V(O) (Thermoset) Epoxy.
- Terminals: Solder plated solderable per MIL-STD-750 Method 2026
- Solderable leads: 230°C for 10 seconds.
- Marking: cathode band(positive terminal, uni-directional devices only), device code, logo
- Weight: 0.093 gram (approx.)



### ORDERING INFORMATION

**SMBJ**     **C** **A**

Voltage .....

Bi Directional.....

5% Voltage Tolerance .....

Packing Option .....

T1 = Taped (500 pcs)

T3 = Taped (3000 pcs)

Figure 1 - Capacitance

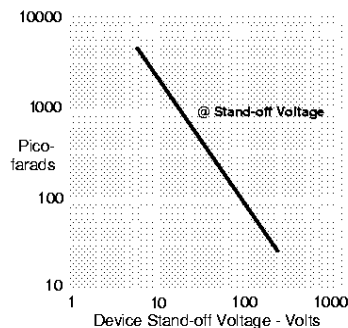
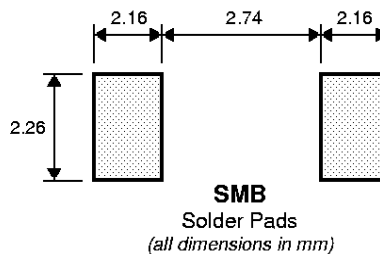


Figure 2 - Pad Size



| PART NUMBER<br>UNI-POLAR | DEVICE CODE<br>UNI-POLAR | PART NUMBER<br>BI-POLAR | DEVICE CODE<br>BI-POLAR<br>C' or 'CA'<br>VERSION | REVERSE<br>STANDOFF<br>VOLTAGE<br>V <sub>R</sub><br>(Volts) | BREAKDOWN<br>VOLTAGE<br>V <sub>BR</sub> (Volts) @ I <sub>T</sub> |       |      | MAXIMUM<br>REVERSE<br>LEAKAGE<br>I <sub>R</sub> @ V <sub>R</sub><br>(µA) | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>V <sub>c</sub> @ I <sub>PP</sub><br>(Volts) | MAXIMUM<br>PEAK PULSE<br>CURRENT<br>I <sub>PP</sub><br>(A) |
|--------------------------|--------------------------|-------------------------|--|---|--|-------|------|--|---|--|
|                          |                          |                         |  |   | MIN  | MAX   | (mA) |  |   |  |
| SMBJ5.0                  | KD                       | SMBJ5.0C                | AD   | 5.0   | 6.40   | 7.55  | 10   | 800.0  | 9.6   | 62.5   |
| SMBJ5.0A                 | KE                       | SMBJ5.0CA               | AE   | 5.0   | 6.40   | 7.25  | 10   | 800.0  | 9.2   | 65.2   |
| SMBJ6.0                  | KF                       | SMBJ6.0C                | AF   | 6.0   | 6.67   | 8.45  | 10   | 800.0  | 11.4  | 52.6   |
| SMBJ6.0A                 | KG                       | SMBJ6.0CA               | AG   | 6.0   | 6.67   | 7.67  | 10   | 800.0  | 10.3  | 58.3   |
| SMBJ6.5                  | KH                       | SMBJ6.5C                | AH   | 6.5   | 7.22   | 9.14  | 10   | 500.0  | 12.3  | 48.7   |
| SMBJ6.5A                 | KK                       | SMBJ6.5CA               | AK   | 6.5   | 7.22   | 8.30  | 10   | 500.0  | 11.2  | 53.6   |
| SMBJ7.0                  | KL                       | SMBJ7.0C                | AL   | 7.0   | 7.78   | 9.86  | 10   | 200.0  | 13.3  | 45.1   |
| SMBJ7.0A                 | KM                       | SMBJ7.0CA               | AM   | 7.0   | 7.78   | 8.95  | 10   | 200.0  | 12.0  | 50.0   |
| SMBJ7.5                  | KN                       | SMBJ7.5C                | AN   | 7.5   | 8.33   | 10.67 | 1    | 100.0  | 14.3  | 42.0   |
| SMBJ7.5A                 | KP                       | SMBJ7.5CA               | AP   | 7.5   | 8.33   | 9.58  | 1    | 100.0  | 12.9  | 46.5   |
| SMBJ8.0                  | KQ                       | SMBJ8.0C                | AQ   | 8.0   | 8.89   | 1.30  | 1    | 50.0   | 15.0  | 40.0   |
| SMBJ8.0A                 | KR                       | SMBJ8.0CA               | AR   | 8.0   | 8.89   | 10.23 | 1    | 50.0   | 13.6  | 44.1   |
| SMBJ8.5                  | KS                       | SMBJ8.5C                | AS   | 8.5   | 9.44   | 11.92 | 1    | 20.0   | 15.9  | 37.7   |
| SMBJ8.5A                 | KT                       | SMBJ8.5CA               | AT   | 8.5   | 9.44   | 10.82 | 1    | 20.0   | 14.4  | 41.7   |
| SMBJ9.0                  | KU                       | SMBJ9.0C                | AU   | 9.0   | 10.00  | 12.60 | 1    | 10.0   | 16.9  | 35.5   |
| SMBJ9.0A                 | KV                       | SMBJ9.0CA               | AV   | 9.0   | 10.00  | 11.50 | 1    | 10.0   | 15.4  | 39.0   |
| SMBJ10                   | KW                       | SMBJ10C                 | AW   | 10.0  | 11.10  | 14.10 | 1    | 5.0  | 18.8  | 31.9   |
| SMBJ10A                  | KX                       | SMBJ10CA                | AX   | 10.0  | 11.10  | 12.80 | 1    | 5.0  | 17.0  | 35.3   |
| SMBJ11                   | KY                       | SMBJ11C                 | AY   | 11.0  | 12.20  | 15.40 | 1    | 5.0  | 20.1  | 29.9   |
| SMBJ11A                  | KZ                       | SMBJ11CA                | AZ   | 11.0  | 12.20  | 14.00 | 1    | 5.0  | 18.2  | 33.0   |
| SMBJ12                   | LD                       | SMBJ12C                 | BD   | 12.0  | 13.30  | 16.90 | 1    | 5.0  | 22.0  | 27.3   |
| SMBJ12A                  | LE                       | SMBJ12CA                | BE   | 12.0  | 13.30  | 15.30 | 1    | 5.0  | 19.9  | 30.2   |
| SMBJ13                   | LF                       | SMBJ13C                 | BF   | 13.0  | 14.40  | 8.20  | 1    | 5.0  | 23.8  | 25.2   |
| SMBJ13A                  | LG                       | SMBJ13CA                | BG   | 13.0  | 14.40  | 16.50 | 1    | 5.0  | 21.5  | 27.9   |
| SMBJ14                   | LH                       | SMBJ14C                 | BH   | 14.0  | 15.60  | 19.80 | 1    | 5.0  | 25.8  | 23.3   |
| SMBJ14A                  | LK                       | SMBJ14CA                | BK   | 14.0  | 15.60  | 17.90 | 1    | 5.0  | 23.2  | 25.8   |
| SMBJ15                   | LL                       | SMBJ15C                 | BL   | 15.0  | 16.70  | 21.10 | 1    | 5.0  | 26.9  | 22.3   |
| SMBJ15A                  | LM                       | SMBJ15CA                | BM   | 15.0  | 16.70  | 19.20 | 1    | 5.0  | 24.4  | 24.0   |
| SMBJ16                   | LN                       | SMBJ16C                 | BN   | 16.0  | 17.80  | 22.60 | 1    | 5.0  | 28.8  | 20.8   |
| SMBJ16A                  | LP                       | SMBJ16CA                | BP   | 16.0  | 17.80  | 20.50 | 1    | 5.0  | 26.0  | 23.1   |
| SMBJ17                   | LQ                       | SMBJ17C                 | BQ   | 17.0  | 18.90  | 23.90 | 1    | 5.0  | 30.5  | 19.7   |
| SMBJ17A                  | LR                       | SMBJ17CA                | BR   | 17.0  | 18.90  | 21.70 | 1    | 5.0  | 27.6  | 21   |
| SMBJ18                   | LS                       | SMBJ18C                 | BS   | 18.0  | 20.00  | 25.30 | 1    | 5.0  | 32.2  | 18.6   |
| SMBJ18A                  | LT                       | SMBJ18CA                | BT   | 18.0  | 20.00  | 23.30 | 1    | 5.0  | 29.2  | 20.5   |
| SMBJ20                   | LU                       | SMBJ20C                 | BU   | 20.0  | 22.20  | 28.10 | 1    | 5.0  | 35.8  | 16.7   |
| SMBJ20A                  | LV                       | SMBJ20CA                | BV   | 20.0  | 22.20  | 25.50 | 1    | 5.0  | 32.4  | 18.5   |
| SMBJ22                   | LW                       | SMBJ22C                 | BW   | 22.0  | 24.40  | 30.90 | 1    | 5.0  | 39.4  | 15.2   |
| SMBJ22A                  | LX                       | SMBJ22CA                | BX   | 22.0  | 24.40  | 28.00 | 1    | 5.0  | 35.5  | 16.9   |
| SMBJ24                   | LY                       | SMBJ24C                 | BY   | 24.0  | 26.70  | 33.80 | 1    | 5.0  | 43.0  | 14.0   |
| SMBJ24A                  | LZ                       | SMBJ24CA                | BZ   | 24.0  | 26.70  | 30.70 | 1    | 5.0  | 38.9  | 15.4   |
| SMBJ26                   | MD                       | SMBJ26C                 | CD   | 26.0  | 28.90  | 36.60 | 1    | 5.0  | 46.6  | 12.4   |
| SMBJ26A                  | ME                       | SMBJ26CA                | CE   | 26.0  | 28.90  | 33.20 | 1    | 5.0  | 42.1  | 14.2   |
| SMBJ28                   | MF                       | SMBJ28C                 | CF   | 28.0  | 31.10  | 39.40 | 1    | 5.0  | 50.0  | 12.0   |
| SMBJ28A                  | MG                       | SMBJ28CA                | CG   | 28.0  | 31.10  | 35.80 | 1    | 5.0  | 45.4  | 13.2   |
| SMBJ30                   | MH                       | SMBJ30C                 | CH   | 30.0  | 33.30  | 42.20 | 1    | 5.0  | 53.5  | 11.2   |
| SMBJ30A                  | MK                       | SMBJ30CA                | CK   | 30.0  | 33.30  | 38.30 | 1    | 5.0  | 46.6  | 12.4   |
| SMBJ33                   | ML                       | SMBJ33C                 | CL   | 33.0  | 36.70  | 46.50 | 1    | 5.0  | 59.0  | 10.2   |

"Note: Non ""A"" devices have higher clamping voltage. Add suffix ""C"" to denote bi-polar devices.

1. For Bi-directional devices having V<sub>R</sub> of 10 volts and under the I<sub>R</sub> limit is doubled.
2. For Uni-direction devices V<sub>F</sub> = 3.5 Volts max at I<sub>F</sub> 50A, 300 µS square wave pulse.



| PART NUMBER<br>UNI-POLAR | DEVICE CODE<br>UNI-POLAR | PART NUMBER<br>BI-POLAR | DEVICE CODE<br>BI-POLAR<br>C' or 'CA'<br>VERSION | REVERSE<br>STANDOFF<br>VOLTAGE<br>V <sub>R</sub><br>(Volts) | BREAKDOWN<br>VOLTAGE<br>V <sub>BR</sub> (Volts) @ I <sub>T</sub> |        |      | MAXIMUM<br>REVERSE<br>LEAKAGE<br>I <sub>R</sub> @ V <sub>R</sub><br>(µA) | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>V <sub>c</sub> @ I <sub>PP</sub><br>(Volts) | MAXIMUM<br>PEAK PULSE<br>CURRENT<br>I <sub>PP</sub><br>(A) |
|--------------------------|--------------------------|-------------------------|--|---|--|--------|------|--|---|--|
|                          |                          |                         |  |   | MIN  | MAX    | (mA) |  |   |  |
| SMBJ33A                  | MM                       | SMBJ33CA                | CM   | 33.0  | 36.70  | 42.20  | 1.0  | 5.0  | 53.3  | 11.3   |
| SMBJ36                   | MN                       | SMBJ36C                 | CN   | 36.0  | 40.00  | 50.70  | 1.0  | 5.0  | 64.3  | 9.3  |
| SMBJ36A                  | MP                       | SMBJ36CA                | CP   | 36.0  | 40.00  | 46.00  | 1.0  | 5.0  | 58.1  | 10.3   |
| SMBJ40                   | MQ                       | SMBJ40C                 | CQ   | 40.0  | 44.40  | 56.30  | 1.0  | 5.0  | 71.4  | 8.4  |
| SMBJ40A                  | MR                       | SMBJ40CA                | CR   | 40.0  | 44.40  | 51.10  | 1.0  | 5.0  | 64.5  | 9.3  |
| SMBJ43                   | MS                       | SMBJ43C                 | CS   | 43.0  | 47.80  | 60.50  | 1.0  | 5.0  | 76.7  | 7.8  |
| SMBJ43A                  | MT                       | SMBJ43CA                | CT   | 43.0  | 47.80  | 54.90  | 1.0  | 5.0  | 69.4  | 8.6  |
| SMBJ45                   | MU                       | SMBJ45C                 | CU   | 45.0  | 50.00  | 63.30  | 1.0  | 5.0  | 80.3  | 7.5  |
| SMBJ45A                  | MV                       | SMBJ45CA                | CV   | 45.0  | 50.00  | 57.50  | 1.0  | 5.0  | 72.7  | 8.3  |
| SMBJ48                   | MW                       | SMBJ48C                 | CW   | 48.0  | 53.30  | 67.50  | 1.0  | 5.0  | 85.5  | 7.0  |
| SMBJ48A                  | MX                       | SMBJ48CA                | CX   | 48.0  | 53.30  | 61.30  | 1.0  | 5.0  | 77.4  | 7.7  |
| SMBJ51                   | MY                       | SMBJ51C                 | CY   | 51.0  | 56.70  | 71.80  | 1.0  | 5.0  | 91.1  | 6.6  |
| SMBJ51A                  | MZ                       | SMBJ51CA                | CZ   | 51.0  | 56.70  | 65.20  | 1.0  | 5.0  | 82.4  | 7.3  |
| SMBJ54                   | ND                       | SMBJ54C                 | DD   | 54.0  | 60.00  | 76.00  | 1.0  | 5.0  | 96.3  | 6.2  |
| SMBJ54A                  | NE                       | SMBJ54CA                | DE   | 54.0  | 60.00  | 69.00  | 1.0  | 5.0  | 87.1  | 6.9  |
| SMBJ58                   | NF                       | SMBJ58C                 | DF   | 58.0  | 64.40  | 81.60  | 1.0  | 5.0  | 103.0   | 5.8  |
| SMBJ58A                  | NG                       | SMBJ58CA                | DG   | 58.0  | 64.40  | 74.10  | 1.0  | 5.0  | 93.6  | 6.4  |
| SMBJ60                   | NH                       | SMBJ60C                 | DH   | 60.0  | 66.70  | 84.50  | 1.0  | 5.0  | 107.0   | 5.6  |
| SMBJ60A                  | NK                       | SMBJ60CA                | DK   | 60.0  | 66.70  | 76.70  | 1.0  | 5.0  | 96.8  | 6.2  |
| SMBJ64                   | NL                       | SMBJ64C                 | DL   | 64.0  | 71.10  | 90.10  | 1.0  | 5.0  | 114.0   | 5.3  |
| SMBJ64A                  | NM                       | SMBJ64CA                | DM   | 64.0  | 71.10  | 81.80  | 1.0  | 5.0  | 103.0   | 5.8  |
| SMBJ70                   | NN                       | SMBJ70C                 | DN   | 70.0  | 77.80  | 98.60  | 1.0  | 5.0  | 125.0   | 4.8  |
| SMBJ70A                  | NP                       | SMBJ70CA                | DP   | 70.0  | 77.80  | 89.50  | 1.0  | 5.0  | 113.0   | 5.3  |
| SMBJ75                   | NQ                       | SMBJ75C                 | DQ   | 75.0  | 83.30  | 105.70 | 1.0  | 5.0  | 134.0   | 4.5  |
| SMBJ75A                  | NR                       | SMBJ75CA                | DR   | 75.0  | 83.30  | 95.80  | 1.0  | 5.0  | 121.0   | 4.9  |
| SMBJ78                   | NS                       | SMBJ78C                 | DS   | 78.0  | 86.70  | 109.80 | 1.0  | 5.0  | 139.0   | 4.3  |
| SMBJ78A                  | NT                       | SMBJ78CA                | DT   | 78.0  | 86.70  | 99.70  | 1.0  | 5.0  | 126.0   | 4.7  |
| SMBJ85                   | NU                       | SMBJ85C                 | DU   | 85.0  | 94.40  | 119.20 | 1.0  | 5.0  | 151.0   | 3.9  |
| SMBJ85A                  | NV                       | SMBJ85CA                | DV   | 85.0  | 94.40  | 108.20 | 1.0  | 5.0  | 137.0   | 4.4  |
| SMBJ90                   | NW                       | SMBJ90C                 | DW   | 90.0  | 100.00   | 126.50 | 1.0  | 5.0  | 160.0   | 3.8  |
| SMBJ90A                  | NX                       | SMBJ90CA                | DX   | 90.0  | 100.00   | 115.50 | 1.0  | 5.0  | 146.0   | 4.1  |
| SMBJ100                  | NY                       | SMBJ100C                | DY   | 100.0   | 111.00   | 141.00 | 1.0  | 5.0  | 179.0   | 3.4  |
| SMBJ100A                 | NZ                       | SMBJ100CA               | DZ   | 100.0   | 111.00   | 128.00 | 1.0  | 5.0  | 162.0   | 3.7  |
| SMBJ110                  | PD                       | SMBJ110C                | ED   | 110.0   | 122.00   | 154.50 | 1.0  | 5.0  | 196.0   | 3.0  |
| SMBJ110A                 | PE                       | SMBJ110CA               | EE   | 110.0   | 122.00   | 140.50 | 1.0  | 5.0  | 177.0   | 3.4  |
| SMBJ120                  | PF                       | SMBJ120C                | EF   | 120.0   | 133.00   | 169.00 | 1.0  | 5.0  | 214.0   | 2.8  |
| SMBJ120A                 | PG                       | SMBJ120CA               | EG   | 120.0   | 133.00   | 153.00 | 1.0  | 5.0  | 193.0   | 3.1  |
| SMBJ130                  | PH                       | SMBJ130C                | EH   | 130.0   | 144.00   | 182.50 | 1.0  | 5.0  | 231.0   | 2.6  |
| SMBJ130A                 | PK                       | SMBJ130CA               | EK   | 130.0   | 144.00   | 165.50 | 1.0  | 5.0  | 209.0   | 2.9  |
| SMBJ150                  | PL                       | SMBJ150C                | EL   | 150.0   | 167.00   | 211.50 | 1.0  | 5.0  | 268.0   | 2.2  |
| SMBJ150A                 | PM                       | SMBJ150CA               | EM   | 150.0   | 167.00   | 192.50 | 1.0  | 5.0  | 243.0   | 2.5  |
| SMBJ160                  | PN                       | SMBJ160C                | EN   | 160.0   | 178.00   | 226.00 | 1.0  | 5.0  | 287.0   | 2.1  |
| SMBJ160A                 | PP                       | SMBJ160CA               | EP   | 160.0   | 178.00   | 205.00 | 1.0  | 5.0  | 259.0   | 2.3  |
| SMBJ170                  | PQ                       | SMBJ170C                | EQ   | 170.0   | 189.00   | 239.50 | 1.0  | 5.0  | 304.0   | 2.0  |
| SMBJ170A                 | PR                       | SMBJ170CA               | ER   | 170.0   | 189.00   | 217.50 | 1.0  | 5.0  | 275.0   | 2.2  |

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2. For Uni-direction devices V<sub>F</sub> = 3.5 Volts max at I<sub>F</sub> 50A, 300 µS square wave pulse.

