

## Surface Mount Transient Voltage Suppressors (TVS)

**SMBJ Series 5.0 To 440 V 600W**

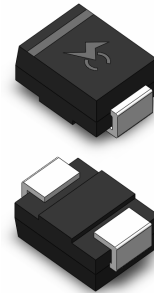
### Description

The SMBJ series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

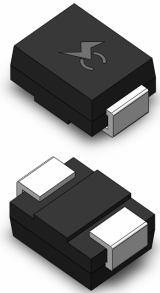
### Features

- u For surface mounted applications in order to optimize board space
- u Low leakage
- u Uni and Bidirectional unit
- u Glass passivated junction
- u Low inductance
- u Excellent clamping capability
- u 600W Peak power capability at 10 × 1000μs waveform Repetition rate (duty cycle):0.01%
- u Fast response time: typically less than 1.0ps from 0 Volts to  $V_{BR}$  min
- u Typical  $I_R$  less than 5μA above 12V.
- u High Temperature soldering: 260°C/40 seconds at terminals
- u Typical maximum temperature coefficient  $\Delta V_{BR} = 0.1\% \times V_{BR}@25^\circ C \times \Delta T$
- u Plastic package has Underwriters Laboratory Flammability 94V-0
- u Matte tin lead-free Plated
- u Halogen free and RoHS compliant
- u Typical failure mode is short from over-specified voltage or current
- u Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c
- u IEC-61000-4-2 ESD 15kV(Air), 8kV (Contact)
- u ESD protection of data lines in accordance with IEC 61000-4-2 (IEC801-2)
- u EFT protection of data lines in accordance with IEC 61000-4-4 (IEC801-4)

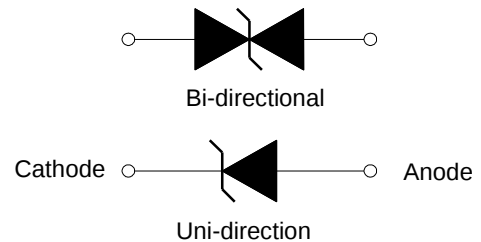
Uni-directional



Bi-directional



### Functional Diagram



### Agency Approvals

| AGENCY                                                                               | AGENCY FILE NUMBER |
|--------------------------------------------------------------------------------------|--------------------|
|  | E341027            |

### Applications

TVS devices are ideal for the protection of I/O interfaces,  $V_{CC}$  bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

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

| Parameter                                                                        | Symbol         | Value          | Unit       |
|----------------------------------------------------------------------------------|----------------|----------------|------------|
| Peak Pulse Power Dissipation with a 10/1000μs waveform (Fig.1)(Note 1), (Note 2) | $P_{PPM}$      | 600            | Watts      |
| Peak Pulse Current with a 10/1000μs waveform.(Note1, Fig.3)                      | $I_{PP}$       | See Next Table | Amps       |
| Power Dissipation on Infinite Heat Sink at $T_L=75^\circ C$                      | $P_{M(AV)}$    | 5.0            | Watt       |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)                 | $I_{FSM}$      | 100            | Amps       |
| Maximum Instantaneous Forward Voltage at 25A for Unidirectional Only (Note 4)    | $V_F$          | 3.5/5.0        | Voltage    |
| Operating junction and Storage Temperature Range.                                | $T_J, T_{STG}$ | -55 to +150    | $^\circ C$ |

### Notes:

1. Non-repetitive current pulse, per Fig. 3 and derated above  $T_A = 25^\circ C$  per Fig. 2.
2. Mounted on 5.0mm x 5.0mm (0.03mm thick) Copper Pads to each terminal.
3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.
4.  $V_F < 3.5V$  for  $V_{BR} < 200V$  and  $V_F < 6.5V$  for  $V_{BR} > 201V$ .

## Surface Mount Transient Voltage Suppressors (TVS)

**SMBJ Series 5.0 To 440 V 600W**
**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

| Part Number |           | Marking |    | Reverse Stand-Off Voltage V <sub>RWM</sub> (V) | Breakdown Voltage V <sub>BR</sub> (V) @I <sub>T</sub> |       | Test Current I <sub>T</sub> (mA) | Maximum Clamping Voltage V <sub>C</sub> @I <sub>PP</sub> (V) | Maximum Peak Pulse Current I <sub>PP</sub> (A) | Maximum Reverse Leakage I <sub>R</sub> @V <sub>RWM</sub> (μA) |
|-------------|-----------|---------|----|------------------------------------------------|-------------------------------------------------------|-------|----------------------------------|--------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------|
| Uni         | Bi        | Uni     | Bi |                                                | MIN                                                   | MAX   |                                  |                                                              |                                                |                                                               |
| SMBJ5.0     | SMBJ5.0C  | KD      | AD | 5.0                                            | 6.40                                                  | 7.30  | 10                               | 9.6                                                          | 62.50                                          | 800                                                           |
| SMBJ5.0A    | SMBJ5.0CA | KE      | AE | 5.0                                            | 6.40                                                  | 7.00  | 10                               | 9.2                                                          | 65.22                                          | 800                                                           |
| SMBJ6.0     | SMBJ6.0C  | KF      | AF | 6.0                                            | 6.67                                                  | 8.15  | 10                               | 11.4                                                         | 52.63                                          | 800                                                           |
| SMBJ6.0A    | SMBJ6.0CA | KG      | AG | 6.0                                            | 6.67                                                  | 7.37  | 10                               | 10.3                                                         | 58.25                                          | 800                                                           |
| SMBJ6.5     | SMBJ6.5C  | KH      | AH | 6.5                                            | 7.22                                                  | 8.82  | 10                               | 12.3                                                         | 48.78                                          | 500                                                           |
| SMBJ6.5A    | SMBJ6.5CA | KK      | AK | 6.5                                            | 7.22                                                  | 7.98  | 10                               | 11.2                                                         | 53.57                                          | 500                                                           |
| SMBJ7.0     | SMBJ7.0C  | KL      | AL | 7.0                                            | 7.78                                                  | 9.51  | 10                               | 13.3                                                         | 45.11                                          | 200                                                           |
| SMBJ7.0A    | SMBJ7.0CA | KM      | AM | 7.0                                            | 7.78                                                  | 8.60  | 10                               | 12.0                                                         | 50.00                                          | 200                                                           |
| SMBJ7.5     | SMBJ7.5C  | KN      | AN | 7.5                                            | 8.33                                                  | 10.20 | 1                                | 14.3                                                         | 41.96                                          | 100                                                           |
| SMBJ7.5A    | SMBJ7.5CA | KP      | AP | 7.5                                            | 8.33                                                  | 9.21  | 1                                | 12.9                                                         | 46.51                                          | 100                                                           |
| SMBJ8.0     | SMBJ8.0C  | KQ      | AQ | 8.0                                            | 8.89                                                  | 10.90 | 1                                | 15.0                                                         | 40.00                                          | 50                                                            |
| SMBJ8.0A    | SMBJ8.0CA | KR      | AR | 8.0                                            | 8.89                                                  | 9.83  | 1                                | 13.6                                                         | 44.12                                          | 50                                                            |
| SMBJ8.5     | SMBJ8.5C  | KS      | AS | 8.5                                            | 9.44                                                  | 11.50 | 1                                | 15.9                                                         | 37.74                                          | 10                                                            |
| SMBJ8.5A    | SMBJ8.5CA | KT      | AT | 8.5                                            | 9.44                                                  | 10.40 | 1                                | 14.4                                                         | 41.67                                          | 10                                                            |
| SMBJ9.0     | SMBJ9.0C  | KU      | AU | 9.0                                            | 10.00                                                 | 12.20 | 1                                | 16.9                                                         | 35.50                                          | 5                                                             |
| SMBJ9.0A    | SMBJ9.0CA | KV      | AV | 9.0                                            | 10.00                                                 | 11.10 | 1                                | 15.4                                                         | 38.96                                          | 5                                                             |
| SMBJ10      | SMBJ10C   | KW      | AA | 10.0                                           | 11.10                                                 | 13.60 | 1                                | 18.8                                                         | 31.91                                          | 5                                                             |
| SMBJ10A     | SMBJ10CA  | KX      | AX | 10.0                                           | 11.10                                                 | 12.30 | 1                                | 17.0                                                         | 35.29                                          | 5                                                             |
| SMBJ11      | SMBJ11C   | KY      | AY | 11.0                                           | 12.20                                                 | 14.90 | 1                                | 20.1                                                         | 29.85                                          | 5                                                             |
| SMBJ11A     | SMBJ11CA  | KZ      | WZ | 11.0                                           | 12.20                                                 | 13.50 | 1                                | 18.2                                                         | 32.97                                          | 5                                                             |
| SMBJ12      | SMBJ12C   | LD      | BD | 12.0                                           | 13.30                                                 | 16.30 | 1                                | 22.0                                                         | 27.27                                          | 5                                                             |
| SMBJ12A     | SMBJ12CA  | LE      | BE | 12.0                                           | 13.30                                                 | 14.70 | 1                                | 19.9                                                         | 30.15                                          | 5                                                             |
| SMBJ13      | SMBJ13C   | LF      | BF | 13.0                                           | 14.40                                                 | 17.60 | 1                                | 23.8                                                         | 25.21                                          | 5                                                             |
| SMBJ13A     | SMBJ13CA  | LG      | BG | 13.0                                           | 14.40                                                 | 15.90 | 1                                | 21.5                                                         | 27.91                                          | 5                                                             |
| SMBJ14      | SMBJ14C   | LH      | BH | 14.0                                           | 15.60                                                 | 19.10 | 1                                | 25.8                                                         | 23.26                                          | 5                                                             |
| SMBJ14A     | SMBJ14CA  | LK      | BK | 14.0                                           | 15.60                                                 | 17.20 | 1                                | 23.2                                                         | 25.86                                          | 5                                                             |
| SMBJ15      | SMBJ15C   | LL      | BL | 15.0                                           | 16.70                                                 | 20.40 | 1                                | 26.9                                                         | 22.30                                          | 5                                                             |
| SMBJ15A     | SMBJ15CA  | LM      | BM | 15.0                                           | 16.70                                                 | 18.50 | 1                                | 24.4                                                         | 24.59                                          | 5                                                             |
| SMBJ16      | SMBJ16C   | LN      | BN | 16.0                                           | 17.80                                                 | 21.80 | 1                                | 28.8                                                         | 20.83                                          | 5                                                             |
| SMBJ16A     | SMBJ16CA  | LP      | BP | 16.0                                           | 17.80                                                 | 19.70 | 1                                | 26.0                                                         | 23.08                                          | 5                                                             |
| SMBJ17      | SMBJ17C   | LQ      | BQ | 17.0                                           | 18.90                                                 | 23.10 | 1                                | 30.5                                                         | 19.67                                          | 5                                                             |
| SMBJ17A     | SMBJ17CA  | LR      | BR | 17.0                                           | 18.90                                                 | 20.90 | 1                                | 27.6                                                         | 21.74                                          | 5                                                             |
| SMBJ18      | SMBJ18C   | LS      | BS | 18.0                                           | 20.00                                                 | 24.40 | 1                                | 32.2                                                         | 18.63                                          | 5                                                             |
| SMBJ18A     | SMBJ18CA  | LT      | BT | 18.0                                           | 20.00                                                 | 22.10 | 1                                | 29.2                                                         | 20.55                                          | 5                                                             |
| SMBJ19      | SMBJ19C   | LA      | BA | 19.0                                           | 21.13                                                 | 25.76 | 1                                | 34.0                                                         | 17.64                                          | 5                                                             |
| SMBJ19A     | SMBJ19CA  | LB      | BB | 19.0                                           | 21.10                                                 | 23.30 | 1                                | 30.8                                                         | 19.49                                          | 5                                                             |
| SMBJ20      | SMBJ20C   | LU      | BU | 20.0                                           | 22.20                                                 | 27.10 | 1                                | 35.8                                                         | 16.67                                          | 5                                                             |
| SMBJ20A     | SMBJ20CA  | LV      | BV | 20.0                                           | 22.20                                                 | 24.50 | 1                                | 32.4                                                         | 18.52                                          | 5                                                             |
| SMBJ22      | SMBJ22C   | LW      | BW | 22.0                                           | 24.40                                                 | 29.80 | 1                                | 39.4                                                         | 15.23                                          | 5                                                             |
| SMBJ22A     | SMBJ22CA  | LX      | BX | 22.0                                           | 24.40                                                 | 26.90 | 1                                | 35.5                                                         | 16.90                                          | 5                                                             |
| SMBJ24      | SMBJ24C   | LY      | BY | 24.0                                           | 26.70                                                 | 32.60 | 1                                | 43.0                                                         | 13.95                                          | 5                                                             |
| SMBJ24A     | SMBJ24CA  | LZ      | BZ | 24.0                                           | 26.70                                                 | 29.50 | 1                                | 38.9                                                         | 15.42                                          | 5                                                             |
| SMBJ26      | SMBJ26C   | MD      | CD | 26.0                                           | 28.90                                                 | 35.30 | 1                                | 46.6                                                         | 12.88                                          | 5                                                             |
| SMBJ26A     | SMBJ26CA  | ME      | CE | 26.0                                           | 28.90                                                 | 31.90 | 1                                | 42.1                                                         | 14.25                                          | 5                                                             |
| SMBJ28      | SMBJ28C   | MF      | CF | 28.0                                           | 31.10                                                 | 38.00 | 1                                | 50.0                                                         | 12.00                                          | 5                                                             |
| SMBJ28A     | SMBJ28CA  | MG      | CG | 28.0                                           | 31.10                                                 | 34.40 | 1                                | 45.4                                                         | 13.22                                          | 5                                                             |
| SMBJ30      | SMBJ30C   | MH      | CH | 30.0                                           | 33.30                                                 | 40.70 | 1                                | 53.5                                                         | 11.21                                          | 5                                                             |
| SMBJ30A     | SMBJ30CA  | MK      | CK | 30.0                                           | 33.30                                                 | 36.80 | 1                                | 48.4                                                         | 12.40                                          | 5                                                             |
| SMBJ33      | SMBJ33C   | ML      | CL | 33.0                                           | 36.70                                                 | 44.90 | 1                                | 59.0                                                         | 10.17                                          | 5                                                             |
| SMBJ33A     | SMBJ33CA  | MM      | CM | 33.0                                           | 36.70                                                 | 40.60 | 1                                | 53.3                                                         | 11.26                                          | 5                                                             |
| SMBJ36      | SMBJ36C   | MN      | CN | 36.0                                           | 40.00                                                 | 48.90 | 1                                | 64.3                                                         | 9.33                                           | 5                                                             |
| SMBJ36A     | SMBJ36CA  | MP      | CP | 36.0                                           | 40.00                                                 | 44.20 | 1                                | 58.1                                                         | 10.33                                          | 5                                                             |
| SMBJ40      | SMBJ40C   | MQ      | CQ | 40.0                                           | 44.40                                                 | 54.30 | 1                                | 71.4                                                         | 8.40                                           | 5                                                             |
| SMBJ40A     | SMBJ40CA  | MR      | CR | 40.0                                           | 44.40                                                 | 49.10 | 1                                | 64.5                                                         | 9.30                                           | 5                                                             |
| SMBJ43      | SMBJ43C   | MS      | CS | 43.0                                           | 47.80                                                 | 58.40 | 1                                | 76.7                                                         | 7.82                                           | 5                                                             |
| SMBJ43A     | SMBJ43CA  | MT      | CT | 43.0                                           | 47.80                                                 | 52.80 | 1                                | 69.4                                                         | 8.65                                           | 5                                                             |

## Surface Mount Transient Voltage Suppressors (TVS)

**SMBJ Series 5.0 To 440 V 600W**
**Electrical Characteristics ( $T_A=25^{\circ}\text{C}$  unless otherwise noted) (Continue)**

| Part Number |           | Marking |    | Reverse Stand-Off Voltage $V_{RWM}$ (V) | Breakdown Voltage $V_{BR}$ (V) @ $I_T$ |        | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C$ @ $I_{PP}$ (V) | Maximum Peak Pulse Current $I_{PP}$ (A) | Maximum Reverse Leakage $I_R$ @ $V_{RWM}$ ( $\mu\text{A}$ ) |
|-------------|-----------|---------|----|-----------------------------------------|----------------------------------------|--------|-------------------------|-----------------------------------------------|-----------------------------------------|-------------------------------------------------------------|
| Uni         | Bi        | Uni     | Bi |                                         | MIN                                    | MAX    |                         |                                               |                                         |                                                             |
| SMBJ45      | SMBJ45C   | MU      | CU | 45.0                                    | 50.00                                  | 61.10  | 1                       | 80.3                                          | 7.47                                    | 5                                                           |
| SMBJ45A     | SMBJ45CA  | MV      | CV | 45.0                                    | 50.00                                  | 55.30  | 1                       | 72.7                                          | 8.25                                    | 5                                                           |
| SMBJ48      | SMBJ48C   | MW      | CW | 48.0                                    | 53.30                                  | 65.10  | 1                       | 85.5                                          | 7.02                                    | 5                                                           |
| SMBJ48A     | SMBJ48CA  | MX      | CX | 48.0                                    | 53.30                                  | 58.90  | 1                       | 77.4                                          | 7.75                                    | 5                                                           |
| SMBJ51      | SMBJ51C   | MY      | CY | 51.0                                    | 56.70                                  | 69.30  | 1                       | 91.1                                          | 6.59                                    | 5                                                           |
| SMBJ51A     | SMBJ51CA  | MZ      | CZ | 51.0                                    | 56.70                                  | 62.70  | 1                       | 82.4                                          | 7.28                                    | 5                                                           |
| SMBJ54      | SMBJ54C   | ND      | DD | 54.0                                    | 60.00                                  | 73.30  | 1                       | 96.3                                          | 6.23                                    | 5                                                           |
| SMBJ54A     | SMBJ54CA  | NE      | DE | 54.0                                    | 60.00                                  | 66.30  | 1                       | 87.1                                          | 6.89                                    | 5                                                           |
| SMBJ58      | SMBJ58C   | NF      | DF | 58.0                                    | 64.40                                  | 78.70  | 1                       | 103.0                                         | 5.83                                    | 5                                                           |
| SMBJ58A     | SMBJ58CA  | NG      | DG | 58.0                                    | 64.40                                  | 71.20  | 1                       | 93.6                                          | 6.41                                    | 5                                                           |
| SMBJ60      | SMBJ60C   | NH      | DH | 60.0                                    | 66.70                                  | 81.50  | 1                       | 107.0                                         | 5.61                                    | 5                                                           |
| SMBJ60A     | SMBJ60CA  | NK      | DK | 60.0                                    | 66.70                                  | 73.70  | 1                       | 96.8                                          | 6.20                                    | 5                                                           |
| SMBJ64      | SMBJ64C   | NL      | DL | 64.0                                    | 71.10                                  | 86.90  | 1                       | 114.0                                         | 5.26                                    | 5                                                           |
| SMBJ64A     | SMBJ64CA  | NM      | DM | 64.0                                    | 71.10                                  | 78.60  | 1                       | 103.0                                         | 5.83                                    | 5                                                           |
| SMBJ70      | SMBJ70C   | NN      | DN | 70.0                                    | 77.80                                  | 95.10  | 1                       | 125.0                                         | 4.80                                    | 5                                                           |
| SMBJ70A     | SMBJ70CA  | NP      | DP | 70.0                                    | 77.80                                  | 86.00  | 1                       | 113.0                                         | 5.31                                    | 5                                                           |
| SMBJ75      | SMBJ75C   | NQ      | DQ | 75.0                                    | 83.30                                  | 102.00 | 1                       | 134.0                                         | 4.48                                    | 5                                                           |
| SMBJ75A     | SMBJ75CA  | NR      | DR | 75.0                                    | 83.30                                  | 92.10  | 1                       | 121.0                                         | 4.96                                    | 5                                                           |
| SMBJ78      | SMBJ78C   | NS      | DS | 78.0                                    | 86.70                                  | 106.00 | 1                       | 139.0                                         | 4.32                                    | 5                                                           |
| SMBJ78A     | SMBJ78CA  | NT      | DT | 78.0                                    | 86.70                                  | 95.80  | 1                       | 126.0                                         | 4.76                                    | 5                                                           |
| SMBJ80      | SMBJ80C   | NA      | DA | 80.0                                    | 88.96                                  | 108.80 | 1                       | 143.2                                         | 4.19                                    | 5                                                           |
| SMBJ80A     | SMBJ80CA  | NB      | DB | 80.0                                    | 88.80                                  | 97.60  | 1                       | 129.6                                         | 4.63                                    | 5                                                           |
| SMBJ85      | SMBJ85C   | NU      | DU | 85.0                                    | 94.40                                  | 115.00 | 1                       | 151.0                                         | 3.97                                    | 5                                                           |
| SMBJ85A     | SMBJ85CA  | NV      | DV | 85.0                                    | 94.40                                  | 104.00 | 1                       | 137.0                                         | 4.38                                    | 5                                                           |
| SMBJ90      | SMBJ90C   | NW      | DW | 90.0                                    | 100.00                                 | 122.00 | 1                       | 160.0                                         | 3.75                                    | 5                                                           |
| SMBJ90A     | SMBJ90CA  | NX      | DX | 90.0                                    | 100.00                                 | 111.00 | 1                       | 146.0                                         | 4.11                                    | 5                                                           |
| SMBJ100     | SMBJ100C  | NY      | DY | 100.0                                   | 111.00                                 | 136.00 | 1                       | 179.0                                         | 3.35                                    | 5                                                           |
| SMBJ100A    | SMBJ100CA | NZ      | DZ | 100.0                                   | 111.00                                 | 123.00 | 1                       | 162.0                                         | 3.70                                    | 5                                                           |
| SMBJ110     | SMBJ110C  | PD      | ED | 110.0                                   | 122.00                                 | 149.00 | 1                       | 196.0                                         | 3.06                                    | 5                                                           |
| SMBJ110A    | SMBJ110CA | PE      | EE | 110.0                                   | 122.00                                 | 135.00 | 1                       | 177.0                                         | 3.39                                    | 5                                                           |
| SMBJ120     | SMBJ120C  | PF      | EF | 120.0                                   | 133.00                                 | 163.00 | 1                       | 214.0                                         | 2.80                                    | 5                                                           |
| SMBJ120A    | SMBJ120CA | PG      | EG | 120.0                                   | 133.00                                 | 147.00 | 1                       | 193.0                                         | 3.11                                    | 5                                                           |
| SMBJ130     | SMBJ130C  | PH      | EH | 130.0                                   | 144.00                                 | 176.00 | 1                       | 231.0                                         | 2.60                                    | 5                                                           |
| SMBJ130A    | SMBJ130CA | PK      | EK | 130.0                                   | 144.00                                 | 159.00 | 1                       | 209.0                                         | 2.87                                    | 5                                                           |
| SMBJ140     | SMBJ140C  | PA      | EA | 140.0                                   | 155.68                                 | 190.40 | 1                       | 250.6                                         | 2.39                                    | 5                                                           |
| SMBJ140A    | SMBJ140CA | PB      | EB | 140.0                                   | 155.00                                 | 171.00 | 1                       | 226.8                                         | 2.65                                    | 5                                                           |
| SMBJ150     | SMBJ150C  | PL      | EL | 150.0                                   | 167.00                                 | 204.00 | 1                       | 268.0                                         | 2.24                                    | 5                                                           |
| SMBJ150A    | SMBJ150CA | PM      | EM | 150.0                                   | 167.00                                 | 185.00 | 1                       | 243.0                                         | 2.47                                    | 5                                                           |
| SMBJ160     | SMBJ160C  | PN      | EN | 160.0                                   | 178.00                                 | 218.00 | 1                       | 287.0                                         | 2.09                                    | 5                                                           |
| SMBJ160A    | SMBJ160CA | PP      | EP | 160.0                                   | 178.00                                 | 197.00 | 1                       | 259.0                                         | 2.32                                    | 5                                                           |
| SMBJ170     | SMBJ170C  | PQ      | EQ | 170.0                                   | 189.00                                 | 231.00 | 1                       | 304.0                                         | 1.97                                    | 5                                                           |
| SMBJ170A    | SMBJ170CA | PR      | ER | 170.0                                   | 189.00                                 | 209.00 | 1                       | 275.0                                         | 2.18                                    | 5                                                           |
| SMBJ180     | SMBJ180C  | PS      | ES | 180.0                                   | 201.00                                 | 244.80 | 1                       | 322.2                                         | 1.86                                    | 5                                                           |
| SMBJ180A    | SMBJ180CA | PT      | ET | 180.0                                   | 201.00                                 | 220.00 | 1                       | 291.6                                         | 2.06                                    | 5                                                           |
| SMBJ190     | SMBJ190C  | PU      | EU | 190.0                                   | 211.21                                 | 258.40 | 1                       | 340.1                                         | 1.76                                    | 5                                                           |
| SMBJ190A    | SMBJ190CA | PV      | EV | 190.0                                   | 211.00                                 | 232.00 | 1                       | 307.8                                         | 1.95                                    | 5                                                           |
| SMBJ200A    | SMBJ200CA | PW      | EW | 200.0                                   | 224.00                                 | 247.00 | 1                       | 324.0                                         | 1.85                                    | 5                                                           |
| SMBJ220A    | SMBJ220CA | PX      | EX | 220.0                                   | 246.00                                 | 272.00 | 1                       | 356.0                                         | 1.69                                    | 5                                                           |
| SMBJ250A    | SMBJ250CA | PZ      | EZ | 250.0                                   | 279.00                                 | 309.00 | 1                       | 405.0                                         | 1.48                                    | 5                                                           |
| SMBJ300A    | SMBJ300CA | QE      | FE | 300.0                                   | 335.00                                 | 371.00 | 1                       | 486.0                                         | 1.23                                    | 5                                                           |
| SMBJ350A    | SMBJ350CA | QG      | FG | 350.0                                   | 391.00                                 | 432.00 | 1                       | 567.0                                         | 1.06                                    | 5                                                           |
| SMBJ400A    | SMBJ400CA | QK      | FK | 400.0                                   | 447.00                                 | 494.00 | 1                       | 648.0                                         | 0.93                                    | 5                                                           |
| SMBJ440A    | SMBJ440CA | QM      | FM | 440.0                                   | 492.00                                 | 543.00 | 1                       | 713.0                                         | 0.84                                    | 5                                                           |

**Note:**

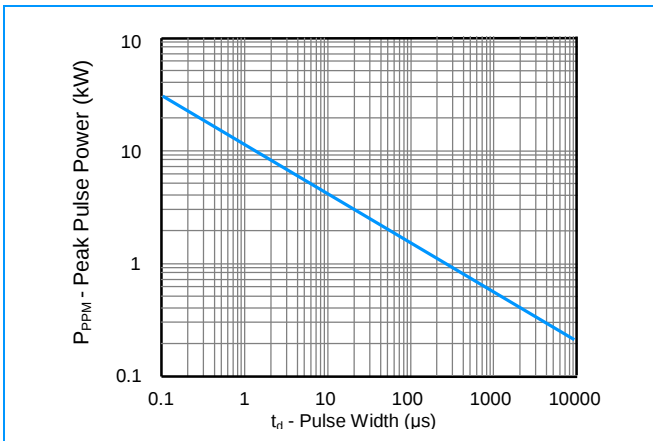
1. Suffix 'A' denotes 5% tolerance device. Without 'A' denotes 10% tolerance device
2. Add suffix 'C' or 'CA' after part number to specify Bi-directional devices
3. For Bi-Directional devices having  $V_R$  of 10 volts and under, the  $I_R$  limit is double

# Surface Mount Transient Voltage Suppressors (TVS)

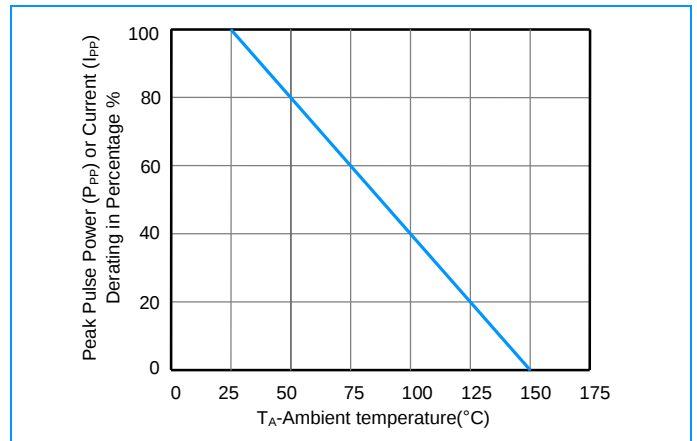
**SMBJ Series 5.0 To 440 V 600W**

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

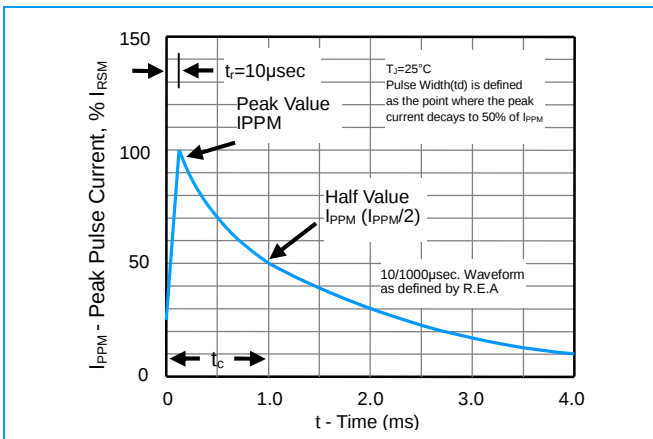
**Figure 1 - Peak Pulse Power Rating Curve**



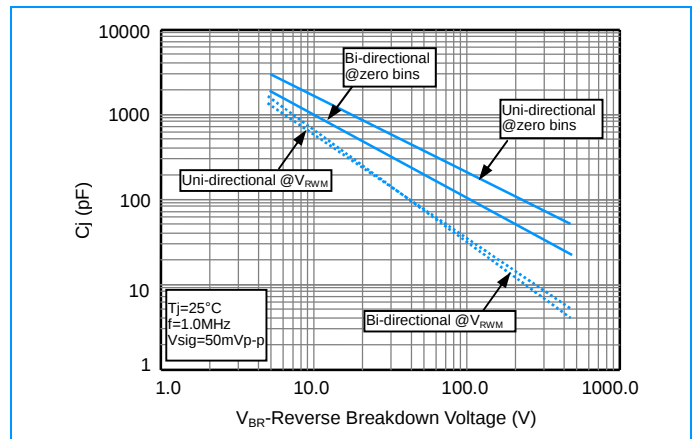
**Figure 2 - Pulse Derating Curve**



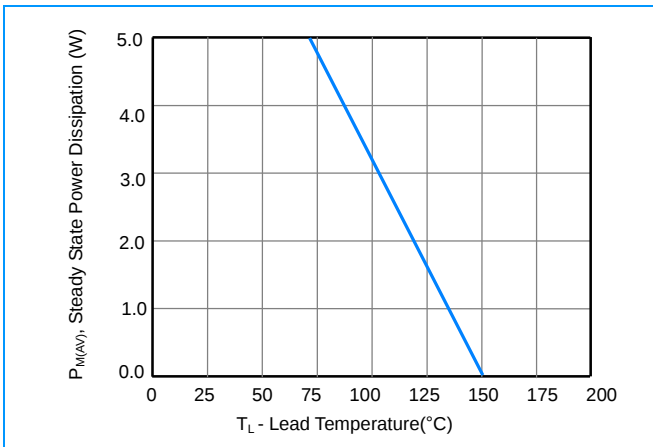
**Figure 3 - Pulse Waveform**



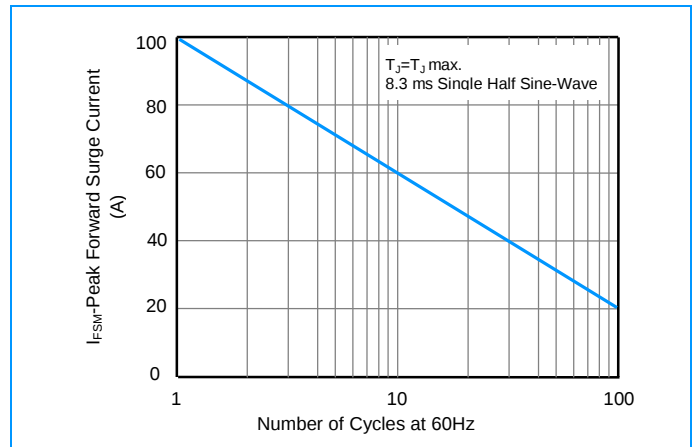
**Figure 4 - Typical Junction Capacitance**



**Figure 5 - Steady State Power Derating Curve**



**Figure 6 - Maximum Non-Repetitive Surge Current**

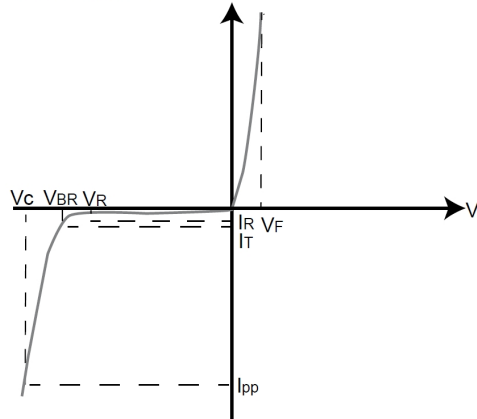


## Surface Mount Transient Voltage Suppressors (TVS)

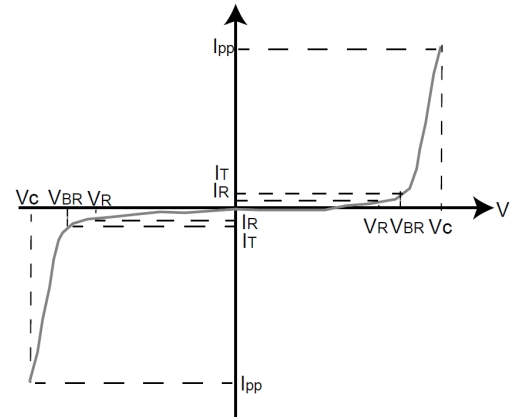
**SMBJ Series 5.0 To 440 V 600W**

### I-V Curve Characteristics

Uni-directional



Bi-directional



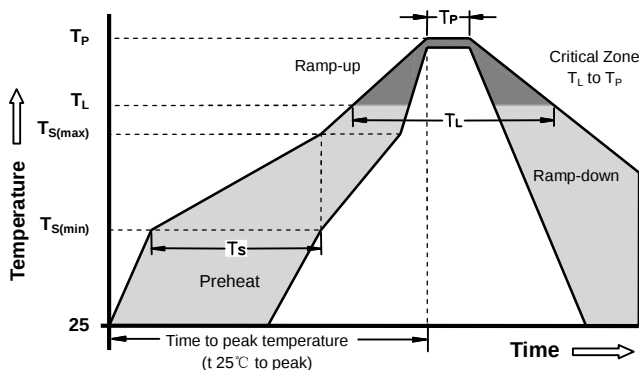
### Physical Specifications

|                 |                                                              |
|-----------------|--------------------------------------------------------------|
| <b>Weight</b>   | 0.003 ounce, 0.093 gram                                      |
| <b>Case</b>     | JEDEC DO-214AA Molded Plastic over glass passivated junction |
| <b>Polarity</b> | Color band denotes cathode except Bipolar                    |
| <b>Terminal</b> | Matte Tin-plated leads, Solderable per JESD22-B102D          |

### Environmental Specifications

|                           |             |
|---------------------------|-------------|
| <b>Temperature Cycle</b>  | JESD22-A104 |
| <b>Pressure Cooker</b>    | JESD22-A102 |
| <b>High Temp. Storage</b> | JESD22-A103 |
| <b>HTRB</b>               | JESD22-A108 |
| <b>Thermal Shock</b>      | JESD22-A106 |

### Soldering Parameters

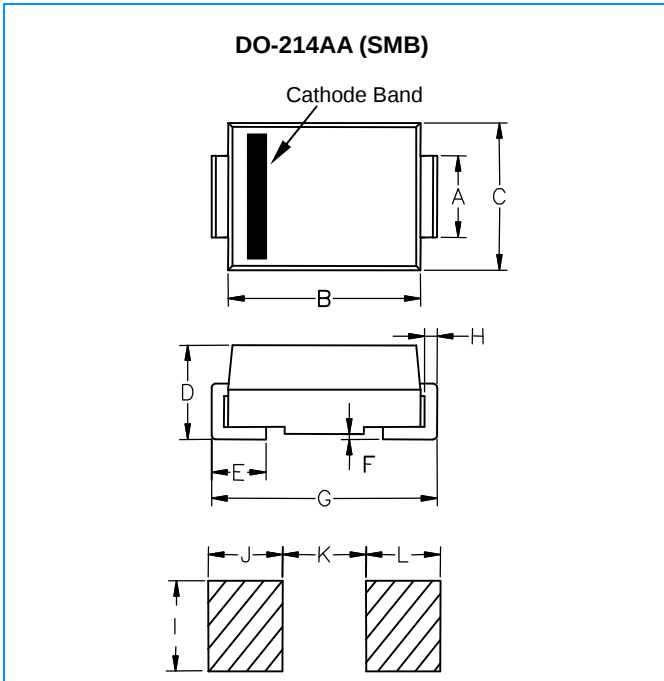


| Reflow Condition                                     |                                    | Lead-free assembly |
|------------------------------------------------------|------------------------------------|--------------------|
| Pre Heat                                             | -Temperature Min ( $T_{S(min)}$ )  | 150°C              |
|                                                      | -Temperature Max ( $T_{S(max)}$ )  | 200°C              |
|                                                      | - Time (min to max) ( $t_s$ )      | 60 -180 Seconds    |
| Average ramp up rate ( Liquidus Temp $T_L$ ) to peak |                                    | 3°C/second max     |
| $T_{S(max)}$ to $T_L$ - Ramp-up Rate                 |                                    | 3°C/second max     |
| Reflow                                               | - Temperature ( $T_L$ ) (Liquidus) | 217°C              |
|                                                      | - Time (min to max) ( $t_s$ )      | 60 -150 Seconds    |
| Peak Temperature ( $T_P$ )                           |                                    | 260 +0/-5°C        |
| Time within 5°C of actual peak Temperature ( $t_p$ ) |                                    | 20 -40 Seconds     |
| Ramp-down Rate                                       |                                    | 6°C/second max     |
| Time 25°C to peak Temperature ( $T_P$ )              |                                    | 8 minutes Max      |
| Do not exceed                                        |                                    | 280°C              |

## Surface Mount Transient Voltage Suppressors (TVS)

**SMBJ Series 5.0 To 440 V 600W**

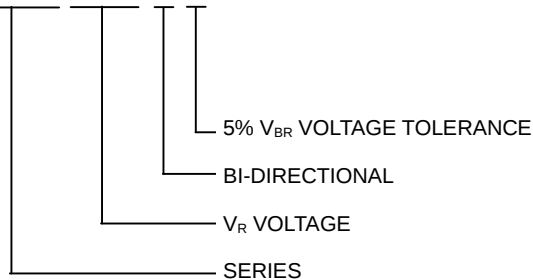
### Dimensions



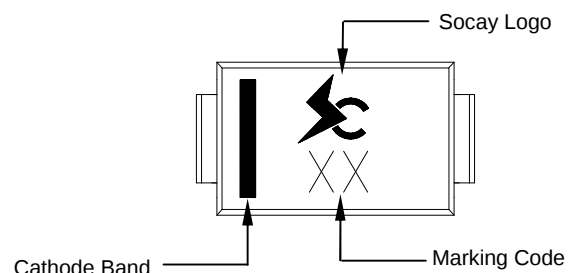
| Dimensions | Inches |       | Millimeters |       |
|------------|--------|-------|-------------|-------|
|            | Min    | Max   | Min         | Max   |
| A          | 0.077  | 0.087 | 1.960       | 2.200 |
| B          | 0.171  | 0.191 | 4.350       | 4.850 |
| C          | 0.130  | 0.155 | 3.300       | 3.940 |
| D          | 0.084  | 0.096 | 2.130       | 2.440 |
| E          | 0.030  | 0.060 | 0.750       | 1.520 |
| F          | -      | 0.008 | -           | 0.203 |
| G          | 0.201  | 0.216 | 5.100       | 5.500 |
| H          | 0.006  | 0.012 | 0.152       | 0.305 |
| I          | 0.089  | -     | 2.260       | -     |
| J          | 0.085  | -     | 2.160       | -     |
| K          | -      | 0.107 | -           | 2.740 |
| L          | 0.085  | -     | 2.160       | -     |

### Part Numbering

**SMBJ × × × CA**



### Part Marking



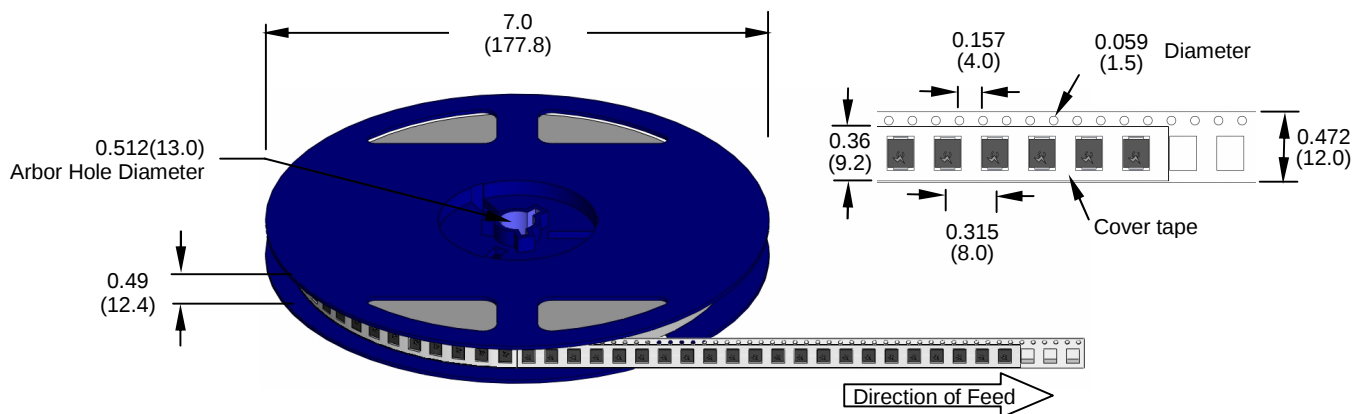
## Surface Mount Transient Voltage Suppressors (TVS)

**SMBJ Series    5.0 To 440 V    600W**

### Packaging

| Part Number | Component Package | Quantity | Packaging Option         | Packaging Specification |
|-------------|-------------------|----------|--------------------------|-------------------------|
| SMBJXXXXX   | DO-214AA          | 500      | Tape & Reel -12mm/7"tape | EIA STD RS-481          |

### Tape and Reel Specifications



Dimensions are in inches  
(and millimeters)