



**DC COMPONENTS CO., LTD.**  
RECTIFIER SPECIALISTS

**SMAJ5.0  
THRU  
SMAJ170CA**

# TECHNICAL SPECIFICATIONS OF SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

VOLTAGE RANGE - 5.0 to 170 Volts

PEAK PULSE POWER - 400 Watts

## FEATURES

- \* Ideal for surface mounted applications
- \* Glass passivated junction
- \* 400 Watts Peak Pulse Power capability on 10/1000  $\mu$ s waveform
- \* Excellent clamping capability
- \* Low zener impedance
- \* Fast response time

## MECHANICAL DATA

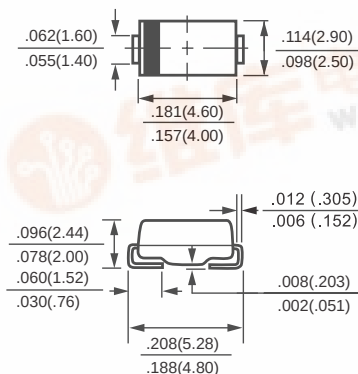
- \* Case: Molded plastic
- \* Epoxy: UL 94V-0 rate flame retardant
- \* Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- \* Polarity: Indicated by cathode band except Bidirectional types.
- \* Mounting position: Any
- \* Weight: 0.064 gram

## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25 °C ambient temperature unless otherwise specified.  
Single phase, half wave, 60 Hz, resistive or inductive load,  
For capacitive load, derate current by 20%.



SMA (DO-214AC)



Dimensions in inches and (millimeters)

## DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA suffix (e.g. SMAJ5.0C, SMAJ170CA)

Electrical characteristics apply in both directions

|                                                                                                                | SYMBOL   | VALUE        | UNITS |
|----------------------------------------------------------------------------------------------------------------|----------|--------------|-------|
| Peak Pulse Power Dissipation on 10/1000 $\mu$ s waveform (Note1)                                               | PPPM     | Minimum 400  | Watts |
| Steady State Power Dissipation ( Note 2 )                                                                      | PM(AV)   | 1.0          | Watts |
| Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load ( JEDEC Method ) ( Note 3 ) | IFSM     | 40           | Amps  |
| Operating and Storage Temperature Range                                                                        | TJ, TSTG | -65 to + 175 | °C    |

NOTES : 1. Non-repetitive current pulse, per Fig.3 and derated above TA = 25°C per Fig.2.

2. Mounted on 0.2 X 0.2\*(5.0 X 5.0mm) copper pad to each terminal.

3. 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum.



RATING AND CHARACTERISTIC CURVES ( SMAJ5.0 THRU SMAJ170CA )

FIG. 1 - PEAK PULSE POWER RATING CURVE

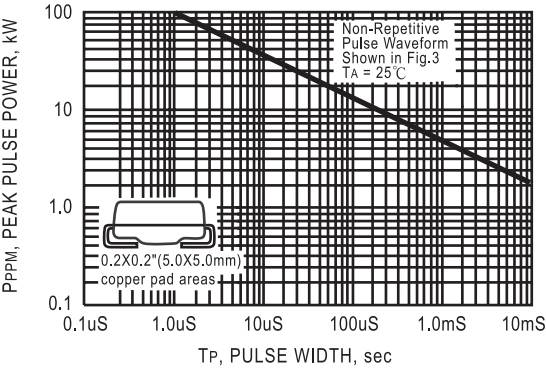


FIG. 2 - PULSE DERATING CURVE

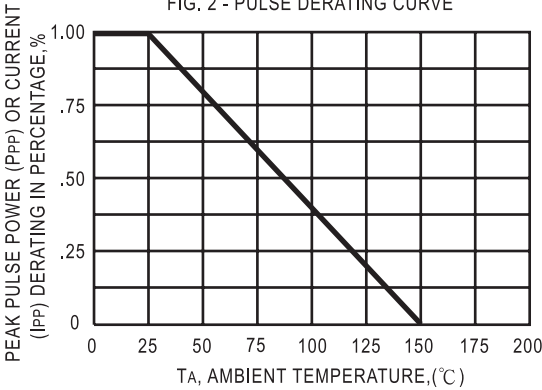


FIG. 3 - PULSE WAVEFORM

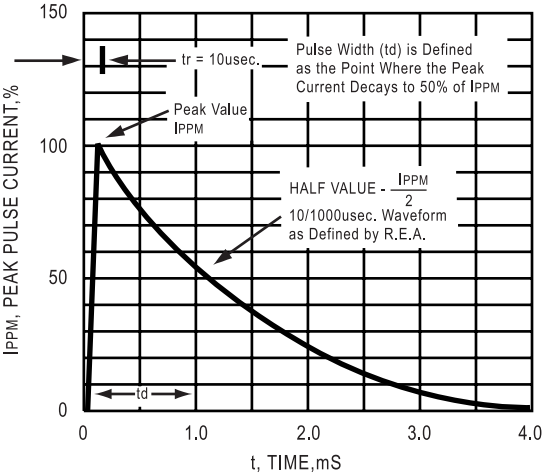


FIG. 4 - TYPICAL JUNCTION CAPACITANCE

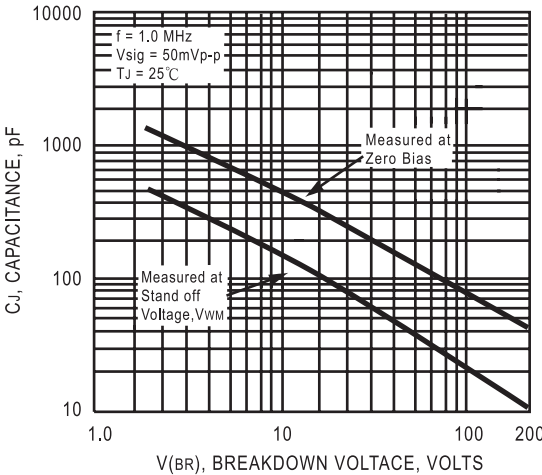
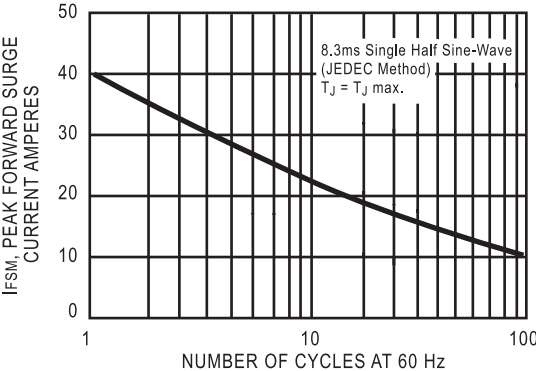


FIG. 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL



# SMAJ (400W) SERIES TRANSIENT VOLTAGE SUPPRESSORS

| TYPE    | Breakdown Voltage |      |          | Reverse Stand off Voltage VWM (Volts) | Maximum Reverse Leakage at VWM Id(uA) | Maximum Peak Pulse Current IPPM (Am s) | Maximum Clamping Voltage at IPPM Vc (Volts) |
|---------|-------------------|------|----------|---------------------------------------|---------------------------------------|----------------------------------------|---------------------------------------------|
|         | VBR (Volts)       |      | @IT (mA) |                                       |                                       |                                        |                                             |
|         | MIN.              | MAX. |          |                                       |                                       |                                        |                                             |
| MAJ5.0  | 6.40              | 7.30 | 10       | 5.0                                   | 800.0                                 | 32.0                                   | 9.6                                         |
| MAJ5.0A | 6.40              | 7.00 | 10       | 5.0                                   | 800.0                                 | 34.0                                   | 9.2                                         |
| MAJ6.0  | 6.67              | 8.15 | 10       | 6.0                                   | 800.0                                 | 27.6                                   | 11.4                                        |
| MAJ6.0A | 6.67              | 7.37 | 10       | 6.0                                   | 800.0                                 | 30.5                                   | 10.3                                        |
| MAJ6.5  | 7.22              | 8.82 | 10       | 6.5                                   | 500.0                                 | 25.6                                   | 12.3                                        |
| MAJ6.5A | 7.22              | 7.98 | 10       | 6.5                                   | 500.0                                 | 28.0                                   | 11.2                                        |
| MAJ7.0  | 7.78              | 9.51 | 10       | 7.0                                   | 200.0                                 | 23.6                                   | 13.3                                        |
| MAJ7.0A | 7.78              | 8.86 | 10       | 7.0                                   | 200.0                                 | 26.0                                   | 12.0                                        |
| MAJ7.5  | 8.33              | 10.2 | 1.0      | 7.5                                   | 100.0                                 | 22.0                                   | 14.3                                        |
| MAJ7.5A | 8.33              | 9.21 | 1.0      | 7.5                                   | 100.0                                 | 24.4                                   | 12.9                                        |
| MAJ8.0  | 8.89              | 10.9 | 1.0      | 8.0                                   | 50.0                                  | 21.0                                   | 15.0                                        |
| MAJ8.0A | 8.89              | 9.83 | 1.0      | 8.0                                   | 50.0                                  | 23.0                                   | 13.6                                        |
| MAJ8.5  | 9.44              | 11.5 | 1.0      | 8.5                                   | 10.0                                  | 19.8                                   | 15.9                                        |
| MAJ8.5A | 9.44              | 10.4 | 1.0      | 8.5                                   | 10.0                                  | 21.8                                   | 14.4                                        |
| MAJ9.0  | 10.0              | 12.2 | 1.0      | 9.0                                   | 5.0                                   | 18.6                                   | 16.9                                        |
| MAJ9.0A | 10.0              | 15.0 | 1.0      | 9.0                                   | 5.0                                   | 20.4                                   | 15.4                                        |
| MAJ10   | 11.1              | 13.6 | 1.0      | 10.0                                  | 5.0                                   | 16.7                                   | 18.8                                        |
| MAJ10A  | 11.1              | 12.3 | 1.0      | 10.0                                  | 5.0                                   | 18.5                                   | 17.0                                        |
| MAJ11   | 12.2              | 14.9 | 1.0      | 11.0                                  | 5.0                                   | 15.6                                   | 20.1                                        |
| MAJ11A  | 12.2              | 13.5 | 1.0      | 11.0                                  | 5.0                                   | 17.3                                   | 18.2                                        |
| MAJ12   | 13.3              | 16.3 | 1.0      | 12.0                                  | 5.0                                   | 14.3                                   | 22.0                                        |
| MAJ12A  | 13.3              | 14.7 | 1.0      | 12.0                                  | 5.0                                   | 15.8                                   | 19.9                                        |
| MAJ13   | 14.4              | 17.6 | 1.0      | 13.0                                  | 5.0                                   | 13.0                                   | 23.8                                        |
| MAJ13A  | 14.4              | 15.9 | 1.0      | 13.0                                  | 5.0                                   | 14.6                                   | 21.5                                        |
| MAJ14   | 15.6              | 19.1 | 1.0      | 14.0                                  | 5.0                                   | 12.2                                   | 25.8                                        |
| MAJ14A  | 15.6              | 17.2 | 1.0      | 14.0                                  | 5.0                                   | 13.5                                   | 23.2                                        |
| MAJ15   | 16.7              | 20.4 | 1.0      | 15.0                                  | 5.0                                   | 11.7                                   | 26.9                                        |
| MAJ15A  | 16.7              | 18.5 | 1.0      | 15.0                                  | 5.0                                   | 12.9                                   | 24.4                                        |
| MAJ16   | 17.8              | 21.8 | 1.0      | 16.0                                  | 5.0                                   | 10.9                                   | 28.8                                        |
| MAJ16A  | 17.8              | 19.7 | 1.0      | 16.0                                  | 5.0                                   | 12.0                                   | 26.0                                        |
| MAJ17   | 18.9              | 23.1 | 1.0      | 17.0                                  | 5.0                                   | 10.3                                   | 30.5                                        |
| MAJ17A  | 18.9              | 20.9 | 1.0      | 17.0                                  | 5.0                                   | 11.4                                   | 27.6                                        |
| MAJ18   | 20.0              | 24.2 | 1.0      | 18.0                                  | 5.0                                   | 9.7                                    | 32.2                                        |
| MAJ18A  | 20.0              | 22.1 | 1.0      | 18.0                                  | 5.0                                   | 10.7                                   | 29.2                                        |
| MAJ20   | 22.2              | 27.1 | 1.0      | 20.0                                  | 5.0                                   | 8.7                                    | 35.8                                        |
| MAJ20A  | 22.2              | 24.5 | 1.0      | 20.0                                  | 5.0                                   | 9.7                                    | 32.4                                        |
| MAJ22   | 24.4              | 29.8 | 1.0      | 22.0                                  | 5.0                                   | 8.0                                    | 39.4                                        |
| MAJ22A  | 24.4              | 26.9 | 1.0      | 22.0                                  | 5.0                                   | 8.8                                    | 35.5                                        |
| MAJ24   | 26.7              | 32.6 | 1.0      | 24.0                                  | 5.0                                   | 7.3                                    | 43.0                                        |
| MAJ24A  | 26.7              | 29.5 | 1.0      | 24.0                                  | 5.0                                   | 8.0                                    | 38.9                                        |
| MAJ26   | 28.9              | 35.3 | 1.0      | 26.0                                  | 5.0                                   | 6.7                                    | 46.6                                        |
| MAJ26A  | 28.9              | 31.9 | 1.0      | 26.0                                  | 5.0                                   | 7.4                                    | 42.1                                        |
| MAJ28   | 31.1              | 38.0 | 1.0      | 28.0                                  | 5.0                                   | 6.3                                    | 50.1                                        |
| MAJ28A  | 31.1              | 34.4 | 1.0      | 28.0                                  | 5.0                                   | 6.9                                    | 45.4                                        |
| MAJ30   | 33.3              | 40.7 | 1.0      | 30.0                                  | 5.0                                   | 5.8                                    | 53.5                                        |
| MAJ30A  | 33.3              | 36.8 | 1.0      | 30.0                                  | 5.0                                   | 6.5                                    | 48.4                                        |
| MAJ33   | 36.7              | 44.9 | 1.0      | 33.0                                  | 5.0                                   | 5.3                                    | 59.0                                        |
| MAJ33A  | 36.7              | 40.6 | 1.0      | 33.0                                  | 5.0                                   | 5.9                                    | 53.3                                        |
| MAJ36   | 40.0              | 48.9 | 1.0      | 36.0                                  | 5.0                                   | 4.8                                    | 64.3                                        |
| MAJ36A  | 40.0              | 44.2 | 1.0      | 36.0                                  | 5.0                                   | 5.4                                    | 58.1                                        |



## SMAJ (400W) SERIES TRANSIENT VOLTAGE SUPPRESSORS

| TYPE     | Breakdown Voltage |      |          | Reverse Stand off Voltage VWM (Volts) | Maximum Reverse Leakage at VWM Id(uA) | Maximum Peak Pulse Current IPPM (Amps) | Maximum Clamping Voltage at IPPM Vc (Volts) |
|----------|-------------------|------|----------|---------------------------------------|---------------------------------------|----------------------------------------|---------------------------------------------|
|          | VBR (Volts)       |      | @IT (mA) |                                       |                                       |                                        |                                             |
|          | MIN.              | MAX. |          |                                       |                                       |                                        |                                             |
| SMAJ40   | 44.4              | 54.3 | 1.0      | 40                                    | 5.0                                   | 4.4                                    | 71.4                                        |
| SMAJ40A  | 44.4              | 49.1 | 1.0      | 40                                    | 5.0                                   | 4.8                                    | 64.5                                        |
| SMAJ43   | 47.8              | 58.4 | 1.0      | 43                                    | 5.0                                   | 4.1                                    | 76.7                                        |
| SMAJ43A  | 47.8              | 52.8 | 1.0      | 43                                    | 5.0                                   | 4.5                                    | 69.4                                        |
| SMAJ45   | 50.0              | 61.1 | 1.0      | 45                                    | 5.0                                   | 3.9                                    | 80.3                                        |
| SMAJ45A  | 50.0              | 55.3 | 1.0      | 45                                    | 5.0                                   | 4.3                                    | 72.7                                        |
| SMAJ48   | 53.3              | 65.1 | 1.0      | 48                                    | 5.0                                   | 3.6                                    | 85.5                                        |
| SMAJ48A  | 53.3              | 58.9 | 1.0      | 48                                    | 5.0                                   | 4.0                                    | 77.4                                        |
| SMAJ51   | 56.7              | 69.3 | 1.0      | 51                                    | 5.0                                   | 3.4                                    | 91.1                                        |
| SMAJ51A  | 56.7              | 62.7 | 1.0      | 51                                    | 5.0                                   | 3.8                                    | 82.4                                        |
| SMAJ54   | 60.0              | 73.3 | 1.0      | 54                                    | 5.0                                   | 3.2                                    | 96.3                                        |
| SMAJ54A  | 60.0              | 66.3 | 1.0      | 54                                    | 5.0                                   | 3.6                                    | 87.1                                        |
| SMAJ58   | 64.4              | 78.7 | 1.0      | 58                                    | 5.0                                   | 3.0                                    | 103                                         |
| SMAJ58A  | 64.4              | 71.2 | 1.0      | 58                                    | 5.0                                   | 3.3                                    | 93.6                                        |
| SMAJ60   | 66.7              | 81.5 | 1.0      | 60                                    | 5.0                                   | 2.9                                    | 107                                         |
| SMAJ60A  | 66.7              | 73.7 | 1.0      | 60                                    | 5.0                                   | 3.2                                    | 96.8                                        |
| SMAJ64   | 71.1              | 86.9 | 1.0      | 64                                    | 5.0                                   | 2.7                                    | 114                                         |
| SMAJ64A  | 71.1              | 78.6 | 1.0      | 64                                    | 5.0                                   | 3.0                                    | 103                                         |
| SMAJ70   | 77.8              | 95.1 | 1.0      | 70                                    | 5.0                                   | 2.5                                    | 125                                         |
| SMAJ70A  | 77.8              | 86.0 | 1.0      | 70                                    | 5.0                                   | 2.7                                    | 113                                         |
| SMAJ75   | 83.3              | 102  | 1.0      | 75                                    | 5.0                                   | 2.3                                    | 134                                         |
| SMAJ75A  | 83.3              | 92.1 | 1.0      | 75                                    | 5.0                                   | 2.6                                    | 121                                         |
| SMAJ78   | 86.7              | 106  | 1.0      | 78                                    | 5.0                                   | 2.2                                    | 139                                         |
| SMAJ78A  | 86.7              | 95.8 | 1.0      | 78                                    | 5.0                                   | 2.5                                    | 126                                         |
| SMAJ85   | 94.4              | 115  | 1.0      | 85                                    | 5.0                                   | 2.0                                    | 151                                         |
| SMAJ85A  | 94.4              | 104  | 1.0      | 85                                    | 5.0                                   | 2.2                                    | 137                                         |
| SMAJ90   | 100               | 122  | 1.0      | 90                                    | 5.0                                   | 1.9                                    | 160                                         |
| SMAJ90A  | 100               | 111  | 1.0      | 90                                    | 5.0                                   | 2.1                                    | 146                                         |
| SMAJ100  | 110               | 136  | 1.0      | 100                                   | 5.0                                   | 1.7                                    | 179                                         |
| SMAJ100A | 110               | 123  | 1.0      | 100                                   | 5.0                                   | 1.9                                    | 162                                         |
| SMAJ110  | 122               | 149  | 1.0      | 110                                   | 5.0                                   | 1.6                                    | 196                                         |
| SMAJ110A | 122               | 135  | 1.0      | 110                                   | 5.0                                   | 1.7                                    | 177                                         |
| SMAJ120  | 133               | 163  | 1.0      | 120                                   | 5.0                                   | 1.4                                    | 214                                         |
| SMAJ120A | 133               | 147  | 1.0      | 120                                   | 5.0                                   | 1.6                                    | 193                                         |
| SMAJ130  | 144               | 176  | 1.0      | 130                                   | 5.0                                   | 1.3                                    | 231                                         |
| SMAJ130A | 144               | 159  | 1.0      | 130                                   | 5.0                                   | 1.5                                    | 209                                         |
| SMAJ150  | 167               | 204  | 1.0      | 150                                   | 5.0                                   | 1.1                                    | 268                                         |
| SMAJ150A | 167               | 185  | 1.0      | 150                                   | 5.0                                   | 1.3                                    | 243                                         |
| SMAJ160  | 178               | 218  | 1.0      | 160                                   | 5.0                                   | 1.0                                    | 287                                         |
| SMAJ160A | 178               | 197  | 1.0      | 160                                   | 5.0                                   | 1.2                                    | 259                                         |
| SMAJ170  | 189               | 231  | 1.0      | 170                                   | 5.0                                   | 1.0                                    | 304                                         |
| SMAJ170A | 189               | 209  | 1.0      | 170                                   | 5.0                                   | 1.1                                    | 275                                         |

NOTES : 1.VBR measured after IT applied for 300μs. IT = Square Wave Pulse or equivalent.

2.For bidirectional use C or CA suffixs for all types (ex. SMAJ5.0C, SMAJ170CA).  
electrical characteristics apply in both directions.

3.For bidirectional types having VWM of 10 volts and less, the Id limit is doubled.

