



**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**

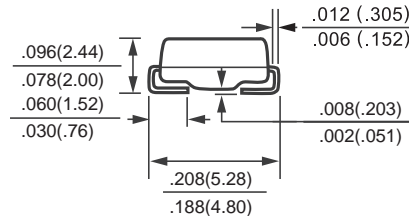
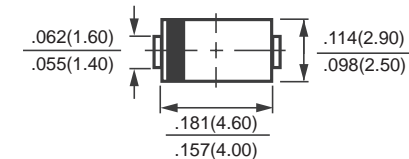
- \* Case: Molded plastic
- \* Epoxy: UL 94V-0 rate flame retardant
- \* Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- \* Polarity: Indicated by cathode band except Bidirectional types.
- \* Mounting position: Any
- \* Weight: 0.064 gram

**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

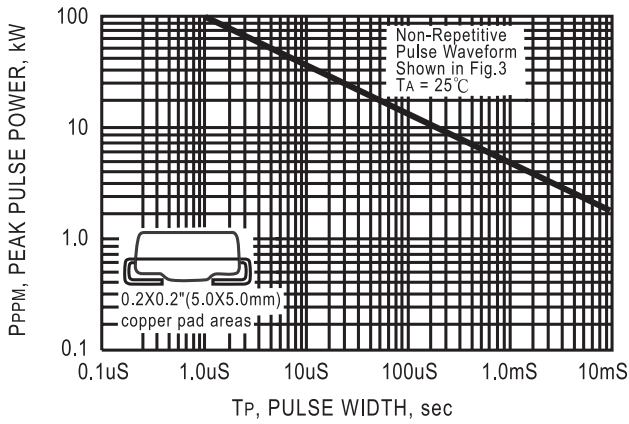


FIG. 2 - PULSE DERATING CURVE

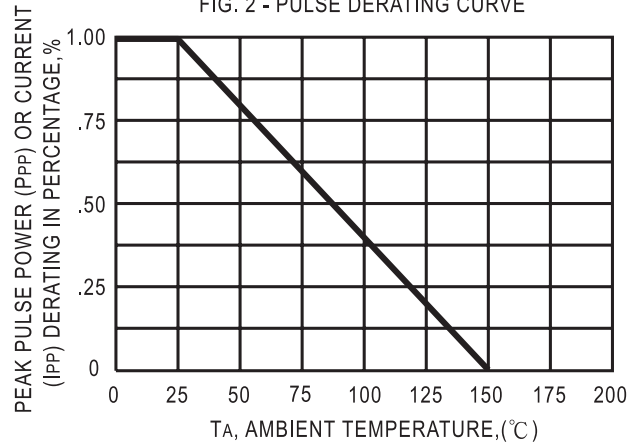


FIG. 3 - PULSE WAVEFORM

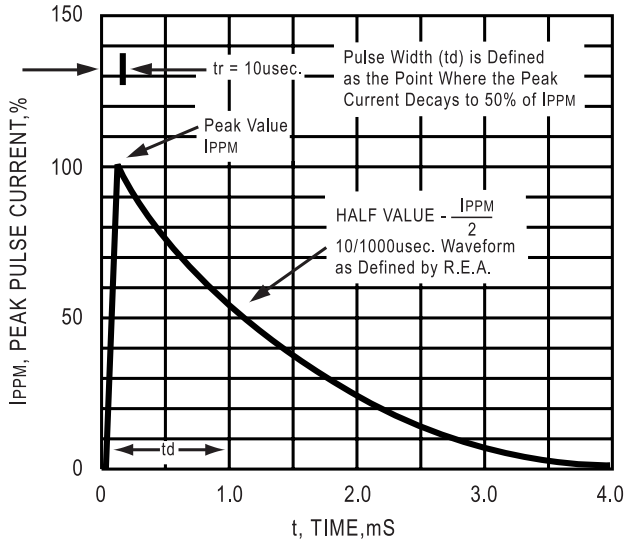


FIG. 4 - TYPICAL JUNCTION CAPACITANCE

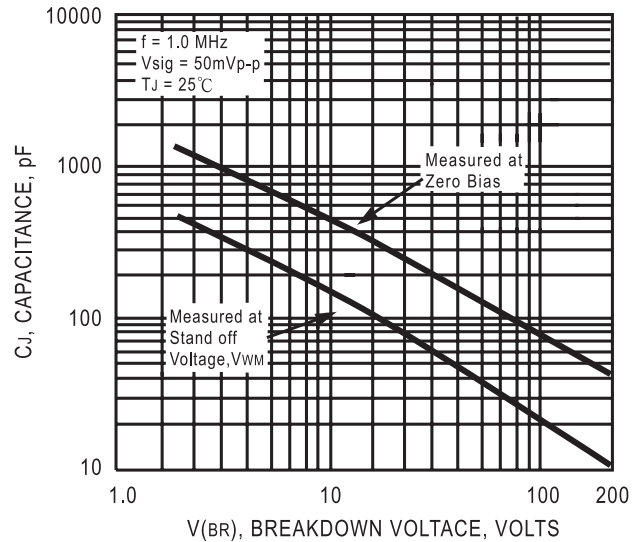
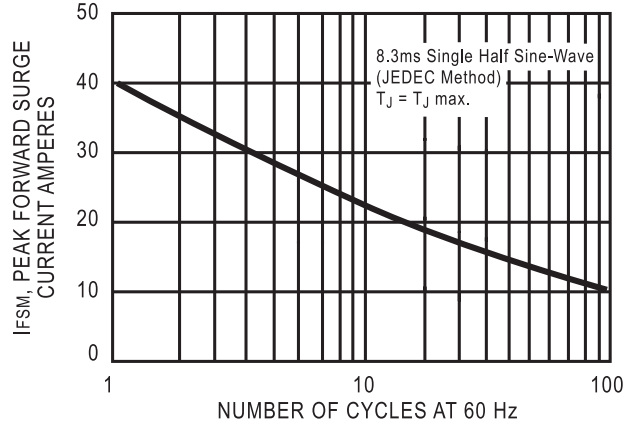


FIG. 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL



DC COMPONENTS CO., LTD.

SMAJ (400W) SERIES TRANSIENT VOLTAGE SUPPRESSORS

| TYPE    | Breakdown Voltage |      | @IT<br>(mA) | Reverse Stand off<br>Voltage<br>VWM<br>(Volts) | Maximum<br>Reverse<br>Leakage<br>at VWM<br>Id(uA) | Maximum<br>Peak Pulse<br>Current<br>IPPM<br>(Am s) | Maximum<br>Clamping<br>Voltage<br>at IPPM<br>Vc (Volts) |
|---------|-------------------|------|-------------|--|---|--|---|
|         | VBR<br>(Volts)    |      |             |  |   |  |   |
|         | 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  |



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| TYPE     | Breakdown Voltage |      | @IT<br>(mA) | Reverse<br>Stand off<br>Voltage<br>VWM<br>(Volts) | Maximum<br>Reverse<br>Leakage<br>at VWM<br>ID(µA) | Maximum<br>Peak Pulse<br>Current<br>IPPM<br>(Amps) | Maximum<br>Clamping<br>Voltage<br>at IPPM<br>Vc (Volts) |
|----------|-------------------|------|-------------|---|---|--|---|
|          | VBR<br>(Volts)    |      |             |   |   |  |   |
|          | 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.



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