

**SA5.0
 thru
 SA170A**

FEATURES:

- ECONOMICAL SERIES
- AVAILABLE IN BOTH UNIDIRECTIONAL AND BI-DIRECTIONAL CONSTRUCTION
- 5.0 TO 170 STAND-OFF VOLTAGE AVAILABLE
- 500 WATTS PEAK PULSE POWER DISSIPATION
- QUICK RESPONSE

DESCRIPTION:

This Transient Voltage Suppressor is an economical, molded, commercial product used to protect voltage sensitive components from destruction or partial degradation. The response time of their clamping action is virtually instantaneous (1×10^{-12} seconds) and they have a peak pulse power rating of 500 watts for 1 ms as depicted in Figure 1 and 2. Microsemi also offers a great variety of other Transient Voltage Suppressor's to meet higher and lower power demands and special applications.

**5.0 thru 170 volts
 500 Watts
 Transient Voltage
 Suppressors**

MAXIMUM RATINGS:

Peak Pulse Power Dissipation at 25°C: 500 Watts

Steady State Power Dissipation: 2.5 Watts at $T_L = +75^\circ\text{C}$

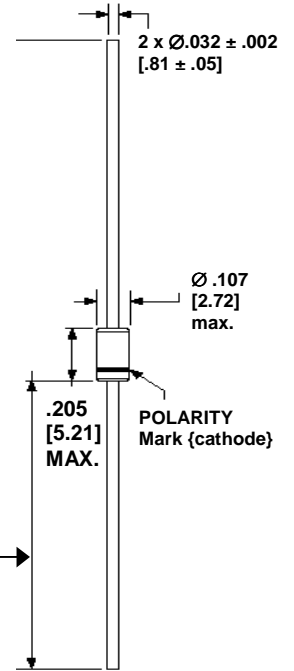
3/8" Lead Length

t_{clamping} (0 volts to BV Min.):

Unidirectional $<1 \times 10^{-12}$ Seconds: Bi-directional $<5 \times 10^{-9}$ Seconds.

Operating and Storage Temperature: -55° to $+175^\circ\text{C}$

DO-41



NOTE: DIMENSIONS IN [] =MILLIMETERS

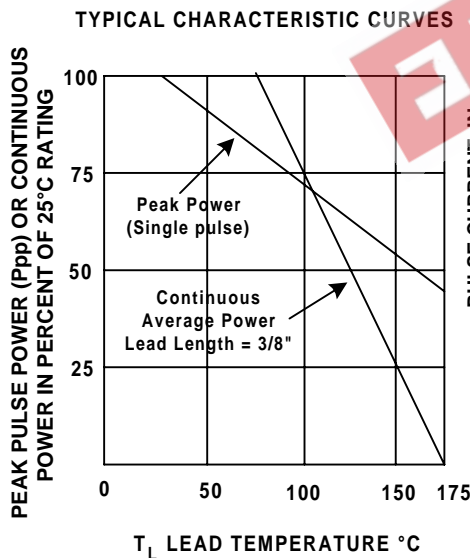


FIGURE 1

DERATING CURVE

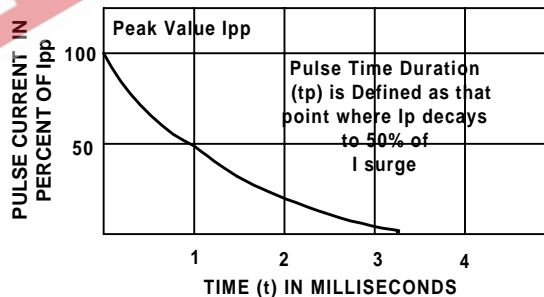


FIGURE 2

PULSE WAVEFORM FOR
 EXPONENTIAL SURGE

**MECHANICAL
 CHARACTERISTICS**

CASE: Void free transfer molded thermosetting plastic.

FINISH: Readily solderable.

POLARITY: Band denotes cathode. Bi-directional not marked.

WEIGHT: 0.7 gram (Appx.).

MOUNTING POSITION: Any



**SA5.0
thru
SA170A**

ELECTRICAL CHARACTERISTICS AT 25°C

| PART NUMBER | BREAKDOWN VOLTAGE V(BR) | | TEST CURRENT I _T | RATED STAND OFF VOLTAGE V _{WM} | MAX. REVERSE STANDBY CURRENT I _D @ V _{WM} | MAX. PEAK REVERSE VOLTAGE V _C MAX. @ I _{PP} | MAX. PEAK PULSE CURRENT I _{PP} (Figure 2) | MAX. TEMP. COEFFICIENT OF V(BR) -55°C TO 175°C α _{V(BR)} |
|-------------|-------------------------|--------------|--------------------------------|--------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------|
| | MIN. VOLTS | MAX VOLTS | | | | | | |
| SA5.0 | 6.40 | 7.30 | 10 | 5.0 | 600 | 9.6 | 52 | .057 |
| SA5.0A | 6.40 | 7.00 | 10 | 5.0 | 600 | 9.2 | 54.3 | .057 |
| SA6.0 | 6.67 | 8.15 | 10 | 6.0 | 600 | 11.4 | 43.9 | .059 |
| SA6.0A | 6.67 | 7.37 | 10 | 6.0 | 600 | 10.3 | 48.5 | .059 |
| SA6.5 | 7.22 | 8.82 | 10 | 6.5 | 400 | 12.3 | 40.7 | .061 |
| SA6.5A | 7.22 | 7.98 | 10 | 6.5 | 400 | 11.2 | 44.7 | .061 |
| SA7.0 | 7.78 | 9.51 | 10 | 7.0 | 150 | 13.3 | 37.8 | .065 |
| SA7.0A | 7.78 | 8.60 | 10 | 7.0 | 150 | 12.0 | 41.7 | .065 |
| SA7.5 | 8.33 | 10.2 | 1 | 7.5 | 50 | 14.3 | 35.0 | .067 |
| SA7.5A | 8.33 | 9.21 | 1 | 7.5 | 50 | 12.9 | 38.8 | .067 |
| SA8.0 | 8.89 | 10.9 | 1 | 8.0 | 25 | 15.0 | 33.3 | .070 |
| SA8.0A | 8.89 | 9.83 | 1 | 8.0 | 25 | 13.6 | 36.7 | .070 |
| SA8.5 | 9.44 | 11.5 | 1 | 8.5 | 5 | 15.9 | 31.4 | .073 |
| SA8.5A | 9.44 | 10.4 | 1 | 8.5 | 5 | 14.4 | 34.7 | .073 |
| SA9.0 | 10.0 | 12.2 | 1 | 9.0 | 1 | 16.9 | 29.5 | .076 |
| SA9.0A | 10.0 | 11.1 | 1 | 9.0 | 1 | 15.4 | 32.5 | .076 |
| SA10 | 11.1 | 13.6 | 1 | 10 | 1 | 18.8 | 26.6 | .078 |
| SA10A | 11.1 | 12.3 | 1 | 10 | 1 | 17.0 | 29.4 | .078 |
| SA11 | 12.2 | 14.9 | 1 | 11 | 1 | 20.1 | 24.9 | .081 |
| SA11A | 12.2 | 13.5 | 1 | 11 | 1 | 18.2 | 27.4 | .081 |
| SA12 | 13.3 | 16.3 | 1 | 12 | 1 | 22.0 | 22.7 | .082 |
| SA12A | 13.3 | 14.7 | 1 | 12 | 1 | 19.9 | 25.1 | .082 |
| SA13 | 14.4 | 17.6 | 1 | 13 | 1 | 23.8 | 21.0 | .084 |
| SA13A | 14.4 | 15.9 | 1 | 13 | 1 | 21.5 | 23.2 | .084 |
| SA14 | 15.6 | 19.1 | 1 | 14 | 1 | 25.8 | 19.4 | .086 |
| SA14A | 15.6 | 17.2 | 1 | 14 | 1 | 23.2 | 21.5 | .086 |
| SA15 | 16.7 | 20.4 | 1 | 15 | 1 | 26.9 | 18.8 | .087 |
| SA15A | 16.7 | 18.5 | 1 | 15 | 1 | 24.4 | 20.6 | .087 |
| SA16 | 17.8 | 21.8 | 1 | 16 | 1 | 28.8 | 17.6 | .088 |
| SA6A | 17.8 | 19.7 | 1 | 16 | 1 | 26.0 | 19.2 | .088 |
| SA17 | 18.9 | 23.1 | 1 | 17 | 1 | 30.5 | 16.4 | .090 |
| SA17A | 18.9 | 20.9 | 1 | 17 | 1 | 27.6 | 18.1 | .090 |
| SA18 | 20.0 | 24.4 | 1 | 18 | 1 | 32.2 | 15.5 | .092 |
| SA18A | 20.0 | 22.1 | 1 | 18 | 1 | 29.2 | 17.2 | .092 |
| SA20 | 22.2 | 27.1 | 1 | 20 | 1 | 35.8 | 13.9 | .093 |
| SA20A | 22.2 | 24.5 | 1 | 20 | 1 | 32.4 | 15.4 | .093 |



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|-------------|-------------------------|--------------|--------------------------------|--------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------|
| | MIN. VOLTS | MAX VOLTS | | | | | | |
| SA22 | 24.4 | 29.8 | 1 | 22 | 1 | 39.4 | 12.7 | .094 |
| SA22A | 24.4 | 26.9 | 1 | 22 | 1 | 35.5 | 14.1 | .094 |
| SA24 | 26.7 | 32.6 | 1 | 24 | 1 | 43.0 | 11.6 | .096 |
| SA24A | 26.7 | 29.5 | 1 | 24 | 1 | 38.9 | 12.8 | .096 |
| SA26 | 28.9 | 35.3 | 1 | 26 | 1 | 46.6 | 10.7 | .097 |
| SA26A | 28.9 | 31.9 | 1 | 26 | 1 | 42.1 | 11.9 | .097 |
| SA28 | 31.1 | 38.0 | 1 | 28 | 1 | 50.0 | 9.9 | .098 |
| SA28A | 31.1 | 34.4 | 1 | 28 | 1 | 45.4 | 11.0 | .098 |
| SA30 | 33.3 | 40.7 | 1 | 30 | 1 | 53.5 | 9.3 | .099 |
| SA30A | 33.3 | 36.8 | 1 | 30 | 1 | 48.4 | 10.3 | .099 |
| SA33 | 36.7 | 44.9 | 1 | 33 | 1 | 59.0 | 8.5 | .100 |
| SA33A | 36.7 | 40.6 | 1 | 33 | 1 | 53.3 | 9.4 | .100 |
| SA36 | 40.0 | 48.9 | 1 | 36 | 1 | 64.3 | 7.8 | .101 |
| SA36A | 40.0 | 44.2 | 1 | 36 | 1 | 58.1 | 8.6 | .101 |
| SA40 | 44.4 | 54.3 | 1 | 40 | 1 | 71.4 | 7.0 | .101 |
| SA40A | 44.4 | 49.1 | 1 | 40 | 1 | 64.5 | 7.8 | .101 |
| SA43 | 47.8 | 58.4 | 1 | 43 | 1 | 76.7 | 6.5 | .102 |
| SA43A | 47.8 | 52.8 | 1 | 43 | 1 | 69.4 | 7.2 | .102 |
| SA45 | 50.0 | 61.1 | 1 | 45 | 1 | 80.3 | 6.2 | .102 |
| SA45A | 50.0 | 55.3 | 1 | 45 | 1 | 72.7 | 6.9 | .102 |
| SA48 | 53.3 | 65.1 | 1 | 48 | 1 | 85.5 | 5.8 | .103 |
| SA48A | 53.3 | 58.9 | 1 | 48 | 1 | 77.4 | 6.5 | .103 |
| SA51 | 56.7 | 69.3 | 1 | 51 | 1 | 91.1 | 5.5 | .103 |
| SA51A | 56.7 | 62.7 | 1 | 51 | 1 | 82.4 | 6.1 | .103 |
| SA54 | 60.0 | 73.3 | 1 | 54 | 1 | 96.3 | 5.2 | .104 |
| SA54A | 60.0 | 66.3 | 1 | 54 | 1 | 87.1 | 5.7 | .104 |
| SA58 | 64.4 | 78.7 | 1 | 58 | 1 | 103.0 | 4.9 | .104 |
| SA58A | 64.4 | 71.2 | 1 | 58 | 1 | 93.6 | 5.3 | .104 |
| SA60 | 66.7 | 81.5 | 1 | 60 | 1 | 107.0 | 4.7 | .104 |
| SA60A | 66.7 | 73.7 | 1 | 60 | 1 | 96.8 | 5.2 | .104 |
| SA64 | 71.1 | 86.9 | 1 | 64 | 1 | 114.0 | 4.4 | .105 |
| SA64A | 71.1 | 78.6 | 1 | 64 | 1 | 103.0 | 4.9 | .105 |
| SA70 | 77.8 | 95.1 | 1 | 70 | 1 | 125.0 | 4.0 | .105 |
| SA70A | 77.8 | 86.0 | 1 | 70 | 1 | 113.0 | 4.4 | .105 |
| SA75 | 83.3 | 102.0 | 1 | 75 | 1 | 134.0 | 3.7 | .105 |
| SA75A | 83.3 | 92.1 | 1 | 75 | 1 | 121.0 | 4.1 | .105 |

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|-------------|-------------------------|--------------|--------------------------------|--------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------|
| | MIN. VOLTS | MAX VOLTS | | | | | | |
| SA78 | 86.7 | 106.0 | 1 | 78 | 1 | 139.0 | 3.6 | .106 |
| SA78A | 86.7 | 95.8 | 1 | 78 | 1 | 126.0 | 4.0 | .106 |
| SA85 | 94.4 | 115.0 | 1 | 85 | 1 | 151.0 | 3.3 | .106 |
| SA85A | 94.4 | 104.0 | 1 | 85 | 1 | 137.0 | 3.6 | .106 |
| SA90 | 100.0 | 122.0 | 1 | 90 | 1 | 160.0 | 3.1 | .107 |
| SA90A | 100.0 | 111.0 | 1 | 90 | 1 | 146.0 | 3.4 | .107 |
| SA100 | 111.0 | 136.0 | 1 | 100 | 1 | 179.0 | 2.8 | .107 |
| SA100A | 111.0 | 123.0 | 1 | 100 | 1 | 162.0 | 3.1 | .107 |
| SA110 | 122.0 | 149.0 | 1 | 110 | 1 | 196.0 | 2.6 | .107 |
| SA110A | 122.0 | 135.0 | 1 | 110 | 1 | 177.0 | 2.8 | .107 |
| SA120 | 133.0 | 163.0 | 1 | 120 | 1 | 214.0 | 2.3 | .107 |
| SA120A | 133.0 | 147.0 | 1 | 120 | 1 | 193.0 | 2.0 | .107 |
| SA130 | 144.0 | 176.0 | 1 | 130 | 1 | 231.0 | 2.2 | .108 |
| SA130A | 144.0 | 159.0 | 1 | 130 | 1 | 209.0 | 2.4 | .108 |
| SA150 | 167.0 | 204.0 | 1 | 150 | 1 | 268.0 | 1.9 | .108 |
| SA150A | 167.0 | 185.0 | 1 | 150 | 1 | 243.0 | 2.1 | .108 |
| SA160 | 178.0 | 218.0 | 1 | 160 | 1 | 287.0 | 1.7 | .108 |
| SA160A | 178.0 | 197.0 | 1 | 160 | 1 | 259.0 | 1.9 | .108 |
| SA170 | 189.0 | 231.0 | 1 | 170 | 1 | 304.0 | 1.6 | .108 |
| SA170A | 189.0 | 209.0 | 1 | 170 | 1 | 275.0 | 1.8 | .108 |

Note: For Bi-directional construction, indicate a C or CA suffix after the part number, i.e. SA5.0CA

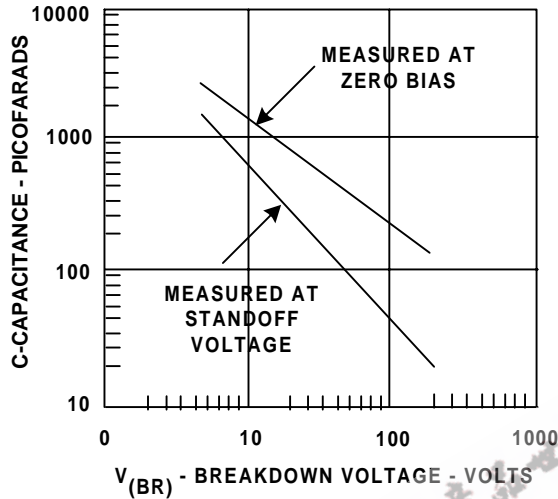
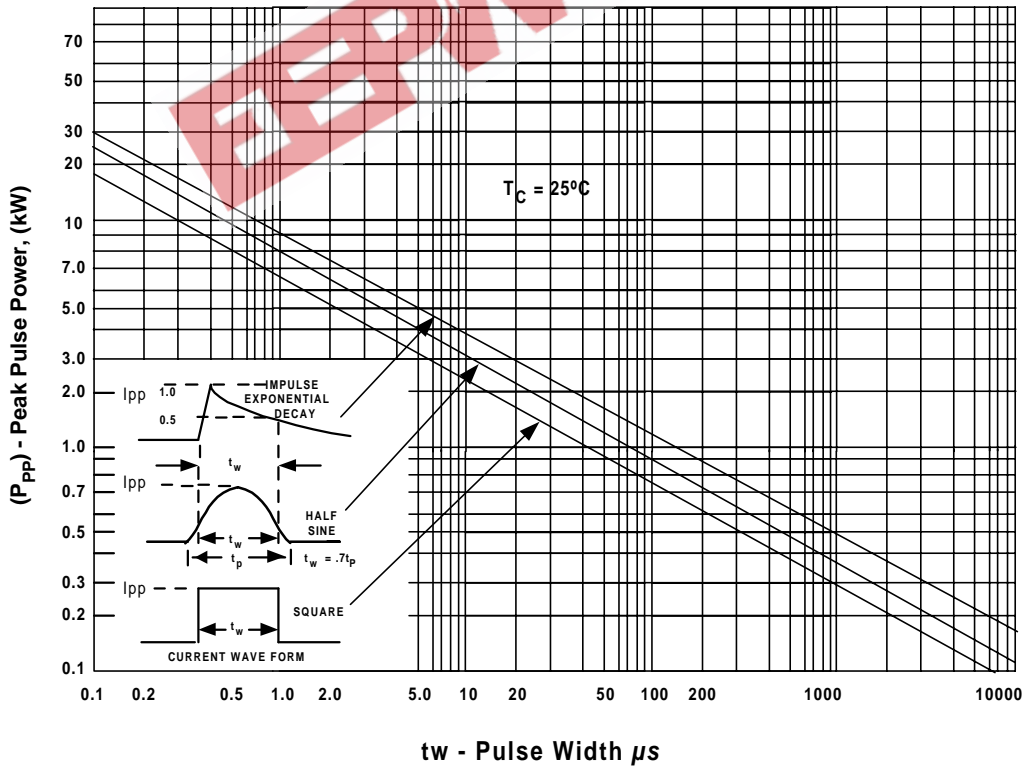


FIGURE 3
TYPICAL CAPACITANCE VS
BREAKDOWN VOLTAGE



tw - Pulse Width μ s
FIGURE 4
PEAK PULSE POWER VS. PULSE TIME