

## Transient Voltage Suppressors SA5V0(C)A - SA170(C)A

### Features

- Glass passivated junction.
- 500W Peak Pulse Power capability on 10/1000  $\mu$ s waveform.
- Excellent clamping capability.
- Low incremental surge resistance.
- Fast response time; typically less than 1.0 ps from 0 volts to BV for unidirectional and 5.0 ns for bidirectional.
- Typical  $I_R$  less than 1.0  $\mu$ A above 10V.



**DO-15**

COLOR BAND DENOTES CATHODE  
ON UNIDIRECTIONAL DEVICES ONLY. NO  
COLOR BAND ON BIDIRECTIONAL DEVICES.

### DEVICES FOR BIPOLAR APPLICATIONS

- Bidirectional types use CA suffix.
- Electrical Characteristics apply in both directions.

## 500 Watt Transient Voltage Suppressors

### Absolute Maximum Ratings\*

$T_A = 25^\circ\text{C}$  unless otherwise noted

| Symbol    | Parameter                                                                                       | Value       | Units            |
|-----------|-------------------------------------------------------------------------------------------------|-------------|------------------|
| $P_{PPM}$ | Peak Pulse Power Dissipation on 10/1000 $\mu$ s waveform                                        | 500         | W                |
| $I_{PPM}$ | Peak Pulse Current on 10/1000 $\mu$ s waveform                                                  | see table   | A                |
| $P_D$     | Power Dissipation<br>.375 " lead length @ $T_A = 75^\circ\text{C}$                              | 1.0         | W                |
| $I_{FSM}$ | Non-repetitive Peak Forward Surge Current<br>superimposed on rated load (JEDEC method) (Note 1) | 70          | A                |
| $T_{stg}$ | Storage Temperature Range                                                                       | -65 to +175 | $^\circ\text{C}$ |
| $T_J$     | Operating Junction Temperature                                                                  | + 175       | $^\circ\text{C}$ |

\*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

**Note 1:** Measured on 8.3 ms single half-sine wave or equivalent square wave; Duty cycle = 4 pulses per minute maximum.

# Transient Voltage Suppressors

(continued)

SA5V0(C)A - SA170(C)A

## Electrical Characteristics

$T_A = 25^\circ\text{C}$  unless otherwise noted

| Uni-directional<br>Bi-directional (C)<br>Device | Reverse<br>Stand-off Voltage<br>$V_{RWM}$ (V) | Breakdown Voltage<br>$V_{BR}$ (V) |       | Test<br>Current<br>$I_T$ (mA) | Clamping Voltage<br>@ $I_{PPM}$<br>$V_C$ (V) | Peak Pulse<br>Current<br>$I_{PPM}$ (A) | Reverse<br>Leakage $V_{RWM}$<br>$I_R$ (uA)* |
|-------------------------------------------------|-----------------------------------------------|-----------------------------------|-------|-------------------------------|----------------------------------------------|----------------------------------------|---------------------------------------------|
|                                                 |                                               | min                               | max   |                               |                                              |                                        |                                             |
| SA5V0(C)A                                       | 5.0                                           | 6.40                              | 7.00  | 10                            | 9.2                                          | 54.3                                   | 600                                         |
| SA6V0(C)A                                       | 6.0                                           | 6.67                              | 7.37  | 10                            | 10.3                                         | 48.5                                   | 600                                         |
| SA6V5(C)A                                       | 6.5                                           | 7.22                              | 7.98  | 10                            | 11.2                                         | 44.7                                   | 400                                         |
| SA7V0(C)A                                       | 7.0                                           | 7.78                              | 8.60  | 10                            | 12.0                                         | 41.7                                   | 150                                         |
| SA7V5(C)A                                       | 7.5                                           | 8.33                              | 9.21  | 1.0                           | 12.9                                         | 38.8                                   | 50                                          |
| SA8V0(C)A                                       | 8.0                                           | 8.89                              | 9.83  | 1.0                           | 13.6                                         | 36.7                                   | 25                                          |
| SA8V5(C)A                                       | 8.5                                           | 9.44                              | 10.4  | 1.0                           | 14.4                                         | 34.7                                   | 10                                          |
| SA9V0(C)A                                       | 9.0                                           | 10.0                              | 11.1  | 1.0                           | 15.4                                         | 32.5                                   | 5                                           |
| SA10(C)A                                        | 10                                            | 11.1                              | 12.3  | 1.0                           | 17.0                                         | 29.4                                   | 1                                           |
| SA11(C)A                                        | 11                                            | 12.2                              | 13.5  | 1.0                           | 18.2                                         | 27.4                                   | 1                                           |
| SA12(C)A                                        | 12                                            | 13.3                              | 14.7  | 1.0                           | 19.9                                         | 25.1                                   | 1                                           |
| SA13(C)A                                        | 13                                            | 14.4                              | 15.9  | 1.0                           | 21.5                                         | 23.2                                   | 1                                           |
| SA14(C)A                                        | 14                                            | 15.6                              | 17.2  | 1.0                           | 23.2                                         | 21.5                                   | 1                                           |
| SA15(C)A                                        | 15                                            | 16.7                              | 18.5  | 1.0                           | 24.4                                         | 20.6                                   | 1                                           |
| SA16(C)A                                        | 16                                            | 17.8                              | 19.7  | 1.0                           | 26.0                                         | 19.2                                   | 1                                           |
| SA17(C)A                                        | 17                                            | 18.9                              | 20.9  | 1.0                           | 27.6                                         | 18.1                                   | 1                                           |
| SA18(C)A                                        | 18                                            | 20.0                              | 22.1  | 1.0                           | 29.2                                         | 17.2                                   | 1                                           |
| SA20(C)A                                        | 20                                            | 22.2                              | 24.5  | 1.0                           | 32.4                                         | 15.4                                   | 1                                           |
| SA22(C)A                                        | 22                                            | 24.4                              | 26.9  | 1.0                           | 35.5                                         | 14.1                                   | 1                                           |
| SA24(C)A                                        | 24                                            | 26.7                              | 29.5  | 1.0                           | 38.9                                         | 12.8                                   | 1                                           |
| SA26(C)A                                        | 26                                            | 28.9                              | 31.9  | 1.0                           | 42.1                                         | 11.9                                   | 1                                           |
| SA28(C)A                                        | 28                                            | 31.1                              | 34.4  | 1.0                           | 45.4                                         | 11.0                                   | 1                                           |
| SA30(C)A                                        | 30                                            | 33.3                              | 36.8  | 1.0                           | 48.4                                         | 10.3                                   | 1                                           |
| SA33(C)A                                        | 33                                            | 36.7                              | 40.6  | 1.0                           | 53.3                                         | 9.4                                    | 1                                           |
| SA36(C)A                                        | 36                                            | 40.0                              | 44.2  | 1.0                           | 58.1                                         | 8.6                                    | 1                                           |
| SA40(C)A                                        | 40                                            | 44.4                              | 49.1  | 1.0                           | 64.5                                         | 7.8                                    | 1                                           |
| SA43(C)A                                        | 43                                            | 47.8                              | 52.8  | 1.0                           | 69.4                                         | 7.2                                    | 1                                           |
| SA45(C)A                                        | 45                                            | 50.0                              | 55.3  | 1.0                           | 72.7                                         | 6.9                                    | 1                                           |
| SA48(C)A                                        | 48                                            | 53.3                              | 58.9  | 1.0                           | 77.4                                         | 6.5                                    | 1                                           |
| SA51(C)A                                        | 51                                            | 56.7                              | 62.7  | 1.0                           | 82.4                                         | 6.1                                    | 1                                           |
| SA54(C)A                                        | 54                                            | 60.0                              | 66.3  | 1.0                           | 87.1                                         | 5.7                                    | 1                                           |
| SA58(C)A                                        | 58                                            | 64.4                              | 71.2  | 1.0                           | 93.6                                         | 5.3                                    | 1                                           |
| SA60(C)A                                        | 60                                            | 66.7                              | 73.7  | 1.0                           | 96.8                                         | 5.2                                    | 1                                           |
| SA64(C)A                                        | 64                                            | 71.1                              | 78.6  | 1.0                           | 103.0                                        | 4.9                                    | 1                                           |
| SA70(C)A                                        | 70                                            | 77.8                              | 86.0  | 1.0                           | 113.0                                        | 4.4                                    | 1                                           |
| SA75(C)A                                        | 75                                            | 83.3                              | 92.1  | 1.0                           | 121.0                                        | 4.1                                    | 1                                           |
| SA78(C)A                                        | 78                                            | 86.7                              | 95.8  | 1.0                           | 126.0                                        | 4.0                                    | 1                                           |
| SA85(C)A                                        | 85                                            | 94.4                              | 104.0 | 1.0                           | 137.0                                        | 3.6                                    | 1                                           |
| SA90(C)A                                        | 90                                            | 100.0                             | 111.0 | 1.0                           | 146.0                                        | 3.4                                    | 1                                           |
| SA100(C)A                                       | 100                                           | 111.0                             | 123.0 | 1.0                           | 162.0                                        | 3.1                                    | 1                                           |
| SA110(C)A                                       | 110                                           | 122.0                             | 135.0 | 1.0                           | 177.0                                        | 2.8                                    | 1                                           |
| SA120(C)A                                       | 120                                           | 133.0                             | 147.0 | 1.0                           | 193.0                                        | 2.7                                    | 1                                           |
| SA130(C)A                                       | 130                                           | 144.0                             | 159.0 | 1.0                           | 209.0                                        | 2.4                                    | 1                                           |
| SA150(C)A                                       | 150                                           | 167.0                             | 185.0 | 1.0                           | 243.0                                        | 2.1                                    | 1                                           |
| SA160(C)A                                       | 160                                           | 178.0                             | 197.0 | 1.0                           | 259.0                                        | 1.9                                    | 1                                           |
| SA170(C)A                                       | 170                                           | 189.0                             | 209.0 | 1.0                           | 275.0                                        | 1.8                                    | 1                                           |

\* For bidirectional parts with  $V_{RWM} < 10\text{V}$ , the  $I_R$  max limit is doubled.

# Transient Voltage Suppressors

(continued)

## Typical Characteristics

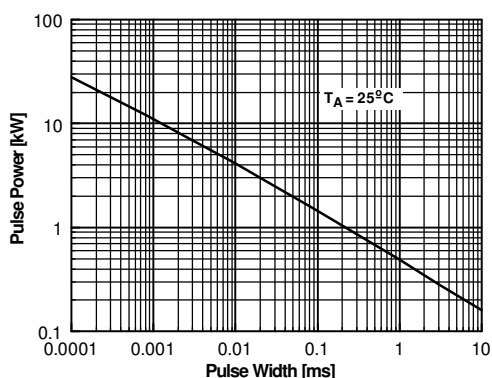


Figure 1. Peak Pulse Power Rating Curve

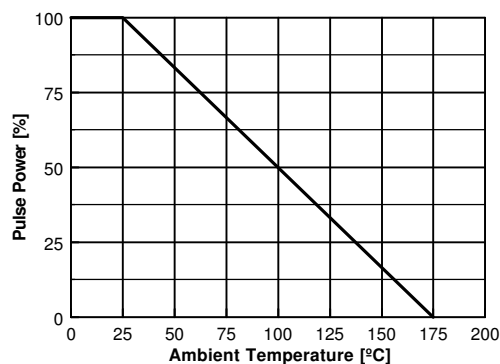


Figure 2. Pulse Derating Curve

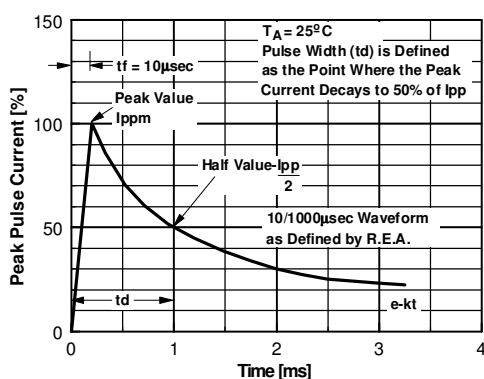


Figure 3. Pulse Waveform

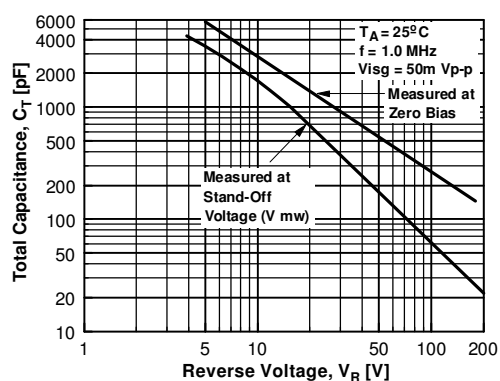


Figure 4. Total Capacitance - Unidirectional

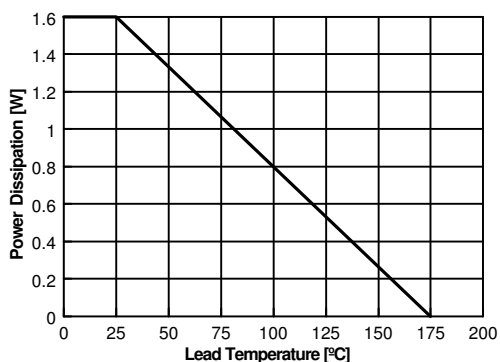


Figure 5. Steady State Power Derating Curve

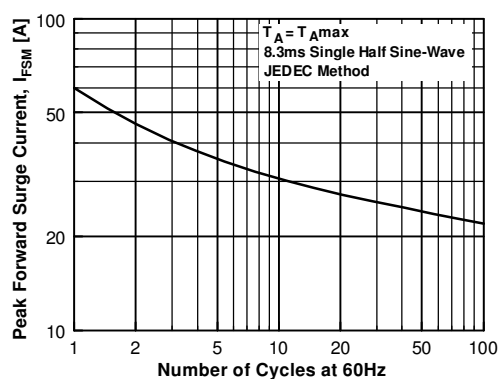


Figure 6. Non-Repetitive Surge Current



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Rev. I53