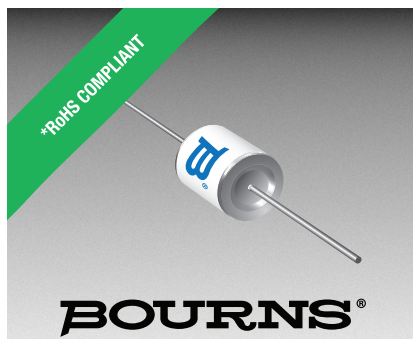




## Features

- High insulation resistance
- Quick response, long service life
- Wide operating temperature range
- AEC-Q200 compliant
- RoHS compliant\*

## Applications

- Street lighting
- Medical devices (low/medium risk)\*\*
- Air conditioning
- Power supplies
- Projectors
- Welders

## SA2-A Series High Voltage Gas Discharge Tube

### Description

Bourns® SA2-A Series two-electrode High Voltage Gas Discharge Tube devices are designed for high isolation applications. The AEC-Q200 compliant series offers high insulation resistance over a wide temperature range and is offered with DC breakdowns from 2.4 kV to 7.2 kV. Other customized voltages between 2 kV and 7.2 kV are available upon request.

### Agency Recognition

| Agency | Category | Agency File No. |
|--------|----------|-----------------|
| UL     | UL 1449  | E313168         |

### Additional Information

Click these links for more information:



### Electrical Characteristics

| Part No.           | Device Specifications                            |      |      |                |                      |                     |                                       |                                 |                        | Life Ratings                 |                                                                    |                                               |
|--------------------|--------------------------------------------------|------|------|----------------|----------------------|---------------------|---------------------------------------|---------------------------------|------------------------|------------------------------|--------------------------------------------------------------------|-----------------------------------------------|
|                    | DC Breakdown Voltage<br>@ 500 V/s <sup>(1)</sup> |      |      |                | Impulse<br>Breakdown | Ramp                | Insulation<br>Resistance<br>@ 250 Vdc | Arc<br>Voltage<br>@ 5 A<br>min. | Capacitance<br>@ 1 MHz | Nominal Impulse<br>Discharge |                                                                    | Nom.<br>DC<br>Break-<br>down<br>After<br>Life |
|                    | Min.                                             | Typ. | Max. | Tol.           | Max.                 | Typ.                | Min.                                  | Typ.                            | Max.                   | 1<br>Operation               | 20<br>Operations                                                   |                                               |
| SA2-A-3000-Dxx-STD | 2550                                             | 3000 | 3600 | -15 % to +20 % | 4500 V               | @7.5<br>kV/ $\mu$ s | 10 G Ohm                              | 20 V                            | 1 pF                   | 10 kA,<br>8/20 $\mu$ s       | 5 kA,<br>8/20 $\mu$ s,<br>±10<br>operations<br>in each<br>polarity | >2.4 kV                                       |
| SA2-A-3000-Cxx-STD | 2400                                             | 3000 | 3600 | -20 % to +20 % |                      |                     |                                       |                                 |                        |                              |                                                                    | >2.3 kV                                       |
| SA2-A-3600-Dxx-STD | 3060                                             | 3600 | 4320 | -15 % to +20 % | 5400 V               | @7.5<br>kV/ $\mu$ s |                                       |                                 |                        |                              |                                                                    | >3.0 kV                                       |
| SA2-A-3600-Cxx-STD | 2880                                             | 3600 | 4320 | -20 % to +20 % |                      |                     |                                       |                                 |                        |                              |                                                                    | >2.8 kV                                       |
| SA2-A-4000-Dxx-STD | 3400                                             | 4000 | 4800 | -15 % to +20 % | 6000 V               | @7.5<br>kV/ $\mu$ s |                                       |                                 |                        |                              |                                                                    | >3.3 kV                                       |
| SA2-A-4000-Cxx-STD | 3200                                             | 4000 | 4800 | -20 % to +20 % |                      |                     |                                       |                                 |                        |                              |                                                                    | >3.1 kV                                       |
| SA2-A-5500-Dxx-STD | 4675                                             | 5500 | 6600 | -15 % to +20 % | 8000 V               | @7.5<br>kV/ $\mu$ s |                                       |                                 |                        |                              |                                                                    | >4.4 kV                                       |
| SA2-A-5500-Cxx-STD | 4400                                             | 5500 | 6600 | -20 % to +20 % |                      |                     |                                       |                                 |                        |                              |                                                                    | >4.2 kV                                       |
| SA2-A-5900-Dxx-STD | 5015                                             | 5900 | 7080 | -15 % to +20 % | 8000 V               | @7.5<br>kV/ $\mu$ s |                                       |                                 |                        |                              |                                                                    | >4.9 kV                                       |
| SA2-A-5900-Cxx-STD | 4720                                             | 5900 | 7080 | -20 % to +20 % |                      |                     |                                       |                                 |                        |                              |                                                                    | >4.6 kV                                       |
| SA2-A-6000-Dxx-STD | 5100                                             | 6000 | 7200 | -15 % to +20 % | 8000 V               | @7.5<br>kV/ $\mu$ s |                                       |                                 |                        |                              |                                                                    | >5.0 kV                                       |
| SA2-A-6000-Cxx-STD | 4800                                             | 6000 | 7200 | -20 % to +20 % |                      |                     |                                       |                                 |                        |                              |                                                                    | >4.7 kV                                       |
| SA2-A-6200-Dxx-STD | 5270                                             | 6200 | 7440 | -15 % to +20 % | 8000 V               | @7.5<br>kV/ $\mu$ s |                                       |                                 |                        |                              |                                                                    | >5.2 kV                                       |
| SA2-A-6200-Cxx-STD | 4960                                             | 6200 | 7440 | -20 % to +20 % |                      |                     |                                       |                                 |                        |                              |                                                                    | >4.9 kV                                       |
| SA2-A-6300-Dxx-STD | 5355                                             | 6300 | 7560 | -15 % to +20 % | 9200 V               | @7.5<br>kV/ $\mu$ s |                                       |                                 |                        |                              |                                                                    | >5.3 kV                                       |
| SA2-A-6300-Cxx-STD | 5040                                             | 6300 | 7560 | -20 % to +20 % |                      |                     |                                       |                                 |                        |                              |                                                                    | >5.0 kV                                       |
| SA2-A-7200-Dxx-STD | 6120                                             | 7200 | 8640 | -15 % to +20 % | 10000 V              | @1<br>kV/ $\mu$ s   |                                       |                                 |                        |                              |                                                                    | >6.3 kV                                       |
| SA2-A-7200-Cxx-STD | 5760                                             | 7200 | 8640 | -20 % to +20 % |                      |                     |                                       |                                 |                        |                              |                                                                    | >6.0 kV                                       |

Note: The Model SA2-A-7200 specification is based on the customer providing sufficient encapsulation/working environment for the component to avoid outside surface breakdown (e.g., non-contaminated equivalent surface in RH 40 % reaches breakdown at 10-12 kV).

(1) In ionized mode.

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\* RoHS Directive 2015/863, Mar 31, 2015 and Annex.

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## SA2-A Series High Voltage Gas Discharge Tube

**BOURNS®**

### Product Characteristics

|                                   |                   |
|-----------------------------------|-------------------|
| Operating Temperature Range ..... | -40 °C to +125 °C |
| Storage Temperature Range .....   | -40 °C to +125 °C |
| Device Plating.....               | Matte-Sn          |
| Moisture Sensitivity Level .....  | 1                 |
| ESD Classification (HBM).....     | 6                 |

### How to Order

**SA 2 - A - nnnn - x x x - STD**

|                                        |       |               |       |       |       |       |
|----------------------------------------|-------|---------------|-------|-------|-------|-------|
| Series Designator                      | _____ | _____         | _____ | _____ | _____ | _____ |
| No. of Electrodes                      | _____ | _____         | _____ | _____ | _____ | _____ |
| 2 = 2 Electrodes                       |       |               |       |       |       |       |
| AEC-Q200 Compliant                     | _____ | _____         | _____ | _____ | _____ | _____ |
| Breakdown Voltage                      | _____ | _____         | _____ | _____ | _____ | _____ |
| 3000 = 3000 V                          |       | 5900 = 5900 V |       |       |       |       |
| 3600 = 3600 V                          |       | 6000 = 6000 V |       |       |       |       |
| 4000 = 4000 V                          |       | 6200 = 6200 V |       |       |       |       |
| 4000 = 4000 V                          |       | 6300 = 6300 V |       |       |       |       |
| 5500 = 5500 V                          |       | 7200 = 7200 V |       |       |       |       |
| Tolerance                              | _____ | _____         | _____ | _____ | _____ | _____ |
| C = -20 % to +20 %                     |       |               |       |       |       |       |
| D = -15 % to +20 %                     |       |               |       |       |       |       |
| Lead Shape                             | _____ | _____         | _____ | _____ | _____ | _____ |
| B = Bent Leads*                        |       |               |       |       |       |       |
| C = No Leads*                          |       |               |       |       |       |       |
| L = Straight Leads**                   |       |               |       |       |       |       |
| Packaging                              | _____ | _____         | _____ | _____ | _____ | _____ |
| B = Bulk                               |       |               |       |       |       |       |
| T = Tape & Reel                        |       |               |       |       |       |       |
| Standard or Modified Product Indicator | _____ | _____         | _____ | _____ | _____ | _____ |
| STD = Standard                         |       |               |       |       |       |       |

\* Available in bulk packaging only.

\*\* Bulk packaging available for straight lead devices ≤3600 V. Devices >3600 V available in tape and reel only.

### Typical Part Marking

..... **B** SA2-A-xxxx **RL**

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## SA2-A Series High Voltage Gas Discharge Tube

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### Environmental Characteristics

| Characteristic                  | Test Condition                                                                                              |
|---------------------------------|-------------------------------------------------------------------------------------------------------------|
| High Temperature Exposure       | Dry heat (+150 °C ± 3 °C)<br>Exposure time 1000 hrs.<br>STP: MIL-STD-202 Method 108                         |
| Low Temperature Exposure        | Cold (-40°C ± 3 °C)<br>Exposure time 100 hrs.<br>STP: IEC 60068-2-1                                         |
| Temperature Cycling             | 1000 cycles (-40 °C to +125 °C) unpowered<br>STP: JESD22 Method JA-104                                      |
| Humidity Bias                   | 1000 hours 85 °C ± 3 °C / RH 85 % ± 3 %<br>Rated 1 kVrms @ 1 mA<br>STP: MIL-STD-202 Method 103              |
| High Temperature Operating Life | 1000 hours (T <sub>A</sub> = 125 °C)<br>Rated 1 kVrms @ 1 mA<br>STP: MIL-STD-202 Method 108                 |
| Terminal Strength               | Test leaded device lead integrity only<br>Conditions: A (2.27 kg), C (227 g)<br>STP: MIL-STD-202 Method 211 |
| Resistance to Solvents          | Also, aqueous wash chemical - OKEM Clean or equivalent<br>STP: MIL-STD-202 Method 215                       |
| Mechanical Shock                | Figure 1 of Method 213<br>LEADED: Condition C<br>STP: MIL-STD-202 Method 213                                |
| Vibration                       | 5 g's for 20 minutes, 12 cycles each of 3 orientations, test from 10-2000 Hz<br>STP: MIL-STD-202 Method 204 |
| Resistance to soldering Heat    | LEADED<br>Condition B No Pre-Heat of samples<br>STP: MIL-STD-202 Method 210                                 |
| ESD                             | AEC-Q200-002 or ISO/DIS10605                                                                                |
| Solderability                   | LEADED<br>Method A @ 235 °C, Category 3<br>STP: J-STD-002                                                   |
| Flammability                    | V-0<br>STP: UL-94                                                                                           |

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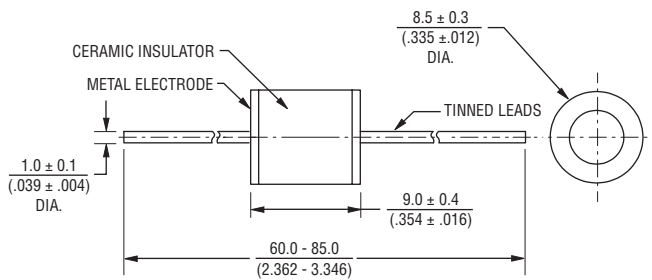
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# SA2-A Series High Voltage Gas Discharge Tube

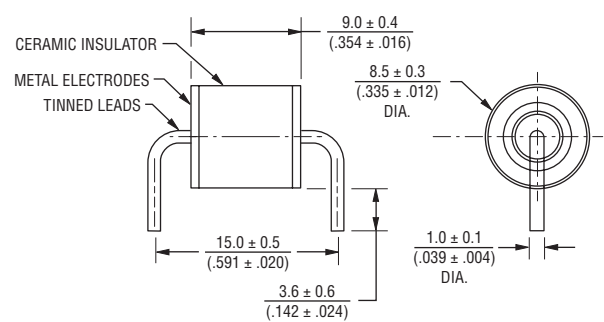
**BOURNS®**

## Product Dimensions

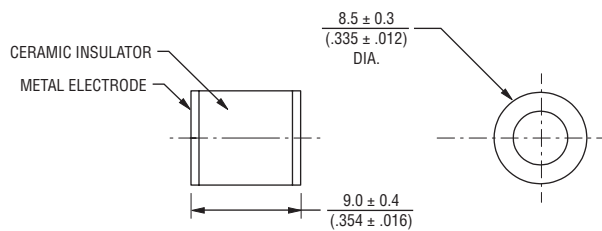
**SA2-A-xxxx-xLx-STD**



**SA2-A-xxxx-xBx-STD**



**SA2-A-xxxx-xCx-STD**



DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

## Packaging Specifications

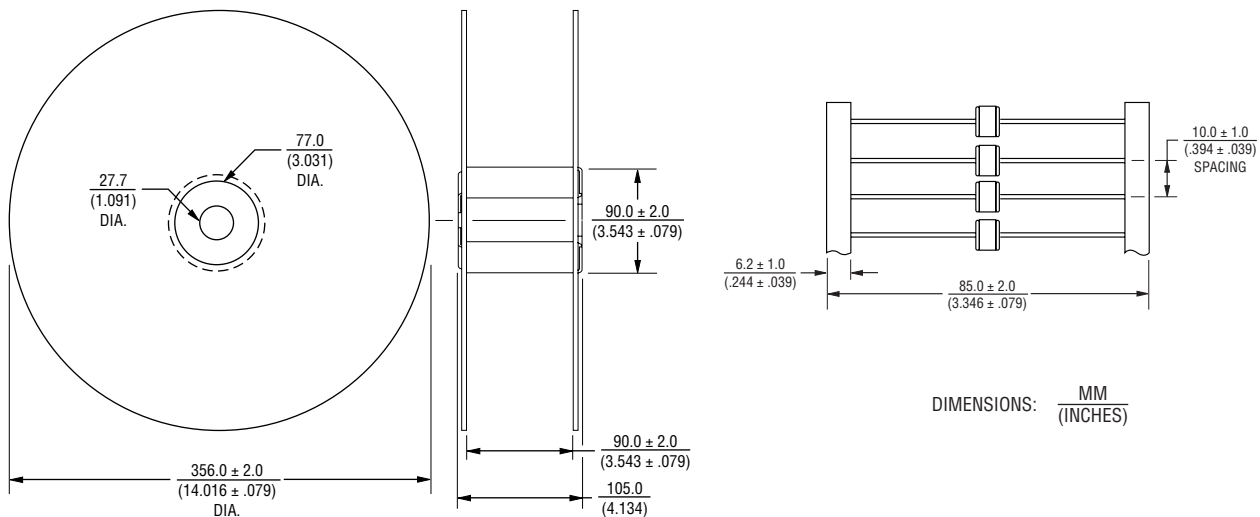
Model SA2-A-xxxx-xLB-STD ships standard bulk pack, 250 units per box / 5 bags of 50 units\*.

Model SA2-A-xxxx-xBB/xCB-STD ships standard bulk pack, 500 units per box / 5 bags of 100 units.

The optional tape and reel packaging contains 1,000 pcs./reel for Model SA2-A-xxxx-xLT-STD.

\* Straight lead versions >3600 V available in bulk or tape and reel packaging; all other models available in bulk packaging only.

**SA2-A-xxxx-xLT-STD**



DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

REV. A 09/24

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