SA2 Series High Voltage Gas Discharge Tube

**Features**
- Formerly a product
- High insulation resistance
- Quick response, long service life
- Available DC breakdown range: 2.4 kV to 7.2 kV
- Wide operating temperature range
- RoHS compliant*

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

**Description**
Bourns® SA2 Series two-electrode High Voltage Gas Discharge Tube devices are designed for high isolation applications. The 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**

<table>
<thead>
<tr>
<th>Agency</th>
<th>Category</th>
<th>Agency File No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL</td>
<td>UL 1449</td>
<td>E313168</td>
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</table>

**Additional Information**
Click these links for more information:
- PRODUCT SELECTOR
- TECHNICAL LIBRARY
- INVENTORY
- SAMPLES
- CONTACT

**Electrical Characteristics**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>DC Breakdown Voltage @ 500 V/s</th>
<th>Impulse Breakdown</th>
<th>Insulation Resistance @ 250 Vdc</th>
<th>Arc Voltage @ 5A min.</th>
<th>Capacitance @ 1 MHz</th>
<th>Nominal Impulse Discharge</th>
<th>Nom. DC Breakdown After Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA2-2400-Dxx-STD</td>
<td>2040</td>
<td>2400</td>
<td>2880</td>
<td>15 % to +20 %</td>
<td>3800 V</td>
<td>@1 kV/μs</td>
<td>10 G Ohm</td>
</tr>
<tr>
<td>SA2-2400-Cxx-STD</td>
<td>1920</td>
<td>2400</td>
<td>2880</td>
<td>-20 % to +20 %</td>
<td>4500 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;1.9 kV</td>
</tr>
<tr>
<td>SA2-3000-Dxx-STD</td>
<td>2560</td>
<td>3000</td>
<td>3600</td>
<td>-15 % to +20 %</td>
<td>5400 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;2.4 kV</td>
</tr>
<tr>
<td>SA2-3000-Cxx-STD</td>
<td>2400</td>
<td>3000</td>
<td>3600</td>
<td>-20 % to +20 %</td>
<td>6000 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;2.3 kV</td>
</tr>
<tr>
<td>SA2-3600-Dxx-STD</td>
<td>3060</td>
<td>3600</td>
<td>4320</td>
<td>-15 % to +20 %</td>
<td>8000 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;3.0 kV</td>
</tr>
<tr>
<td>SA2-3600-Cxx-STD</td>
<td>2880</td>
<td>3600</td>
<td>4320</td>
<td>-20 % to +20 %</td>
<td>8000 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;2.8 kV</td>
</tr>
<tr>
<td>SA2-4000-Dxx-STD</td>
<td>3400</td>
<td>4000</td>
<td>4800</td>
<td>-15 % to +20 %</td>
<td>10000 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;3.3 kV</td>
</tr>
<tr>
<td>SA2-4000-Cxx-STD</td>
<td>3200</td>
<td>4000</td>
<td>4800</td>
<td>-20 % to +20 %</td>
<td>10000 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;3.1 kV</td>
</tr>
<tr>
<td>SA2-5500-Dxx-STD</td>
<td>4675</td>
<td>5500</td>
<td>6600</td>
<td>-15 % to +20 %</td>
<td>10000 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;4.4 kV</td>
</tr>
<tr>
<td>SA2-5500-Cxx-STD</td>
<td>4400</td>
<td>5500</td>
<td>6600</td>
<td>-20 % to +20 %</td>
<td>10000 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;4.2 kV</td>
</tr>
<tr>
<td>SA2-5900-Dxx-STD</td>
<td>5015</td>
<td>5900</td>
<td>7080</td>
<td>-15 % to +20 %</td>
<td>8000 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;4.9 kV</td>
</tr>
<tr>
<td>SA2-5900-Cxx-STD</td>
<td>4720</td>
<td>5900</td>
<td>7080</td>
<td>-20 % to +20 %</td>
<td>8000 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;4.6 kV</td>
</tr>
<tr>
<td>SA2-6000-Dxx-STD</td>
<td>5100</td>
<td>6000</td>
<td>7200</td>
<td>-15 % to +20 %</td>
<td>8000 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;5.0 kV</td>
</tr>
<tr>
<td>SA2-6000-Cxx-STD</td>
<td>4800</td>
<td>6000</td>
<td>7200</td>
<td>-20 % to +20 %</td>
<td>8000 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;4.7 kV</td>
</tr>
<tr>
<td>SA2-6200-Dxx-STD</td>
<td>5270</td>
<td>6200</td>
<td>7440</td>
<td>-15 % to +20 %</td>
<td>8000 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;5.2 kV</td>
</tr>
<tr>
<td>SA2-6200-Cxx-STD</td>
<td>4960</td>
<td>6200</td>
<td>7440</td>
<td>-20 % to +20 %</td>
<td>8000 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;4.9 kV</td>
</tr>
<tr>
<td>SA2-6300-Dxx-STD</td>
<td>5355</td>
<td>6300</td>
<td>7560</td>
<td>-15 % to +20 %</td>
<td>9200 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;5.3 kV</td>
</tr>
<tr>
<td>SA2-6300-Cxx-STD</td>
<td>5040</td>
<td>6300</td>
<td>7560</td>
<td>-20 % to +20 %</td>
<td>9200 V</td>
<td>@7.5 kV/μs</td>
<td>&gt;5.0 kV</td>
</tr>
<tr>
<td>SA2-7200-Dxx-STD</td>
<td>6120</td>
<td>7200</td>
<td>8640</td>
<td>-15 % to +20 %</td>
<td>10000 V</td>
<td>@1 kV/μs</td>
<td>&gt;6.3 kV</td>
</tr>
<tr>
<td>SA2-7200-Cxx-STD</td>
<td>5760</td>
<td>7200</td>
<td>8640</td>
<td>-20 % to +20 %</td>
<td>10000 V</td>
<td>@1 kV/μs</td>
<td>&gt;6.0 kV</td>
</tr>
</tbody>
</table>

Note: Model SA2-7200 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).

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### Product Characteristics

- **Operating Temperature Range**: -40 °C to +125 °C
- **Storage Temperature Range**: -65 °C to +125 °C
- **Device Plating**: Matte-Sn
- **Moisture Sensitivity Level**: 1
- **ESD Classification (HBM)**: 6

### Environmental Characteristics

<table>
<thead>
<tr>
<th>Section</th>
<th>Category</th>
<th>Test</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 60068-2-13 test M</td>
<td>Operational</td>
<td>Low Air Pressure</td>
<td>Temp. +55 °C, Time 0.5 Sec., Pressure 600 hPa</td>
</tr>
<tr>
<td>IEC 60068-2-1, test Ab</td>
<td>Non-Operational</td>
<td>Cold</td>
<td>-40 °C, 96 Hours</td>
</tr>
<tr>
<td>IEC 60068-2-2, test Bb</td>
<td></td>
<td>Dry Heat</td>
<td>+100 °C, 96 Hours</td>
</tr>
<tr>
<td>IEC 60068-2-30, test Ca</td>
<td></td>
<td>Damp Heat, Steady State</td>
<td>+40 °C, 93 % RH, 21 Days</td>
</tr>
<tr>
<td>IEC 60068-2-14, test Na</td>
<td></td>
<td>Rapid Change in Temperature</td>
<td>Upper Temp. +100 °C, Lower Temp. -40 °C, 5 Cycles</td>
</tr>
<tr>
<td>IEC 60068-2-6, test Fc</td>
<td></td>
<td>Vibration</td>
<td>10-55 Hz, 30 Min. per Axis, Double Amplitude 0.70 Min.</td>
</tr>
<tr>
<td>IEC 60068-2-27, test Ea</td>
<td></td>
<td>Shock Test</td>
<td>30 g, 11 ms, Half Sine Pulse</td>
</tr>
<tr>
<td>IEC 60068-2-20, test Ta</td>
<td></td>
<td>Solderability</td>
<td>Method 1, +235 °C, 2 Sec., Aging</td>
</tr>
<tr>
<td>IEC 60068-2-20, test Tb</td>
<td></td>
<td>Resistance to Soldering Heat</td>
<td>Method 1A, +260 °C, 5 Sec.</td>
</tr>
<tr>
<td>IEC 60068-2-21</td>
<td></td>
<td>Robustness of Terminations</td>
<td>Ua1 (Tensile), Ua2 (Thrust), Ub (Bending) and Uc (Torsion)</td>
</tr>
</tbody>
</table>

### How to Order

- **Series Designator**: SA 2 - nnnn - x x x - STD
- **No. of Electrodes**: 2 = 2 Electrodes
- **Breakdown Voltage**
  - 2400 V = 2400 V
  - 3000 V = 3000 V
  - 3600 V = 3600 V
  - 4000 V = 4000 V
  - 5500 V = 5500 V
- **Tolerance**
  - C = -20 % to +20 %
  - D = -15 % to +20 %
- **Lead Shape**
  - B = Bent Leads*
  - C = No Leads*
  - K = Bent Leads with Kinks*
  - L = Straight Leads**
- **Packaging**
  - B = Bulk
  - T = Tape & Reel
- **Standard or Modified Product Indicator**
  - STD = Standard

### Typical Part Marking

- Typical Part Marking: SA2-xxxx

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SA2 Series High Voltage Gas Discharge Tube

Product Dimensions

SA2-xxxx-xLx

CERAMIC INSULATOR
METAL ELECTRODE
TINNED LEADS

8.5 ± 0.1/0.3
(.335 ± .004/-.012) DIA.

8.9 ± 0.4
(.350 ± .016) DIA.

1.0 ± 0.1
(.039 ± .004) DIA.

40.0 - 85.0
(1.575 - 3.346)

SA2-xxxx-xKx

CERAMIC INSULATOR
METAL ELECTRODES
TINNED LEADS

8.9 ± 0.4
(.350 ± .016) DIA.

18.0 ± 0.5
(.709 ± .020)

15.0 ± 0.5
(.591 ± .020)

1.0 ± 0.1
(.039 ± .004) DIA.

SA2-xxxx-xCx

CERAMIC INSULATOR
METAL ELECTRODE

8.5 ± 0.1/0.3
(.335 ± .004/-.012) DIA.

8.9 ± 0.4
(.350 ± .016) DIA.

14.2 ± 0.5
(.563 ± .020)

4.3 ± 0.5
(.169 ± .020)

SA2-xxxx-xK1x

CERAMIC INSULATOR
METAL ELECTRODES
TINNED LEADS

8.5 ± 0.1/0.3
(.335 ± .004/-.012) DIA.

8.9 ± 0.4
(.350 ± .016) DIA.

17.2 ± 0.1
(.677 ± .004)

12.5 ± 0.5
(.492 ± .020)

SA2-xxxx-xBx

CERAMIC INSULATOR
METAL ELECTRODES
TINNED LEADS

8.9 ± 0.4
(.350 ± .016) DIA.

8.5 ± 0.1/0.3
(.335 ± .004/-.012) DIA.

7.5 ± 0.5
(.295 ± .020)

3.6 ± 0.5
(.142 ± .020)

DIMENSIONS:

SA2 Series High Voltage Gas Discharge Tube

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SA2 Series High Voltage Gas Discharge Tube

Packaging Specifications

Model SA2-xxxx-xxB ships standard bulk pack, 1,000 pcs./bag*.
The optional tape and reel packaging contains 1,000 pcs./reel for Model SA2-xxxx-xLT.

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

SA2-xxxx-xLT

DIMENSIONS: MM (INCHES)

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