Surge arrester

2-electrode arrester

Series/Type: S30-A230XS
Ordering code: B88069X9801T203
Date: 2019-04-10
Version: 04
Product description
The S30 series has been especially designed to meet data transmission protection requirements. The optimized design features a high level of protection against fast rising transients usually caused by lightning disturbances. For use in high frequency data lines, the series offers ultra low capacitances and shows only marginally signal losses up to high frequencies. The devices are extremely reliable and are able to withstand high surge currents without destruction.

Features
- Very small size (EIA 1812)
- Short response time
- High current capability
- Stable performance over service life
- Ultra low capacitance and insertion loss
- High insulation resistance
- Excellent SMD handling
- RoHS-compatible

Applications
- Telecommunication:
  - Ethernet, PoE, xDSL
  - Cable modem, splitters, line cards
  - Wireless antenna protection
- Others:
  - CCTV
  - Switching power supply

Product characteristics

<table>
<thead>
<tr>
<th>Physical dimensions</th>
<th>0.18 × 0.12 × 0.10 in</th>
</tr>
</thead>
<tbody>
<tr>
<td>(length × width × height)</td>
<td>4.5 × 3.2 × 2.7 mm</td>
</tr>
<tr>
<td></td>
<td>EIA 1812 / 4532 metric</td>
</tr>
<tr>
<td>Weight</td>
<td>~ 0.2 g</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>−40 ... +125 °C</td>
</tr>
<tr>
<td>Recommended storage ¹)</td>
<td>+5 ... +35 °C</td>
</tr>
<tr>
<td></td>
<td>45 ... 80 %</td>
</tr>
<tr>
<td></td>
<td>≤ 2 years</td>
</tr>
<tr>
<td>Climatic category (IEC 60068-1)</td>
<td>40/125/21</td>
</tr>
<tr>
<td>Moisture sensitivity level ²)</td>
<td>1</td>
</tr>
</tbody>
</table>

Marking, black positive

\[ \text{FY} \]
\[ F - \text{Nominal voltage (F} \equiv 230 \text{ V)} \]
\[ Y - \text{Year of production (last digit)} \]

Notes:
¹) Specified in terms of corrosion against Sn-plating
²) Tests according to JEDEC J-STD-020
## Electrical specifications and stress test methods

<table>
<thead>
<tr>
<th></th>
<th>Nominal DC spark-over voltage (^3) (^4)</th>
<th>Impulse spark-over voltage</th>
<th>Service life (^5)</th>
<th>Insulation resistance at 100 V(_{DC})</th>
<th>Capacitance at 1 MHz</th>
<th>Arc voltage at 1 A</th>
<th>Glow to arc transition current</th>
<th>Glow voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>230 (\pm 30)%</td>
<td>- for 99% of measured values</td>
<td>(&lt; 500)</td>
<td>(&gt; 1) (\Omega)</td>
<td>(&lt; 0.4) (\mu)F</td>
<td>(~ 20)</td>
<td>(&lt; 0.4)</td>
<td>(~ 140)</td>
</tr>
<tr>
<td>Min.</td>
<td>161</td>
<td>(&lt; 400)</td>
<td>500</td>
<td>100</td>
<td>A</td>
<td>8/20 (\mu)s</td>
<td>1</td>
<td>150</td>
</tr>
<tr>
<td>Max.</td>
<td>299</td>
<td>(&lt; 600)</td>
<td>600</td>
<td>1</td>
<td>kA</td>
<td>20 ((+\text{ }) &amp; 10 ((-\text{ }))</td>
<td>2 kA</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>(20 \text{ operations}) (8/20 \mu\text{ s})</td>
<td>(1 \text{ operation}) (8/20 \mu\text{ s})</td>
<td>(10 \text{ operations}) (5/320 \mu\text{ s}) (^6)</td>
<td>(100 \text{ operations}) (10/1000 \mu\text{ s})</td>
<td>(~ 140)</td>
<td>V</td>
<td>A</td>
<td>V</td>
</tr>
</tbody>
</table>

\(^3\) At delivery AQL 0.65 level II, DIN ISO 2859  
\(^4\) In ionized mode  
\(^5\) Tests according to ITU-T Rec. K. 12 and UL 497B  
\(^6\) DC spark-over voltage values may exceed ±50% after stress, but tubes still operate w/o venting  
Terms and current waveforms in accordance with ITU-T Rec. K. 12; IEC 61643-21 and IEC 61643-311.
Surge arrester

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B88069X9801T203

S30-A230XS

Dimensions in mm and inch [...]

Ordering code and packing advice

B88069X9801T203 = 2000 pcs. on SMD-tape & reel

SMD-tape according to IEC 60286-3
Soldering parameter

Reflow soldering

<table>
<thead>
<tr>
<th>Reflow profile features</th>
<th>Sn-Pb eutectic assembly</th>
<th>Pb-free assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preheat and soak</td>
<td>T_{min} 100 °C</td>
<td>150 °C</td>
</tr>
<tr>
<td>- Temperature min</td>
<td>T_{max} 150 °C</td>
<td>200 °C</td>
</tr>
<tr>
<td>- Temperature max</td>
<td>T_{min} to T_{max} 60 ... 120 s</td>
<td>60 ... 180 s</td>
</tr>
<tr>
<td>Average ramp-up rate</td>
<td>T_{min} to T_{p} max. 3 °C/ s</td>
<td>max. 3 °C/ s</td>
</tr>
</tbody>
</table>

Liquido temperature

| Temperature min | T_{L} 183 °C | 217 °C |
| Time at liquidous | T_{L} 60 ... 150 s | 60 ... 150 s |

Peak package body temperature *, Classification temperature **

| Temperature min | T_{p}, T_{C} 220 ... 235 °C ** | 245 ... 260 °C ** |
| Time (t_{p}) ** within 5 °C of the specified classification temperature (T_{C}) | 20 s *** | 30 s *** |

Average ramp-down rate

| Temperature min | T_{s} to T_{max} max. 6 °C/ s | max. 6 °C/ s |
| Time 25 °C to peak temperature max. 6 min | max. 8 min |

* = Tolerance for peak profile temperature (T_{p}) is defined as a supplier minimum and a user maximum.
** = For details please refer to JEDEC J-STD-020D.
*** = Tolerance for time at peak profile temperature (t_{p}) is defined as a supplier minimum and a user maximum.

Surface mounted components (SMD) may exhibit a temporary increase in the DC spark-over voltage after the solder reflow process. The components will recover within 24 hours. There is no quality defect nor change in protection levels during the temporary change in DC spark-over voltage.

Cautions and warnings

- Do not operate surge arresters in power supply networks, whose maximum operating voltage exceeds the minimum spark-over voltage of the surge arresters.
- Surge arresters may become hot in the event of longer periods of current stress (burn risk). In the event of overload the connectors may fail or the component may be destroyed.
- Surge arresters must be handled with care and must not be dropped.
- Do not continue to use damaged surge arresters.
- The shown SMD pad dimensions represent a safe way to mount the arrester and are a recommendation of the manufacturer. During the reflow process it must be assured that no solder material reduces the insulation distance between the pads below the arrester.
- SMD surge arresters should be soldered within 24 month after shipment.

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