Surge arrester

2-electrode arrester

Series/Type: ES350XSMD
Ordering code: B88069X4911T902
Date: 2018-10-08
Version: 06
**Surge arrester**

**2-electrode arrester**

**ES350XSMD**

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### Features
- Small size
- Very fast response time
- Stable performance over life
- Very low capacitance
- High insulation resistance
- Excellent SMD handling
- RoHS-compatible

### Applications
- Modem
- Consumer electronic
- Tuner

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### Electrical specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>DC spark-over voltage 1) 2)</th>
<th>Impulse spark-over voltage at 100 V/µs</th>
<th>Service life 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance</td>
<td>350 ± 15 V</td>
<td>&lt; 530 V</td>
<td>10 operations</td>
</tr>
<tr>
<td>Min.</td>
<td>298 V</td>
<td>&lt; 450 V</td>
<td>5 kA</td>
</tr>
<tr>
<td>Max.</td>
<td>403 V</td>
<td>&lt; 600 V</td>
<td>1 operation</td>
</tr>
</tbody>
</table>

- for 99% of measured values
- typical values of distribution

<table>
<thead>
<tr>
<th>Feature</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>
<th>Weight</th>
<th>Operation and storage temperature</th>
<th>Climatic category (IEC 60068-1)</th>
<th>Marking, red positive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 1 pF</td>
<td>~ 15 V</td>
<td>~ 0.5 A</td>
<td>~ 130 V</td>
<td>~ 1.5 g</td>
<td>−40 °C ... +125 °C</td>
<td>40/125/21</td>
<td>EPCOS ES 350 YY O</td>
</tr>
</tbody>
</table>

1) At delivery AQL 0.65 level II, DIN ISO 2859
2) In ionized mode
3) According to IEC 61000-4-5

Terms in accordance with ITU-T Rec. K.12 and IEC 61643-311

**Certification**

UL 497B (E163070)

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**PPD AB PD / PPD AB PM**

Version: 06 / 2018-10-08

Please read Cautions and warnings and Important notes at the end of this document.
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B88069X4911T902

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Dimensional drawing in mm

Ordering code and packing advice

B88069X4911T902 = 900 pcs. on SMD-tape & reel
Surge arrester

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ES350XSMD

Soldering parameter

Reflow soldering

Reflow profile features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Sn-Pb eutectic assembly</th>
<th>Pb-free assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preheat and soak</td>
<td>T\text{\textsubscript{preheat}}</td>
<td>100 °C</td>
</tr>
<tr>
<td>- Temperature min</td>
<td>T\text{\textsubscript{max}}</td>
<td>150 °C</td>
</tr>
<tr>
<td>- Temperature max</td>
<td>T\text{\textsubscript{max}}</td>
<td>150 °C</td>
</tr>
<tr>
<td>- Time</td>
<td>t\text{\textsubscript{soak}} to t\text{\textsubscript{preheat}}</td>
<td>60 ... 120 s</td>
</tr>
<tr>
<td>- Time</td>
<td>T\text{\textsubscript{max}} to T\text{\textsubscript{p}}</td>
<td>60 ... 180 s</td>
</tr>
<tr>
<td>Average ramp-up rate</td>
<td>T\text{\textsubscript{max}} to T\text{\textsubscript{p}}</td>
<td>max. 3 °C/ s</td>
</tr>
<tr>
<td>Liquidus temperature</td>
<td>T\text{\textsubscript{l}}</td>
<td>183 °C</td>
</tr>
<tr>
<td>Liquidus temperature</td>
<td>t\text{\textsubscript{l}}</td>
<td>60 ... 150 s</td>
</tr>
<tr>
<td>Time at liquidus</td>
<td>T\text{\textsubscript{l}}</td>
<td>217 °C</td>
</tr>
<tr>
<td>Time at liquidus</td>
<td>t\text{\textsubscript{l}}</td>
<td>60 ... 150 s</td>
</tr>
<tr>
<td>Peak package body</td>
<td>T\text{\textsubscript{p}}, T\text{\textsubscript{c}}</td>
<td>220 ... 235 °C **</td>
</tr>
<tr>
<td>temperature *</td>
<td></td>
<td>245 ... 260 °C **</td>
</tr>
<tr>
<td>Classification</td>
<td>T\text{\textsubscript{p}}, T\text{\textsubscript{c}}</td>
<td>20 s ***</td>
</tr>
<tr>
<td>temperature **</td>
<td></td>
<td>30 s ***</td>
</tr>
<tr>
<td>Time (t\textsubscript{p}) ** within 5 °C of the specified classification temperature (T\text{\textsubscript{c}})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average ramp-down rate</td>
<td>T\text{\textsubscript{p}} to T\text{\textsubscript{max}}</td>
<td>max. 6 °C/ s</td>
</tr>
<tr>
<td>Time 25 °C to peak</td>
<td>T\text{\textsubscript{p}} to T\text{\textsubscript{max}}</td>
<td>max. 6 °C/ s</td>
</tr>
<tr>
<td>Temperature</td>
<td>T\text{\textsubscript{max}} to peak temperature</td>
<td>max. 6 min</td>
</tr>
<tr>
<td>Average ramp-down rate</td>
<td>T\text{\textsubscript{p}} to T\text{\textsubscript{max}}</td>
<td>max. 8 min</td>
</tr>
</tbody>
</table>

* = Tolerance for peak profile temperature (T\text{\textsubscript{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\text{\textsubscript{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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Release 2018-10