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## Surge arrester

2-electrode arrester

|                       |                        |
|-----------------------|------------------------|
| <b>Series/Type:</b>   | <b>S20-A200X</b>       |
| <b>Ordering code:</b> | <b>B88069X9731T303</b> |
| Date:                 | 2018-01-19             |
| Version:              | 06                     |

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## Product description

The S20 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 1206)
- Short response time
- High current handling 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

|  |                                |   |
|--|--------------------------------|---|
| Physical dimensions<br>(length × width × height)                             | 0.126 × 0.063 × 0.063          | in  |
|  | 3.2 × 1.6 × 1.6                | mm  |
|  | EIA 1206 / 3216 metric         |   |
| Weight   | ~ 0.05                         | g   |
| Operating temperature  | -40 ... +125                   | °C  |
| Recommended storage <sup>1)</sup><br>- temperature<br>- humidity<br>- period | +5 ... +35<br>45 ... 80<br>≤ 2 | °C<br>%<br>years  |
| Climatic category (IEC 60068-1)  | 40/125/21                      |   |
| Moisture sensitivity level <sup>2)</sup>                                     | 1                              |   |
| Marking  | without                        |   |
| Certifications   | UL 497B (E163070)              |  |

#### Notes:

<sup>1)</sup> Specified in terms of corrosion against Sn-plating

<sup>2)</sup> Tests according to JEDEC J-STD-020

**Electrical specifications and stress test methods**

|  |  |                |
|--|--|----------------|
| Nominal DC spark-over voltage <sup>3) 4)</sup> | 200  | V              |
| Tolerance                                      | ±30  | %              |
| Min.   | 140  | V              |
| Max.   | 260  | V              |
| Impulse spark-over voltage                     |  |                |
| at 100 V/μs                                    | - for 99% of measured values<br>- typical values of distribution | < 600<br>< 500 |
| at 1 kV/μs                                     | - for 99% of measured values<br>- typical values of distribution | < 800<br>< 700 |
| Service life <sup>5) 6)</sup>                  |  |                |
| 10 operations [5× (+) & 5× (-)]                | 8/20 μs  | 0.5            |
| 10 operations [5× (+) & 5× (-)]                | 5/320 μs <sup>6)</sup>   | 150            |
| Insulation resistance at 100 V <sub>DC</sub>   | > 1  | GΩ             |
| Capacitance at 1 MHz                           | < 0.3  | pF             |
| Arc voltage at 1 A                             | ~ 10   | V              |
| Glow to arc transition current                 | < 0.1  | A              |
| Glow voltage                                   | ~ 65   | V              |

<sup>3)</sup> At delivery AQL 0.65 level II, DIN ISO 2859

<sup>4)</sup> In ionized mode

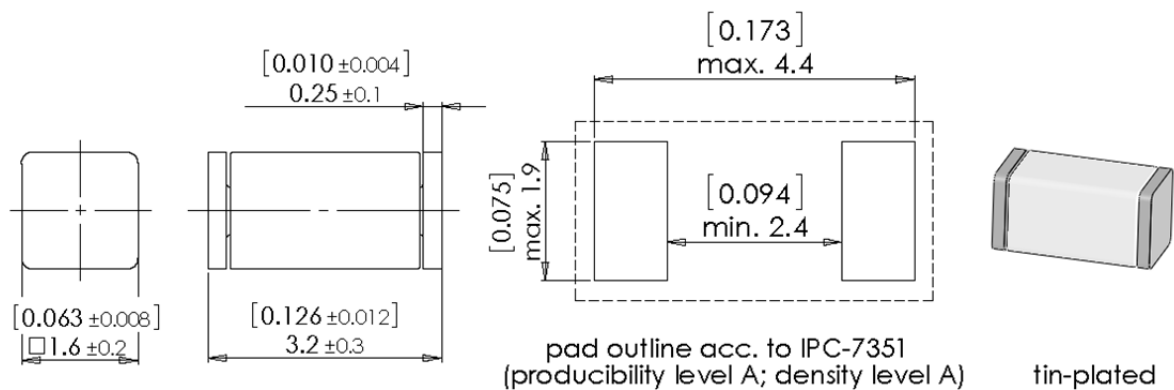
<sup>5)</sup> Tests according to ITU-T Rec. K. 12 and UL 497B

<sup>6)</sup> DC spark-over voltage values may exceed ±50% after stress, but tubes still operates w/o venting

Terms and current waveforms in accordance with ITU-T Rec. K. 12; IEC 61643-21 and IEC 61643-311.



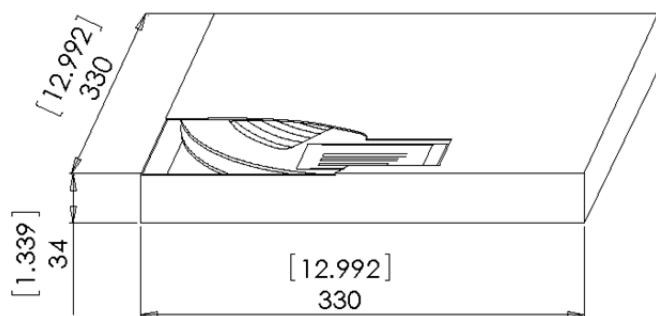
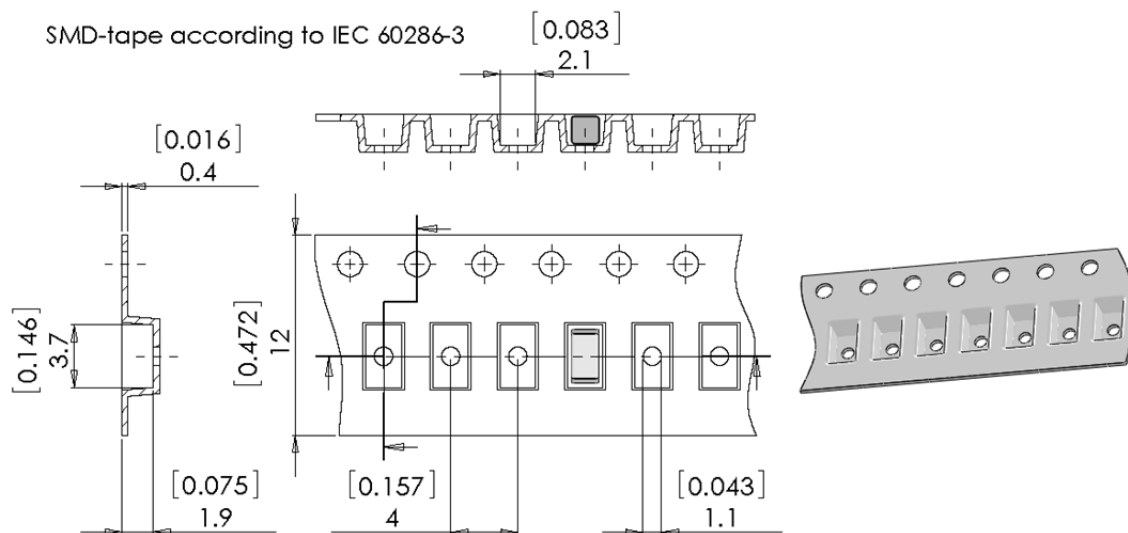
Dimensions in mm and inch [...]



Ordering code and packing advice

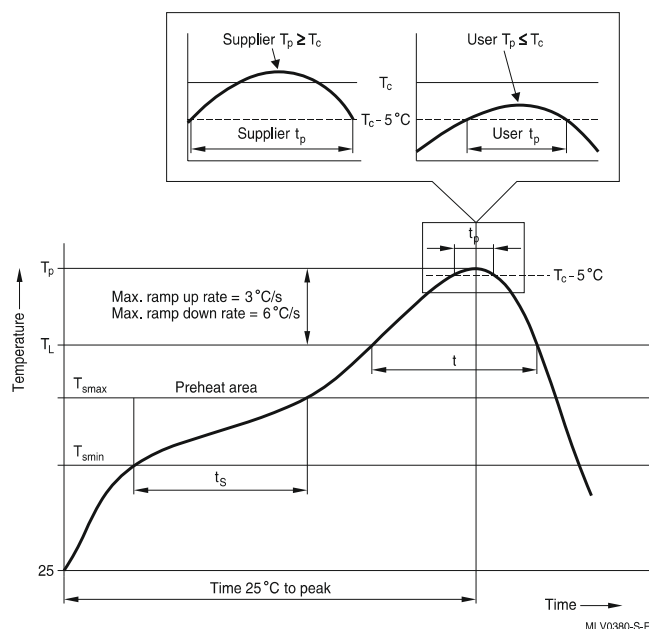
B88069X9731T303 = 3000 pcs. on SMD-tape & reel

SMD-tape according to IEC 60286-3



## Soldering parameter

### Reflow soldering



| Reflow profile features  |  | Sn- Pb eutectic assembly         | Pb-free assembly                 |
|--|--|----------------------------------|----------------------------------|
| Preheat and soak<br>- Temperature min<br>- Temperature max<br>- Time   | $T_{smin}$<br>$T_{smax}$<br>$t_{smin}$ to $t_{smax}$ | 100 °C<br>150 °C<br>60 ... 120 s | 150 °C<br>200 °C<br>60 ... 180 s |
| Average ramp-up rate   | $T_{smax}$ to $T_p$                                  | max. 3 °C/ s                     | max. 3 °C/ s                     |
| Liquidous temperature<br>Time at liquidous   | $T_L$<br>$t_L$                                       | 183 °C<br>60 ... 150 s           | 217 °C<br>60 ... 150 s           |
| Peak package body temperature *,<br>Classification temperature **  | $T_p$ , $T_c$  | 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   | $T_p$ to $T_{smax}$                                  | 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.<br>** = For details please refer to JEDEC J-STD-020D.<br>*** = 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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