



Surge arrester

2-electrode arrester

Series/Type: ES400XSMD
Ordering code: B88069X5591T902
Date: 2019-07-23
Version: 05


Features

- Very 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

Electrical specifications

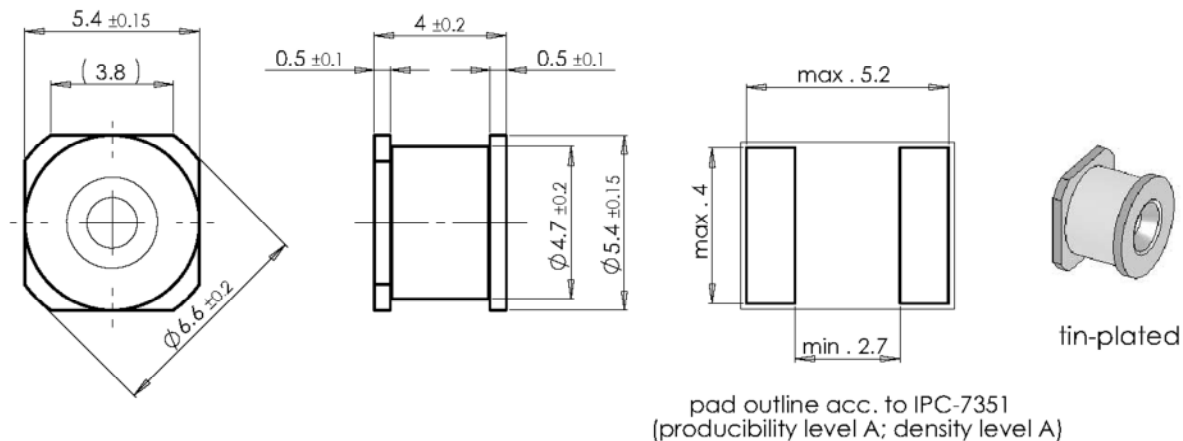
| | | |
|---|---|---|
| DC spark-over voltage ^{1) 2)} | 400 | V |
| Tolerance | ±15 | % |
| Min. | 340 | V |
| Max. | 460 | V |
| Impulse spark-over voltage | | |
| at 100 V/μs - for 99% of measured values | < 800 | V |
| - typical values of distribution | < 750 | V |
| at 1 kV/μs - for 99% of measured values | < 1000 | V |
| - typical values of distribution | < 850 | V |
| Service life | | |
| 10 operations 50 Hz, 1 s | 2.5 | A |
| 10 operations 8/20 μs | 2.5 | kA |
| 1 operation 8/20 μs | 5 | kA |
| 300 operations [150x (+) & 150x (-)] | 10 | A |
| 100 operations [50x (+) & 50x (-)] | 50 | A |
| Insulation resistance at 100 V _{DC} | > 1 | GΩ |
| Capacitance at 1 MHz | < 1 | pF |
| Arc voltage at 1 A | ~ 11 | V |
| Glow to arc transition current | < 0.5 | A |
| Glow voltage | ~ 80 | V |
| Weight | ~ 1 | g |
| Operation and storage temperature | -40 ... +125 | °C |
| Climatic category (IEC 60068-1) | 40/125/21 | |
| Marking, red positive | EPCOS ES 400 YY O ES - Series 400 - Nominal voltage YY - Year of production O - Non radioactive | |
| Certification | UL 497B (E163070) |  |

¹⁾ At delivery AQL 0.65 level II, DIN ISO 2859

²⁾ In ionized mode

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

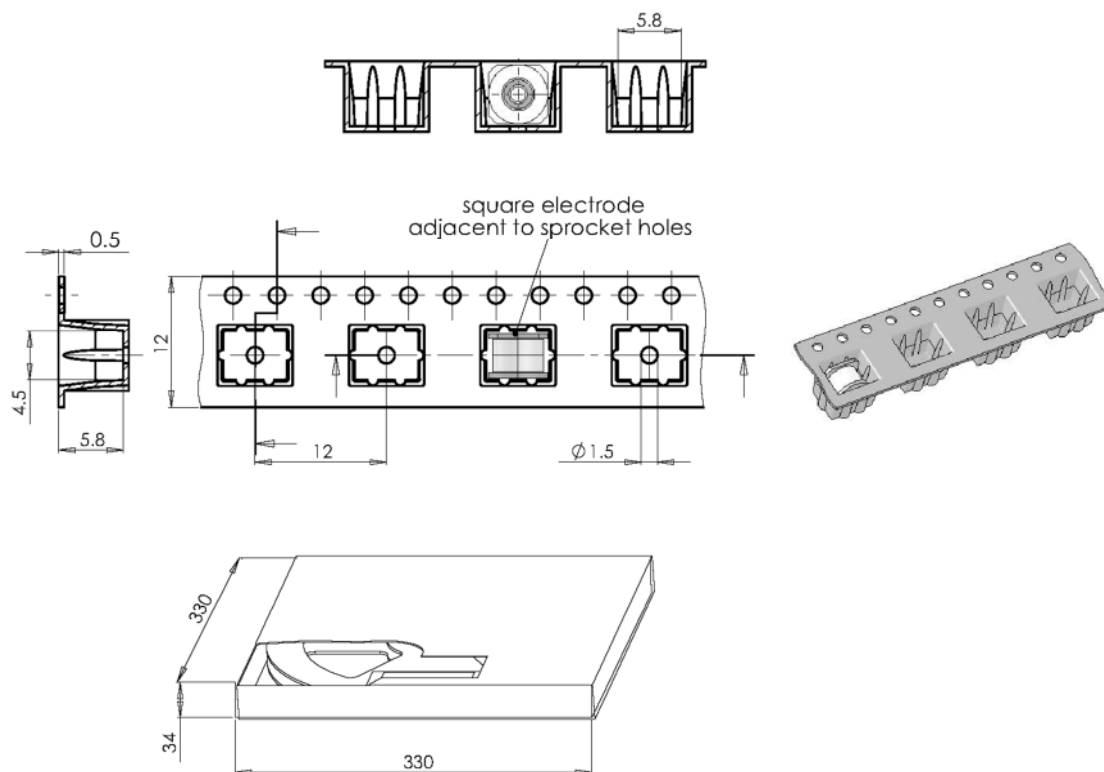
Dimensional drawing in mm



Ordering codes and packing advices

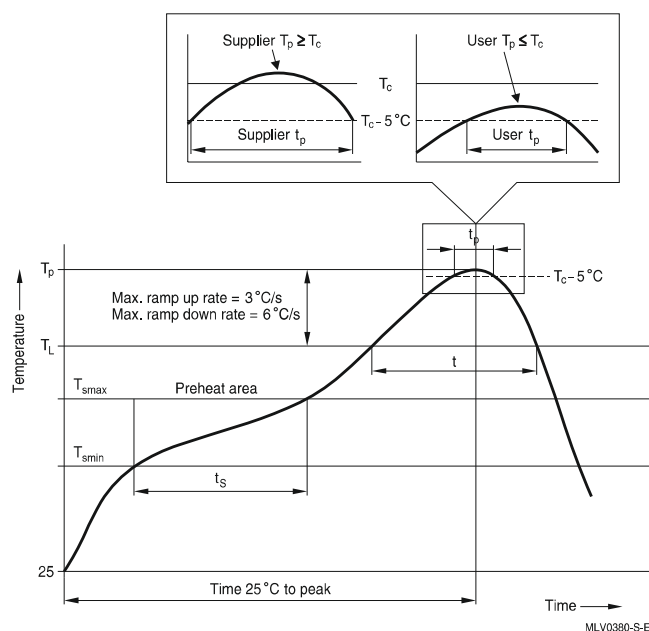
B88069X5591T902 = 900 pcs. on SMD-tape & reel

SMD-tape according to IEC 60286-3



Soldering parameter

Reflow soldering



| Reflow profile features | | Sn- Pb eutectic assembly | Pb-free assembly |
|--|--|----------------------------------|----------------------------------|
| Preheat and soak - Temperature min - Temperature max - Time | T_{smin} T_{smax} t_{smin} to t_{smax} | 100 °C 150 °C 60 ... 120 s | 150 °C 200 °C 60 ... 180 s |
| Average ramp-up rate | T_{smax} to T_p | max. 3 °C/ s | max. 3 °C/ s |
| Liquidous temperature Time at liquidous | T_L t_L | 183 °C 60 ... 150 s | 217 °C 60 ... 150 s |
| Peak package body temperature *, 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. ** = 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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Release 2018-10

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