



## Surge arrester

### 3-electrode arrester

<b>Series/Type:</b>	<b>TQ90-A90</b>
<b>Ordering code:</b>	<b>B88069X1963T902</b>
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Version:	05

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## Product description

The TQ90-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

- Small size
- Fast response time
- High current handling capability
- Stable performance over service life
- 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 (length x width x height)	7.6 x 5.0 x 5.0	mm
Weight	~ 0.9	g
Operating temperature	-40 ... +90	°C
Recommended storage <sup>1)</sup> - temperature - humidity - period	+5 ... +35 45 ... 80 ≤ 2	°C % years
Climatic category (IEC 60068-1)	40/ 90/ 21	
Moisture sensitivity level <sup>2)</sup>	1	
Marking	without	

#### 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) 5)</sup>	90	V
Tolerance	±20	%
Min.	72	V
Max.	108	V
Impulse spark-over voltage <sup>5)</sup>		
at 100 V/μs	- for 99% of measured values - typical values of distribution	< 450 < 350
at 1 kV/μs	- for 99% of measured values - typical values of distribution	< 650 < 550
Service life <sup>7)</sup>		
10 operations	50 Hz, 1 s	10
1 operation	50 Hz; 0.18 s <sup>8)</sup>	15
10 operations [5x (+) & 5x (-)]	8/20 μs	10
1 operation	8/20 μs <sup>8)</sup>	15
1 operation	10/350 μs <sup>8)</sup>	2
10 operations [5x (+) & 5x (-)]	10/700 μs	150
1 operation	10/700 μs	300
300 operations [150x (+) & 150x (-)]	10/1000 μs	200
Insulation resistance at 50 V <sub>DC</sub> <sup>3)</sup>	> 1	GΩ
Capacitance at 1 MHz	< 1.2 <sup>5)</sup>	< 0.6 <sup>6)</sup>
Arc voltage at 1 A	~ 9	V
Glow to arc transition current	~ 0.2	A
Glow voltage	~ 55	V

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

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

<sup>5)</sup> Tip or ring electrode to center electrodes

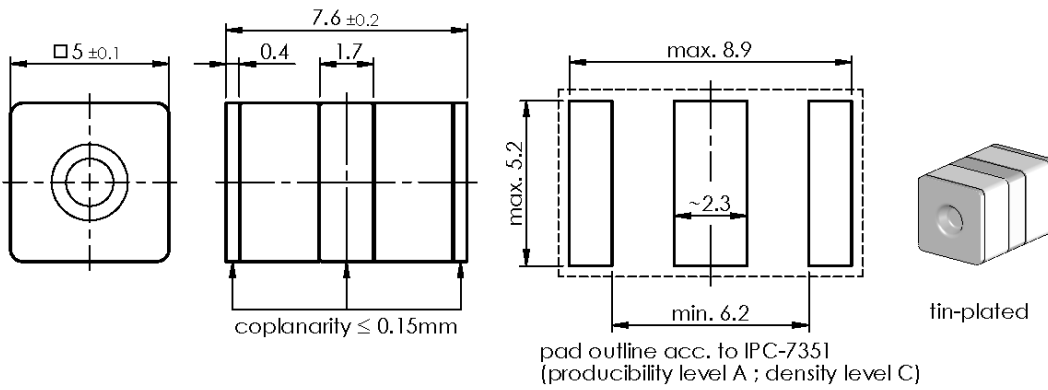
<sup>6)</sup> Tip to ring electrode

<sup>7)</sup> Total current through center electrodes, half value through tip respectively ring electrode.

<sup>8)</sup> After service life: DC spark-over voltage 90 V ±30%

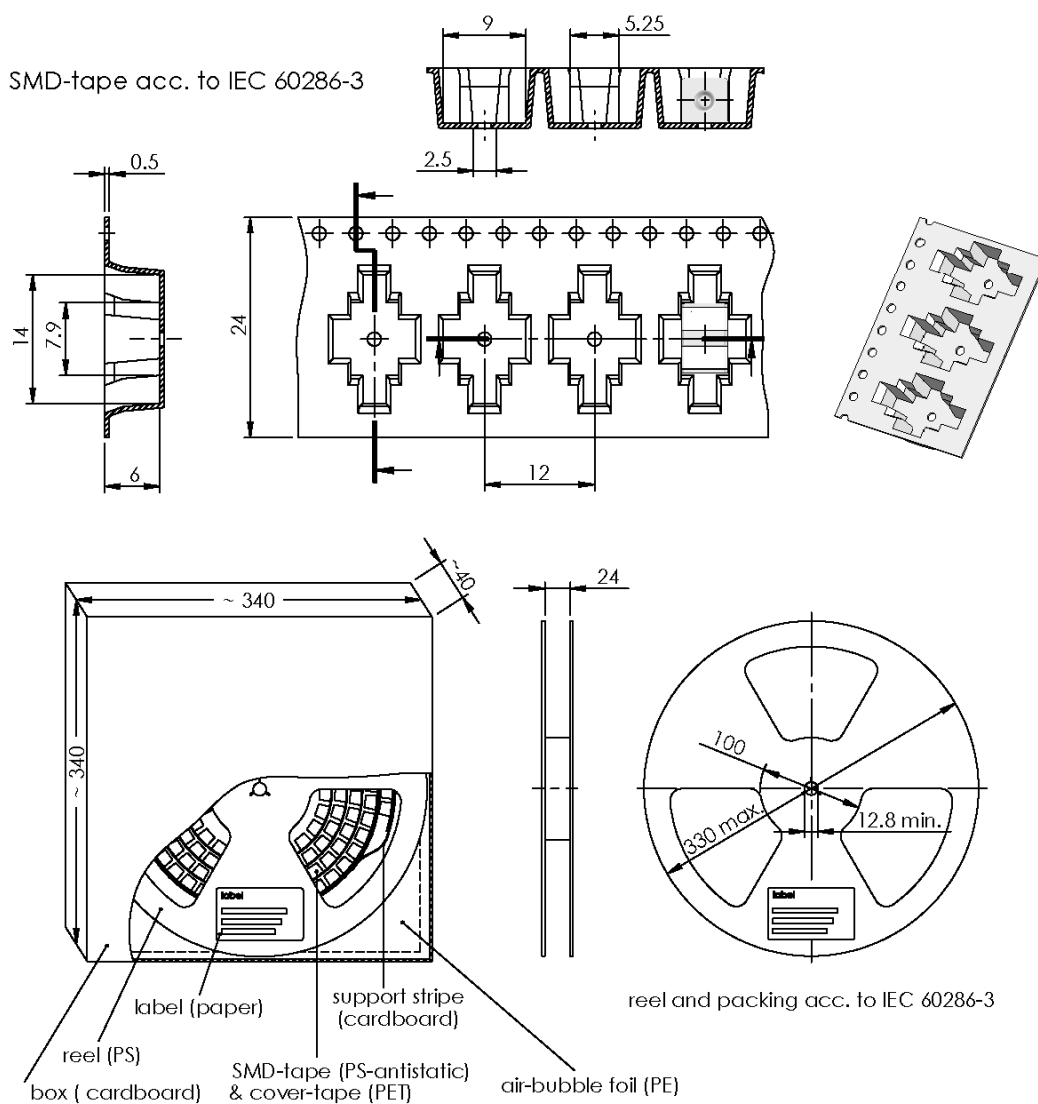
Terms and current waveforms in accordance with ITU-T Rec. K. 12; IEC 61643-21; IEC 61643-311 and IEC 61663-2.

Dimensions in mm



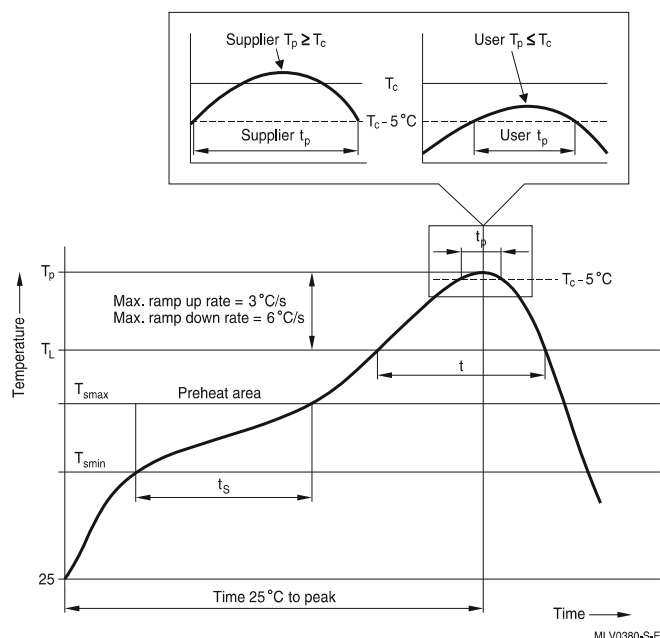
Ordering code and packing advice

B88069X1963T902 = 900 pcs. on SMD-tape and reel



## 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.

## 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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