



## Surge arrester

### 3-electrode arrester

**Series/Type:** T90-A170XFSMD  
**Ordering code:** B88069X5910T902  
**Date:** 2016-02-03  
**Version:** 03

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**Features**

- Very small size
- Fast response time
- High current rating
- Stable performance over life
- Very low capacitance
- High insulation resistance
- Reliable failsafe device
- Excellent SMD handling
- RoHS-compatible

**Applications**

- Line protection
- Station protection
- Base stations

**Electrical specifications**

DC spark-over voltage <sup>1) 2) 3)</sup>	170 ±18	V %
Impulse spark-over voltage <sup>3)</sup>		
at 100 V/μs - for 99% of measured values - typical values of distribution	< 550 < 450	V V
at 1 kV/μs - for 99% of measured values - typical values of distribution	< 700 < 600	V V
Service life		
10 operations                                   50 Hz; 1 s <sup>4)</sup>	10	A
1 operation                                    50 Hz; 0.18 s (9 cycl.) <sup>4)</sup>	10	A
10 operations [5x (+) & 5x (-)]           8/20 μs <sup>4)</sup>	10	kA
1 operation                                   10/350 μs <sup>4)</sup>	1	kA
300 operations (+/- alternating polarity) 10/1000 μs <sup>4)</sup>	200	A
Insulation resistance at 50 V <sub>DC</sub> <sup>3)</sup>	> 1	GΩ
Capacitance at 1 MHz <sup>3)</sup>	< 1.5	pF
Transverse delay time <sup>5)</sup>	< 0.2	μs
Arc voltage at 1 A	~ 10	V
Glow to arc transition current	< 1.0	A
Glow voltage	~ 60	V
Weight	~ 1.2	g
Operation and storage temperature	-40 ... +125	°C
Climatic category (IEC 60068-1)	40/125/21	
Marking, blue negative	<b>EPCOS</b> <b>90 YY O</b> 90 - Nominal voltage YY - Year of production O - Non radioactive	

Remarks on next page

- 1) At delivery AQL 0.65 level II, DIN ISO 2859
- 2) In ionized mode
- 3) Tip or ring electrode to center electrode
- 4) Total current through center electrode, half value through tip respectively ring electrode.
- 5) Test according to ITU-T Rec. K.12

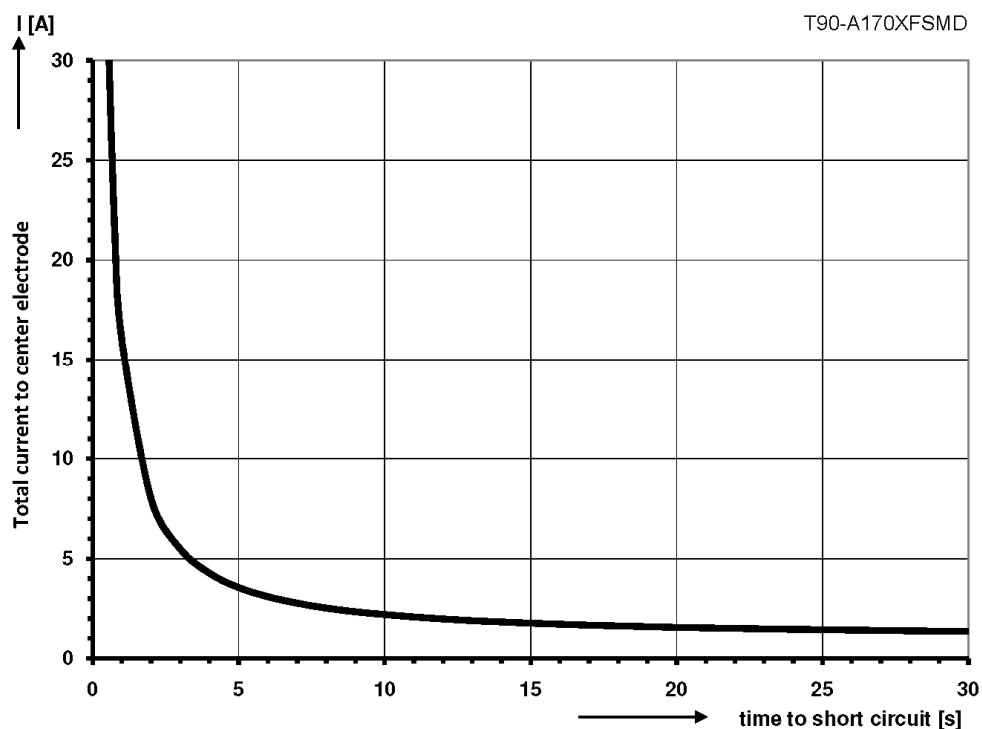
Terms in accordance with ITU-T Rec. K.12; IEC 61663 and IEC 61643-311.

The arrester failsafe mechanism contains an insulating foil with a melting temperature of 260 °C.

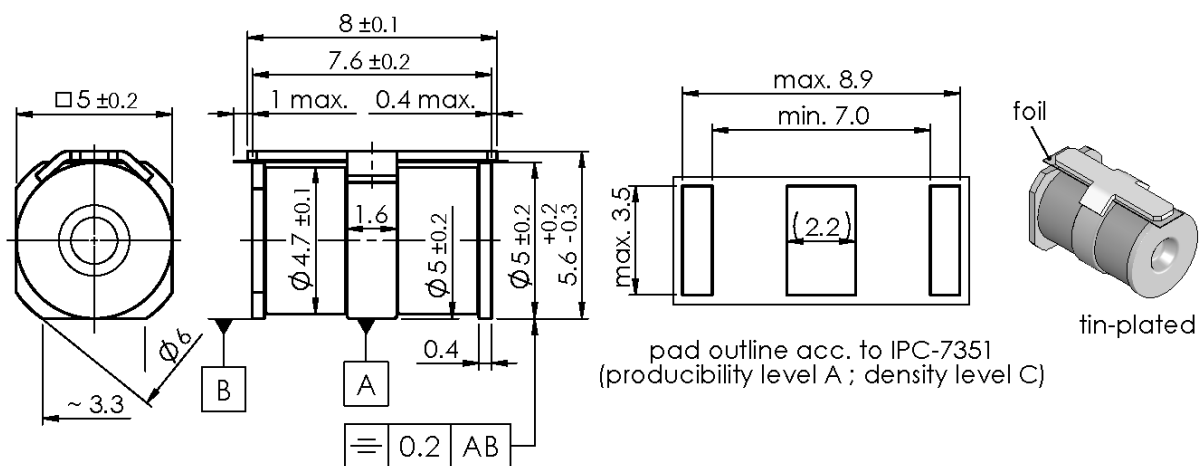
Arrester failsafe works at temperatures > 260 °C. The arrester has to be fixed mechanically, if the arrester is contacted by soldering and if the solder temperature is less than 260 °C.

### Failsafe characteristic diagram

For arrester only, characteristic can differ in assembled module.

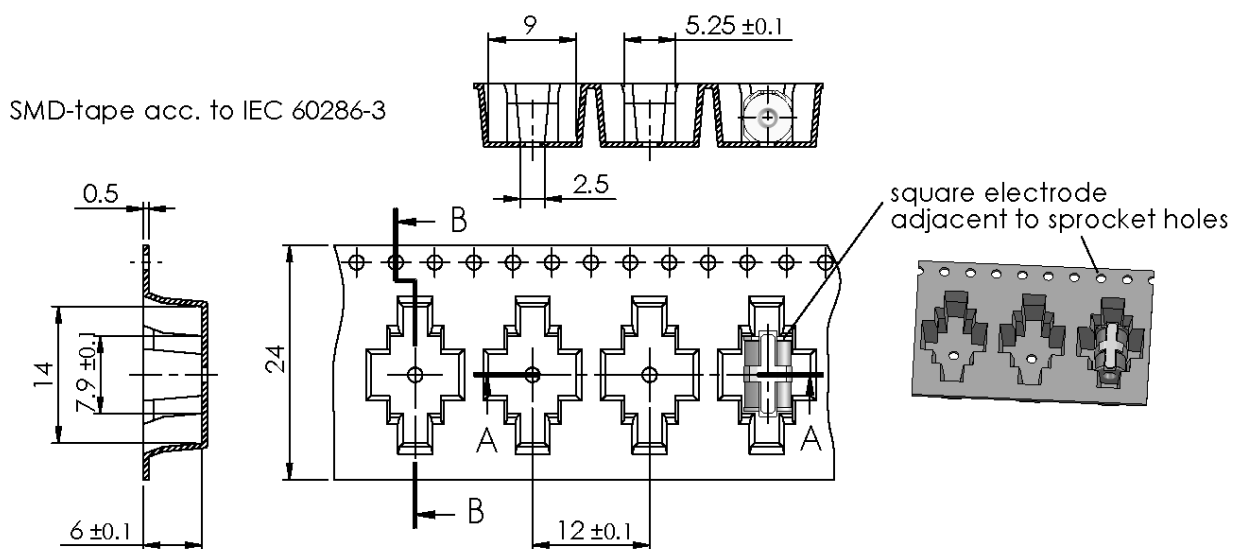


Dimensional drawing in mm



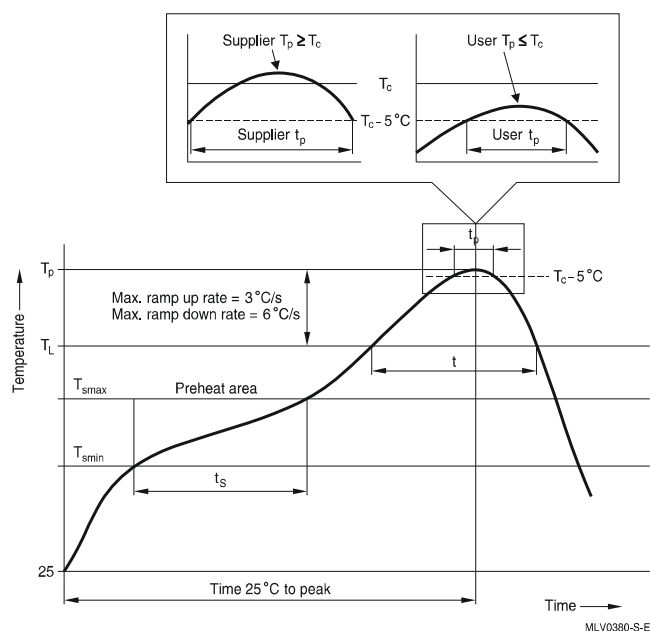
Ordering code and packing advice

B88069X5910T902 = 900 pcs. on SMD-tape & 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.			

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

- Depending on the sensor material the short-circuit spring does not trigger until 260 °C is reached. Thermal radiation to adjacent components must be taken into consideration in the circuit design. Depending on the mounting position, the surge arrester may have to be secured by additional mechanical means.
- Do not continue to use surge arresters whose short-circuit mechanisms have been activated.
- If the contacts of the surge arresters are defective, current load can cause sparks and loud noises.
- 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.

Surge arrester

B88069X5910T902

3-electrode arrester

T90-A170XFSMD

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