



## Surge arrester

3-electrode arrester

**Series/Type:** TQ30F-C450  
**Ordering code:** [B88069X2713T203](#)  
**Version/Date:** Issue 01 / 2013-08-19

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### Product description

The TQ30F-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. For applications with limited space, the TQ30F-parts offer a reduced height for optimized PCB – stacking capability.

### Features

- Very small size
- 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 (length x width x height)	0.24 x 0.12 x 0.08	in
	6.2 x 3.2 x 2.0	mm
Weight	~ 0.03	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>	450	V
Tolerance	-20 / +25	%
Min.	360	V
Max.	560	V
Impulse spark-over voltage <sup>5)</sup>		
at 100 V/μs	- for 99% of measured values - typical values of distribution	< 900 < 850
at 1 kV/μs	- for 99% of measured values - typical values of distribution	< 1200 < 1050
Service life		
10 operations	50 Hz, 0.2 s <sup>6) 7) 9)</sup>	2
20 operations [10x (+) & 10x (-)]	8/20 μs <sup>6) 7) 9)</sup>	2
10 operations [ 5x (+) & 5x (-)]	5/320 μs <sup>6) 7) 8) 9)</sup>	300
Insulation resistance at 100 V <sub>DC</sub> <sup>3)</sup>	> 1	GΩ
Capacitance at 1 MHz <sup>3)</sup>	< 0.5	pF
Arc voltage at 1 A	~ 12	V
Glow to arc transition current	~ 0.5	A
Glow voltage	~ 90	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> Total current through center electrodes, half value through tip respectively ring electrode.

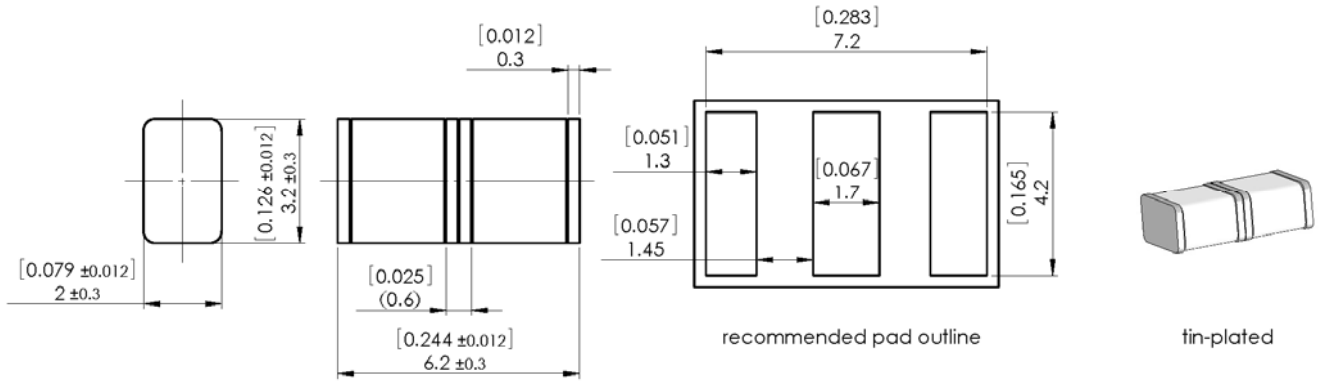
<sup>7)</sup> Electrical specifications may vary after stress tests

<sup>8)</sup> Test generator 6 kV, 10/700 μs, 40 Ω

<sup>9)</sup> Tests according to ITU-T Rec. K. 12 and UL 497B

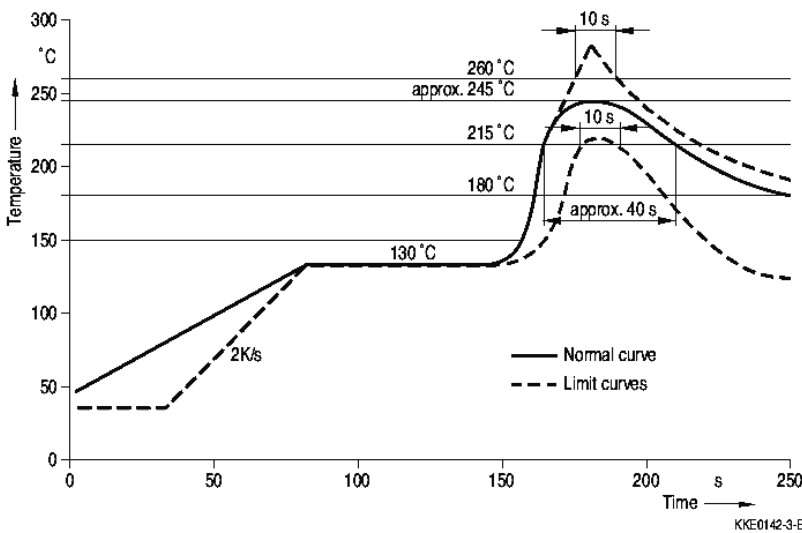
Terms and current waveforms in accordance with ITU-T Rec. K. 12; IEC 61643-21; IEC 61643-311 and IEC 61663-2.

Dimensions in mm and inch [...]



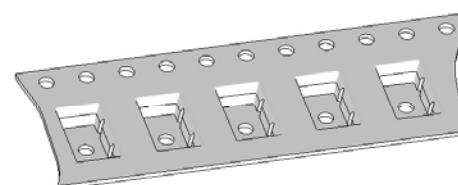
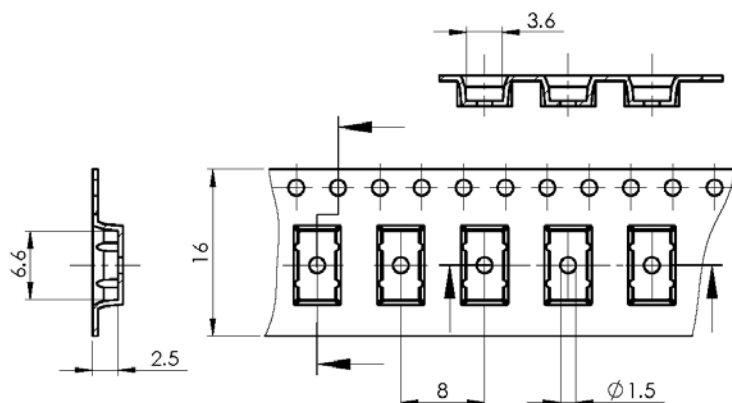
Soldering parameters

Reflow soldering



Temperature rise rate: 3 °C/s

Solder	Solder bath temperature	Dwell time
Sn 95.5/ Ag 3.8/ Cu 0.7	263 (±3) °C	< 3 s

**Ordering code and packing advice**
*B88069X2713T203 = SMD-tape with 2000 pcs.*


SMD-tape according to IEC 60286-3

**Reliability inspections**

Test	Parameter
Outer dimensions	Arrester (acc. data sheet)
Environmental testing – test B: dry heat DIN IEC 60068 part 2-2 test Bd	T = max. operating temperature period: 16 h
Environmental testing – test A: cold DIN IEC 60068 part 2-1 test Ab	T = min. operating temperature period = 16 h
Environmental testing – test N: change of temperature DIN IEC 60068 part 2-14 test Na	TA = min. operating temperature; TB = max. operating temperature t1 = each 30 min.; cycles = 5
Environmental testing – test Cab: damp heat, steady state DIN IEC 60068 part 2-78 test Cab	T = 40 °C; relative humidity = 93% test period = 21 days
Environmental testing – test Ea: shock DIN IEC 60068 part 2-29 test Ea	a = 400 m/s <sup>2</sup> ; shock period = 6 ms; shock number = 4000
Environmental testing – test Fc: vibration DIN IEC 60068 part 2-6 test Fc	f = 10 ... 500 Hz; A = 0.75 mm; a = 100 m/s <sup>2</sup> ; cycles = 10; directions = 2
Environmental testing – test T: soldering DIN IEC 60068 part 2-20 test Ta method 3	Enclosing time in delivery status ≤ 2 s; after aging ≤ 4 s
Environmental testing – test Td: solderability (SMD) DIN IEC 60068 part 2-58 test Td	Solder temperature = 260 °C pre heating = 150 °C / 120 s cooling < 50 s; dipping time = 3 × 10 s

**Cautions and warnings**

- Surge arresters must not be operated directly in power supply networks.
- Surge arresters may become hot in the event of longer periods of current stress (danger of burning). In the event of thermal overload. The connectors may fail or the component may be destroyed.
- Damaged surge arresters must not be re-used.

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