

<b>Microchip</b>	<b>Filter specification</b>	<b>TFS869P</b>	<b>1/5</b>
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**Measurement condition**

Ambient temperature  $T_A$ : 23 °C  
 Input power level: 0 dBm

Terminating impedance:

Input: 50 Ω  
 Output: 50 Ω

**Characteristics**

Remark:

The maximum attenuation in the passband is defined as the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 869.5 MHz without any tolerance or limit. The values of absolute attenuation  $a_{abs}$  are guaranteed for the whole operating temperature range. The frequency shift of the filter in the operating temperature range is included in the production tolerance scheme.

D a t a	typ. value	tolerance / limit
<b>Insertion loss</b>	$a_e$ 1.8 dB	max. 3.0 dB
<b>Nominal frequency</b>	$f_N$ -	869.5 MHz
<b>Passband</b>	PB -	$f_N \pm 6.5$ MHz
<b>Passband variation</b>	0.4 dB	max. 2.0 dB
<b>Absolute attenuation</b>	$a_{abs}$	
698 MHz ... 847 MHz	46 dB	min. 25 dB
847 MHz ... 849 MHz	37 dB	min. 20 dB
886 MHz ... 888 MHz	35 dB	min. 10 dB
888 MHz ... 915 MHz	48 dB	min. 25 dB
1726 MHz ... 1752 MHz	45 dB	min. 20 dB
2589 MHz ... 2628 MHz	36 dB	min. 25 dB
<b>Return loss within PB</b>	13 dB	min. 9.5 dB
<b>Group delay ripple within PB</b>	20 ns	max. 100 ns
<b>Input power level within PB</b>	*) -	max. 30 dBm
<b>Operating temperature range</b>	OTR -	- 40 °C ... + 85 °C
<b>Storage temperature range</b>	-	- 55 °C ... + 125 °C
<b>Temperature coefficient of frequency</b>	$TC_f$ **) -42 ppm/K	

\*) duty cycle = 50%, lifetime = 10 years

\*\*)  $\Delta f = TC_f(T - T_A)f_N$

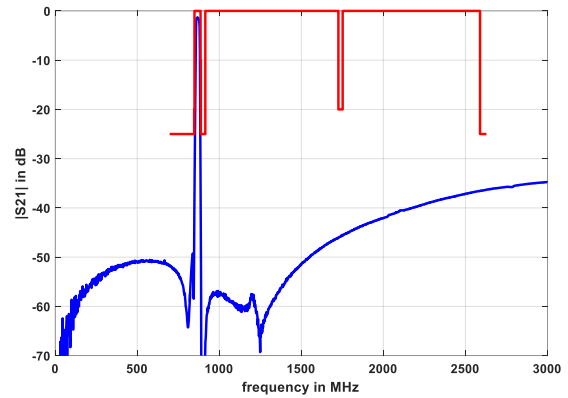
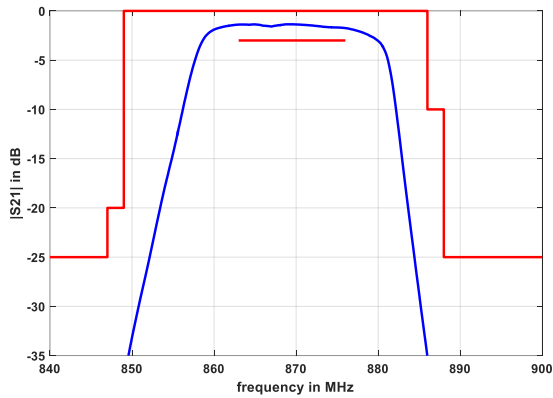
**Generated:**

**Checked / Approved:**

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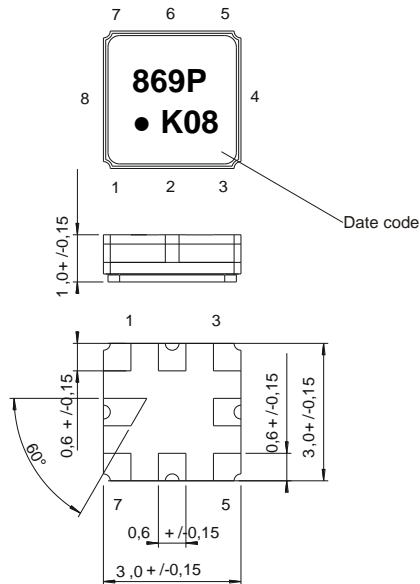
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**Filter characteristic**



**Construction and pin connection**

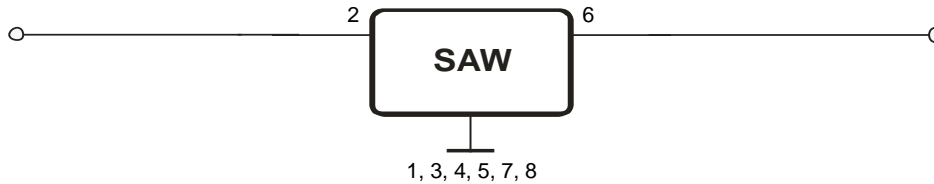
(All dimensions in mm)



- 1 Ground
- 2 Input
- 3 Ground
- 4 Ground
- 5 Ground
- 6 Output
- 7 Ground
- 8 Ground

Date code: Year + week  
 K 2018  
 L 2019  
 M 2020  
 ...

**50 Ω Test circuit**



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**Stability characteristics, reliability**

After the following tests the filter shall meet the whole specification:

1. Shock: 500 g, 1 ms, half sine wave, 3 shocks each plane;  
DIN IEC 60068 T2 - 27
2. Vibration: 10 Hz to 2000 Hz, 0.35 mm or 5 g respectively, 1 octave per min, 10 cycles per plane, 3 planes; DIN IEC 60068 T2 - 6
3. Change of temperature: -55 °C to 125 °C / 15 min. each / 100 cycles  
DIN IEC 60068 part 2 – 14 Test N
4. Resistance to solder heat (reflow): reflow possible: three times max.;  
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;
5. SAW devices are Electrostatic Discharge (ESD) sensitive devices.

This filter is RoHS compliant (2011/65/EU)

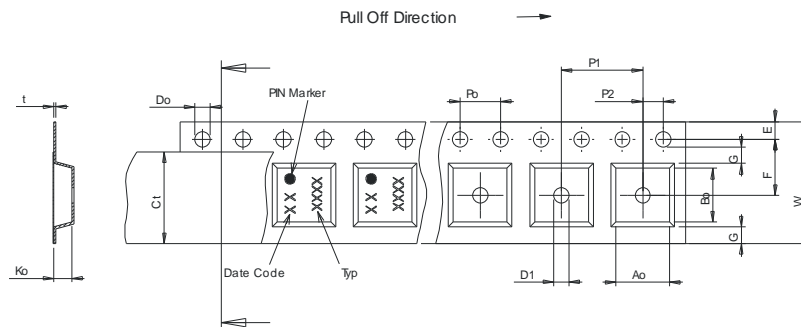
**Packing**

Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;  
tape type II, embossed carrier tape with top cover tape on the upper side;

reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

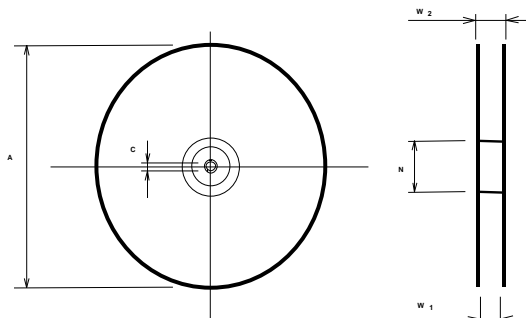
**Tape (all dimensions in mm)**

- W : 8.00 ±0.3
- Po : 4.00 ±0.1
- Do : 1.50 +0.1/-0
- E : 1.75 ±0.1
- F : 3.50 ±0.05
- G(min) : 0.75
- P2 : 2.00 ±0.05
- P1 : 4.00 ±0.1
- D1(min) : 1.50
- Ao : 3.25 ±0.1
- Bo : 3.25 ±0.1
- Ct : 5.30 ±0.1
- Ko : 1.50 ±0.1
- t : 0.25 ±0.05



**Reel (all dimensions in mm)**

- A : 330 or 180
- W1 : 8.40 +1.5/-0
- W2(max) : 14.40
- N(min) : 60.00
- C : 13.0 ±0.2



The minimum bending radius is 45 mm.

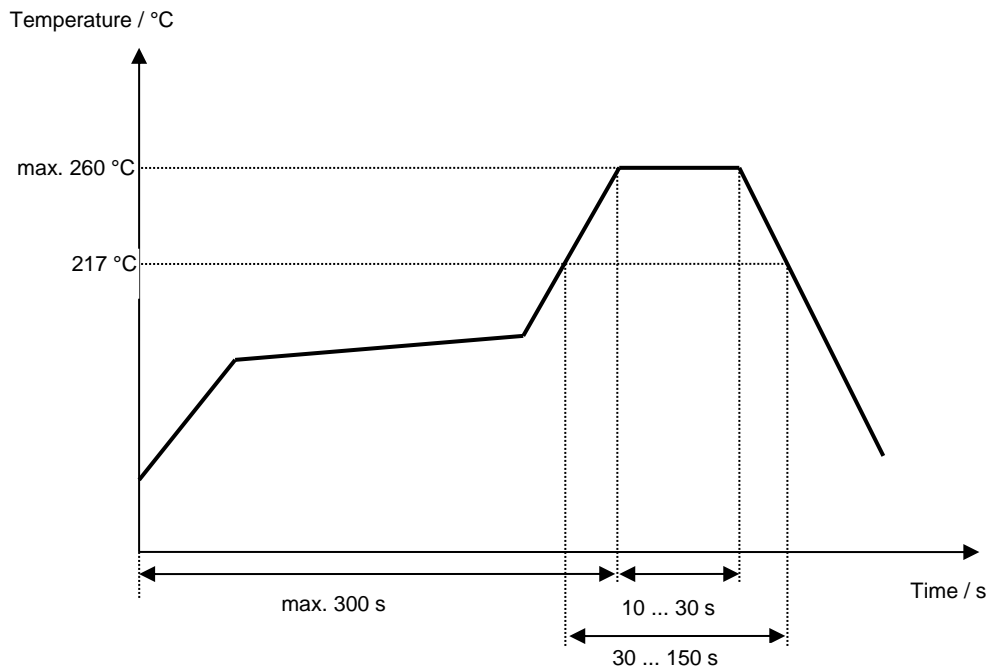
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**Air reflow temperature conditions**

Conditions	Exposure
Average ramp-up rate (30 °C to 217 °C)	less than 3 °C / second
> 100 °C	between 300 and 600 seconds
> 150 °C	between 240 and 500 seconds
> 217 °C	between 30 and 150 seconds
Peak temperature	max. 260 °C
Time within 5 °C of actual peak temperature	between 10 and 30 seconds
Cool-down rate (Peak to 50 °C)	less than 6 °C / second
Time from 30 °C to Peak temperature	no greater than 300 seconds

**Chip-mount air reflow profile**



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**Microchip****Filter specification****TFS869P****5/5**

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**History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	Generation of development specification	A. Molke	02.03.2017
1.1	- Change from development spec to filter spec - Typical values added - Filter characteristic added	A. Molke	20.02.2018

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