

**Microchip**

**Filter specification**

**TFS 869H**

**1/5**

**Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	50	Ω
Output:	50	Ω

**Characteristics**

Remark:

The reference level for the relative attenuation  $a_{rel}$  of the TFS 869H is the minimum of the pass band attenuation  $a_{min}$ . The minimum of the pass band attenuation  $a_{min}$  is defined as the insertion loss  $a_e$ . The centre frequency  $f_c$  is the arithmetic mean value of the upper and lower frequencies at the 3 dB filter attenuation level relative to the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 869,2125 MHz without any tolerance. The given values for both the relative attenuation  $a_{rel}$  and the group delay ripple have to be achieved at the frequencies given below even if the centre frequency  $f_c$  is shifted due to the temperature coefficient of frequency  $TC_f$  in the operating temperature range and due to a production tolerance for the centre frequency  $f_c$ .

<b>D a t a</b>		<b>typ. value</b>	<b>tolerance / limit</b>
<b>Insertion loss</b> (reference level)	$a_e$	4,4 dB	max. 7,0 dB
<b>Nominal frequency</b>	$f_N$	-	869,2125 MHz
<b>Centre frequency</b>	$f_c$	869,2125 MHz	-
<b>Bandwidth</b> 3 dB	BW	360 kHz	min. 20 kHz
<b>Relative attenuation</b> $f_N - 10$ kHz ... $f_N + 10$ kHz	$a_{rel}$	1,0 dB	max. 3 dB
<b>Absolute attenuation</b> $f_N + 910$ kHz	$a_{abs}$	32 dB	min. 28 dB
<b>Input power level</b>			max. 15 dBm
<b>Operating temperature range</b>	OTR	-	- 20 °C ... + 80 °C
<b>Storage temperature range</b>		-	- 40 °C ... + 85 °C
<b>Frequency inversion temperature</b>		0 °C	
<b>Temperature coefficient of frequency</b>	$TC_f$ *	-0,04 ppm/K <sup>2</sup>	

\*)  $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T - T_A)^2 \times f_{CAT}(\text{MHz})$

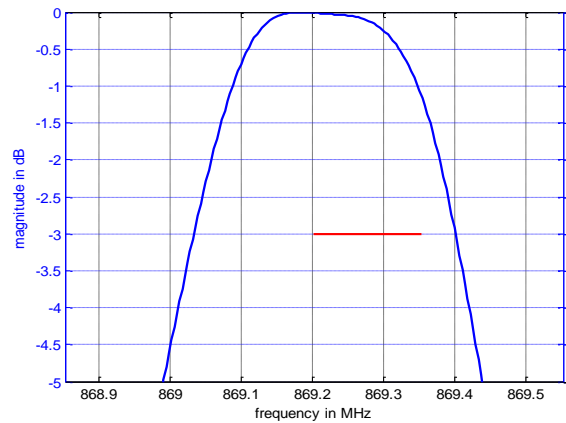
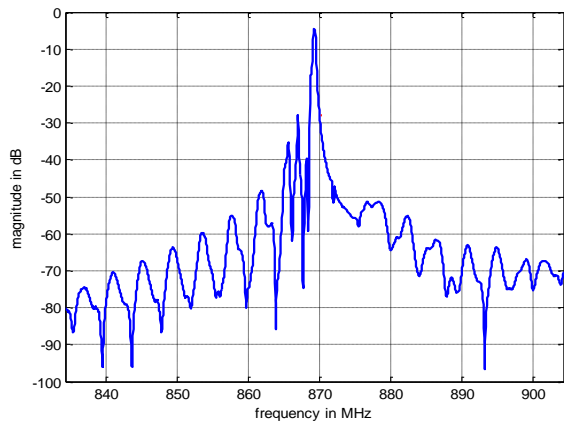
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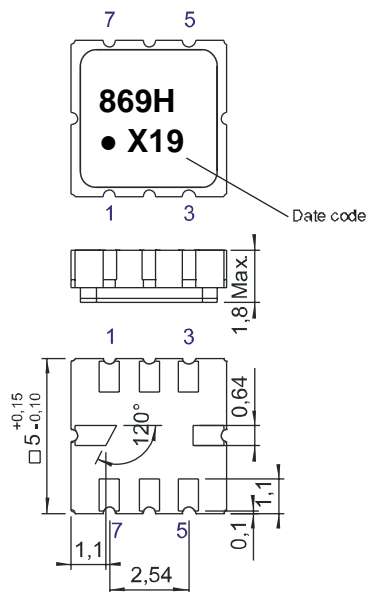
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**Filter characteristic**



**Construction and pin connection**

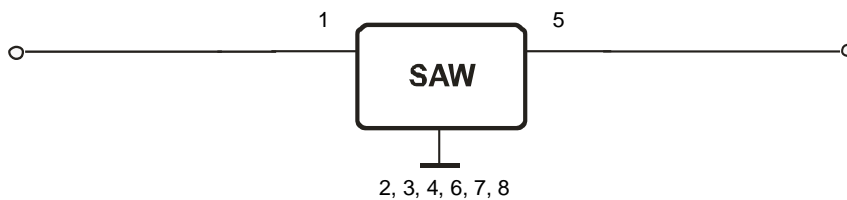
(All dimensions in mm)



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

Date code: Year + week  
 X 2009  
 A 2010  
 B 2011  
 ...

**50 Ω Test circuit**



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**Stability characteristics, reliability**

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

1. Shock: 500g, 1 ms, half sine wave, 3 shocks each plane;  
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 500 Hz, 0,35 mm or 5 g respectively, 1 octave per min, 10 cycles per plan, 3 plans;  
DIN IEC 68 T2 - 6
3. Change of temperature: -55 °C to 125°C / 30 min. each / 10 cycles  
DIN IEC 68 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;

This filter is RoHS compliant (2002/95/EG, 2005/618/EG)

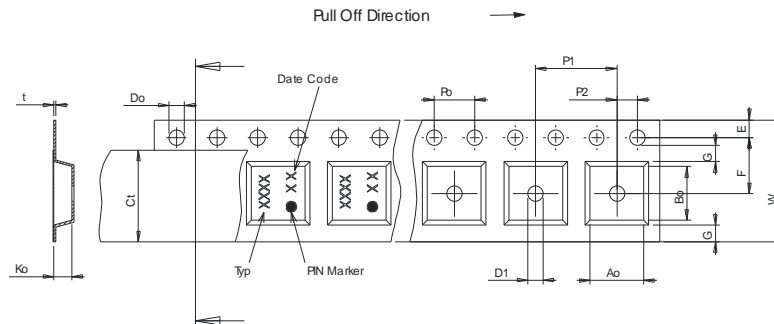
**Packing**

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;

max. pieces of filters per reel:	3000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

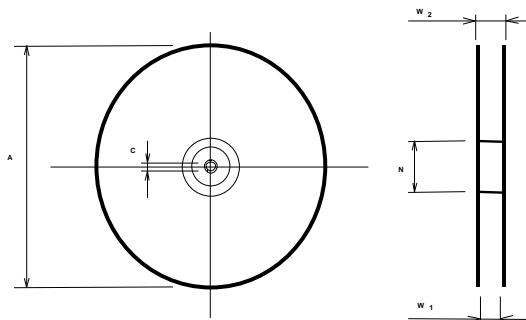
**Tape (all dimensions in mm)**

- W : 12,00
- Po : 4,00
- Do : 1,50
- E : 1,75
- F : 5,50
- G(min) : 0,75
- P2 : 2,00
- P1 : 8,00
- D1(min) : 1,50
- Ao : 5,30
- Bo : 5,30
- Ct : 9,5



**Reel (all dimensions in mm)**

- A : 330
- W1 : 12,4
- W2(max) : 18,4
- N(min) : 50
- C : 13,0



The minimum bending radius is 45 mm.

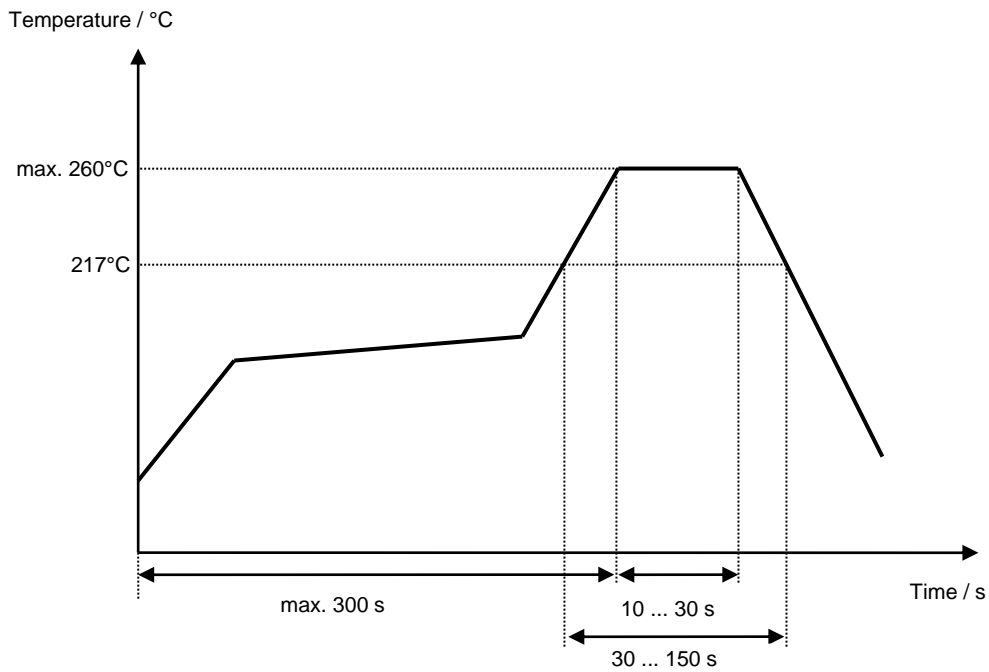
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**Air reflow temperature conditions**

<b>Conditions</b>	<b>Exposure</b>
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****TFS 869H****5/5****History**

<b>Version</b>	<b>Reason of changes</b>	<b>Name</b>	<b>Date</b>
1.0	- Generation of development specification	Strehl	30.05.2005
1.1	- Change absolute attenuation - Add typical value and filter characteristic - Generation of filter specification	Noack	27.06.2005
1.2	- Add Input power level	S. Channaa	06.05.2009

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