

Microchip**Filter specification****TFS 869L****1/5****cMeasurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	50 Ω	
Output:	50 Ω	
Source:	464 Ω	$\parallel$ -1.1 pF
Load:	379 Ω	$\parallel$ -1.2 pF

Characteristics**Remark:**

The reference level for the relative attenuation a_{rel} of the TFS869L is the maximum of the passband attenuation a_{max} . The maximum of the passband attenuation a_{max} is defined as the insertion loss a_e . The nominal frequency f_N is fixed at 869.2125 MHz without any tolerance. The values of the relative attenuation a_{rel} are guaranteed over the whole operating temperature range. The frequency shift of the filter within the operating temperature range is included in the production tolerance scheme.

D a t a		typ. value		tolerance / limit		
Insertion loss (reference level)	a_e	2.0	dB	max.	3.0	dB
Nominal frequency	f_N	-			869.2125	MHz
Passband	PB	-		$f_N \pm$	12.5	kHz
Passband variation		0.1	dB	max.	1.0	dB
Relative attenuation	a_{rel}					
1 MHz ... f_N - 2 MHz		18	dB	min.	15	dB
f_N + 2 MHz ... 900 MHz		20	dB	min.	15	dB
Input power level		-		max.	10**	dBm
Operating temperature range	OTR	-		- 10 °C ... + 55 °C		
Storage temperature range		-		- 40 °C ... + 85 °C		
Frequency inversion temperature		23	°C			
Temperature coefficient of frequency	TC_f ***	-0.03	ppm/K ²			

*) The terminating impedances depend on parasitics and q-values of matching elements and the board used, and are to be understood as reference values

only. Should there be additional questions do not hesitate to ask for an application note or contact our design team.

**) power durability requirement is 10 dBm for each 4 seconds per hour over lifetime

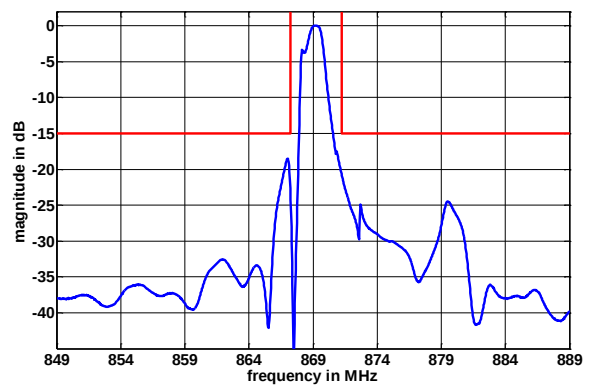
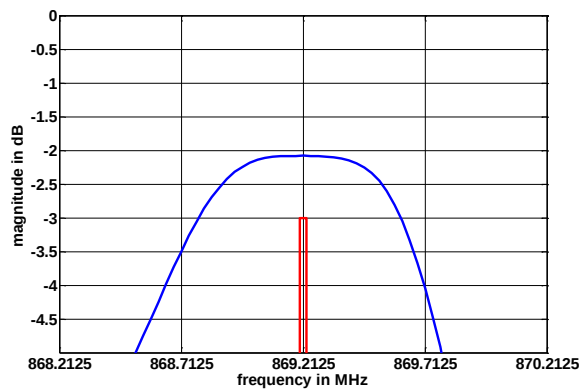
***) $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T - T_0)^2 \times f_{CAT}(\text{MHz})$

Generated:**Checked / Approved:**

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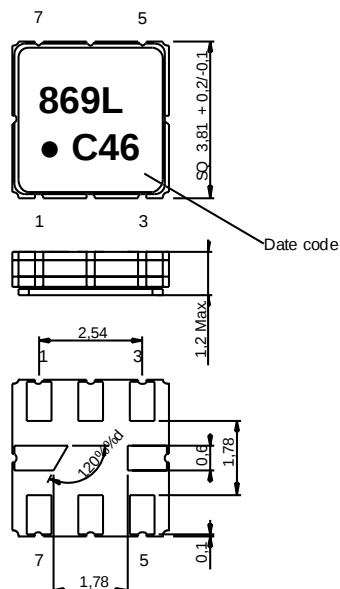
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Filter characteristic



Construction and pin connection

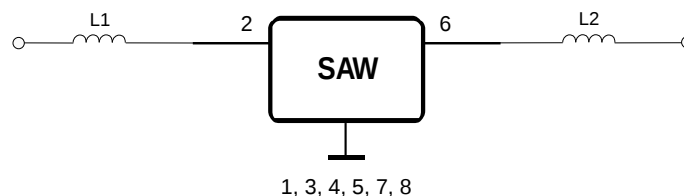
(All dimensions in mm)



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

Date code:	Year + week
B	2011
C	2012
D	2013
...	

50 Ohm 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 plane, 3 planes; 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, see page 4: "Air reflow temperature conditions"
5. ESD ANSI/ESD S20.20-1999, class 1A for HBM

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

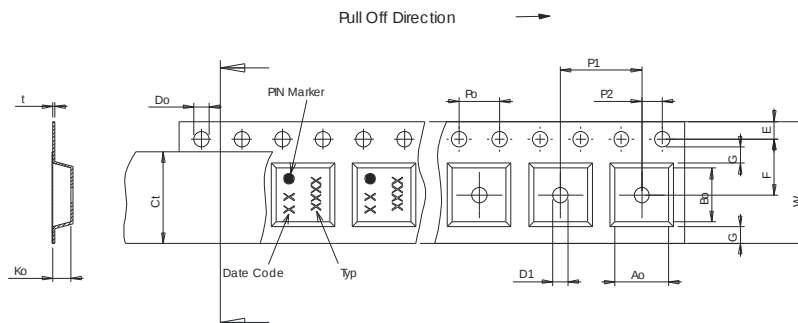
Packing

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;

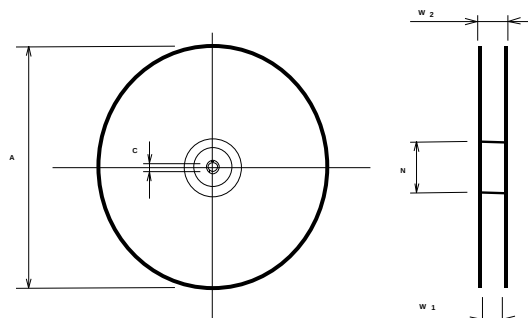
max. pieces of filters per reel:	3000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

Tape (all dimensions in mm)

W	: 12,00 ± 0,3
Po	: 4,00 ± 0,1
Do	: 1,50 +0,1/-0
E	: 1,75 ± 0,1
F	: 5,50 ± 0,05
G(min)	: 0,75
P2	: 2,00 ± 0,05
P1	: 8,00 ± 0,1
D1(min)	: 1,50
Ao	: 4,30 ± 0,1
Bo	: 4,30 ± 0,1
Ct	: 9,2 ± 0,1

**Reel (all dimensions in mm)**

A	: 330
W1	: 12,4 +2/-0
W2(max)	: 18,4
N(min)	: 50
C	: 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

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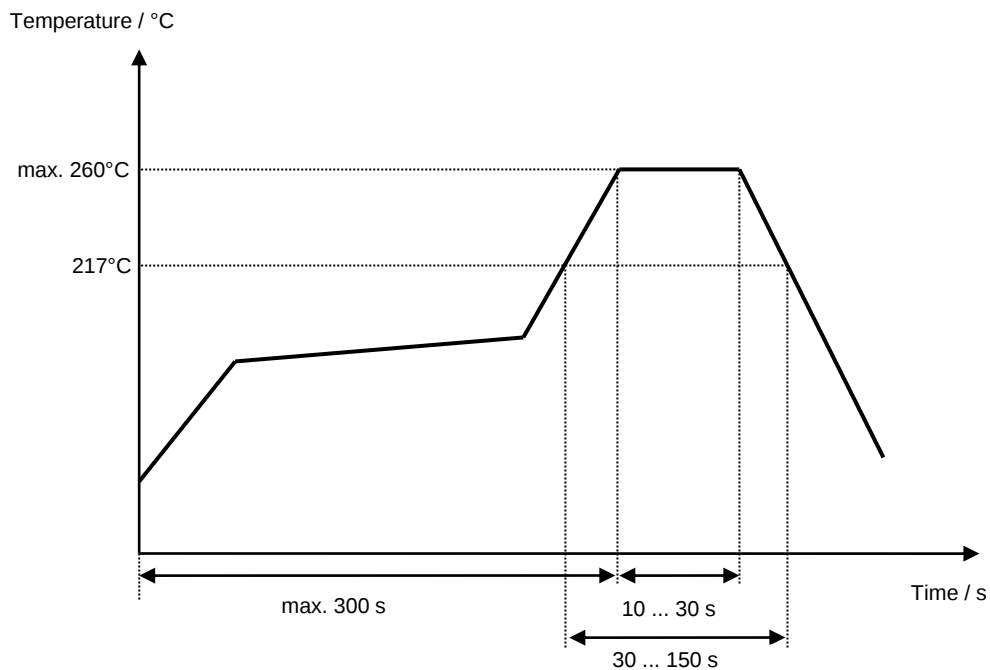
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Air reflow temperature conditions

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**Microchip Frequency Technology GmbH****Potsdamer Straße 18****D 14 513 TELTOW / Germany****Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30**

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Microchip**Filter specification****TFS 869L****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	Noack	29.08.2011
2.0	- Change from development spec to filter spec - Temperature coefficient updated - Typical values added - Filter characteristic added	Molke	16.11.2012

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