

VI TELEFILTER

Filter specification

TFS 420H

Measurement condition

Ambient temperature: 23 °C
 Input power level: 0 dBm
 Terminating impedance: *
 Input: 61 Ω || -9.0 pF
 Output: 81 Ω || -8.9 pF

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of the TFS420H 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 420 MHz without any tolerance. The given values for the relative attenuation a_{rel} 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 .

D a t a		typ. value	tolerance / limit
Insertion loss (reference level)	a_e	8,2 dB	max. 10 dB
Nominal frequency (at 70°C)	f_N		420 MHz
Centre frequency (at ambient temperature)	f_c	421,7 MHz	
Passband			$f_N \pm 15$ MHz
Pass band ripple		0,5 dB	max. 1 dB
Relative attenuation	a_{rel}		
$f_N - 410$ MHz ... $f_N - 25$ MHz		43 dB	min. 40 dB
$f_N + 25$ MHz ... $f_N + 180$ MHz		42 dB	min. 40 dB
$f_N + 180$ MHz ... $f_N + 580$ MHz		55 dB	min. 25 dB
Phase linearity (p-p) within PB			max. 12 deg
VSWR within $f_N \pm 12$ MHz		1,4:1	max. 1,5:1
within $f_N \pm 15$ MHz		1,6:1	max. 1,8:1
Operating temperature range	OTR		+ 65 °C ... + 75 °C
Storage temperature range			- 40 °C ... + 85 °C
Temperature coefficient of frequency	TC_f **	-87 ppm/K	-

*) 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.

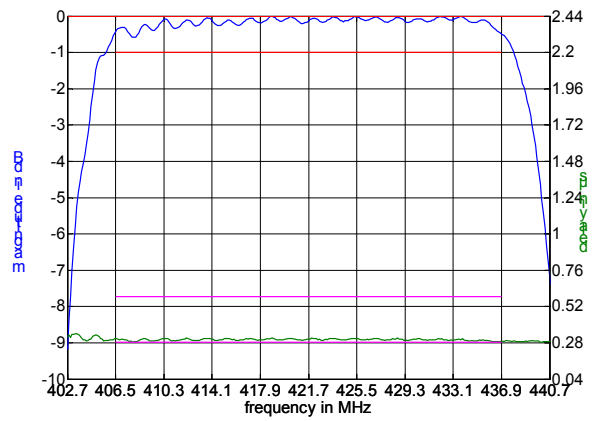
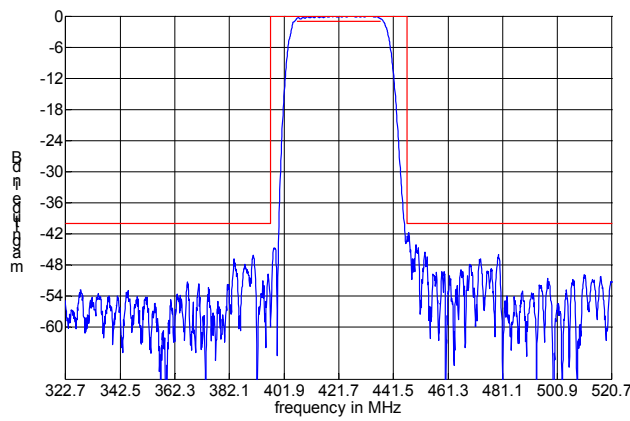
***) $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_A) \times f_{CAT}(\text{MHz})$

Generated:

Checked / Approved:

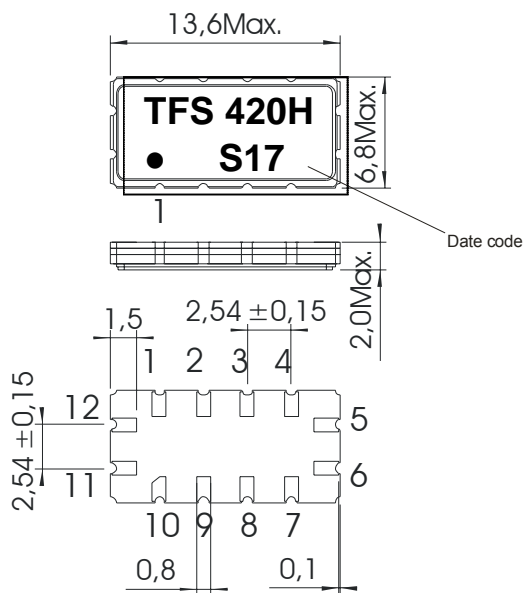
Tele Filter GmbH
Potsdamer Straße 18
D 14 513 TELTOW / Germany
Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30
E-Mail: tft@telefilter.com

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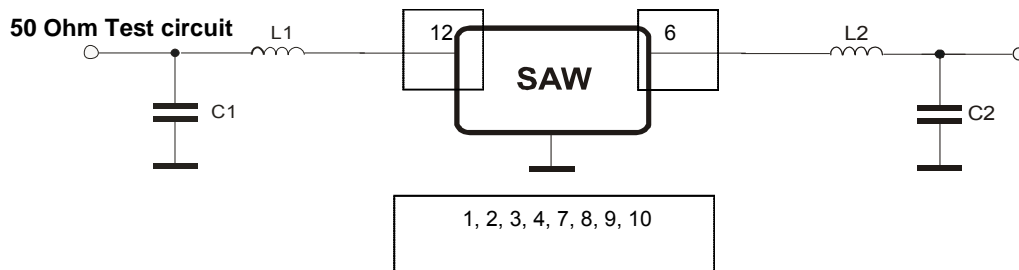
Construction and pin connection

(All dimensions in mm)



1	Ground
2	Ground
3	Ground
4	Ground
5	Output RF Return
6	Output
7	Ground
8	Ground
9	Ground
10	Ground
11	Input RF Return
12	Input

Date code:	Year + week
S	2004
T	2005
U	2006
...	



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Stability Characteristics

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

1. Shock: 500g, 18 ms, half sine wave, 3 shocks each plane;
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 500 Hz, 0,35 mm or 5g 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: twice max.;
for temperature conditions, please refer to the attached "Air reflow temperature conditions" on page 4;

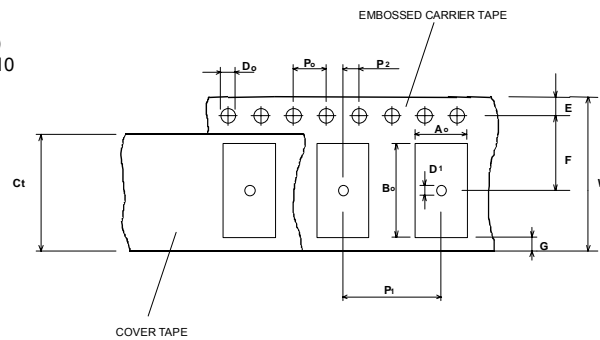
Packing

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 peer reel:	1700
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

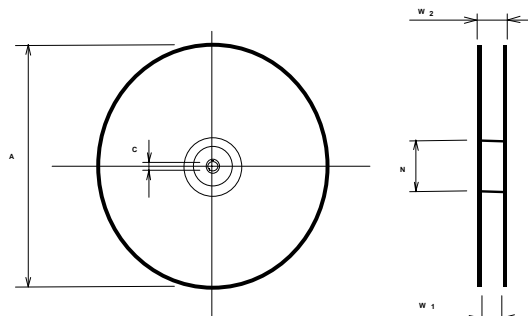
Tape (all dimensions in mm)

- W : 24,00 +0,30/-0,10
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,10
- F : 11,50 ± 0,10
- G(min) : 0,60
- P2 : 2,00 ± 0,1
- P1 : 12,00 ± 0,1
- D1(min) : 1,50
- Ao : 7,10 ± 0,10
- Bo : 13,90 ± 0,10
- Ct : 21,5 ± 0,1



Reel (all dimensions in mm)

- A : 330
- W1 : 24,4 +2/-0
- W2(max) : 30,4
- N(min) : 60
- C : 13,0 +0,5/-0,2



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. Marking of the filters can be read if the upper side of the carrier tape is regarded with the sprocket holes on the right.

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Air reflow temperature conditions

1st and 2nd air reflow profile

Name:	pre-heating periods	main-heating periods	peak temperature
Temperature:	150 °C - 170 °C	over 200 °C	255 °C ± 5 °C
Time:	60 sec. - 90 sec.	20 sec. - 25 sec.	

Chip-mount air reflow profile

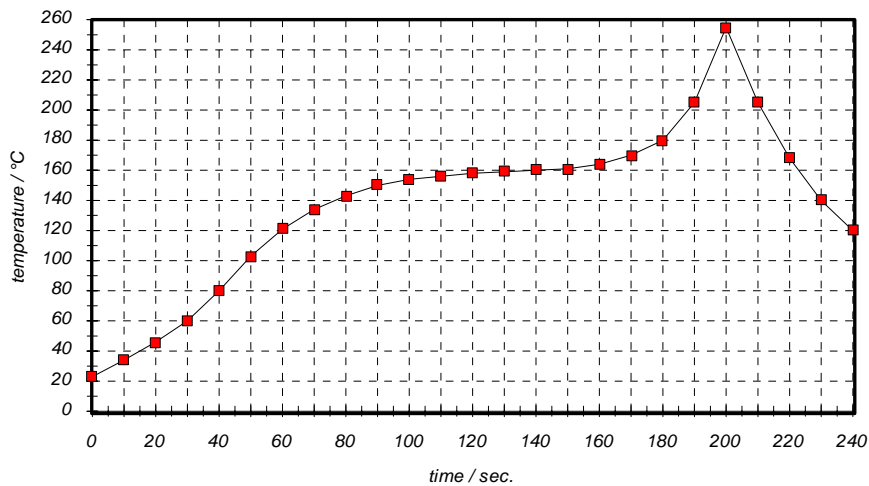


Table for temperature vs. time during the air reflow process

Tolerance of temperatures: ± 5 °C

time / sec.	temperature / °C	time / sec.	temperature / °C
0	23	140	160
10	34	150	161
20	46	160	164
30	60	170	170
40	80	180	180
50	103	190	205
60	121	195	230
70	134	200	255
80	143	205	230
90	150	210	205
100	154	215	180
110	156	220	165
120	158	230	140
130	159	240	120

History

Version	Reason of Changes	Name	Date
1.0	generate of development specification	Roizengaft	18.11.2003
1.1	changed remark changed insertion loss changed temperature for nominal frequency changed centre frequency changed to relative attenuation changed explanation for temperature coefficient changed date code	Chilla	10.03.2004
1.2	changed insertion loss	Chilla	25.03.2004
1.3	created filter specification added typical values added filter characteristic changed mark changed VSWR	Chilla	26.04.2004