

VI TELEFILTER**Filter specification****TFS 420 A1 - 1/4****1. Measurement condition**

Ambient temperature T_A : 23 °C
 Input power level: 0 dBm
 Typical terminating impedances in f_N :
 for input: 210 Ω | -5,38 pF.
 for output: 174 Ω | -3,99 pF.

2. Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the **TFS 420A1** 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 nominal frequency f_N is fixed at **420,0 MHz** without tolerance or limit. The reference 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 temperature coefficient of frequency T_{cf} is valid both for the reference frequency f_c and the frequency response of the filter in the operating temperature range.

Data	typ. value	tolerance / limit
Insertion loss (Reference level) a_e	21,5 dB	max 24 dB
Nominal frequency f_N	-	420,0 MHz
Centre frequency f_c at ambient temperature (f_{CAT})	420,03 MHz	-
Pass band (-1dB)		$f_N - 4,1 \text{ MHz} \dots f_N + 4,1 \text{ MHz}$
Amplitude ripple (p-p): $f_N \dots f_N \pm 4,1 \text{ MHz}$	0,4 dB	max 1,0 dB
Bandwidth at ambient temperature:		
1 dB - band width	9,14 MHz	
3 dB - band width	10,50 MHz	
20 dB - band width	14,23 MHz	
40 dB - band width	15,91 MHz	
Relative attenuation a_{rel}		
f_N	$f_N \pm 4,1 \text{ MHz}$	- max. 1 dB
$f_N \pm 4,1 \text{ MHz}$	$f_N \pm 5,0 \text{ MHz}$	- max. 3 dB
$f_N \pm 5,5 \text{ MHz}$	$f_N \pm 10 \text{ MHz}$	- min. 3 dB
$f_N \pm 10 \text{ MHz}$	$f_N \pm 100 \text{ MHz}$	45...60 dB min. 40 dB
$f_N - 430 \text{ MHz}$	$f_N - 100 \text{ MHz}$	70...80 dB
$f_N + 100 \text{ MHz}$	$f_N + 300 \text{ MHz}$	60...70 dB
Average group delay in pass band:	0,630 μ s	
Group delay ripple in pass band (p-p):	40 ns	max 60 ns
Triple transit attenuation compared to main signal:	45...49 dB	
Crosstalk	50...54 dB	
Frequency inversion temperature (T_o)	30 °C	
Temperature coefficient of frequency (T_{cf})	- 0,050 ppm/K ²	
Frequency deviation of f_c over temperature T : *)	$\Delta f_c(\text{Hz}) = T_{cf}(\text{ppm/K}) \times (T - T_o)^2 \times f_{T0}(\text{MHz})$	
Operating temperature range	-20 °C ... + 75 °C	
Storage temperature range	- 40 °C ... + 85 °C	
Input power level	-	max. + 10 dBm

*) f_{T0} is reference frequency f_c at frequency inversion temperature (T_o)

Generated: Wadim P. Dunzow

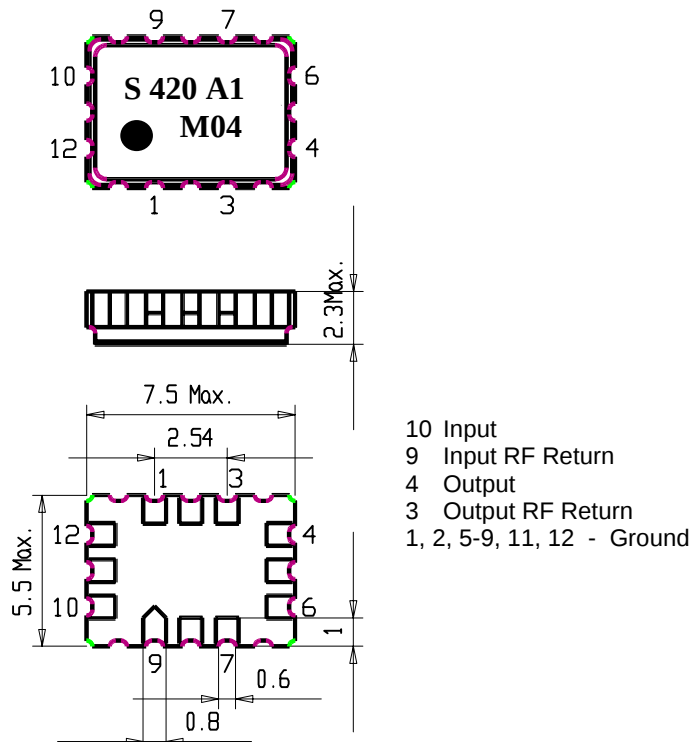
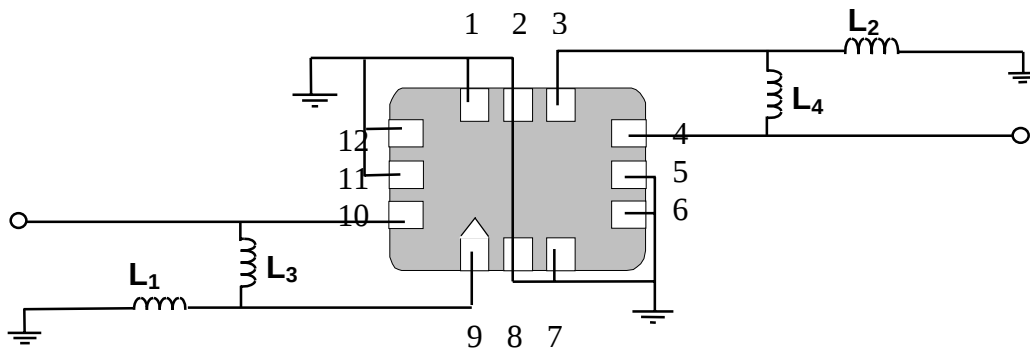
Checked/Approved: Dr. Bert Wall

VI TELEFILTER
 Potsdamer Straße 18
 D 14 513 TELTOW / Germany
 Tel: (+49) 3328 4784-52 / Fax: (+49) 3328 4784-30
 E-Mail: tft@telefilter.com

Vectron International, Inc.
 267 Lowell Road
 Hudson, NH 03051 / USA
 Tel: (603) 598-0070 Fax: (603) 598-0075
 E-Mail: vti@vtinh.com

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3. Package

4. 50 Ω matching network:

Stability characteristics

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

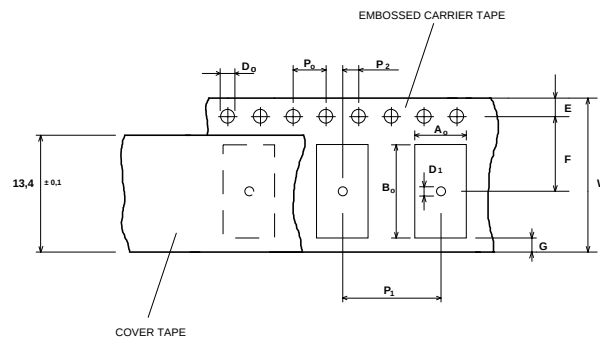
1. Shock: 30g, 18 ms, half sine wave, 3 shocks each plane;
IEC 68 - 2 - 27
2. Vibration: 10 Hz to 150 Hz, 0.35 mm amplitude, 5g; 2 hours for 3 planes;
IEC 68 - 2 - 6
3. Damp heat: 90 % to 95 % rel. humidity, 40 °C, 10 days;
IEC 68 - 2 - 3
4. Resistance to solder heat (Reflow): 260 °C for 10 sec;

Packing

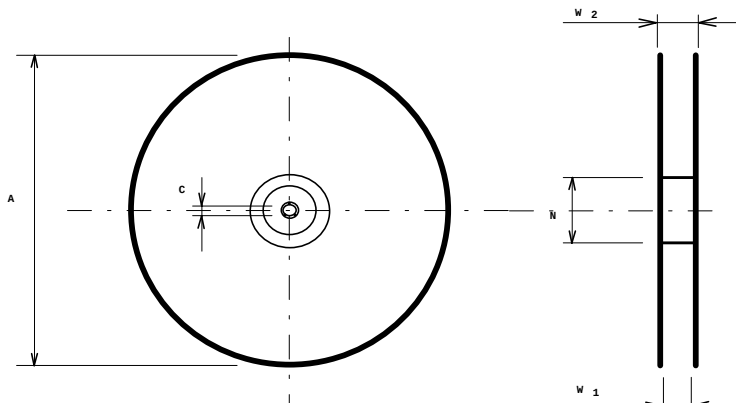
Tape & Reel: IEC 286 - 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;
max. pieces of filters per reel: 3000

Tape (all dimensions in mm)

W	: 16 ± 0,3
Po	: 4 ± 0,1
Do	: 1,5 ± 0,5
D1	: 1,5 ± 0,5
E	: 1,75 ± 0,1
F	: 7,5 ± 0,1
G (min)	: 0,75
P2	: 2 ± 0,05
P1	: 8 ± 0,1
D1(min)	: 1,5
Ao	: 5,4 ± 0,1
Bo	: 7,4 ± 0,1

**Reel (all dimensions in mm):**

A	:	330
W1	:	16,4 +2
W2 (max)	:	22,4
N (min)	:	>= 90
C	:	13 ± 0,25



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. The marking of the filters is able to read if the view is directed on the upper side of the carrier tape with the sprocket holes on the right side of the tape.

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.	

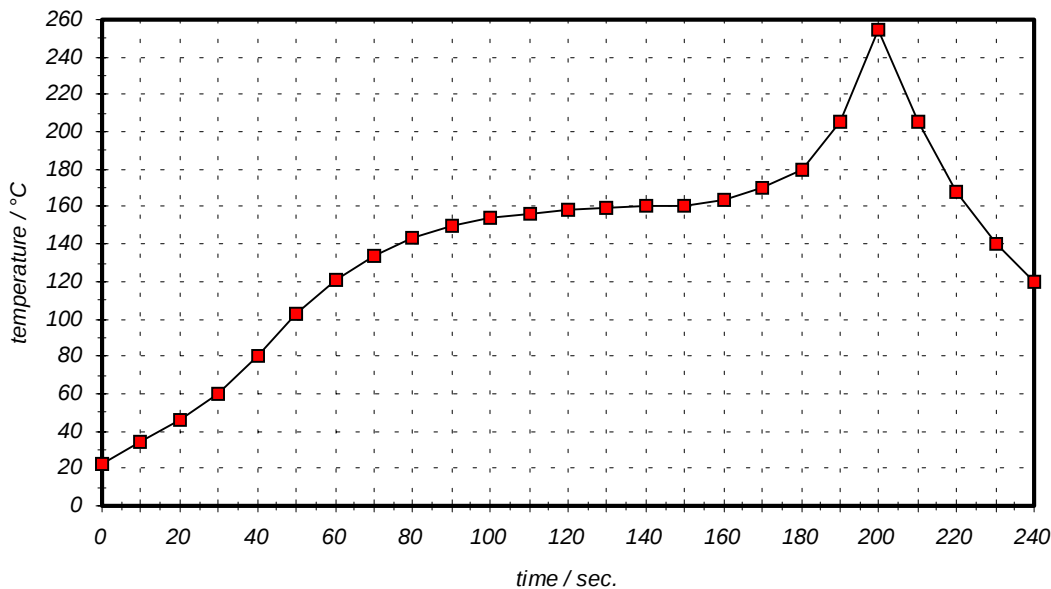
Chip-mount air reflow profile

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	156	215	180
110	158	220	165
120	159	230	140
130		240	120