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 420A** 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 frequence f_N is fixed at **420,0 MHz** without tolerance or limit. The reference frequence 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 Tc_f 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 MHz ... f_N + 4,1 MHz	
Amplitude ripple (p-p): f_N ... f_N ± 4,1 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 ± 4,1 MHz		-	max. 1	dB
f_N ± 4,1 MHz / f_N ± 5,0 MHz		-	max. 3	dB
f_N ± 5,5 MHz / f_N ± 10 MHz		-	min. 3	dB
f_N ± 10 MHz / f_N ± 100 MHz	45...60	dB	min. 40	dB
f_N - 430 MHz / f_N - 100 MHz	70...80	dB		
f_N + 100 MHz / f_N + 300 MHz	60...70	dB		
Average group delay in pass band**:**	0,630	µs		
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 (Tc_f)	- 0,050	ppm/K²		
Frequency deviation of f_C over temperature T : *)	$\Delta f_C(Hz) = Tc_f(ppm/K) \times (T - T_o)^2 \times f_{To}(MHz)$			
Operating temperature range	-20 °C ... + 75 °C			
Storage temperature range	- 40 °C ... + 85 °C			
Input power level	-		max. + 10	dBm

***)** f_{To} is reference frequence f_C at frequency inversion temperature (T_o)

Generated: **Wadim P. Dunzow**

Checked/Approved: **Dr. Bert Wall**

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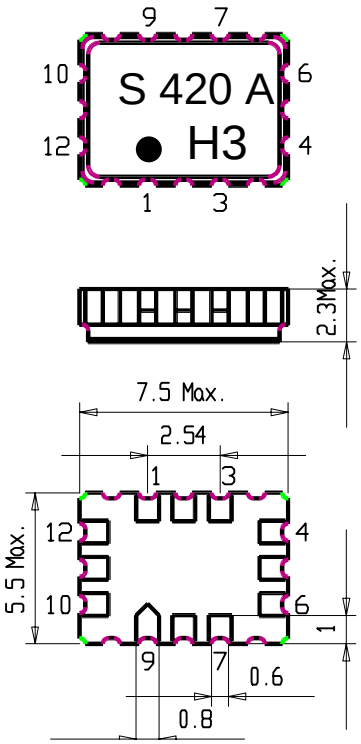
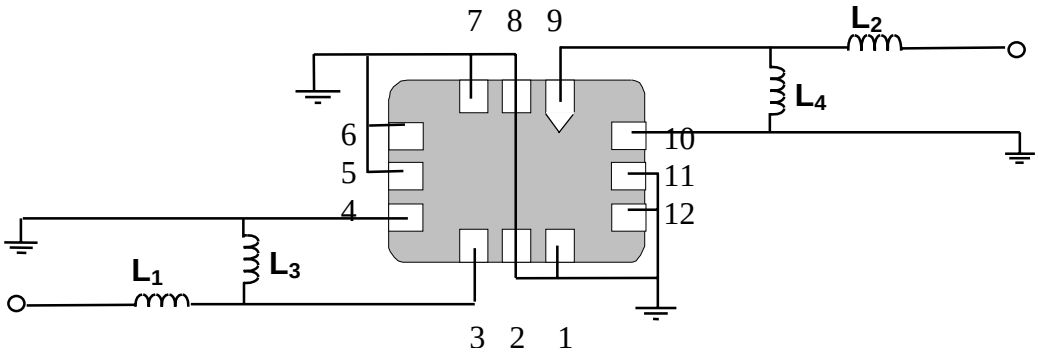
3. Package



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

4. 50 Ω matching network:



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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;

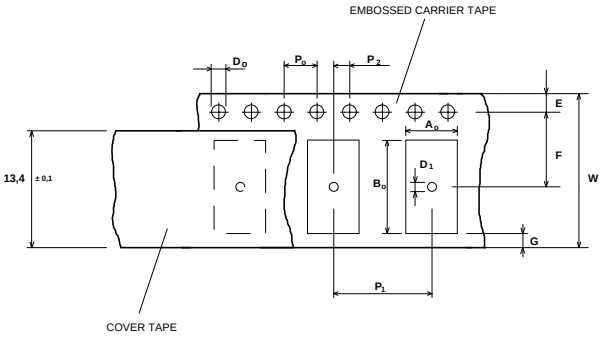
Packing

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

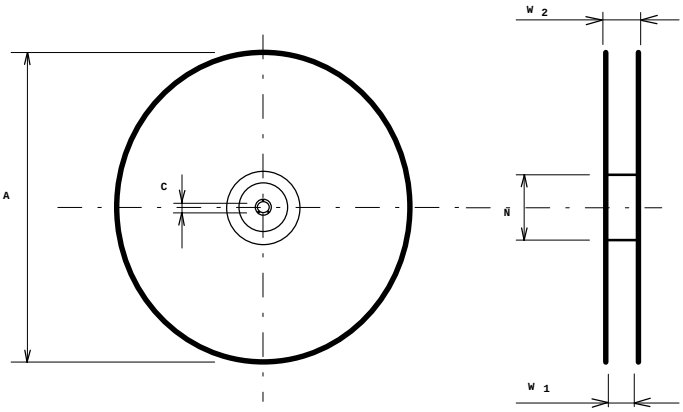
Tape (all dimensions in mm)

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.

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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

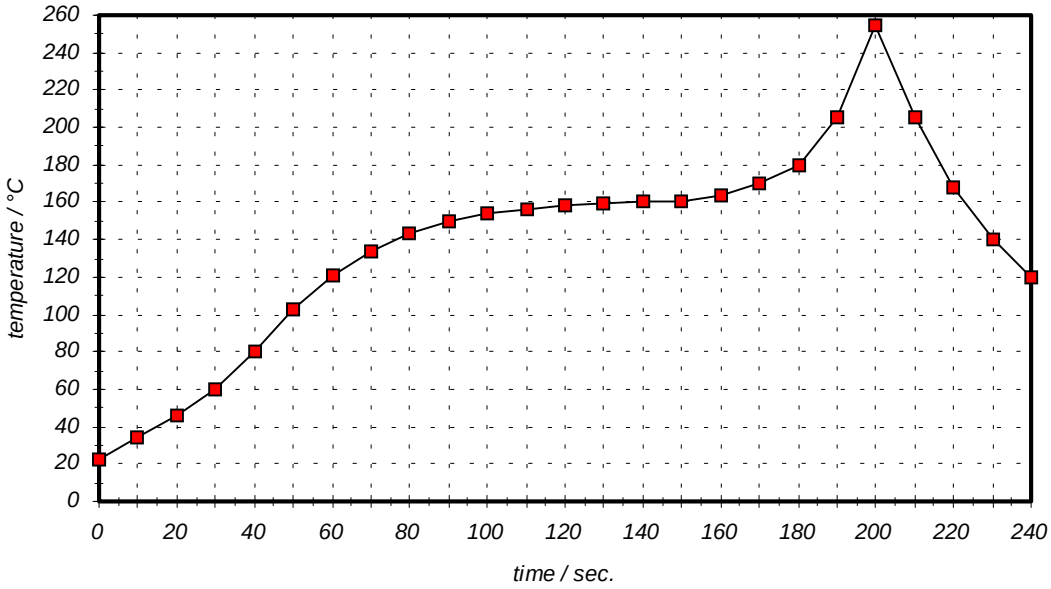

Table for temperature vs. time during the air reflow process

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

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