VI TELEFILTER — Filter Specification — TFS 70L30 — 1/4

1. Measurement condition **Package, pin connection and 50 Ω matching network** (see page 2.)

Ambient temperature T_A: 25 °C
Input power level: 0 dBm (typ.) Max 10 dBm.
Terminating impedances in f_C: for input: 215 Ω | -6,05 pF. [50 Ω + j (55±5) Ω]
for output: 1190 Ω | -3,37 pF. [50 Ω + j (55±5) Ω]

2. Characteristics

Remark:
Reference level for the relative attenuation a_{rel} of the **TFS 300A** 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 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 nominal frequency f_N is fixed on **300 MHz** without tolerance. The given values for the relative attenuation a_{rel} and for the group delay ripple have to be reached at the frequencies given below also if the centre frequency f_o 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.

Data		typ. value		tolerance / limit	
Insertion loss (Reference level)	a_e	16,3	dB	max 20	dB
Nominal frequency	f_N at ambient temperature (f_{NTA})	-	MHz	300	MHz
Centre frequency	f_C at ambient temperature (f_{CTA})	300	MHz		MHz
1 dB - band width		4,55	MHz		
3 dB - band width		5,25	MHz		
20 dB - band width		6,96	MHz		
40 dB - band width		9,30	MHz		
Amplitude ripple (p-p):	f_N ... f_N ± 2,05 MHz	0,8	dB	max 1,0	dB
Relative attenuation	a_{rel}				
f_N	f_N ± 2,05 MHz		-	max 1	dB
f_N ± 2,05 MHz	f_N ± 2,5 MHz		-	max 3	dB
f_N ± 2,75 MHz	f_N ± 5,0 MHz		-	min 3	dB
f_N ± 5,0 MHz	f_N ± 7,0 MHz	43...45	dB	min 40	dB
f_N ± 7 MHz	f_N ± 100 MHz	55...70	dB	min 50	dB
f_N - 290 MHz	f_N - 100 MHz	90	dB	-	dB
f_N + 100 MHz	f_N + 700 MHz	90	dB	-	dB
Group delay		1,1	µs	-	µs
Group delay ripple (p-p)	f_N ... f_N ± 2,2 MHz	± 35	ns	± max 50	ns
Deviation from linear phase (p-p)	f_N ... f_N ± 1,8 (2,5) MHz	2° (2,6°)			
Triple transit attenuation compared to main signal		39	dB		
Input/Output return loss with matching network (S11/S22):		T.B.M.	dB		
Crosstalk		60...65	dB		
Substrate material		Quartz			
Frequency inversion temperature (T_o)		-20°			
Temperature coefficient of frequency (Tc_f)		-0,0297	ppm/K²	-0,036	ppm/K²
Frequency deviation of f_O over temperature: *)		Δf_O(Hz) = Tc_f(ppm/K) x (T - T_o)² x f_O (MHz)			
Operating temperature range		- 20 °C ... + 70 °C			
Storage temperature range		- 40 °C ... + 85 °C			

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

5. Responsible:

Generated: **Dunzow W.**

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

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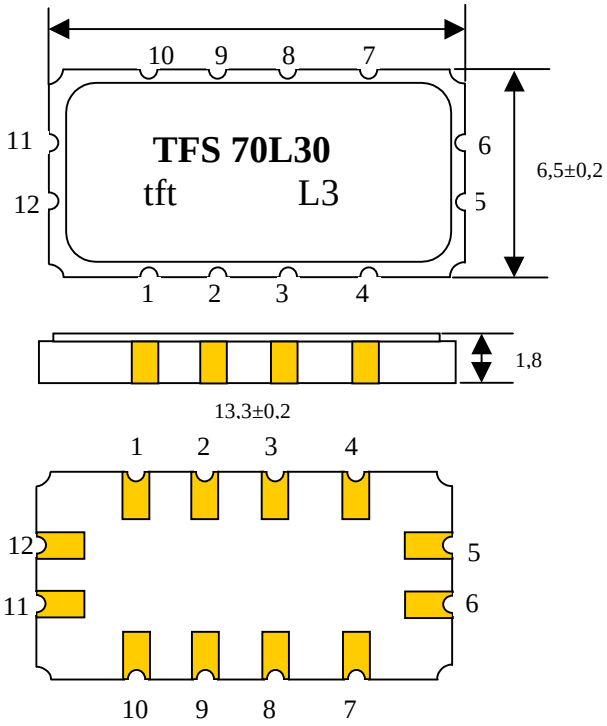
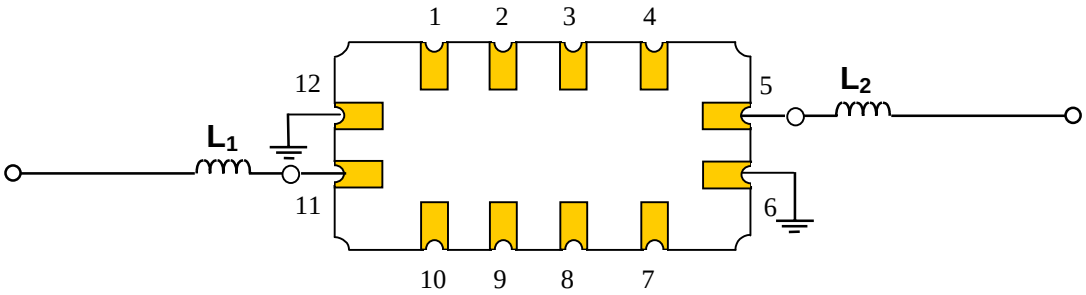
3. Package, pin grid 2,54 mm



Pin **11** - Input.
Pin 12 - Input RF Return.
Pin **5** - Output.
Pin 6 - Output RF Return.
Pin 1-2-3-4-7-8-9-10 PackageGround.

4. 50 Ω matching network:



L_1 = 120±20 nH.
L_2 = 120±20 nH.

These values will be influenced by your board design.

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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; DIN IEC 68 T2 - 27
2. Vibration:	10 Hz to 150 Hz, 0.35 mm amplitude, 5g; 2 hours for 3 planes; DIN IEC 68 T2 - 6
3. Damp heat: (steady state)	90 % to 95 % rel. humidity, 40 °C, 10 days; DIN IEC 68 - 2 - 3
4. Resistance to solder heat (reflow):	max. 2 times reflow process; for temperature conditions refer to the attached "Air reflow temperature conditions" on sheet 4;

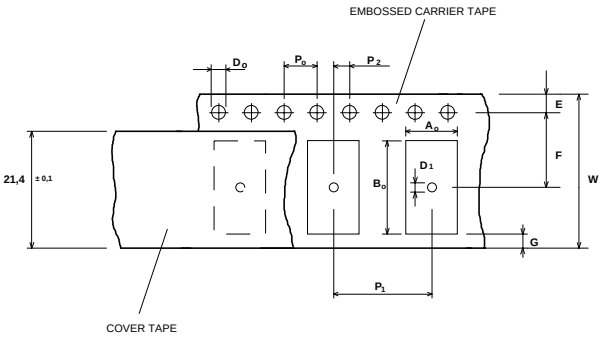
Packing

Tape & Reel: DIN 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: 1700

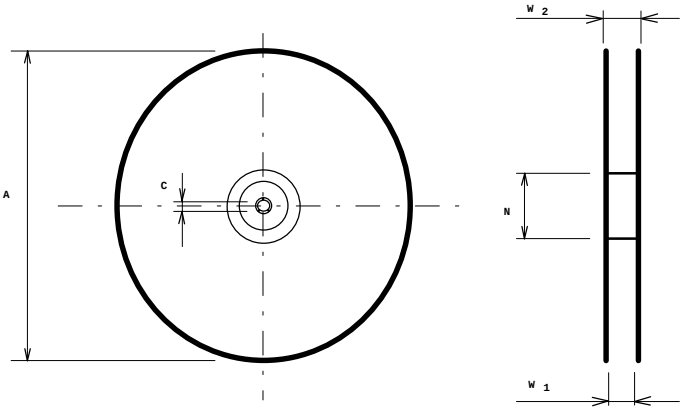
Tape (all dimensions in mm)

W	:	24	± 0,3
Po	:	4	± 0,1
Do	:	1,5	+ 0,5
D1	:	1,5	+ 0,5
E	:	1,75	± 0,1
F	:	11,5	± 0,1
G (min)	:	0,75	
P2	:	2	± 0,1
P1	:	12	± 0,1
D1(min)	:	1,5	
Ao	:	7,1	± 0,2
Bo	:	13,9	± 0,2



Reel (all dimensions in mm):

A	:	330	
W1	:	24,4	+2
W2 (max)	:	30,4	
N (min)	:	>= 90	
C	:	13	± 0,25



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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

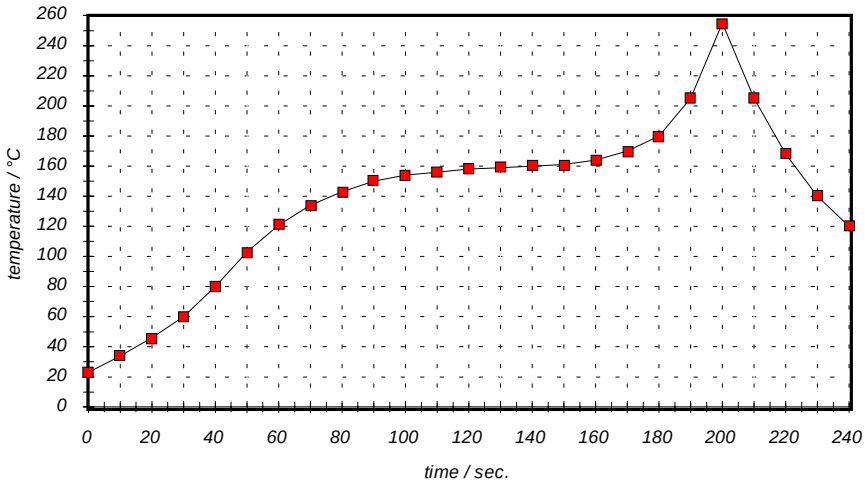

Table for temperature vs. time during the air reflow process

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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