

VI TELEFILTER**Filter Specification****TFS 221A****1/5****Measurement condition**

Ambient temperature T_A : 23 °C
 Input power level: 0 dBm
 Terminating impedances at f_C^* :
 input: 327 Ω // -13,1 pF
 output: 361 Ω // -11,2 pF

Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the TFS 221A is the insertion loss. 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 1 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	8,3 dB	max 9,0 dB
Centre frequency f_C	-	221,000 MHz $\pm$ 1,0 MHz
Relative attenuation a_{rel}		
f_C $f_C \pm 1,0$ MHz	-	max 1 dB
@ $f_C - 9,75$ MHz	55 dB	min 50 dB
@ $f_C - 5,00$ MHz	55 dB	min 50 dB
$f_C + 89$ MHz $f_C + 100$ MHz	-	min 50 dB
$f_C + 249$ MHz $f_C + 255$ MHz	-	min 50 dB
Temperature coefficient of frequency (T_{Cf})		-18 ppm/K
Frequency deviation of f_C over temperature T:	$\Delta f_C(\text{Hz}) = T_{Cf}(\text{ppm/K}) \times (T - T_A) \times f_{CAT}(\text{MHz})$	
Operating temperature range	- 30 °C ... + 80 °C	
Storage temperature range	- 40 °C.... + 85 °C	

*) 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.

generated:

checked / approved:

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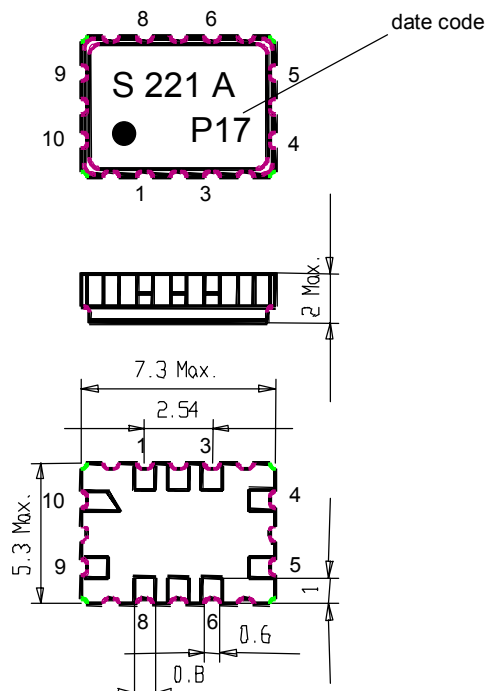
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Construction, pin configuration and 50 Ω - matching network

(All dimensions in mm)

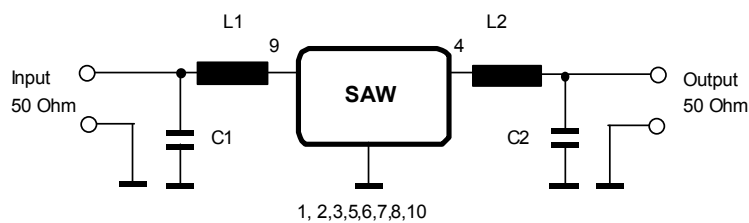


- | | |
|----|------------------|
| 1 | ground |
| 2 | ground |
| 3 | ground |
| 4 | input |
| 5 | input rf return |
| 6 | ground |
| 7 | ground |
| 8 | ground |
| 9 | output |
| 10 | output rf return |

date code: year + week

M	2000
N	2001
P	2002

.....

50 Ω test circuit

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;

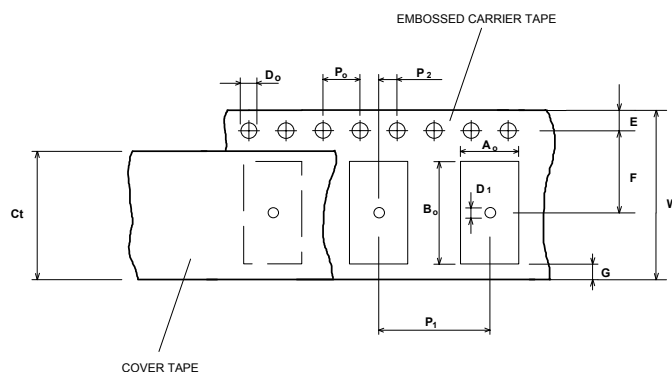
Packing

Tape & Reel: 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;

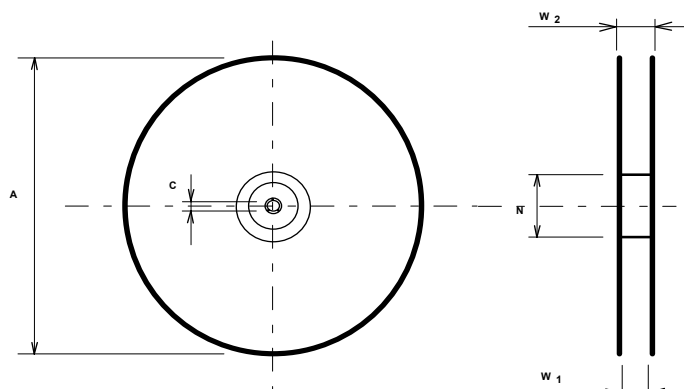
max. pieces of filters per reel:	3000
reel of empty components at start:	min 300 mm
reel of empty components at start including leader:	min 500 mm
trailer	min 300 mm

Tape (all dimensions in mm)

W : 16 ± 0,3
 Po : 4 ± 0,1
 Do : 1,5 + 0,1
 E : 1,75 ± 0,1
 F : 7,5 ± 0,1
 G (min) : 0,6
 P2 : 2 ± 0,1
 P1 : 8 ± 0,1
 D1(min) : 1,5
 Ao : 5,5 ± 0,1
 Bo : 7,5 ± 0,1
 Ct : 13,5+/-0,1

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

A : 330
 W1 : 16,4 +2
 W2 (max) : 22,4
 N (min) : 50
 C : 13 + 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. Markings on the filters can be read if the upper side of the carrier tape is regarded with the sprocket holes on its right.

Air reflow temperature conditions

1st and 2nd air reflow profile

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

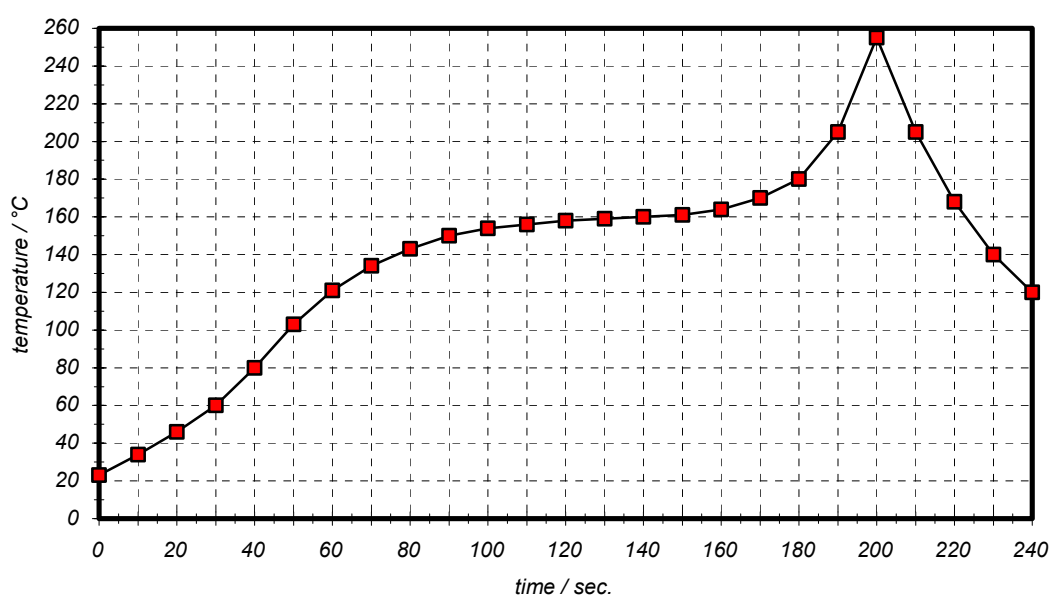
Air reflow profile

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

VI TELEFILTER**Filter Specification****TFS 221A****5/5****History**

Version	Reason of Changes	Name	Date
1.0	generation of specification	Du Hamél	19.02.2001
1.1	correct pinning information	Du Hamél	19.03.2001
1.2	change of insertion loss, centre frequency, relative attenuation	Pfeiffer	04.12.2001
1.3	- terminated impedances added - typical values added	Pfeiffer	27.03.2002
1.4	- terminating impedances changed	Pfeiffer	22.04.2002