

VI TELEFILTER**Filter Specification****TFS 174 C****1/5****Measurement condition**

Ambient temperature T_A : 25 °C $\pm$ 2°C
 Input power level: 0 dBm
 Terminating impedances at f_C : *
 input: 840 Ω || -9,2 pF
 output: 940 Ω || -8,0 pF

Characteristics

Remark: Reference level for the relative attenuation a_{rel} of the TFS 174C 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 174,2 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 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 .

Data	typ. value	tolerance / limit	
Insertion loss (reference level) a_e	5,2 dB	max.	7,0 dB
Nominal frequency f_N	-	174,2	MHz
Centre frequency f_C	174,2 MHz	-	
Relative attenuation a_{rel}			
f_N $f_N \pm 0,067$ MHz	0,07 dB	max.	0,25 dB
$f_N \pm 0,067$ MHz $f_N \pm 0,125$ MHz	0,10 dB	max.	1,00 dB
$f_N \pm 0,125$ MHz $f_N \pm 0,200$ MHz	0,15 dB	max.	1,20 dB
$f_N \pm 0,2$ MHz $f_N \pm 0,330$ MHz	1,2 dB	max.	3 dB
$f_N \pm 0,469$ MHz $f_N \pm 0,600$ MHz	6,5 dB	min.	4 dB
$f_N \pm 0,600$ MHz $f_N \pm 0,860$ MHz	22 dB	min.	11 dB
$f_N \pm 0,860$ MHz $f_N \pm 1,200$ MHz	40 dB	min.	20 dB
$f_N \pm 1,200$ MHz $f_N \pm 6,000$ MHz	44 dB	min.	40 dB
$f_N - 154,200$ MHz $f_N - 6,000$ MHz	80 dB	min.	50 dB
$f_N + 6,000$ MHz $f_N + 225,800$ MHz	80 dB	min.	50 dB
Absolute group delay in PB	2,2 μ s	max.	2,6 μ s
Group delay variation in PB	80 ns	max.	260 ns
Input power level	-	max.	20 dBm (***)
Return loss in PB	20 dB	min.	10 dB
Temperature coefficient of frequency TC_f **	- 0,04 ppm/K ²	-	
Operating temperature range	-	- 5 °C ...	+ 85 °C
Storage temperature range	-	- 40 °C ...	+ 85 °C
Frequency inversion temperature T_0	32 °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.

***) This power level is allowed for short term operation only. The max. input power for continuous operation is max. 15 dBm only.

generated:

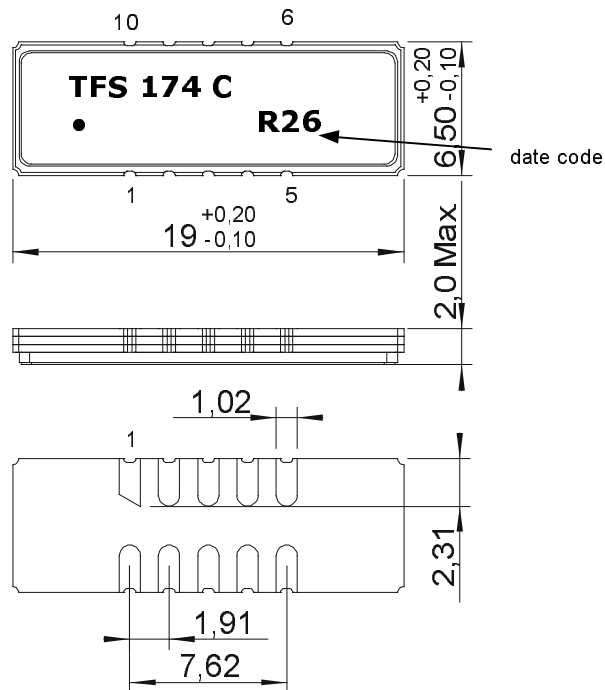
checked / approved:

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VI TELEFILTER**Filter Specification****TFS 174 C****2/5****Construction and pin connection**

(all dimensions in mm)

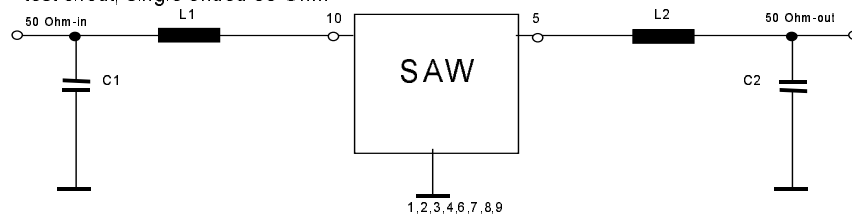


1	Input
2	Ground
3	Ground
4	Ground
5	Output
6	Output
7	Ground
8	Ground
9	Ground
10	Input

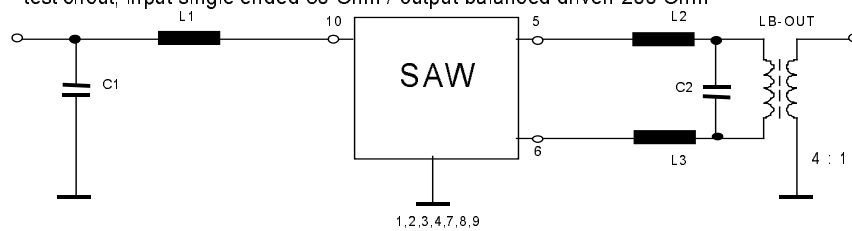
Date code:	year + week
N	2001
P	2002
R	2003
...	

matching circuit

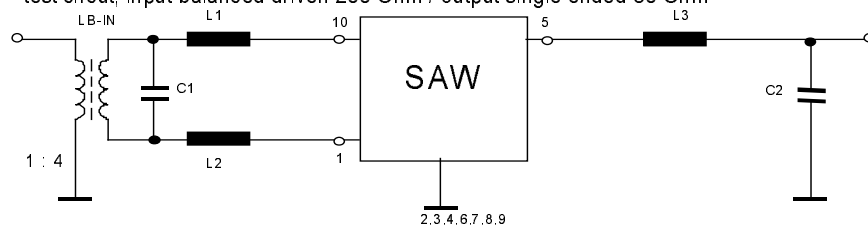
- test circuit, single ended 50 Ohm



- test circuit, input single ended 50 Ohm / output balanced driven 200 Ohm



- test circuit, input balanced driven 200 Ohm / output single ended 50 Ohm

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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;

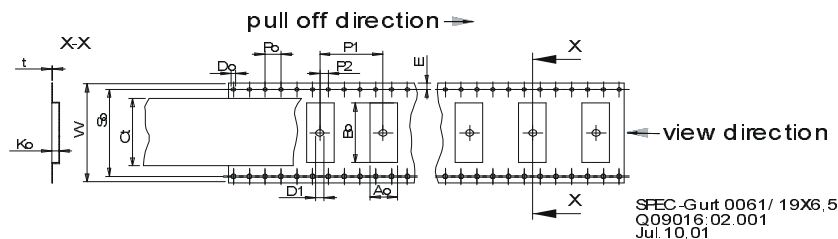
Packing

Tape & Reel: 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;

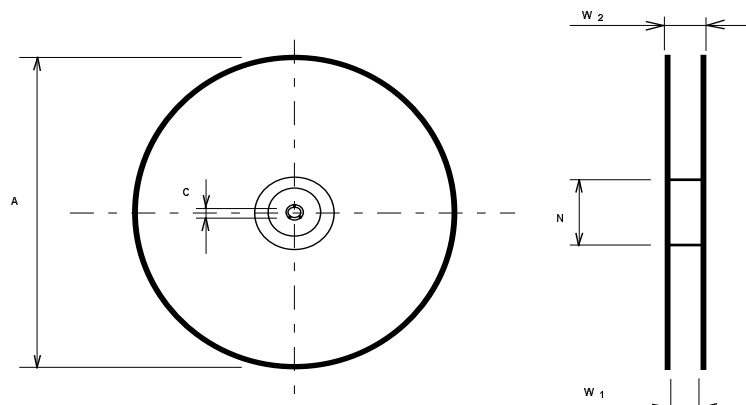
max. pieces of filters per reel:	2000
reel of empty components at start:	min 300 mm
reel of empty components at start including leader:	min 500 mm
trailer	min 300 mm

Tape (all dimensions in mm)

W	: 32 ± 0,3
Po	: 4 ± 0,1
Do	: 1,5 ± 0,5
E	: 1,75 ± 0,1
S0	: 28,4 ± 0,1
P2	: 2 ± 0,1
P1	: 12 ± 0,1
D1 (min)	: 1,5
Ao	: 7,1 ± 0,1
Bo	: 19,6 ± 0,1
Ko	: 2,0 ± 0,1
t	: 0,35 ± 0,05
Ct	: 25,5 ± 0,1

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

A	: 330
W1	: 32,4 +2
W2 (max)	: 38,4
N (min)	: 100
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. The marking of the filters is able to read if the view is directed on the upper side of the carrier tape in the above shown direction.

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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.	

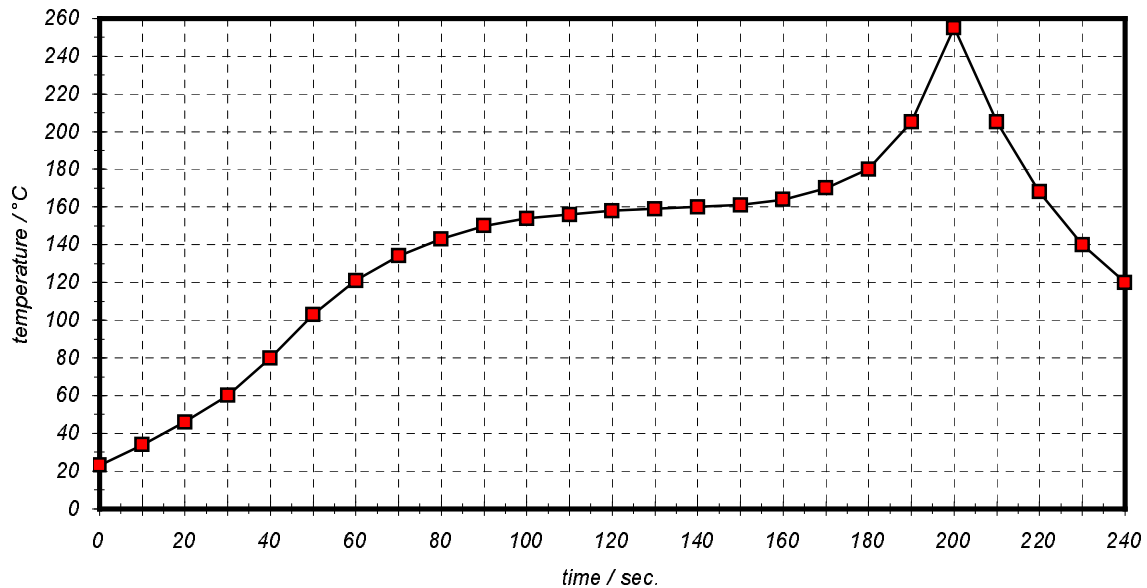
Air reflow profile

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 174 C****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- generate development specification	Pfeiffer	12.05.2003
1.1	- typical values and terminating impedances added - additional matching configurations attached	Pfeiffer	27.06.2003

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