VI TELEFILTER **Filter Specification** **TFS 346 A** **1/5**

Measurement condition

Ambient temperature T_A: 23 °C
Input power level: 0 dBm
Terminating impedances at f_C *): input: 472 Ω// -6,6 pF
output: 210 Ω// -4,9 pF

Characteristics

Remark: Reference level for the relative attenuation a_{rel} of the **TFS 346A** 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 temperature coefficient of frequency Tc_f is valid for both 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	9,5 dB	max. 14,5 dB
Nominal frequency	f_N	-	346 MHz
Centre frequency at ambient temperature	f_c	346 MHz	-
Pass band	PB	-	f_N ± 0,5 MHz
Amplitude ripple within f_N ± 0,45 MHz		0,4 dB	max. 0,8 dB
In band ripple (in any 112,5 kHz increment within the PB)		0,1 dB	max. 0,5 dB p-p
Relative attenuation	a_{rel}		
f_N ..... f_N ± 0,45	MHz	0,4 dB	max. 0,8 dB
f_N ± 0,45 MHz ..... f_N ± 0,50	MHz	0,6 dB	max. 1,2 dB
f_N ± 1,2 MHz ..... f_N ± 1,5	MHz	42 dB	min. 39 dB
f_N ± 1,5 MHz ..... f_N ± 3	MHz	45 dB	min. 40 dB
DC ..... f_N - 3	MHz	55 dB	min. 50 dB
f_N + 3 MHz ..... f_N + 1,5	GHz	53 dB	min. 50 dB
Group delay at f_N		1,75 µs	max. 2 µs
Group delay ripple in PB (in any 112,5 kHz increment within the PB)		50 ns	max. 120 ns
Phase linearity in PB (in any 112,5 kHz increment within the PB)		1,5 deg	max. 5 deg p-p
Input power level		-	max. 23 dBm**)
Operating temperature range		-	- 40 °C ... + 70 °C
Storage temperature range		-	- 40 °C ... + 100 °C
Turnover temperature T_o		20 °C	-
Temperature coefficient of frequency TC_f***		- 0,05 ppm / K²	-

*) 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 only allowed for short term operation (10% of the life time), the max. input power for continuous operation is max.15dBm only
***) $\Delta f(Hz) = TC_f(ppm/K^2) \times (T-T_0)^2 \times f_{To}(MHz)$

generated:

checked / approved:

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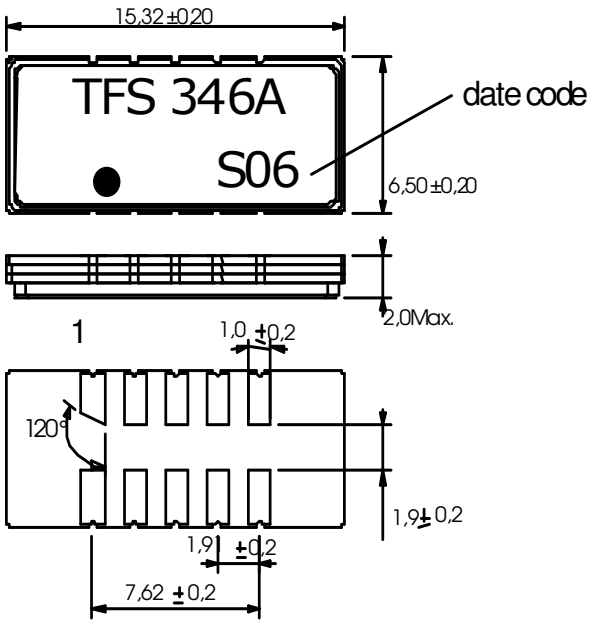
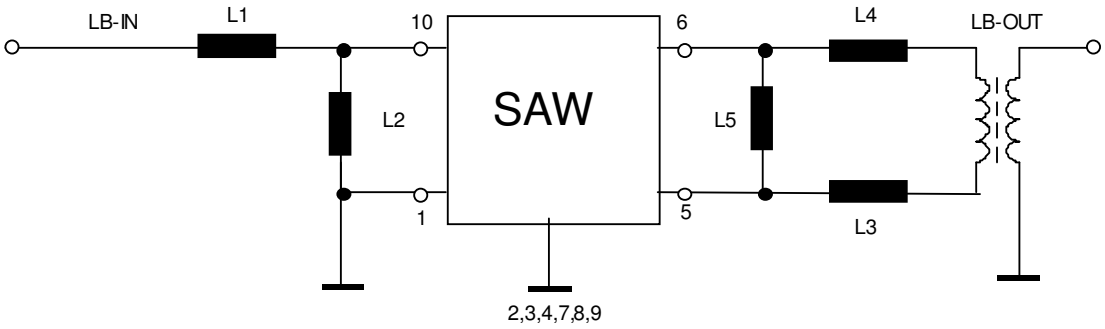
Construction and pin connection
(All dimensions in mm)



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

Date code:	year + week
S	2004
T	2005
U	2006
...	

50 Ω matching network :



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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;

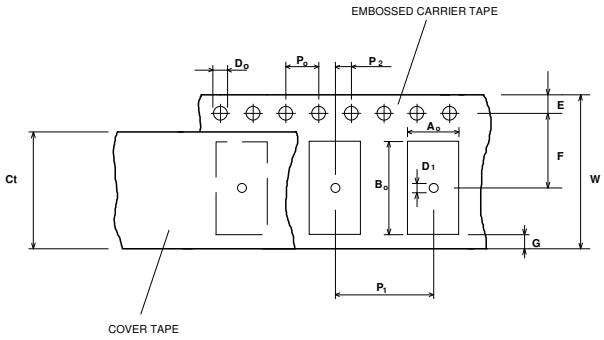
Packing

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

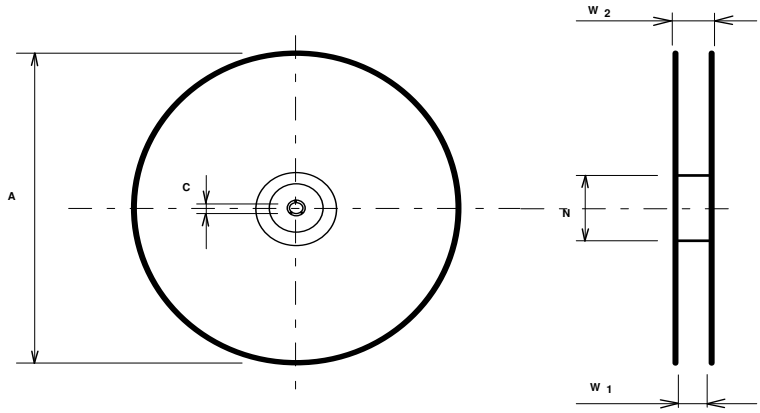
Tape (all dimensions in mm)

W	:	24	± 0,3
Po	:	4	± 0,1
Do	:	1,5	+ 0,1
E	:	1,75	± 0,1
F	:	11,5	± 0,1
G (min)	:	0,60	
P2	:	2	± 0,1
P1	:	12	± 0,1
D1(min)	:	1,5	
Ao	:	7,1	± 0,2
Bo	:	15,9	± 0,2
Ct	:	21,5	± 0,1



Reel (all dimensions in mm):

A	:	330	
W1	:	24,40	+2,0
W2 (max)	:	30,4	
N (min)	:	60	
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.

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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

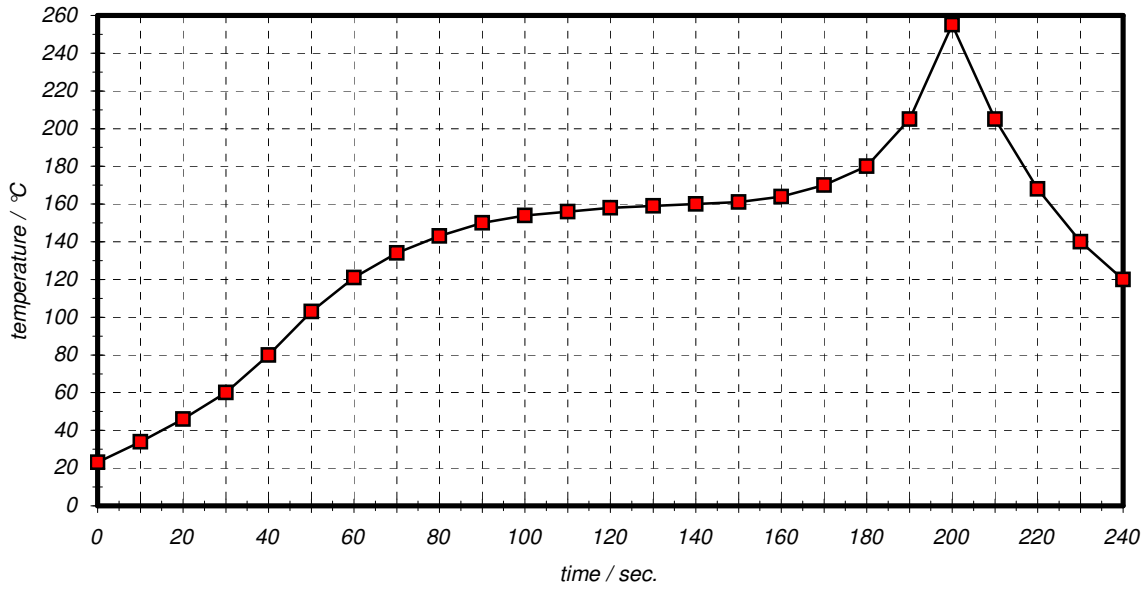

Table for temperature vs. time during the air reflow process

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

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History

Version	Reason of Changes	Name	Date
1.0	- generate specification according to customer requirements	Pfeiffer	16.10.2002
1.1	- typical values added - terminated impedance added - triple transit suppression removed	Pfeiffer	04.02.2003
2.0	- filter name changed from TFS346 to TFS346A	Pfeiffer	11.02.2003
2.1	- relaxation in pass band ripple	Pfeiffer	05.02.2004

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