

**VI TELEFILTER****Filter Specification****TFS 86 A****1/4****Measurement condition**

Ambient temperature: 23°

**Generated:****Checked / approved:**

Input power level: 0 dBm  
 Source impedance: 850 Ω || -2 pF  
 Load impedance: 850 Ω || -2 pF

**Construction and pin configuration**

see page 2

**Characteristics**

Remark:

Reference level for the relative attenuation  $a_{rel}$  of the TFS 86 A 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  $f_o$  is the arithmetic mean value of the upper and lower frequencies at the 3dB filter attenuation level relative to the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed on 86,85 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  $f_o$ .

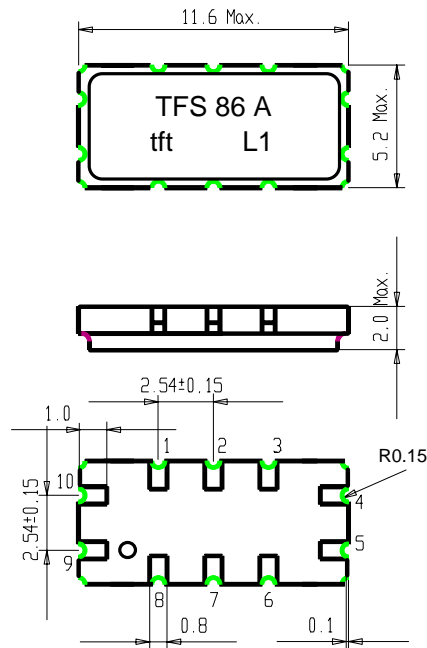
<b>D a t a</b>		<b>typ. value</b>	<b>tolerance / limit</b>
<b>Insertion loss</b> (Reference level)	$a_e = a_{min}$	-	max. 4 dB
<b>Nominal frequency</b>	$f_N$	-	86,85 MHz
<b>Centre frequency</b>	$f_o$	86,85 MHz	-
<b>Pass band ripple</b> $f_N \pm 13$ kHz		-	max. 1,5 dB
<b>Relative attenuation</b> $f_N \pm 15$ kHz	$a_{rel}$		max. 3 dB
$f_N - 1000$ kHz ... $f_N - 940$ kHz		-	min. 50 dB
$f_N - 940$ kHz ... $f_N - 880$ kHz		-	min. 70 dB
$f_N - 880$ kHz ... $f_N - 400$ kHz		-	min. 50 dB
$f_N - 400$ kHz ... $f_N - 120$ kHz		-	min. 40 dB
$f_N - 120$ kHz ... $f_N - 60$ kHz		-	min. 20 dB
$f_N + 60$ kHz ... $f_N + 120$ kHz		-	min. 20 dB
$f_N + 120$ kHz ... $f_N + 150$ kHz		-	min. 40 dB
$f_N + 150$ kHz ... $f_N + 400$ kHz		-	min. 30 dB
$f_N + 400$ kHz ... $f_N + 1000$ kHz		-	min. 40 dB
<b>Group delay distortion</b> $f_N \pm 11$ kHz	GDD	-	max. 10 μs
<b>Intermodulation</b> Intermodulation in the composite signal by $f_N \pm 60$ kHz and $f_N \pm 120$ kHz each of -20 dBm		-	max. -90 dBm
<b>Operating temperature range</b>		- 20 °C ... + 70 °C	
<b>Storage temperature range</b>		- 40 °C ... + 85 °C	
<b>Temperature coefficient of frequency</b>	TC	ca. - 0,036 ppm/K <sup>2</sup>	
<b>Frequency inversion temperature</b>		+ 20 °C ... + 30 °C	
<b>Permissible DC voltage</b>	$V_{DC}$	-	max. 10 V

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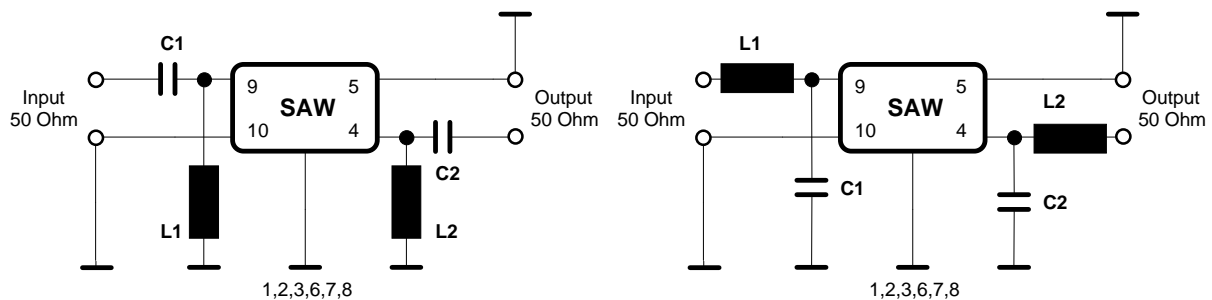
### Construction and pin configuration



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

Note: The filter has the same impedance for input and output. The orientation of the marking referring to soldering pads can deviate from filter to filter. The orientation of marking and/or soldering pads can change from filter to filter also in case of tape & reel and is not defined in any way. Only the mounting surface of the filters faces the bottom side of the embossed carrier tape.

### 50 $\Omega$ matching network



Note: The filter operates in the matching network in the same manner if the filter is inserted with a rotation of 180°.

### Stability Characteristics

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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 500 Hz, 0,075 mm or 1g respectively, 1 octave per min, 10 cycles per plan, 3 plans;  
DIN IEC 68 T2 - 6
3. Damp heat: 90 % to 95 % rel. humidity, 40 °C, 10 days;  
(steady state) 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;

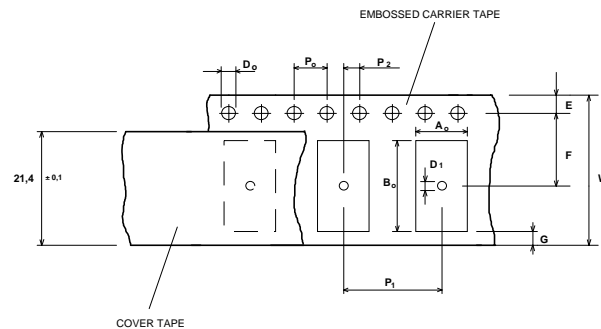
## Packing

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

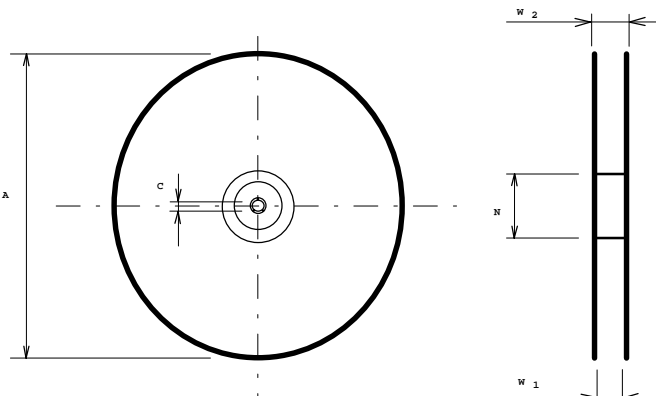
### Tape (all dimensions in mm)

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 <sup>A</sup>



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.

## Air reflow temperature conditions

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## 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

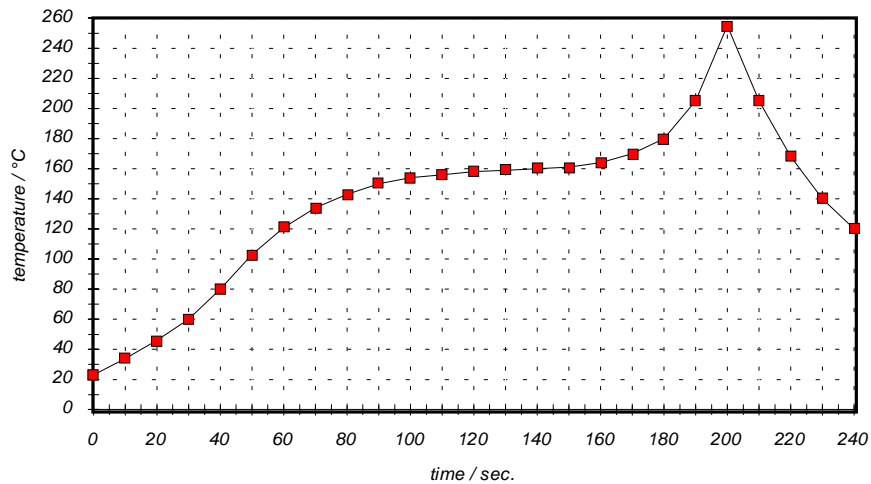


Table for temperature vs. time during the air reflow process

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