

**VI TELEFILTER****Filter Specification****TFS 240 H****1/5****Measurement condition**

Ambient temperature  $T_A$ : 25 °C  
 Input power level: 0 dBm  
 Terminating impedances at  $f_C^*$ : input: 455  $\Omega$  // -9,1 pF  
 output: 520  $\Omega$  // -8,3 pF

**Characteristics**

## Remark:

Reference level for the relative attenuation  $a_{rel}$  of the TFS 240 H 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 25 dB filter attenuation level relative to the insertion loss  $a_e$ . The temperature coefficient of frequency  $TC_f$  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
<b>Insertion loss</b>	$a_e$	7,2 dB	max. 9 dB
<b>Centre frequency</b> (reference frequency at ambient temperature)	$f_C$	-	240 MHz $\pm$ 25 kHz
<b>Passband Ripple (p-p)</b>	$f_C \pm 100$ kHz	0,25 dB	max. 0,5 dB
<b>Relative attenuation</b>	$a_{rel}$		
$f_C$	$f_C \pm 0,1$ MHz	0,25 dB	max. 0,5 dB
$f_C \pm 0,1$ MHz	$f_C \pm 0,15$ MHz	0,75 dB	max. 1 dB
$f_C \pm 0,375$ MHz	$f_C \pm 0,575$ MHz	30 dB	min. 25 dB
$f_C \pm 0,575$ MHz	$f_C \pm 0,975$ MHz	33 dB	min. 30 dB
$f_C \pm 0,975$ MHz	$f_C \pm 5$ MHz	40 dB	min. 35 dB
10 MHz	$f_C - 5$ MHz	45 dB	min. 38 dB
$f_C + 5$ MHz	$f_C + 360$ MHz	45 dB	min. 38 dB
<b>Triple transit response suppression</b>		25 dB	min. 15 dB
<b>Group delay ripple</b>	in $f_C \pm 100$ kHz	270 ns	max. 400 ns
<b>Average group delay</b>	in $f_C \pm 100$ kHz	2,1 $\mu$ s	max. 2,4 $\mu$ s
<b>Return loss</b>	in $f_C \pm 150$ kHz	10 dB	min. 7 dB
<b>Input Power Level</b>		-	max. 20 dBm***)
<b>Operating temperature range</b>		-	- 30 °C.... + 80 °C
<b>Storage temperature range</b>		-	- 40 °C.... + 85 °C
<b>Temperature coefficient of frequency</b>	$TC_f$ **	-0,04 ppm/K <sup>2</sup>	-
<b>Frequency inversion temperature</b>	$T_0$	28 °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.

\*\*)  $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T - T_0)^2 \times f_{T0}(\text{MHz})$

\*\*\*) This power level is allowed for short term operation (10% of life time) only, the max. input power for continuous operation is 15 dBm

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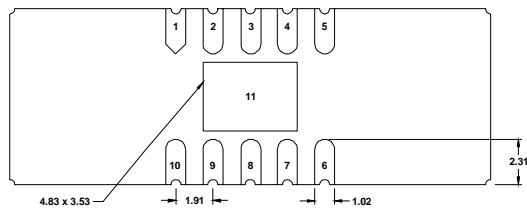
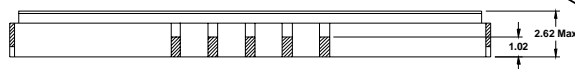
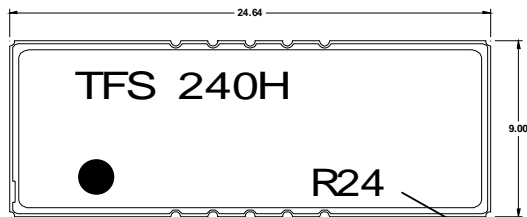
checked / approved: \_\_\_\_\_

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**Construction, pin configuration and 50 Ω - matching network**

(all dimensions in mm)

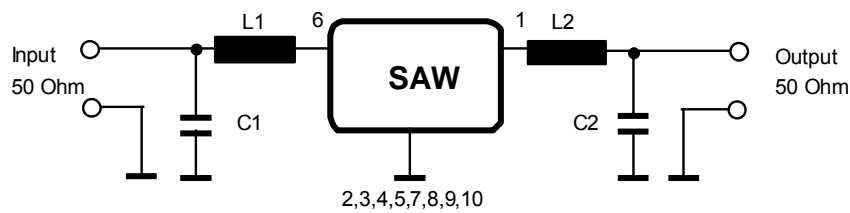


- 1 output
- 2 ground
- 3 ground
- 4 ground
- 5 input rf return
- 6 input
- 7 ground
- 8 ground
- 9 ground
- 10 output rf return

date code: year + week

- N 2001
- P 2002
- R 2003
- .....

**50 Ω test circuit**



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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;

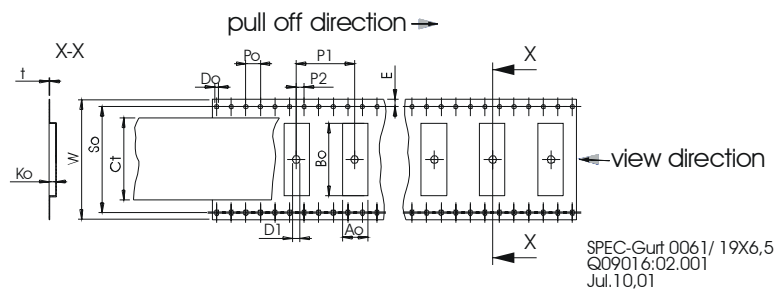
**Packing**

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;

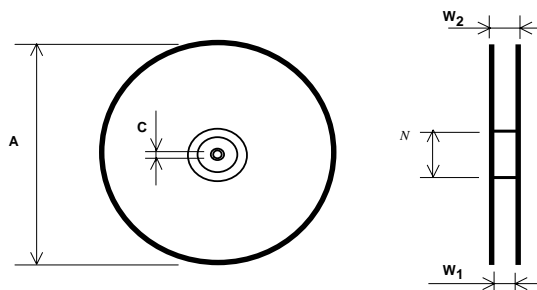
max. pieces of filters per reel:	1000
reel of empty components at start:	min 300 mm
reel of empty components at start including leader:	min 500 mm
trailer	min 300 mm

**Tape (all dimensions in mm)**

W	:	44	± 0,3
Po	:	4	± 0,1
Do	:	1,5	+ 0,1
E	:	1,75	± 0,1
F	:	20,25	± 0,05
G (min)	:	0,75	
P2	:	2	± 0,05
P1	:	16	± 0,1
D1(min)	:	2,0	
Ao	:	9,3	± 0,1
Bo	:	24,9	± 0,1
CT	:	38	± 0,2

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

A	:	330
W1	:	44,4 +2,0 / -0
W2 (max)	:	50,4
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 °	Cover 200 °C	255 °C ± 5 °C
Time:		60 sec. - 90 sec.	20 sec. - 25 sec.

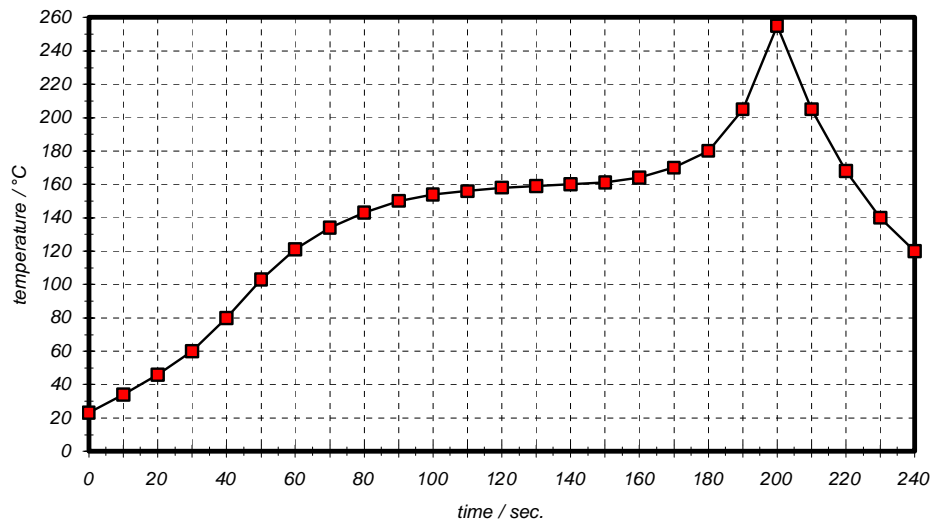
**Air reflow profile**

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

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**History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	generation of development specification	Pfeiffer	25.02.2003
2.0	typical values, matching configuration and terminating impedances added package changed	Pfeiffer	13.06.2003

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