

**VI TELEFILTER****Filter Specification****TFS 71 L****1/5****Measurement condition**

Ambient Temperature: 23 °C  
 Input Power Level: 0 dBm  
 Terminating Impedance at  $f_c^*$ :  
     input: 3,28 k $\Omega$  // -11,0 pF  
     output: 3,14 k $\Omega$  // -11,3 pF

**Characteristics****Remark:**

The nominal frequency  $f_N$  is fixed at 71,1 MHz. The insertion loss  $a_e$  is defined as loss value determined at  $f_N$ . Reference level for the relative attenuation  $a_{rel}$  of the TFS 71L is the insertion loss  $a_e$ . All specified data are met within the operating temperature range.

<b>D a t a</b>		<b>typ. Value</b>	<b>Limit</b>
<b>Insertion loss</b> (Reference Level)	$a_e = a_{min}$	10 dB	max. 14 dB
<b>Nominal frequency</b>	$f_N$	-	71,1 MHz
<b>Centre frequency</b>	$f_c$	71,1 MHz	-
<b>Pass band</b>	PB	-	$f_N \pm 525$ kHz
<b>Relative attenuation</b>	$a_{rel}$		
$f_N \dots f_N \pm 0,525$ MHz		0,5 dB	max. 1 dB
$f_N \pm 0,525$ MHz ... $f_N \pm 0,590$ MHz		1,5 dB	max. 3,75 dB
$f_N \pm 0,75$ MHz ... $f_N \pm 0,9$ MHz		14 dB	min. 10 dB
$f_N \pm 0,9$ MHz ... $f_N \pm 4,5$ MHz		32 dB	min. 26 dB
$f_N - 40,1$ MHz ... $f_N - 4,5$ MHz		52 dB	min. 45 dB
$f_N + 4,5$ MHz ... $f_N + 428,9$ MHz		55 dB	min. 45 dB
<b>Average Group Delay within <math>f_N \pm 630</math> kHz</b>		2,6 $\mu$ s	max. 3,2 $\mu$ s
<b>Group Delay Variation within PB</b>		190 ns	max. 300 ns p-p
<b>Phase Variation within <math>f_N \pm 630</math> kHz</b>		1 deg rms	max. 2 deg rms
<b>Return Loss within PB</b>		15 dB	min. 10 dB
<b>Operating Temperature Range</b>		-	0 ... +85 ° C
<b>Storage Temperature Range</b>		-	-10... +100 ° C
<b>Frequency inversion temperature <math>T_0</math></b>		37 °C	-
<b>Temperature Coefficient of frequency <math>TC_f</math> **</b>		- 0,036 ppm / K <sup>2</sup>	-
<b>Intermodulation <math>IP_3</math></b>		> 45 dB	min. 35 dB
modulation signals:	$f_N + 2$ MHz and $f_N + 4$ MHz, each of 10 dBm		
<b>Permissible DC voltage <math>V_{DC}</math></b>		-	max. 5 V

\*) 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.

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

**generated:** \_\_\_\_\_

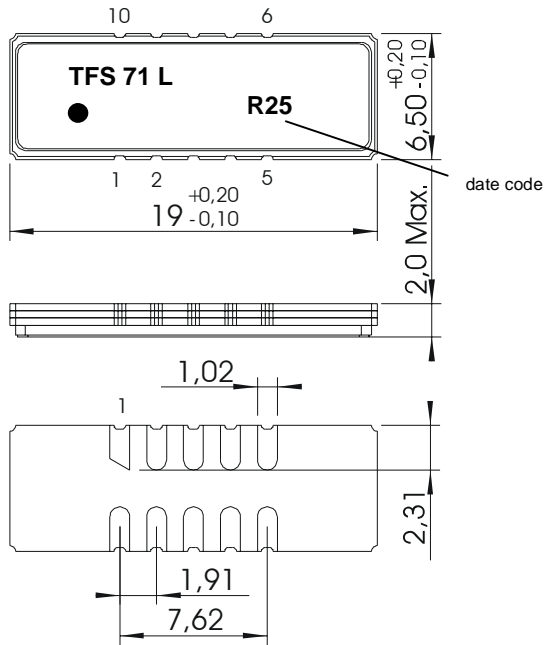
**checked / approved:** \_\_\_\_\_

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**Construction and pin connection**

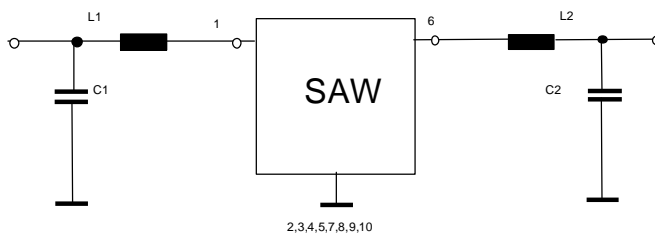
(All dimensions in mm)



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

date code year + week  
 N 2001  
 P 2002  
 R 2003  
 ...

**50 Ω matching network**



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**VI TELEFILTER****Filter Specification****TFS 71 L****3/5****Stability Characteristics**

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;

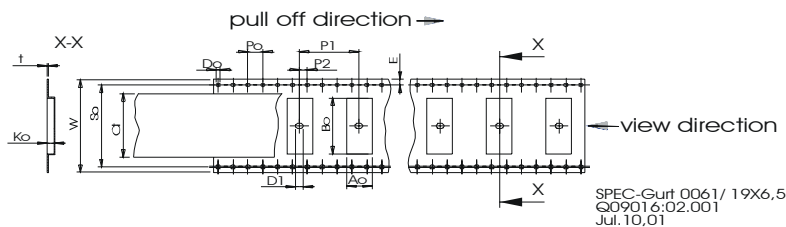
**Packing**

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;

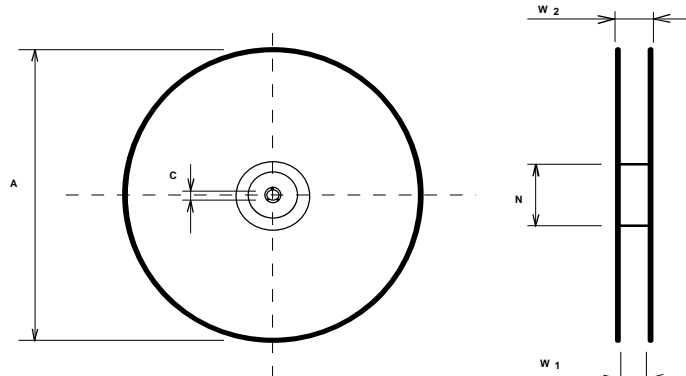
max. pieces of filters per reel: 2000  
reel of empty components at start: min 300 mm  
reel of empty components at start including leader: min 500 mm  
trailer: min 300 mm

**Tape (all dimensions in mm)**

W	: 32 ± 0,3
Po	: 4 ± 0,1
Do	: 1,5 ± 0,5
E	: 1,75 ± 0,1
So	: 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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**VI TELEFILTER****Filter Specification****TFS 71 L****4/5****Air reflow temperature conditions**1<sup>st</sup> and 2<sup>nd</sup> 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.	

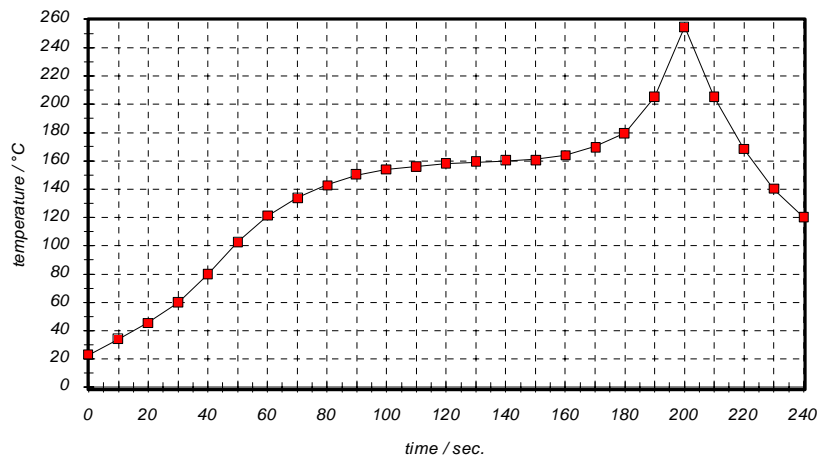
**Chip-mount air reflow profile**

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

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**VI TELEFILTER****Filter Specification****TFS 71 L****5/5****History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	- generation of specification according to customer requirements	Pfeiffer	02.08.2002
1.1	- reducing limit of insertion loss	Pfeiffer	16.08.2002
1.2	- terminating impedance and typical values of relative attenuation, group delay and phase ripple deviation added	Pfeiffer	11.11.2002
1.3	- terminating impedance fixed, typical values changed	Pfeiffer	26.03.2003

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