

VI TELEFILTER**Filter Specification****TFS 71 F****1/5****Measurement Condition**

Ambient temperature T_A :	23 °C
Input power level:	0 dBm
Terminating impedances: *)	
Input:	1,7 k Ω - 13,9 pF
Output:	2,2 k Ω - 14,1 pF

Characteristics**Remark:**

The reference level for the relative attenuation a_{rel} is the pass band attenuation at the nominal frequency f_N . This value 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 given values for the centre frequency, the relative attenuation a_{rel} and 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	Variation / Limitation
Insertion Loss (Reference Level)	a_e	5,0 dB	max 8,0 dB
Nominal frequency	f_N	-	71,0 MHz
Center frequency	f_N	-	71,0 MHz \pm 20 kHz
3 dB - Bandwidth	BW	310 kHz	min. 200 kHz
Pass band ripple $f_N - 80$ kHz ... $f_N + 80$ kHz		0,5 dB	max. \pm 0,75 dB
Relative Attenuation	a_{rel} (***)		
$f_N \pm 200$ kHz ... $f_N \pm 400$ kHz		9 dB	min. 3 dB
$f_N \pm 400$ kHz ... $f_N \pm 600$ kHz		35 dB	min. 25 dB
$f_N \pm 600$ kHz ... $f_N \pm 1,0$ MHz		38 dB	min. 35 dB
$f_N - 1,0$ MHz ... $f_N - 1,2$ MHz		48 dB	min. 42 dB
$f_N - 1,2$ MHz ... $f_N - 1,4$ MHz		48 dB	min. 40 dB
$f_N - 1,4$ MHz ... $f_N - 40$ MHz		47 dB	min. 35 dB
$f_N + 1,0$ MHz ... $f_N + 40$ MHz		40 dB	min. 35 dB
Group delay	f_N	3,1 μ s	max. 5 μ s
Group delay ripple	in $f_N - 80$ kHz ... $f_N + 80$ kHz	350 ns	max. 1 μ s
Input Intermodulation	**)	-	max. -81 dBm
Input power level		-	max. 0 dBm
$f_N \pm 400$ kHz ... $f_N \pm 600$ kHz		-	max. +12 dBm
$f_N \pm 800$ kHz ... $f_N \pm 3$ MHz		-	max. +22 dBm
$f_N \pm 3$ MHz ... $f_N \pm 40$ MHz		-	max. +25 dBm
Operating Temperature Range		-	5 °C ... +70 °C
Storage Temperature Range		-	-40 °C ... +85 °C
Temperature Coefficient	TC 2nd order ****)	-0,032 ppm/K ²	
Frequency inversion temperature T_0		+25 °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

***) first measurement: $f_{in1}=70.2$ MHz; $f_{in2}=69,4$ MHz; $P_{in}=-5$ dBm $f_{measurement} = 71,0$ MHz
second measurement: $f_{in1}=71.8$ MHz; $f_{in2}=72,6$ MHz; $P_{in}=-5$ dBm $f_{measurement} = 71,0$ MHz

****) It is allowed to have max. 3 spurious responses in the high frequency stop band range of less than 100 kHz bandwidth (3dB) with a rejection of 10 dB less than specified here

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

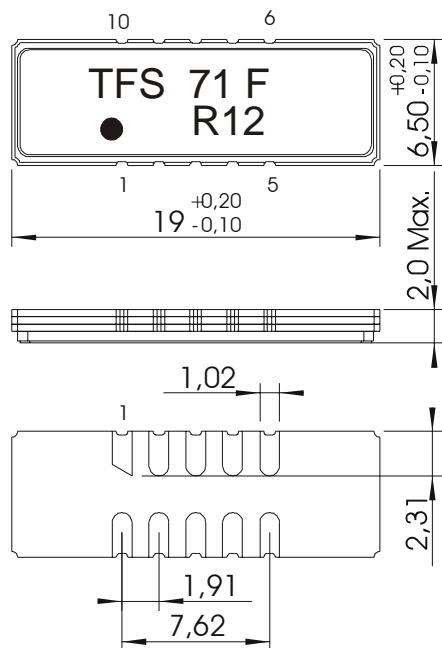
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Construction and Pin Configuration

(All Dimensions in mm)

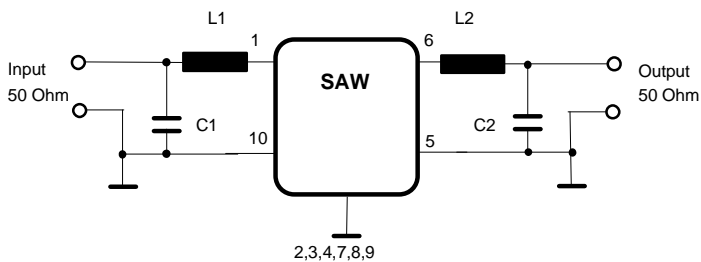


- 1 Input
- 2 Ground
- 3 Ground
- 4 Ground
- 5 Output RF-return
- 6 Output
- 7 Ground
- 8 Ground
- 9 Ground
- 10 Input RF-return

Date code Year+month

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

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. Damp heat:
(cycle) 25 °C to 55°C / 95% r.H. / 10 cycles
DIN IEC 68 - 2 – 30 Db
4. Resistance to solder heat : reflow possible: twice max.;
for temperature conditions, please refer to the attached "Air reflow temperature conditions" on page 4;

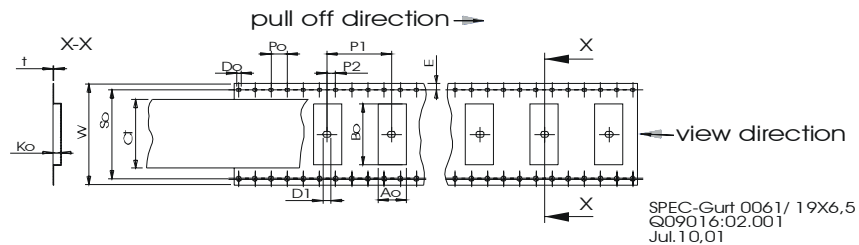
Packing

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;

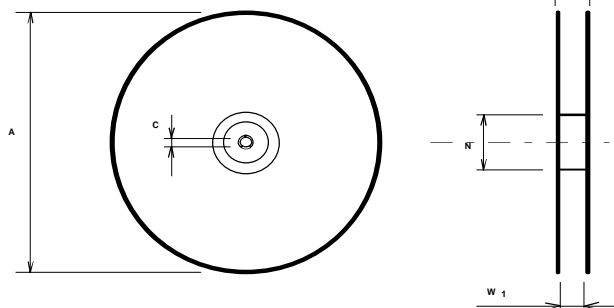
max. pieces of filters per reel: 2000
reel of empty components at start: min 300 mm
reel of empty components at start including leader: min 500 mm
trailer: min 300 mm

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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Soldering temperature conditions

1st and 2nd soldering temperature 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.	

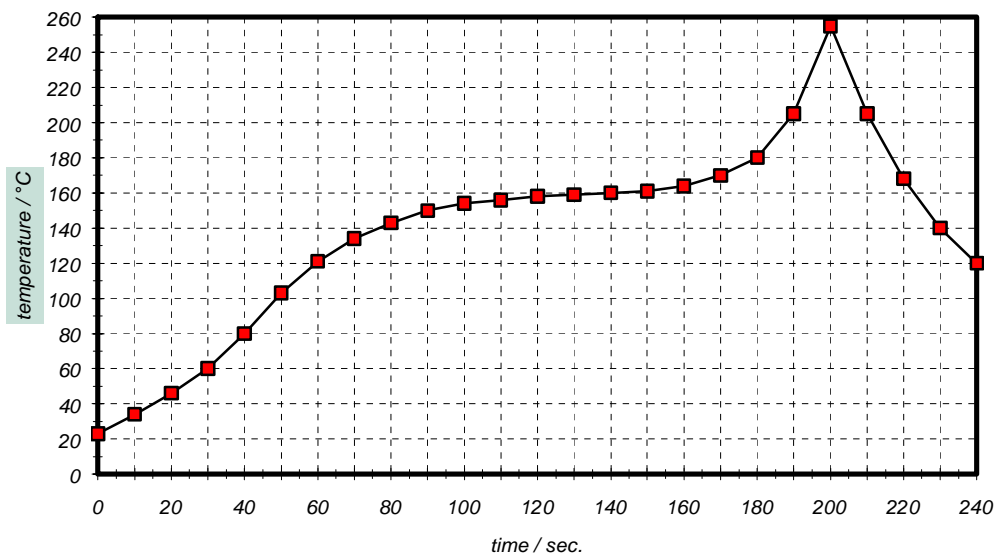
Soldering temperature profile

Table for temperature vs. time during the soldering 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 F****5/5****History**

Version	Reason of Changes	Name	Date
Filter specification			
2.0	- typical values and terminating impedances added - tape and reel section corrected	Steiner	19.03.2003
2.1	- group delay corrected	Steiner	04.04.2002
2.2	- additional limits for the 3dB centre frequency introduced	Steiner	16.04.2003

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