

## VI TELEFILTER

## Filter specification

TFS 75

1/3

## 1. Measurement condition

Ambient temperature  $T_A$ :

25 °C

Input power level:

0 dBm (typ.)

Max 10 dBm.

Terminating impedances at  $f_C$ :

for input:

190  $\Omega$  | 49 pF.

for output:

2,1  $\Omega$  | 24 pF.Package, pin connection and 50  $\Omega$  matching network (see page 2.)

## 2. Characteristics

Remark:

Reference level for the relative attenuation  $a_{rel}$  of the TFS 75 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 reference frequency  $f_C$  is the arithmetic mean value of the upper and lower frequencies at the 20 dB filter attenuation level relative to the insertion loss  $a_e$ .

Data	typ. value	tolerance / limit
<b>Insertion loss</b> (Reference level) $a_e$	24,8 dB	max 26 dB
<b>Reference frequency</b> $f_C$ at operation temperature $T_O=70^\circ\text{C}$ ( $f_{COT}$ *)	75.30 MHz	75.30 $\pm$ 0,20 MHz
<b>Relative frequency distance of <math>f_{CAT}</math> within one set of 3 filters</b>		
1nd filter with $f_{CAT} = 65,9$ MHz $\pm$ 200 kHz *)	9400 kHz	max $\pm$ 20 kHz
3rd filter with $f_{CAT} = 87,1$ MHz $\pm$ 200 kHz	11800 kHz	max $\pm$ 20 kHz
1 dB - band width	6,00 MHz	
3 dB - band width	6,06 MHz	
10 dB - band width	6,27 MHz	
20 dB - band width	6,41 MHz	
40 dB - band width	6,55 MHz	
45 dB - band width	6,60 MHz	
<b>Amplitude ripple (p-p):</b> $f_C \dots f_C \pm 2,8$ MHz	0,9 dB	max 1,0 dB
<b>Relative attenuation</b> $a_{rel}$		
$f_C$	-	max 1,0 dB
$f_C \pm 2,8$ MHz	-	max 3 dB
$f_C \pm 3,3$ MHz	45 dB	min 40 dB
In the frequency range $f_C \pm 3,3$ MHz ... $f_C \pm 20$ MHz the limit line is of type SLOPING LINE.		
$f_C \pm 20$ MHz	60 dB	min 45 dB
In the frequency range $f_C \pm 20$ MHz ... $f_C \pm 25$ MHz the limit line is of type SLOPING LINE.		
$f_C \pm 25$ MHz	55 dB	min 50 dB
$f_C \pm 25$ MHz	75 dB	-
<b>Group delay at operation temperature 25°C</b>	4.96 $\mu\text{s}$	
<b>Group delay at operation temperature 70°C</b>	4.98 $\mu\text{s}$	max 5,0 $\mu\text{s}$
<b>Group delay ripple (p-p):</b> $f_C \dots f_C \pm 3,0$ MHz	$\pm 175$ ns	$\pm$ max 200 ns
<b>Deviation from linear phase (p-p):</b> $f_C \dots f_C \pm 2,8$ (3,0) MHz	6,5° (16°)	
<b>Triple transit attenuation compared to main signal</b>	48 dB	
<b>Input/Output return loss with matching network (S11/S22):</b>	1,6/1,7 dB	
<b>Crosstalk</b>	60 dB	
<b>Substrate material</b>	LiNbO <sub>3</sub>	
<b>Temperature coefficient of frequency ( <math>T_C</math> )</b>	-76,466 ppm/K	-94 ppm/K
<b>Frequency deviation of <math>f_C</math> over temperature</b>	$\Delta f_C(\text{Hz}) = T_{Ci}(\text{ppm/K}) \times (T - T_A) \times f_{CAT} (\text{MHz})$	
<b>Operating temperature range</b>	+ 70 ° $\pm$ 1 ° C	
<b>Storage temperature range</b>	- 40 °C ... + 85 °C	

\*) For the 2nd filter  $f_{COT}$  is its reference frequency  $f_C$  at the operation temperature  $OT = 70^\circ\text{C} \pm 1^\circ\text{C}$ .

The reference frequency at ambient temperature  $f_{CAT}$  for this 2nd filter and the from it resulting relative frequency distance have to be determined.

Responsible:

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Checked/Approved:

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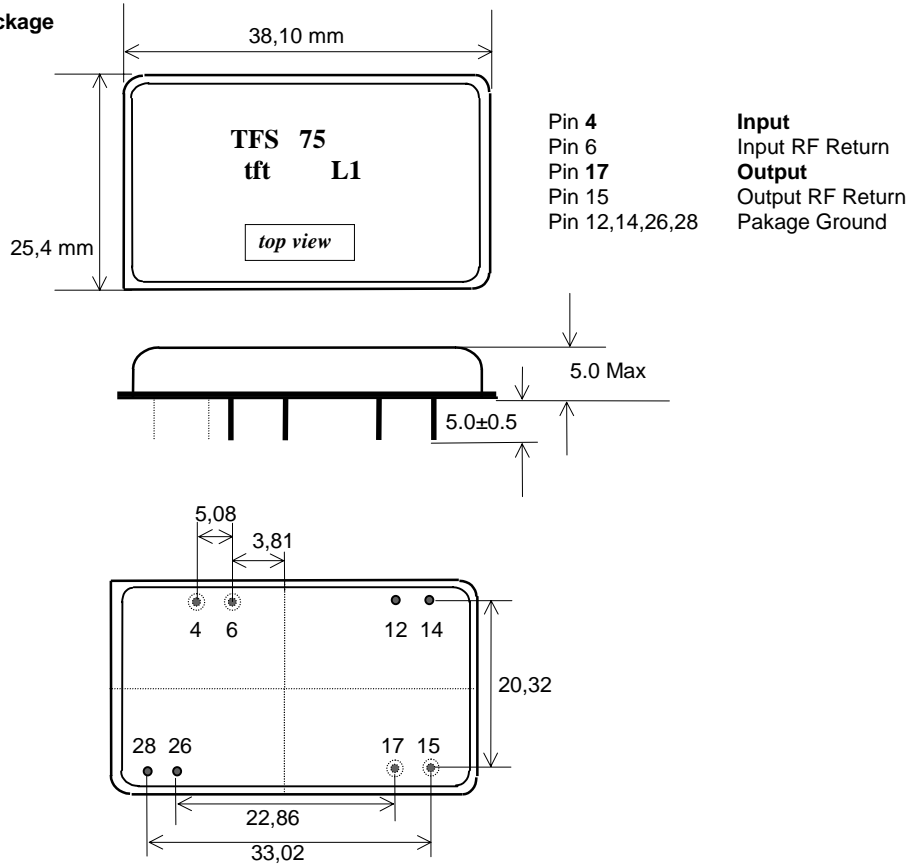
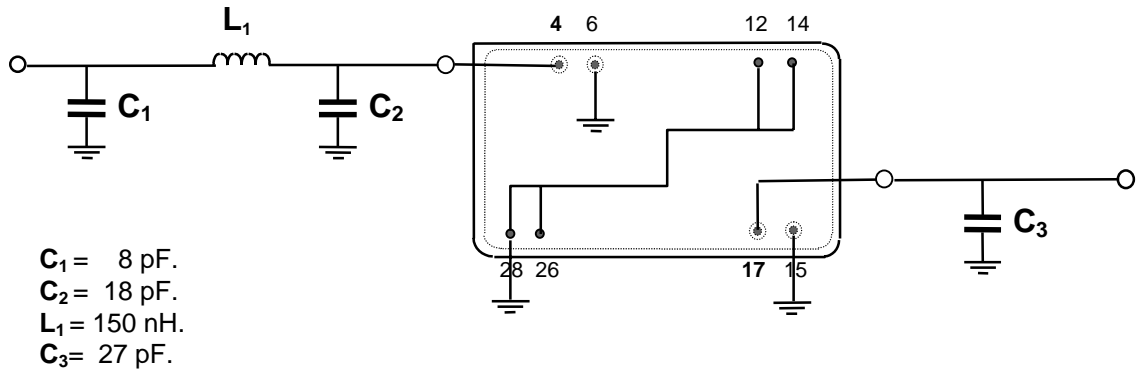
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**VI TELEFILTER****Filter specification****TFS 75****2/3****3. Package****4. 50 Ω matching network:****VI TELEFILTER**

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## Air reflow temperature conditions

1st and 2nd air reflow profile

<b>Name:</b>	pre-heating periods	main-heating periods	peak temperature
<b>Temperature:</b>	150 °C - 170 °C	over 200 °C	255 °C ± 5 °C
<b>Time:</b>	60 sec. - 90 sec.	20 sec. - 25 sec.	

## Chip-mount air reflow profile

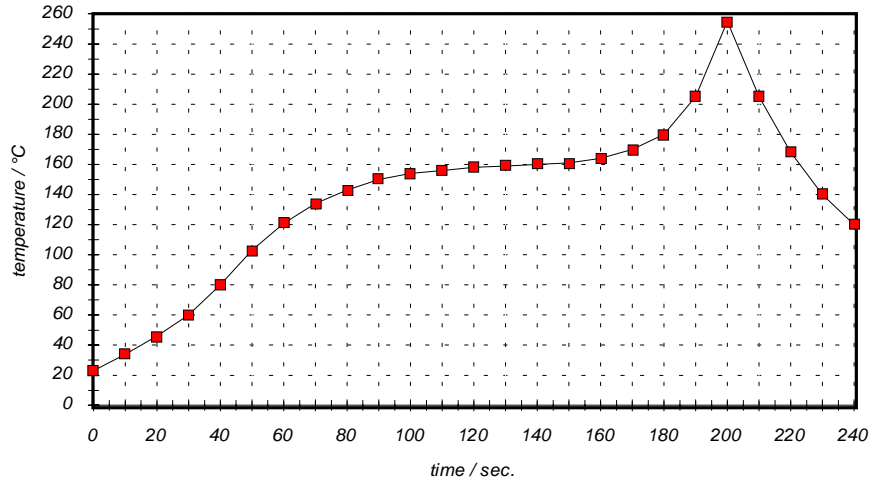


Table for temperature vs. time during the air reflow process

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