

VI TELEFILTER**Filter specification****TFS 70L****1/5****1. Measurement condition :**

Ambient temperature T_A : 25 °C.
 Input power level: 0 dBm.
 Terminating impedance f_C^*) : for input: 50 Ω | 33 pF.
 for output: 50 Ω | 0 pF.

2. Characteristics :

Remark:

Reference level for the relative attenuation a_{rel} of the **TFS 70L** 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 3 dB filter attenuation level relative to the insertion loss a_e . The temperature coefficient of frequency T_{Cf} is valid both for the reference frequency f_C and the frequency response of the filter in the operating temperature range. The frequency shift of the filter in the operating temperature range is not included in the production tolerance scheme.

Data	typ. value	tolerance / limit
Insertion loss (Reference level) a_e	24,5 dB	max. 27 dB
Centre frequency f_C at ambient temperature (f_{CTA})	70,0 MHz	70,00 \pm 0,10 MHz
Pass band : PB		$f_C \dots f_C \pm 3,9$ MHz
Amplitude ripple in PB :	0,4 dB	max. 1,0 dB
Bandwidth (BW) : at ambient temperature T_A		
1 dB	8,12 MHz	min. 7,8 MHz
2 dB	8,26 MHz	min. 8,2 MHz
3 dB	8,36 MHz	
20 dB	8,98 MHz	max. 9,0 MHz
25 dB	9,08 MHz	max. 9,2 MHz
30 dB	9,17 MHz	
Relative attenuation a_{rel}		
$f_C \dots f_C \pm 3,9$ MHz	-	max. 1 dB
$f_C \pm 3,9$ MHz \dots $f_C \pm 4,1$ MHz	-	max. 2 dB
$f_C \pm 4,5$ MHz \dots $f_C \pm 4,7$ MHz	25 dB	min. 20 dB
$f_C \pm 4,7$ MHz \dots $f_C \pm 6$ MHz	35 dB	min. 25 dB
$f_C \pm 6$ MHz \dots $f_C \pm 30$ MHz	50 dB	min. 35 dB
Group delay (mean value in PB):	2,94 μ s	max. 3 μ s
Group delay ripple in PB (p-p):	60 ns	max. 100 ns
Deviation from linear phase in PB :	4° (r.m.s. 0,9°)	
Triple transit attenuation compared to main signal	54 dB	
Crosstalk	60...65 dB	
Temperature coefficient of frequency (T_{Cf}):	- 87 ppm/K	
Frequency deviation of f_C over temperature :	$\Delta f_C(\text{Hz}) = T_{Cf}(\text{ppm/K}) \times (T - T_A) \times f_{CTA}(\text{MHz})$	
Operating temperature range		- 25 °C ... + 80 °C
Storage temperature range		- 40 °C ... + 85 °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.

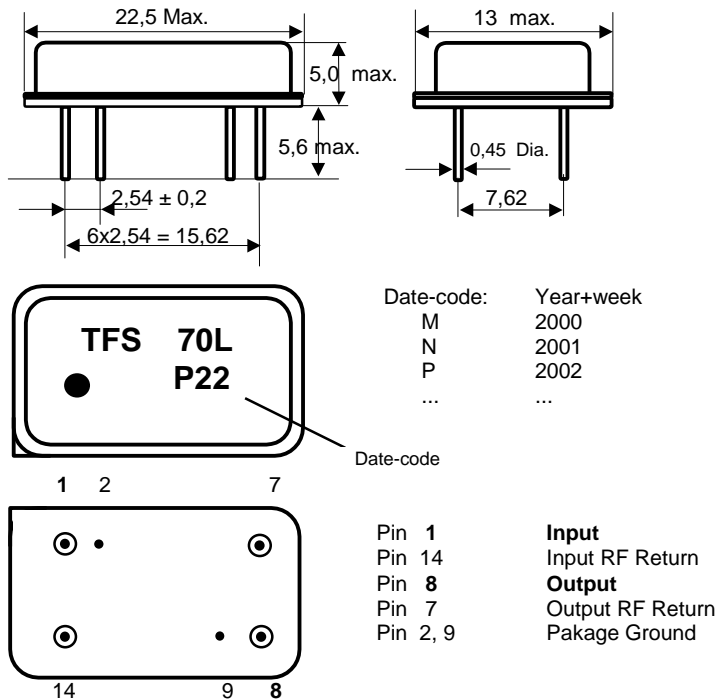
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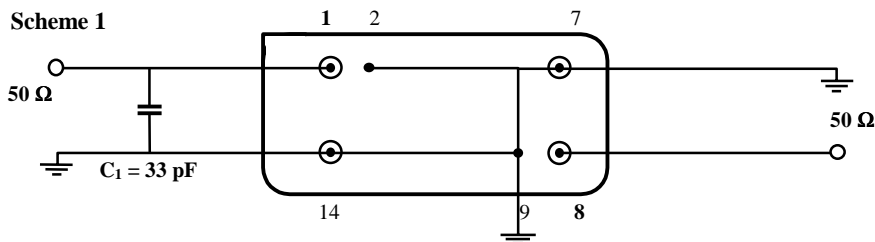
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3. Construction and pin connection (all dimensions in mm)



4. 50 Ω matching networks (please refer to the application note for further details) :



5. 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;

6. Air reflow temperature conditions :

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

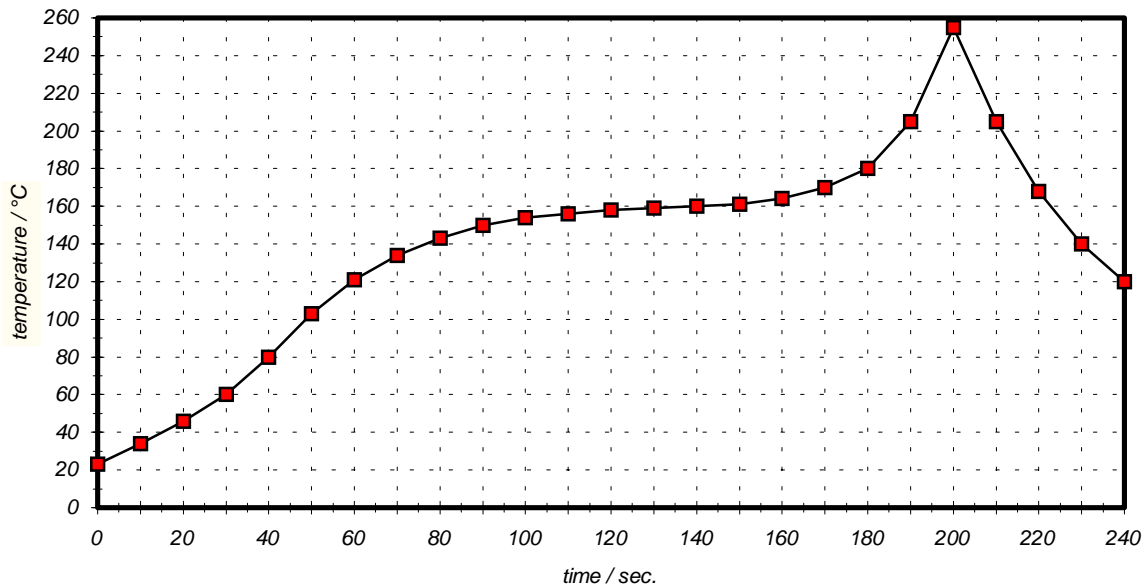


Table for temperature vs. time during the air reflow process

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

VI TELEFILTER**Filter specification****TFS 70L****5/5****7. History :**

Version	Reason of changes	Name	Date
1,0...5.2	Generate filter specification .	Dunzow W.	12.01.1999.
5.3	correct package drawing .	Dunzow W.	14.02.2002.

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