

VI TELEFILTER

Filter specification

TFS 70 N

1/3

1. Measurement condition **Package, pin connection and 50 Ω matching network** (see page 2.)

Ambient temperature T_A : 23 °C
 Input power level: 0 dBm.
 Terminating impedances in f_C :
 for input: 56,8 Ω | - 40,8 pF. [27,9 Ω + j 28,4 Ω]
 for output: 46,5 Ω | - 35,3 pF. [30,6 Ω + j 22,0 Ω]
 (see Application Note)

2. Characteristics

Remark:
 Reference level for the relative attenuation a_{rel} of the **TFS 70N** 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 . 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. The frequency shift of the filter in the operating temperature range is not included in the production tolerance scheme.

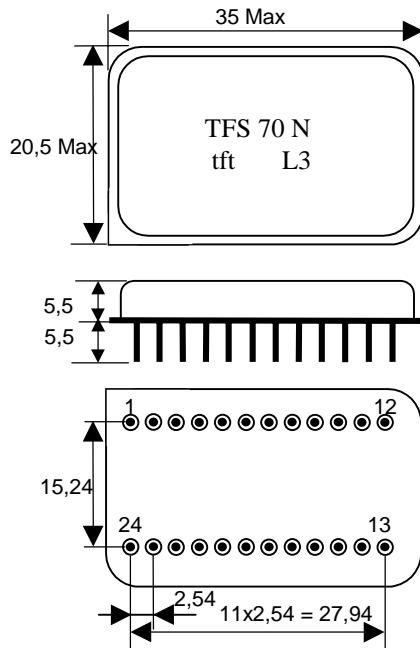
Data	typ. value	tolerance / limit
Insertion loss (Reference level) a_e	20,6 dB	max 24 dB
Reference frequency f_C at ambient temperature (f_{CAT}) :	70 MHz	70 ± 0,1 MHz
Pass band (-2 dB) :		$f_C - 4,8 \text{ MHz} \dots f_C + 4,8 \text{ MHz}$
Bandwidth at ambient temperature:		
1,0 dB - band width	9,92 MHz	
1,5 dB - band width	9,94 MHz	
2,0 dB - band width	9,98 MHz	min. 9,6 MHz
3,0 dB - band width	10,12 MHz	min. 10,0 MHz
20 dB - band width	10,60 MHz	
35 dB - band width	10,77 MHz	min. 10,8 MHz
45 dB - band width	10,843 MHz	min. 11,2 MHz
50 dB - band width	10,900 MHz	
Amplitude ripple (p-p): $f_C \dots f_C \pm 4,8 \text{ MHz}$	0,7 dB	max 2 dB
Relative attenuation a_{rel}		
f_C	-	max 2 dB
$f_C \pm 4,8 \text{ MHz}$	-	max 3 dB
$f_C \pm 5,4 \text{ MHz}$	40 dB	min 35 dB
$f_C \pm 5,6 \text{ MHz}$	55 dB	min 45 dB
$f_C \pm 6,0 \text{ MHz}$	55...65 dB	min 50 dB
Group delay inpass band:	3,74 μs	max 4,5 μs
Group delay ripple (p-p): $f_C \dots f_C \pm 4,8 \text{ MHz}$	140 ns	max 200 ns
Deviation from linear phase (p-p): $f_C \dots f_C \pm 5,0 \text{ MHz}$	5,5°	
Crosstalk attenuation compared to main signal	70 dB	
Triple transit attenuation compared to main signal	50 dB	
Temperature coefficient of frequency (Tc_f)	-87 ppm/K	-94 ppm/K
Frequency deviation of f_C over temperature	$\Delta f_C(\text{Hz}) = Tc_f(\text{ppm/K}) \times (T - T_A) \times f_{CAT} (\text{MHz})$	
Operating temperature range	0 °C ... + 60 °C	
Storage temperature range	- 20 °C ... + 85 °C	

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Checked/Approved: _____ **Dr. Bert Wall**

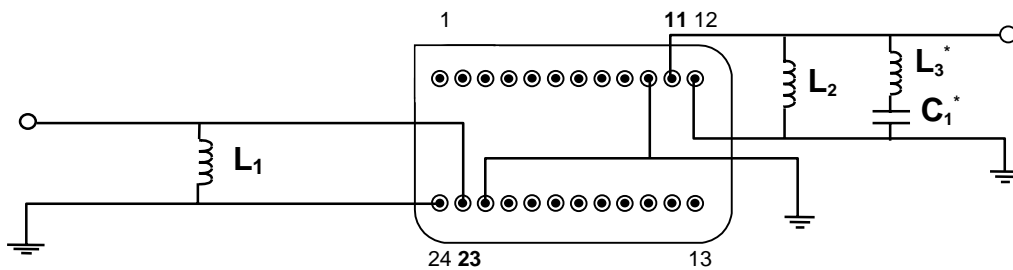


3. Package



Pin 23	Input
Pin 24	Input RF Return
Pin 11	Output
Pin 12	Output RF Return
Pin 1-10, 13-22	Ground

4. 50 Ω matching network:



$$L_1 = 125 \text{ nH}$$

$$L_2 = 60 \text{ nH}$$

$$C_1 = 27 \text{ pF.}$$

$$*) L_3 \approx 85 \pm 5 \text{ nH. } L_3 C_1 \approx \sqrt{2 \pi f_1}, \quad f_1 = 94,3 \pm 0,3 \text{ MHz}$$

5. 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

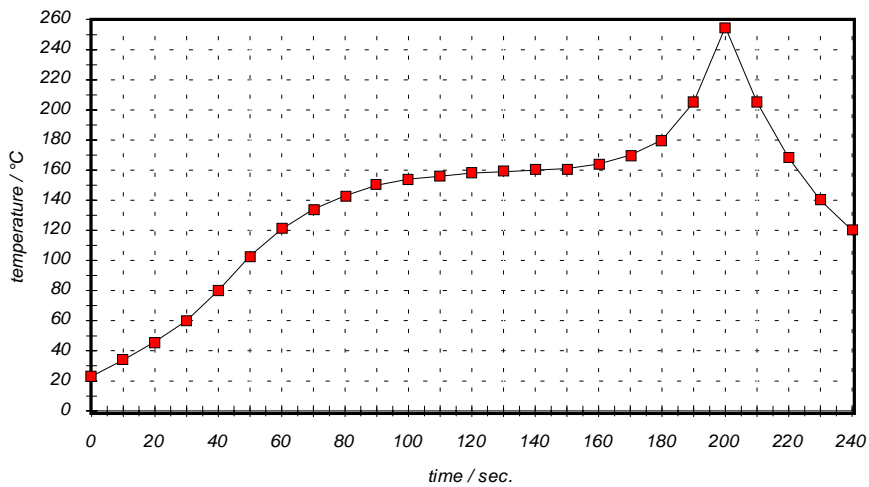


Table for temperature vs. time during the air reflow process

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