

VI TELEFILTER**Filter Specification****TFS 70 R****1/3****1. Measurement condition**

Ambient temperature T_A :	23 °C	
Input power level:	0 dBm.	
Terminating impedances in f_c :	for input: 72,35 Ω	- 38,29 pF.
	for output: 72,35 Ω	- 38,29 pF.

2. Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the **TFS 70R** 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 **40 dB** filter attenuation level relative to the insertion loss a_e . The temperature coefficient of frequency T_c 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	dB	max 25	dB
Reference frequency f_c at ambient temperature (f_{CAT})	70	MHz	70 ± 0,1	MHz
Pass band (PB) :	$f_c - 7,1 \text{ MHz} \dots f_c + 7,1 \text{ MHz}$			
Bandwidth at ambient temperature:				
1,0 dB - band width	14,52	MHz	min. 14,2	MHz
3,0 dB - band width	14,70	MHz	min. 14,6	MHz
20 dB - band width	15,17	MHz		
40 dB - band width	15,37	MHz	max. 15,4	MHz
45 dB - band width	15,40	MHz		
50 dB - band width	15,42	MHz		
Amplitude ripple in pass band (p-p) :	0,7	dB	max 1	dB
Relative attenuation a_{rel}				
f_c	$f_c \pm 7,1$	MHz	0,7	dB
$f_c \pm 7,1$ MHz	$f_c \pm 7,3$	MHz	-	max. 3
$f_c \pm 7,7$ MHz	$f_c \pm 8,3$	MHz	45	dB
$f_c \pm 8,3$ MHz	$f_c \pm 35$	MHz	50...55	dB
$f_c - 65$ MHz	$f_c - 35$	MHz	75...60	dB
$f_c + 35$ MHz	$f_c + 40$	MHz *)	56...60	dB
$f_c + 40$ MHz	$f_c + 50$	MHz	60...65	dB
$f_c + 50$ MHz	$f_c + 65$	MHz	56...60	dB
Average group delay in PB :	3,70	µs	max 4,2	µs
Group delay ripple in PB (p-p) :	135	ns	max 200	ns
Deviation from linear phase in PB :	7,6° p-p...(2° r.m.s.)			
Triple transit attenuation compared to main signal	56	dB		
Crosstalk	57...63	dB		
Temperature coefficient of frequency (T_{c_f})	-87	ppm/K	-94	ppm/K
Frequency deviation of f_c over temperature	$\Delta f_c(\text{Hz}) = T_{c_f}(\text{ppm/K}) \times (T - T_A) \times f_{CAT} \text{ (MHz)}$			
Operating temperature range	- 25 °C ... + 85 °C			
Storage temperature range	- 25 °C ... + 85 °C			

*) in this frequency range the limit line is of type SLOPING LINE

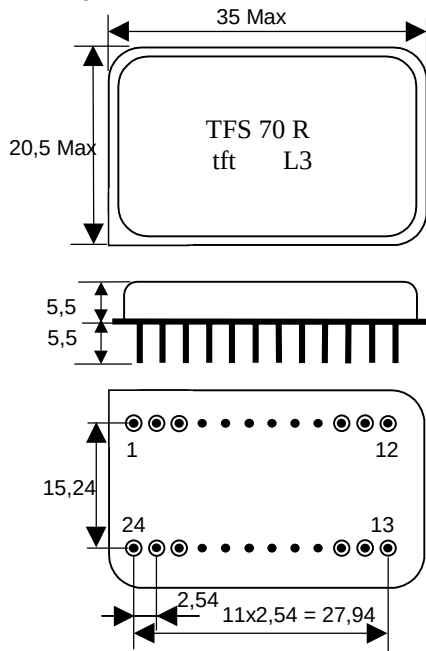
Generated: Wadim P. DunzowChecked/Approved: Dr. Bert Wall

VI TELEFILTER
Potsdamer Straße 18
D 14 513 TELTOW / Germany
Tel: (+49) 3328 4784-52 / Fax: (+49) 3328 4784-30
E-Mail: tft@telefilter.com

Vectron International, Inc.
267 Lowell Road
Hudson, NH 03051 / USA
Tel: (603) 598-0070 Fax: (603) 598-0075
E-Mail: vti@vtinh.com

VI TELEFILTER reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

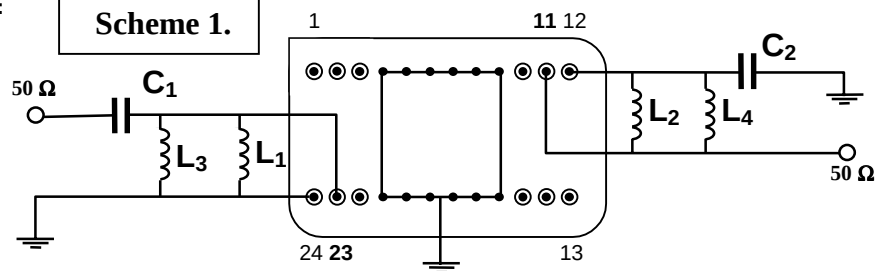
3. Package



Pin 23	Input
Pin 24	Input RF Return
Pin 11	Output
Pin 12	Output RF Return
Pin 4-9, 16-21	Ground
Pin 1-3, 10, 13-15, 22	not connected

4. 50 Ω matching network:

Scheme 1.

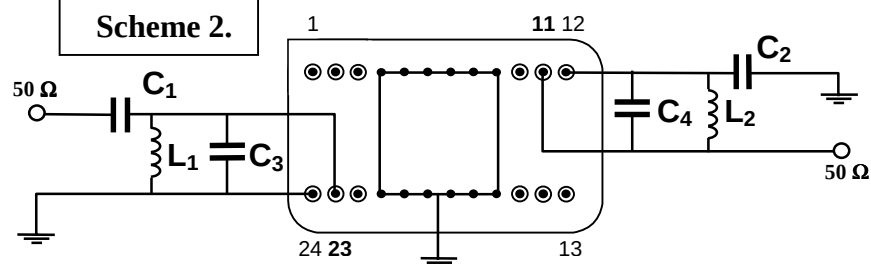


$$C_1 = C_2 = 68 \text{ pF.}$$

$$L_1 = L_2 = 100 \text{ nH.}$$

$$L_3 = L_4 = 680 \text{ nH. (has to be adjusted)}$$

Scheme 2.



$$C_1 = C_2 = 68 \text{ pF.}$$

$$L_1 = L_2 = 82 \text{ nH.}$$

$$C_3 = C_4 = 3,9 \text{ pF. (has to be adjusted)}$$

For final test in production we use matching network 1.

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.	

Air reflow profile

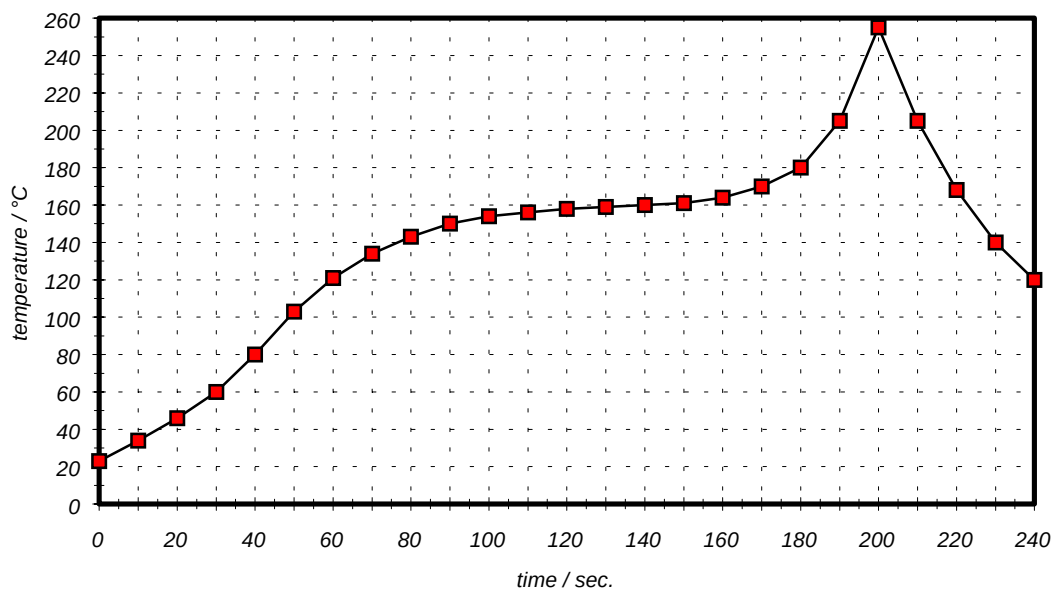


Table for temperature vs. time during the air reflow process

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