VI TELEFILTER **Filter specification** **TFS 70 F - 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: 53 Ω ‖ -40 pF.
for output: 54 Ω ‖ -40 pF.

Package, pin connection and 50 Ω matching network
see page 2.

2. Characteristics

Remark:
Reference level for the relative attenuation a_{rel} of the **TFD 70F** 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 frequence 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 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	22.5	dB	max 25	dB
Reference frequency f_C at ambient temperature (f_{CTA})		70	MHz	70 ± 0.1	MHz
1 dB - band width		12.24	MHz		
3 dB - band width		12.45	MHz		
40 dB - band width		13.23	MHz		
45 dB - band width		13.30	MHz		
Amplitude ripple (p-p): f_C ... f_C ± 6.1 MHz		0.5	dB	max 1.0	dB
Relative attenuation	a_{rel}				
f_C	f_C ± 6.1 MHz		-	max 1	dB
f_C ± 6.1 MHz	f_C ± 6.2 MHz		-	max 3	dB
f_C ± 6.65 MHz	f_C ± 6.7 MHz*)	45	dB	min 40	dB
f_C - 69 MHz	f_C - 6.7 MHz	55	dB	min 45	dB
f_C + 6.7 MHz	f_C + 20 MHz	55	dB	min 45	dB
f_C + 20 MHz	f_C + 35 MHz	45	dB	min 40	dB
Group delay		4.1	µs	max 4.5	µs
Group delay ripple (p-p): f_C ... f_C ± 6.0 MHz		± 50	ns	± max 100	ns
Deviation from linear phase (p-p): f_C ... f_C ± 6.0 MHz		7.5°	(p-p)		
Triple transit attenuation compared to main signal		52	dB		
Input/Output return loss with matching network (S11/S22):		3.6/3.7	dB		
Crosstalk		65	dB		
Substrate material		$LiNbO_3$			
Temperature coefficient of frequency (Tc_f)		-86		-94	ppm/K
Frequency deviation of f_C over temperature		$\Delta f_C(Hz) = Tc_f(ppm/K) \times (T - T_A) \times f_{CTA}(MHz)$			
Operating temperature range		- 25 °C ... + 80 °C			
Storage temperature range		- 40 °C ... + 85 °C			

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

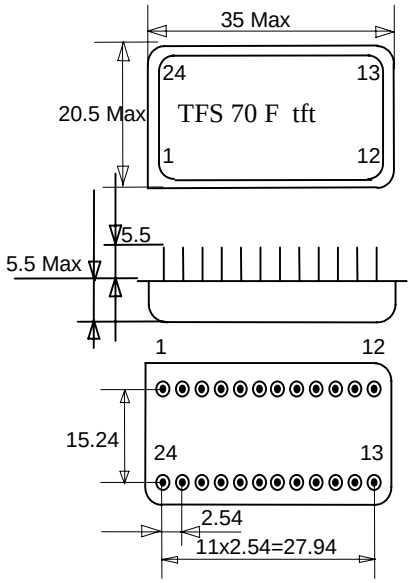
Generated: **Weinberg**

Checked/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

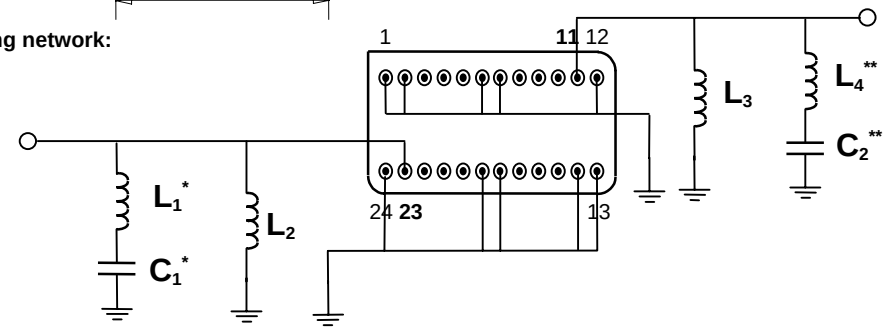
Vectron International, Inc.
267 Lowell Road
Hudson, NH 03051 / USA
Tel: (603) 598-0070 Fax: (603) 598-0075
E-Mail: vti@vtinh.com

3. Package



Pin **23**	**Input**
Pin 24	Input RF Return
Pin **11**	**Output**
Pin 12	Output RF Return
Pin 5-8,17-20	Pakage Ground

4. 50 Ω matching network:



L_2 = 217 ± 5 nH
L_3 = 100 ± 5 nH
*) L_1 = 465 ± 10 nH C_1 = 70 pF.
$1/\sqrt{L_1 C_1} = 2\pi f_1$, f_1 = 28.937 MHz
**) L_4 = 200 ± 10 nH C_2 = 10.6 pF.
$1/\sqrt{L_4 C_2} = 2\pi f_2$, f_2 = 107.375 MHz

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

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

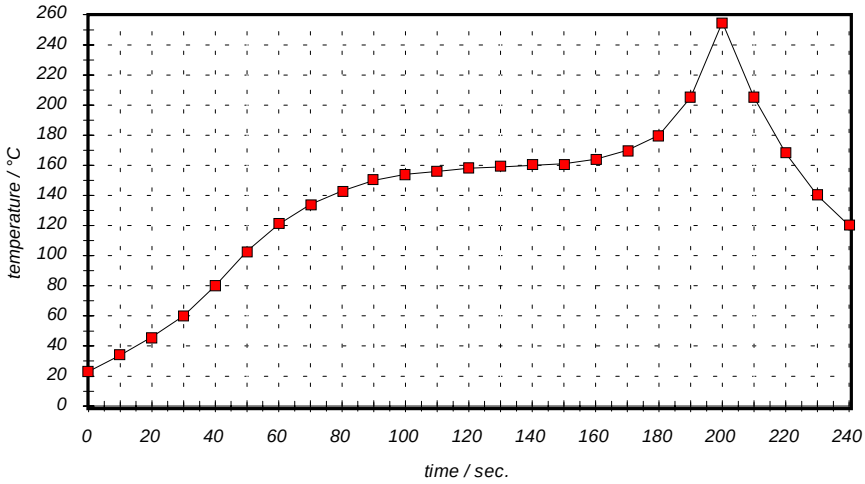


Table for temperature vs. time during the air reflow process

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
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