

**VI TELEFILTER****Filter Specification****TFS 140C - 1/4****1. Measurement condition**

Ambient temperature $T_A$ :	25	°C.
Input power level:	0	dBm.
Terminating impedances in $f_C$ :	for input:	833,5 $\Omega$   - 7,879 pF. (typical value)
	for output:	941,3 $\Omega$   - 8,379 pF. (typical value)
Q-value of matching elements:	30	

**2. Characteristics**

Remark:

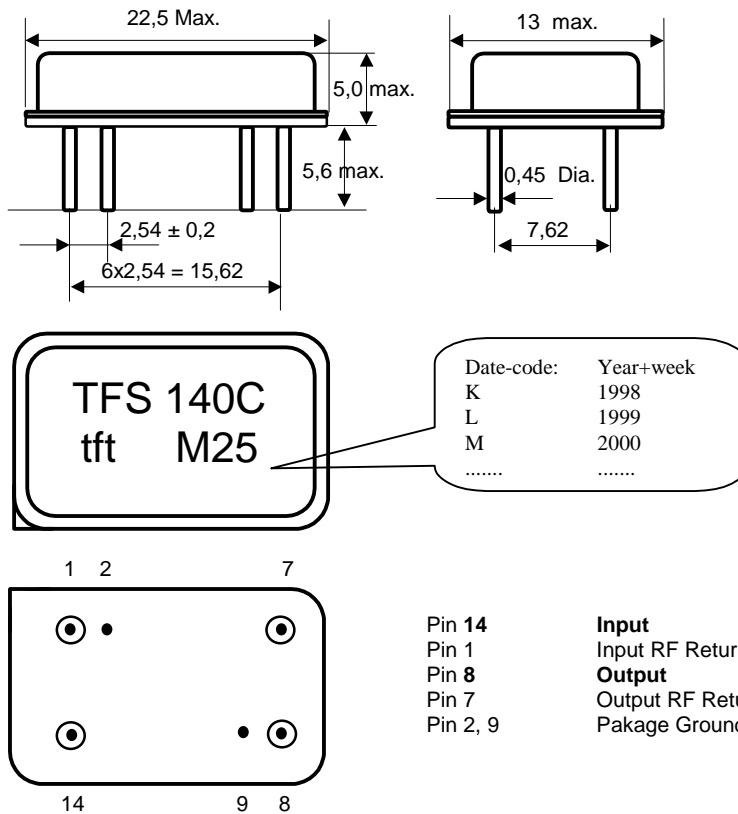
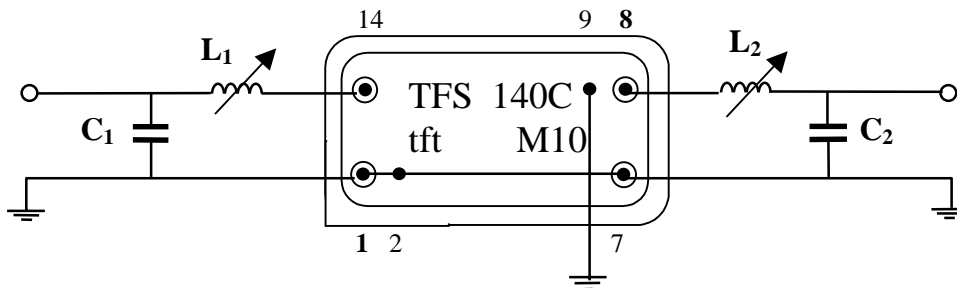
Reference level for the relative attenuation  $a_{rel}$  of the **TFS 140C** is the minimum of the pass band attenuation  $a_{min}$ . The minimum of the pass band attenuation  $a_{min}$  is defined as the insertion loss  $a_e$ . The reference frequency  $f_C$  is the arithmetic mean value of the upper and lower frequencies at the 3 dB filter attenuation level relative to the insertion loss  $a_e$ . The temperature coefficient of frequency  $T_C$  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
<b>Insertion loss</b> (Reference level) $a_e$	21 dB	max. 23 dB
<b>Centre frequency</b> $f_C$ at ambient temperature ( $f_{CTA}$ )	140,01 MHz	140 $\pm$ 0,1MHz
<b>Pass band ( PB ) :</b>	$f_C - 2,35$ MHz ... $f_C + 2,35$ MHz	
<b>Amplitude ripple in PB (p-p):</b>	0,3..0,4 dB	max. 0,7 dB
<b>Bandwidth :</b>	at ambient temperature $T_A$	
0,7 dB - band width	4,73 MHz	min. 4,7 MHz
3 dB - band width	5,23 MHz	min. 5,0 MHz
20 dB - band width	6,29 MHz	
40 dB - band width	6,80 MHz	max. 7,0 MHz
45 dB - band width	6,88 MHz	max. 9,0 MHz
<b>Relative attenuation</b> $a_{rel}$		
$f_C \pm 2,35$ MHz ..... $f_C \pm 2,50$ MHz	-	max. 0,7 dB
$f_C \pm 3,50$ MHz ..... $f_C \pm 4,50$ MHz	48 dB	max. 3 dB
$f_C - 135$ MHz ..... $f_C - 4,50$ MHz	70...55 dB	min. 40 dB
$f_C + 4,50$ MHz ..... $f_C + 400$ MHz	55...70 dB	min. 45 dB
<b>Group delay ( mean value in PB ):</b>	2,14 $\mu$ s	max. 2,2 $\mu$ s
<b>Group delay ripple in PB (p-p):</b>	60...80 ns	max. 120 ns
<b>Deviation from linear phase in</b> $f_C \dots f_C \pm 2,5$ MHz	5 ° (r.m.s. 1,3 °)	
<b>Triple transit attenuation compared to main signal</b>	44..47 dB	
<b>Crosstalk</b>	60...65 dB	
<b>Substrate material</b>	Quartz	
<b>Frequency inversion temperature ( <math>T_o</math> ):</b>	20 °C.	
<b>Temperature coefficient of frequency ( <math>T_C</math> ):</b>	-0.036 ppm/K <sup>2</sup>	
<b>Frequency deviation of <math>f_C</math> over temperature :</b>	$\Delta f_C(\text{Hz}) = T_C(\text{ppm/K}) \times (T - T_o)^2 \times f_{CTA} (\text{MHz})$	
<b>Operating temperature range</b>	- 25 °C ... + 80 °C	
<b>Storage temperature range</b>	- 40 °C ... + 85 °C	

\*)  $f_o = f_{T_o}$  is reference frequency  $f_C$  at frequency inversion temperature ( $T_o$ )**Generated:****Wadim Dunzow****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**

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## 3. Package :

4. 50  $\Omega$  matching network:

**Remark:**  $L_1$ ,  $L_2$  have to be adjusted (refer to Application Note TFS 140C).

## 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.	

## Air reflow profile

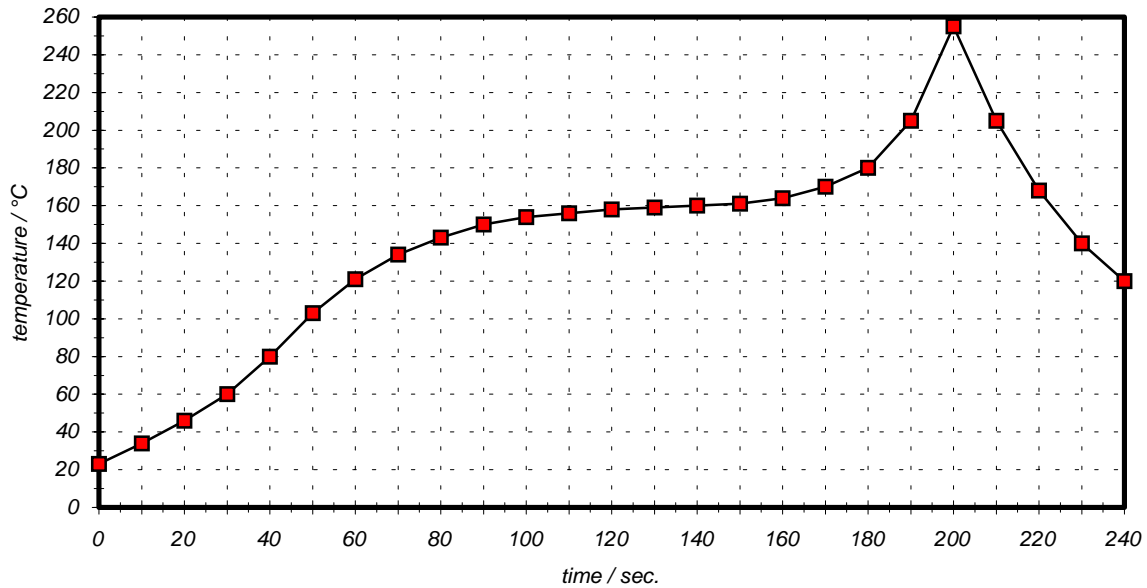


Table for temperature vs. time during the air reflow process

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 140C - 4/4**

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**History**

<b>Version</b>	<b>Reason of changes</b>	<b>Name</b>	<b>Date</b>
3.1	Correct <b>Amplitude ripple</b> information.	Dunzow W.	04.07.2000.

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