

**VI TELEFILTER****Filter specification****TFS 70H17****1/5****1. Measurement condition :**

Ambient temperature  $T_A$ : 25 °C.  
 Input power level: 0 dBm.  
 Terminating impedances in  $f_C$ :  
 for input: 50  $\Omega$  | 0 pF.  
 for output: 50  $\Omega$  | 0 pF.

**2. Characteristics :**

Remark: Reference level for the relative attenuation  $a_{rel}$  of the **TFS 70H17** 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  $T_{Cf}$  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
<b>Insertion loss (Reference level) <math>a_e</math></b>	25,5 dB	max. 26 dB
<b>Centre frequency <math>f_C</math> at ambient temperature (<math>f_{CTA}</math>)</b>	70,0 MHz	70,0 $\pm$ 0,10 MHz
<b>Pass band ( PB ) :</b>		$f_C \dots f_C \pm$ 5,0 MHz
<b>Amplitude ripple in : <math>f_C - 4,5</math> MHz ... <math>f_C + 4,5</math> MHz</b>	0,7 dB	max. 1 dB
<b>Bandwidth ( BW ) :</b> at ambient temperature $T_A$		
1 dB	9,99 MHz	min. 9,0 MHz
3 dB	10,35 MHz	min. 10,0 MHz
20 dB	11,31 MHz	
40 dB	11,78 MHz	max. 12 MHz
50 dB	11,93 MHz	
<b>Relative attenuation <math>a_{rel}</math></b>		
$f_C \dots f_C \pm 4,5$ MHz	-	max. 1 dB
$f_C \pm 4,5$ MHz ... $f_C \pm 5,0$ MHz	-	max. 3 dB
$f_C \pm 6$ MHz ... $f_C \pm 7$ MHz	50 dB	min. 40 dB
$f_C \pm 7$ MHz ... $f_C \pm 14$ MHz	55 dB	min. 48 dB
$f_C \pm 14$ MHz ... $f_C \pm 30$ MHz	58 dB	min. 50 dB
<b>Group delay ( mean value in PB ) : 2,09</b>	2,2 $\mu$ s	max. 2,5 $\mu$ s
<b>Group delay ripple in PB (p-p):</b>	50...65 ns	max. 70 ns
<b>Deviation from linear phase in PB :</b>	3,3 ° (r.m.s. 0,7 °)	max. 4 ° p-p
<b>Triple transit attenuation compared to main signal</b>	60 dB	
<b>Crosstalk</b>	70...75 dB	
<b>Temperature coefficient of frequency ( <math>T_{Cf}</math> ) :</b>	-87 ppm/K	
<b>Frequency deviation of <math>f_C</math> over temperature :</b>	$\Delta f_C(\text{Hz}) = T_{Cf}(\text{ppm/K}) \times (T - T_0) \times f_{CTA}(\text{MHz})$	
<b>Operating temperature range</b>		- 25 °C ... + 80 °C
<b>Storage temperature range</b>		- 40 °C ... + 85 °C

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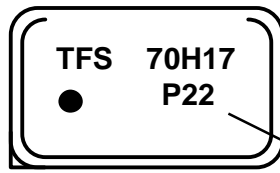
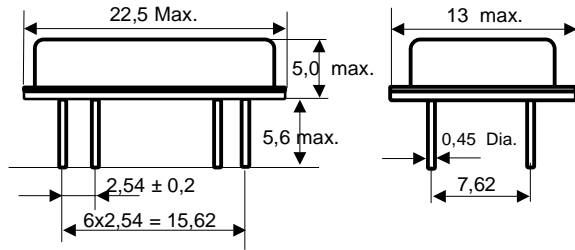
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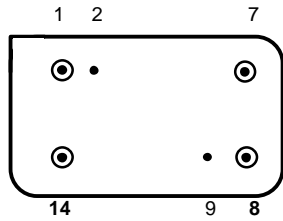
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**3. Construction and pin connection** ( all dimensions in mm)



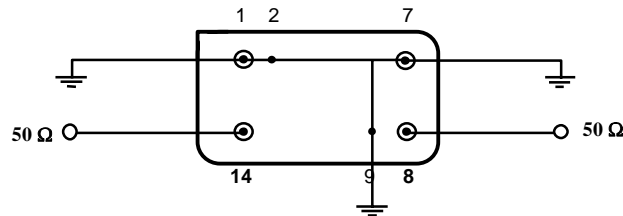
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 N 2001  
 P 2002  
 ... ..

Date-code



Pin 14 **Input**  
 Pin 1 Input RF Return  
 Pin 8 **Output**  
 Pin 7 Output RF Return  
 Pin 2, 9 Package Ground

**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

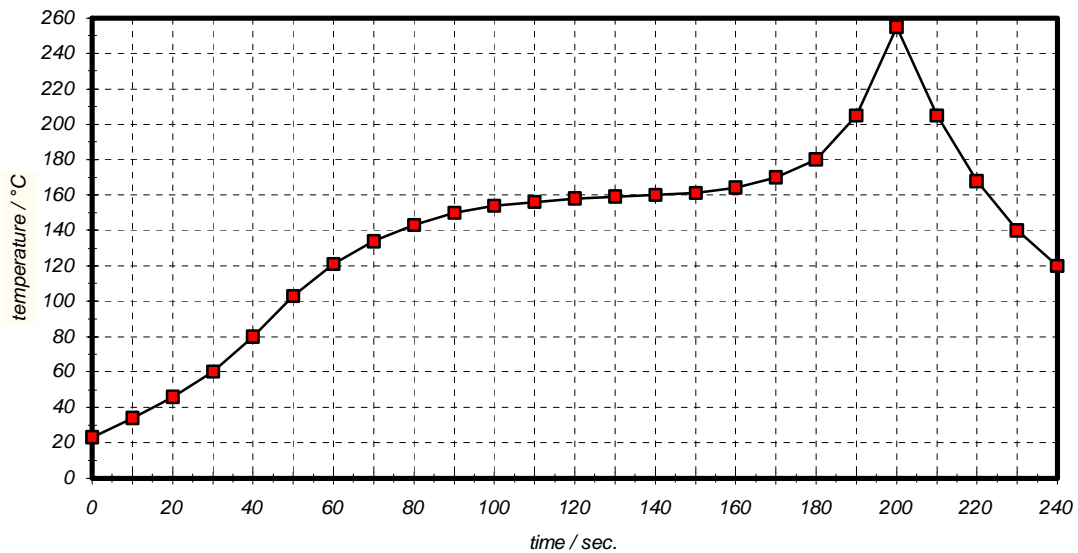


Table for temperature vs. time during the air reflow process

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

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**7. History :**

<b>Version</b>	<b>Reason of changes</b>	<b>Name</b>	<b>Date</b>
1.0	Generate filter specification.	Steiner.	20.02.2002

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