1. Measurement condition :

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

2. Characteristics :

Remark:
Reference level for the relative attenuation a_{rel} of the **TFS 70H13** 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	22,7	dB	max. 24		dB
Centre frequency at ambient temperature (f_{CTA})	f_C	70,0	MHz	70,0 ± 0,1		MHz
Pass band :	**PB**			f_C ... f_C ± 4,0		MHz
Amplitude ripple in : f_C ... f_C ± 3,6 MHz		0,45	dB	max. 0,8		dB
Bandwidth at ambient temperature T_A:	**BW**					
1 dB		7,83	MHz	min. 7,6		MHz
3 dB		8,39	MHz	min. 8,0		MHz
5 dB		8,70	MHz			
10 dB		9,20	MHz			
20 dB		9,78	MHz			
30 dB		10,16	MHz			
40 dB		10,43	MHz	max. 10,6		MHz
50 dB		10,62	MHz			
Relative attenuation	a_{rel}					
f_C ... f_C ± 3,6 MHz		-		max. 0,8		dB
f_C ± 3,6 MHz ... f_C ± 3,8 MHz		-		max. 1		dB
f_C ± 3,8 MHz ... f_C ± 4,0 MHz		-		max. 3		dB
f_C ± 5,3 MHz ... f_C ± 6 MHz		45	dB	min. 40		dB
f_C ± 6 MHz ... f_C ± 15 MHz		50	dB	min. 45		dB
f_C ± 15 MHz ... f_C ± 50 MHz		55...60	dB	min. 50		dB
Group delay (mean value in PB): -		1,83	µs	max. 2,5		µs
Group delay ripple in PB (p-p):		40	ns	max. 60		ns
Deviation from linear phase in PB :		2,4	deg	max. 4		deg
Triple transit attenuation compared to main signal		54	dB			
Crosstalk		60	dB			
Temperature coefficient of frequency (Tc_f) :		-87	ppm/K			
Frequency deviation of f_C over temperature :		Δf_C(Hz) = Tc_f(ppm/K) x (T - T_o) x f_{CTA} (MHz)				
Operating temperature range				- 25 °C ... + 80 °C		
Storage temperature range				- 40 °C ... + 85 °C		

Generated: **W. Dunzow**

Checked / approved: **Dr. Bert Wall**

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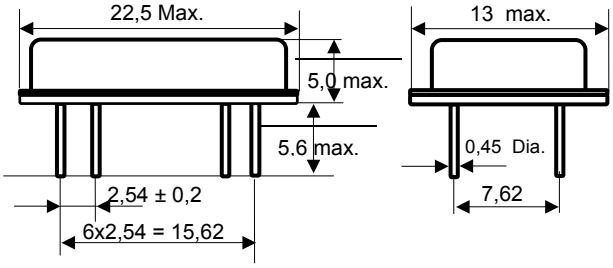
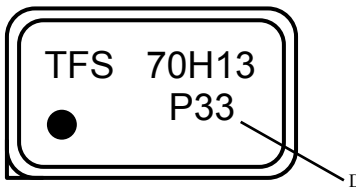
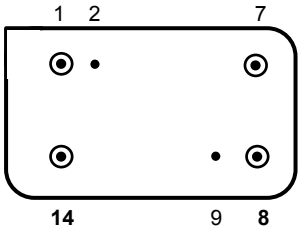
3. Construction and pin connection :

(All dimensions in mm)



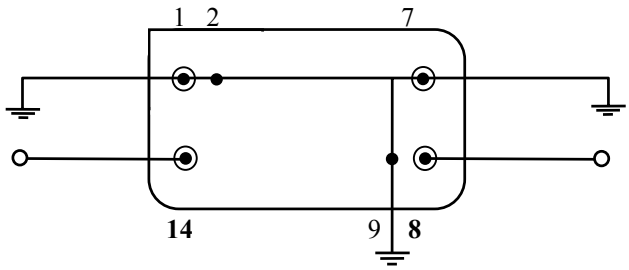


Date-code:	Year+week
M	2000
N	2001
P	2002
...	...



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

4. 50 Ω matching network (please refer to the application note for further details) :



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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;

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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.	

Air reflow profile

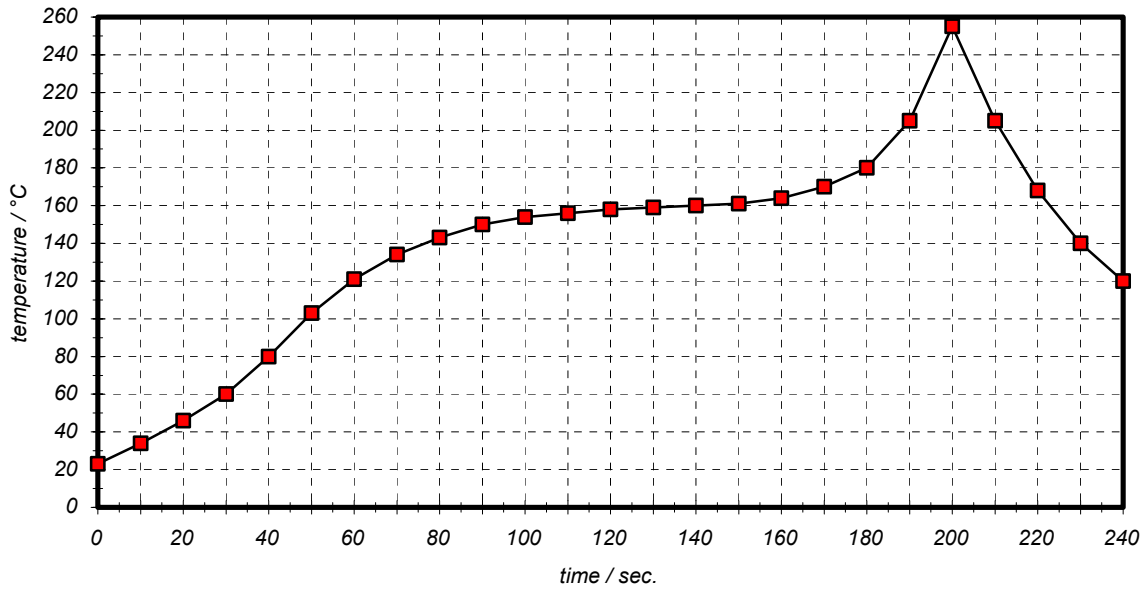

Table for temperature vs. time during the air reflow process

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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History

Version	Reason of changes	Name	Date
1.0	generate preliminary specification .	Dunzow W.	22.11.2001
1.1	generate filter specification.	Dunzow W.	24.06.2002

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