

**VI TELEFILTER****Filter specification****TFS 35 B****1/5****1. Measurement condition :**

Ambient temperature $T_A$ :	25 °C
Input power level:	0 dBm
Terminating impedances in $f_C$ *):	for input: 310 $\Omega$   - 25,7 pF.
	for output: 690 $\Omega$   - 10,1 pF.
Source impedance .	50 $\Omega$ .
Load impedance .	50 $\Omega$ .

**2. Characteristics :**

Remark: Reference level for the relative attenuation  $a_{rel}$  of the **TFS 35B** 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 nominal frequency  $f_N$  is fixed at **35,42 MHz** without tolerance. All specified values are guaranteed in operating temperature range.

<b>D a t a</b>	<b>typ. value</b>	<b>tolerance / limit</b>
<b>Insertion loss (Reference level)</b> $a_e$	14,8 dB	max. 17 dB
<b>Nominal frequency</b> $f_N$	-	35,42 MHz
<b>Centre frequency</b> $f_C$ at ambient temperature ( $f_{CTA}$ )	35,42 MHz	-
<b>Pass band :</b> <b>PB</b>		$f_C \dots f_C \pm 0,80$ MHz
<b>Amplitude ripple in PB (p-p) :</b>	0,6 dB	max. 1,6 dB
<b>Bandwidth :</b> <b>BW</b>		
1 dB	2,01 MHz	min. 1,7 MHz
3 dB	2,44 MHz	-
21 dB	3,32 MHz	max. 3,74 MHz
<b>Relative attenuation in O.T.R. :</b> $a_{rel}$		
34,62 MHz ... 36,22 MHz	0,8 dB	max. 1,6 dB
0,1 MHz ... 7 MHz	55...27 dB	-
7 MHz ... 28 MHz	55...50 dB	min. 35 dB
28 MHz ... 31 MHz	35 dB	min. 30 dB
31 MHz ... 33,5 MHz	40...30 dB	min. 21 dB
37,34 MHz ... 39,84 MHz	27...42 dB	min. 21 dB
39,84 MHz ... 62,42 MHz	45...60 dB	min. 35 dB
62,42 MHz ... 72,42 MHz	36 dB	min. 30 dB
72,42 MHz ... 110,42 MHz	70...80 dB	min. 40 dB
<b>Group delay ( mean value in PB ):</b>	1,4 $\mu$ s	max. 1,7 $\mu$ s
<b>Group delay ripple in PB (p-p) :</b>	200 ns	max. 300 ns
<b>Deviation from linear phase in PB (p-p) :</b>	$\pm 2$ degree	-
<b>Triple transit attenuation compared to main signal</b>	35 dB	
<b>Crosstalk attenuation compared to main signal</b>	50 dB	
<b>Temperature coefficient of frequency ( <math>T_C</math> )</b>	- 20 ppm/K	-
<b>Frequency deviation of <math>f_C</math> over temperature</b>	$\Delta f_C(\text{Hz}) = T_C(\text{ppm/K}) \times (T - T_A) \times f_{CTA}(\text{MHz})$	-
<b>Operating temperature range ( O.T.R. )</b>	-	- 40 °C ... + 85 °C
<b>Storage temperature range</b>	-	- 40 °C ... + 85 °C

\*) The terminating impedances depend on parasitics and q-values of matching elements and the board used, and are to be understood as reference values only. Should there be additional questions do not hesitate to ask for an application note or contact our design team.

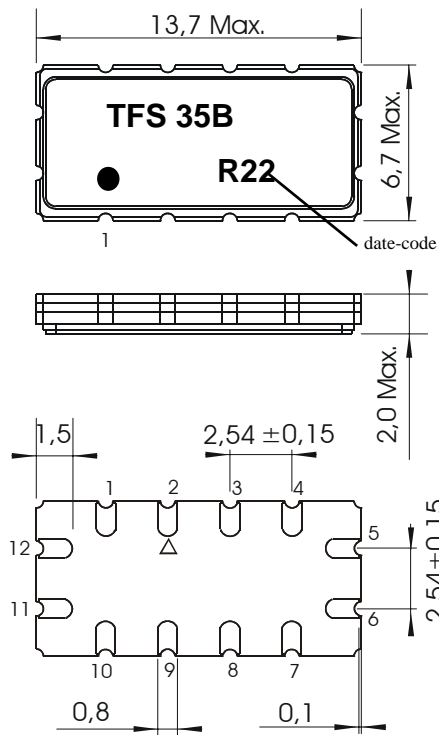
**Generated:** Chilla

**Checked / approved:** Dr. Wall

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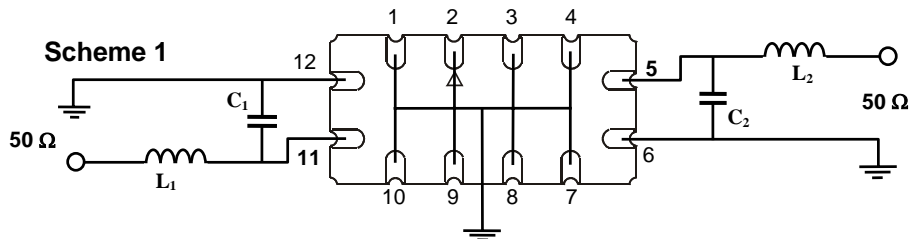
### 3. Package and pin connection : (All dimensions in mm)



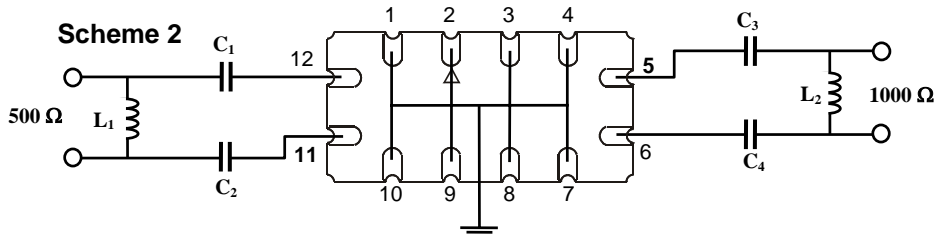
date -code:	year + week
N	2001
P	2002
R	2003
...	...

Pin 11	<b>Input</b>
Pin 12	Input RF Return
Pin 5	<b>Output</b>
Pin 6	Output RF Return
Pin 1-4, 7-10	Package Ground

### 4. 50 Ω matching network ( for details refer to application note ):



#### 4.1 Matching network for 500 Ω x 1000 Ω ( for details refer to application note ):



For final test we use scheme 1.

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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 refer to the attached "Air reflow temperature conditions" on page 4;

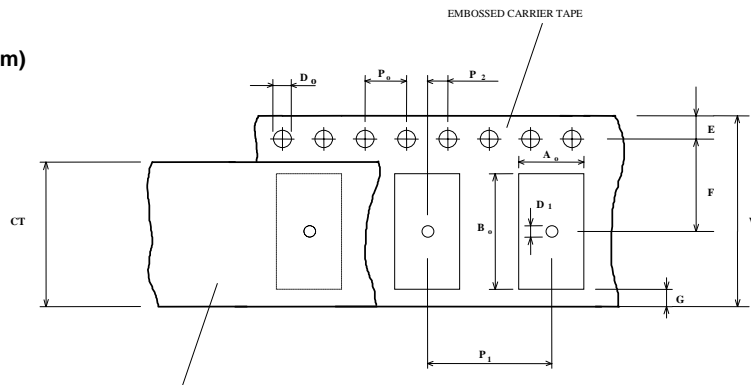
## 6. Packing :

Tape & Reel: DIN IEC 286 - 3, with exception of value for N and minimum bending radius;  
tape type II, embossed carrier tape with top cover tape on the upper side;

max. pieces of filters per reel:	1700
reel of empty components at start:	min 300 mm
reel of empty components at start including leader:	min 500 mm
Trailer	min 300 mm

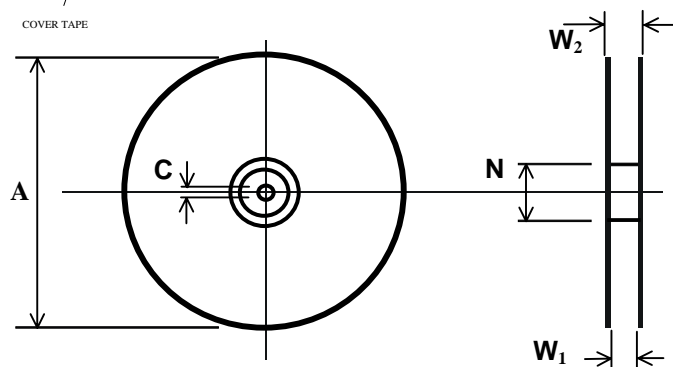
### Tape (all dimensions in mm)

W	: 24± 0,3
Po	: 4 ± 0,1
Do	: 1,5 ± 0,1
E	: 1,75 ± 0,1
F	: 11,5 ± 0,1
G (min)	: 0,6
P2	: 2 ± 0,1
P1	: 12 ± 0,1
D1(min)	: 1,5
Ao	: 7,1 ± 0,2
Bo	: 13,9 ± 0,2
CT	: 21,5 ± 0,1



### Reel (all dimensions in mm):

A	: 330
W1	: 24,4 + 2
W2(max)	: 30,4
N(min)	: 60
C	: 13 +0,5/-0,2



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. Markings on the filters can be read if the upper side of the carrier tape is regarded with the sprocket holes on its right.

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## 7. 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**

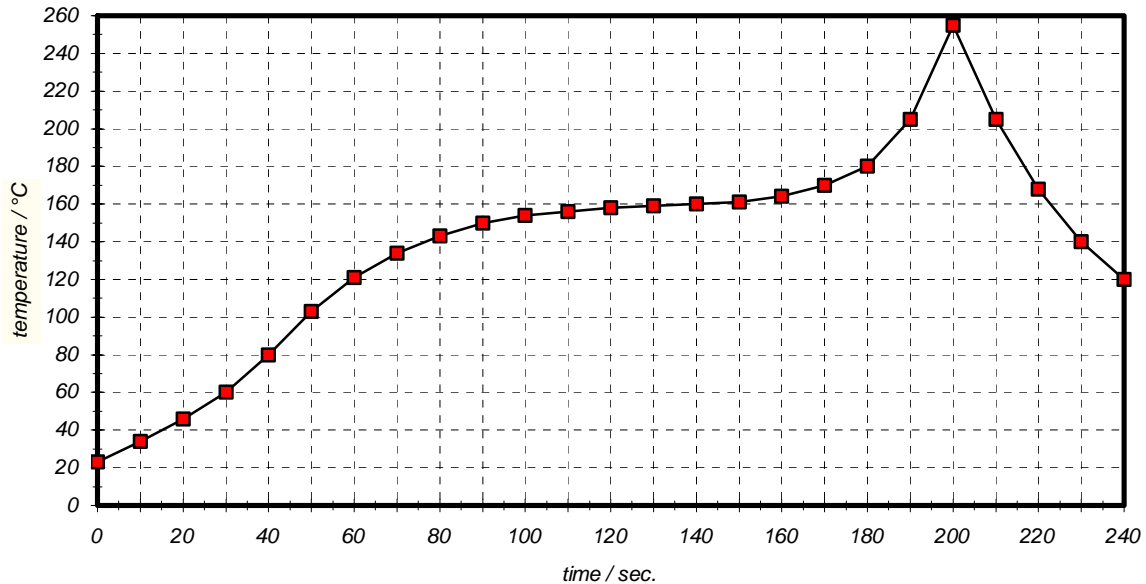


Table for temperature vs. time during the air reflow process

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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**8. History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	- generate specification.	Chilla	10.02.03