

VI TELEFILTER

Filter Specification

TFS 112K - 1/5

1. Measurement condition :

Ambient temperature T_A : 23 °C
 Input power level: 0 dBm.
 Terminating impedances at f_C :
 for input: 565 Ω | - 6,5 pF.
 for output: 650 Ω | - 5,7 pF.
 Q-value of matching elements: 50...70

2. Characteristics :

Remark:

Reference level for the relative attenuation a_{rel} of the TFS 112K is the minimum of the passband attenuation a_{min} . The minimum of the passband 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 30 dB filter attenuation level relative to the insertion loss a_e .

Data		typ. value	tolerance / limit
Insertion loss (Reference level) a_e		13,5 dB	max. 14 dB
Reference frequency f_C (BW(-30 dB))		112,32 MHz	112,320 $\pm$ 0,035 MHz
Bandwidth at ambient temperature:			
3 dB bandwidth		1,05 MHz	-
10 dB bandwidth		1,72 MHz	-
20 dB bandwidth		2,17 MHz	-
30 dB bandwidth		2,45 MHz	-
40 dB bandwidth		2,66 MHz	-
Relative attenuation a_{rel}			
f_C	$f_C \pm 0,475$ MHz	0,475 MHz	max. 3 dB
$f_C \pm 0,475$ MHz	$f_C \pm 0,815$ MHz	0,815 MHz	max. 10 dB
$f_C \pm 1,175$ MHz	$f_C \pm 1,300$ MHz	1,300 MHz	min. 20 dB
$f_C \pm 1,300$ MHz	$f_C \pm 1,475$ MHz	1,475 MHz	min. 30 dB
$f_C \pm 1,475$ MHz	$f_C \pm 5,0$ MHz	5,0 MHz	min. 40 dB
$f_C + 5,0$ MHz	$f_C + 12,5$ MHz	12,5 MHz	min. 35 dB
$f_C + 12,5$ MHz	$f_C + 20$ MHz	20 MHz	min. 40 dB
$f_C - 20$ MHz	$f_C - 5,5$ MHz	5,5 MHz	min. 40 dB
Average group delay in $f_C \dots f_C \pm 800$ kHz :		1,35 μ s	
Group delay ripple in $f_C \dots f_C \pm 800$ kHz :		150 ns	max. 300 ns
Frequency inversion temperature (T_o)		20 °C	
Temperature coefficient ($Tc1_f$) 1st order *)		0 ppm/K	max. $\pm 7,5$ ppm/K
Temperature coefficient ($Tc2_f$) 2nd order **)		- 0,036 ppm/K ²	-
Operating temperature range			- 20 °C ... + 85 °C
Storage temperature range			- 25 °C ... + 90 °C
Input power level		-	max. 10 dBm
Permissible DC voltage V_{DC}		-	12 V
Permissible AC voltage V_{pp}		-	10 V

*) $\Delta f_C(\text{Hz}) = Tc1_f(\text{ppm/K}) \times (T - T_o) \times f_{r0}(\text{MHz})$

**) $\Delta f_C(\text{Hz}) = Tc2_f(\text{ppm/K}^2) \times (T - T_o)^2 \times f_{r0}(\text{MHz})$

f_{r0} is reference frequency f_C at frequency inversion temperature (T_o)

Generated:

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Checked/Approved:

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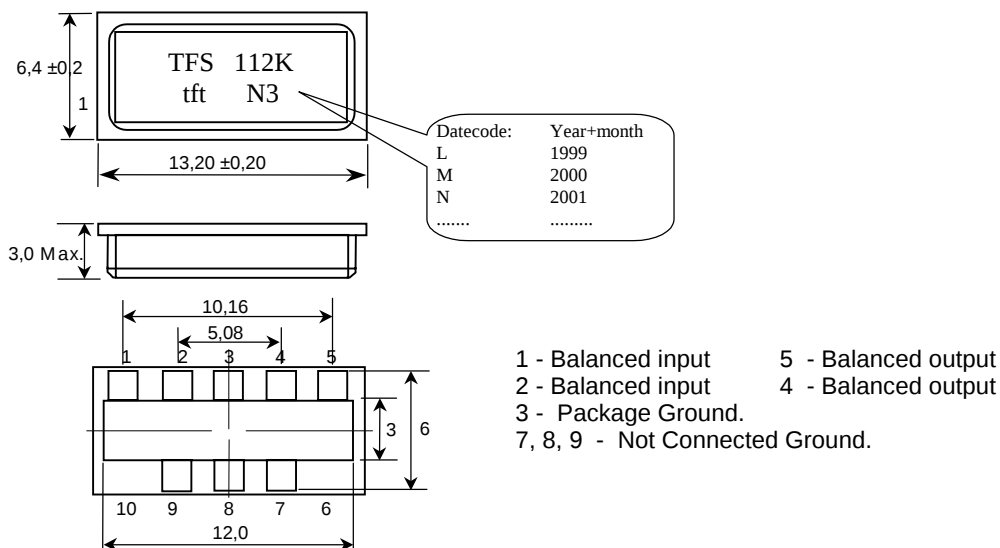
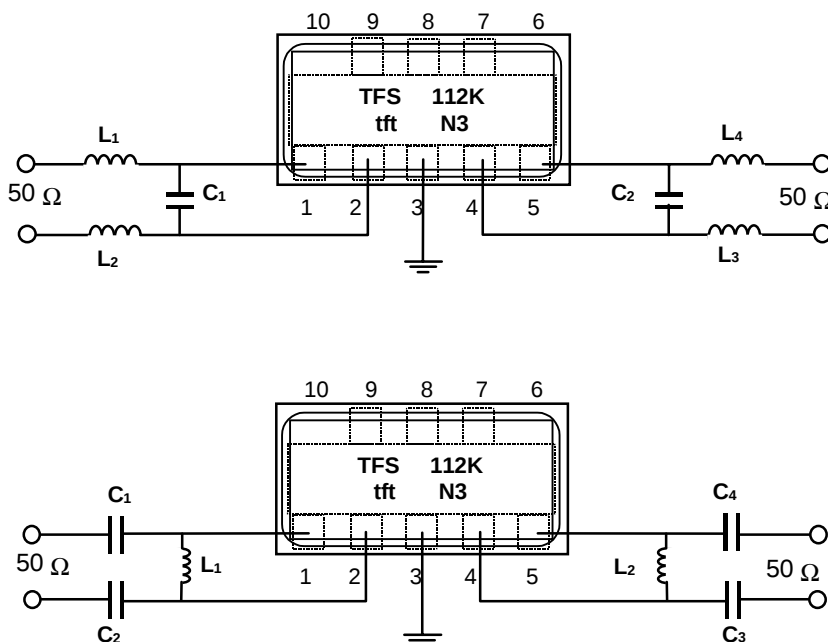
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VI TELEFILTER**Filter Specification****TFS 112K - 2/5****3. Package and pin connection :** (All dimensions in mm)**4. 50 Ω - matching network (Principal scheme) :**

About matching element values and unbalanced Scheme see Application Note.

VI TELEFILTER**Filter Specification****TFS 112K - 3/5****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. Resistance to solder heat (reflow): max. 2 times reflow process;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

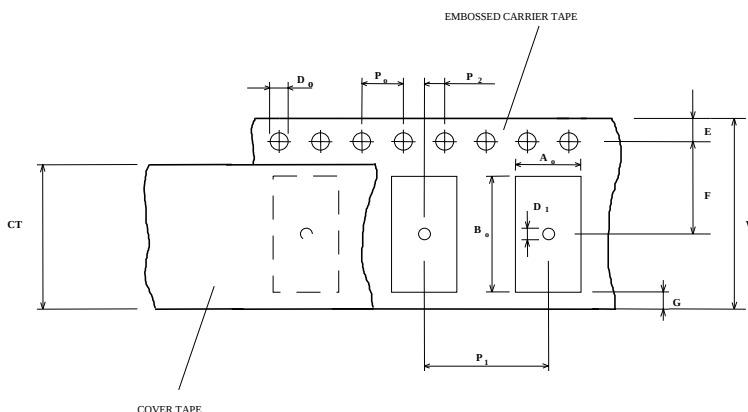
6. Packing :

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;

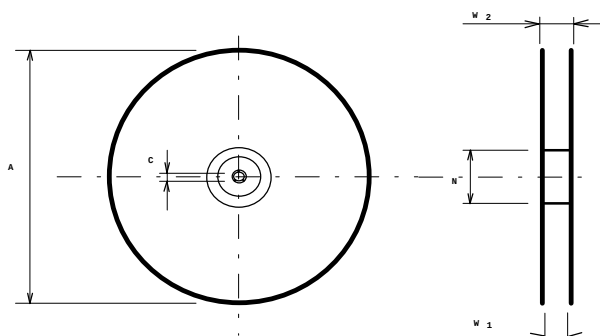
max. pieces of filters per reel: 1700
 Reel of empty components at start: min 300 mm
 Reel of empty components at start including leader: min 500 mm
 Trailer min 300 mm

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. The marking of the filters is able to read if the view is directed on the upper side of the carrier tape with the sprocket holes on the right side of the tape.

VI TELEFILTER**Filter Specification****TFS 112K - 4/5****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.	

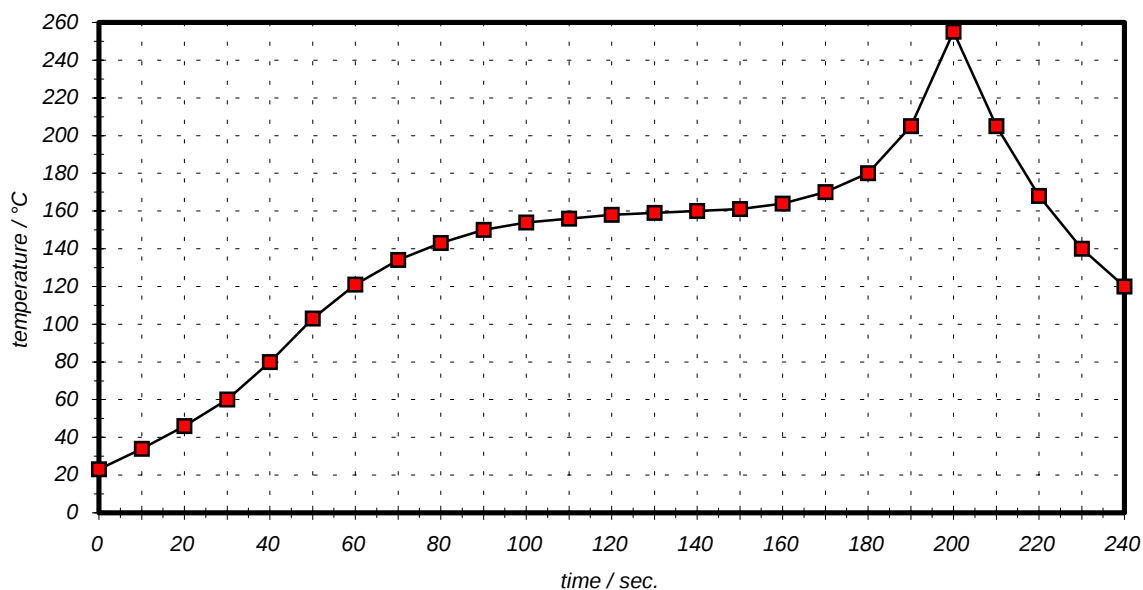
Air reflow profile

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

VI TELEFILTER**Filter Specification****TFS 112K - 5/5**

8. History :

Version	Reason of Changes	Name	Date
1.0	Generate filter specification according to customer requirements.	Dunzow W.	03.01.2000
1.1	Format correctionn.	Dunzow W.	12.02.2001