

Filename: tfs140X.doc

version 1.2

24.11.2003

VI TELEFILTER
Filter specification
TFS 140X
1/5
Measurement condition

Ambient temperature: 25 °C
 Input power level: 0 ± 2 dBm
 Source and load impedance: 50 Ω
 Terminating impedances *
 Input: 99 Ω || - 28.3 pF
 Output: 103 Ω || - 27.2 pF

Characteristics
Remark:

The reference level for the relative attenuation a_{rel} of TFS140X is the minimum of the pass band attenuation a_{min} . This value is defined as the insertion loss a_0 . The centre 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_0 . The frequency shift of the filter in the operating temperature range is not included in the production tolerance scheme

Data

		typ. value		limit		
Insertion loss	$a_0 = a_{min}$	9	dB	max.	12	dB
Nominal frequency	f_N	140	MHz		140,0	MHz
Centre frequency f_C	(at ambient temperature)				139,60 ... 140,40	MHz
Pass band	PB			f_N	± 7,1	MHz
Amplitude ripple	(peak to adjacent valley) within $f_N \pm 7,2$ MHz	0.2		max.	1	dB
Bandwidth						
1	dB	17,6	MHz	min.	17	MHz
3	dB	18,5	MHz	min.	17,75	MHz
35	dB	21,8	MHz	max.	24	MHz
40	dB	24,8	MHz	max.	48	MHz
Relative attenuation	a_{rel}					
$f_N \dots$	$f_N \pm 8,5$ MHz	0,5	dB	max.	1	dB
$f_N \pm 8,5$ MHz ...	$f_N \pm 8,875$ MHz	1,5	dB	max.	3	dB
$f_N \pm 12$ MHz ...	$f_N \pm 24$ MHz	40	dB	min.	35	dB
$f_N \pm 24$ MHz ...	$f_N \pm 40$ MHz	50	dB	min.	40	dB
Phase variation	within PB	6	deg	max.	10	deg p-p
Group delay ripple	within PB	44	ns	max.	60	ns
Absolute group delay	within PB	777	ns	max.	825	ns
Input power level				max.	+ 10	dBm
Operable temperature range					- 40 °C ... + 85 °C	
Storage temperature range					- 40 °C ... + 85 °C	
Temperature coefficient of frequency	TCf	-87	ppm/K			

*) 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:

Checked / approved:

Tele Filter GmbH

Potsdamer Straße 18

D 14 513 Teltow / Germany

Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30

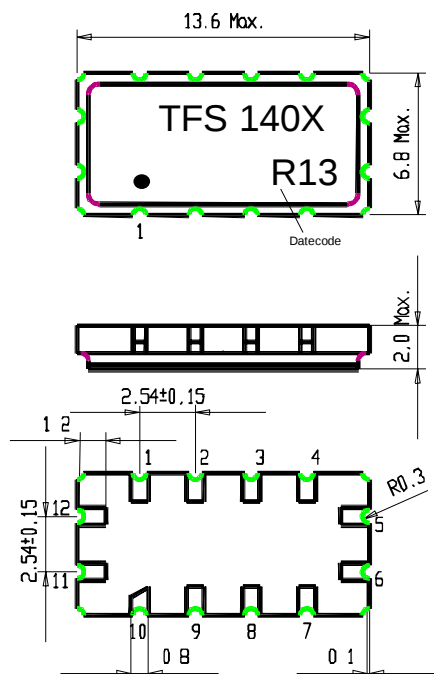
 E-Mail: tft@telefilter.com

VI TELEFILTER reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.



VI TELEFILTER**Filter specification****TFS 140X****2/5****Construction and pin connection**

(All dimensions in mm)



1	Ground
2	Ground
3	Ground
4	Ground
5	Output
6	Output RF Return
7	Ground
8	Ground
9	Ground
10	Ground
11	Input
12	Input RF Return

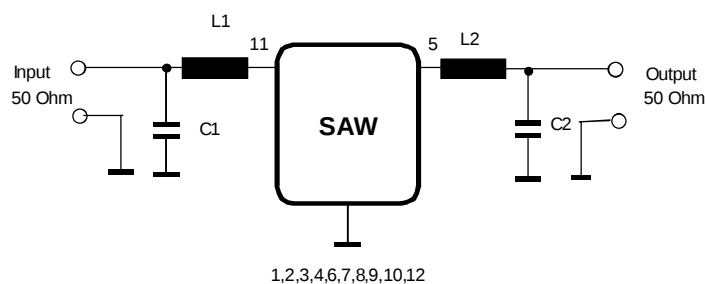
Date code: Year+week

N 2001

P 2002

R 2003

.....

50 Ω test circuit

VI TELEFILTER**Filter specification****TFS 140X****3/5****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;

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:
reel of empty components at start:
reel of empty components at start including leader:
trailer

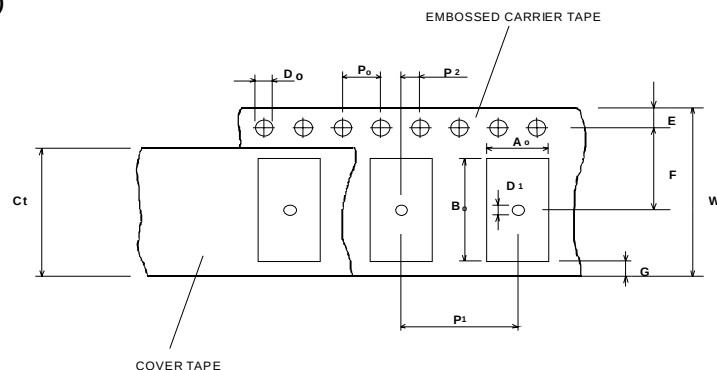
1700
min 300 mm
min 500 mm

min 300

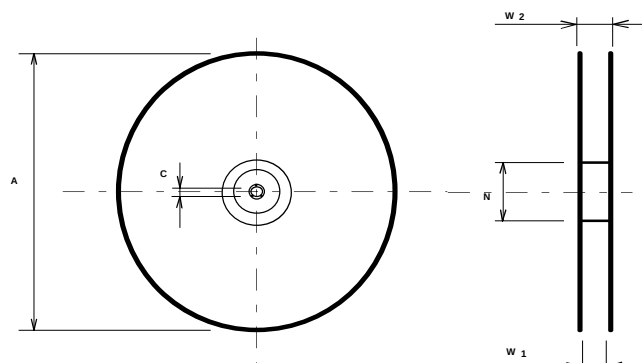
mm

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)	: 0,60	
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	: 24,40 +2,0
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.

Tele Filter GmbH**Potsdamer Straße 18****D 14 513 Teltow / Germany****Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30****E-Mail: tft@telefilter.com**

VI TELEFILTER reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

VI TELEFILTER**Filter specification****TFS 140X****4/5****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.	

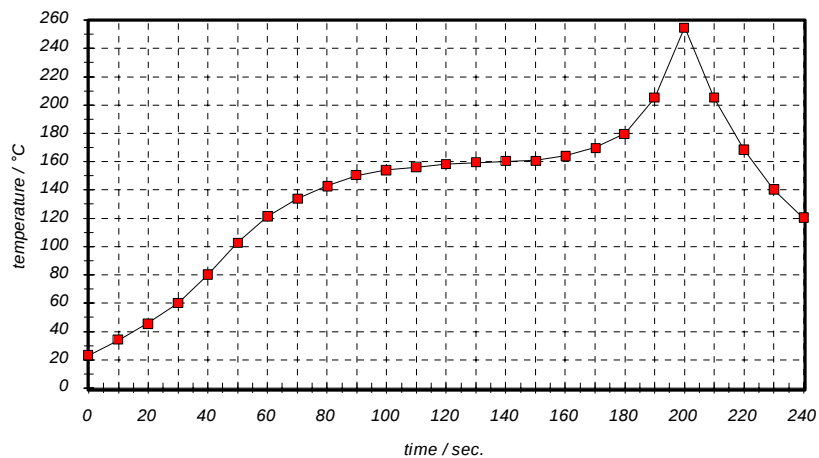
Chip-mount air reflow profile

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

VI TELEFILTER**Filter specification****TFS 140X****5/5****History**

Version	Reason of Changes	Name	Date
1.0	generation of specification according to customer requirements	E. Chilla	28.04.2003
1.1	group delay ripple changed absolute group delay added	E. Chilla	21.04.2003
1.2	changed to filter specification terminating impedances added typical values added pass band added bandwidth for 1 dB, 3 dB, 35 dB changed relative attenuation changed	E. Chilla	24.11.2003