Measurement condition

Ambient temperature: 23 °C
Input power level : 0 dBm
Terminating impedances at fc *: for input: 930 Ω || - 13,5 pF
for output: 940 Ω || - 15,2 pF

Characteristics

Remark:
Reference level for the relative attenuation a_{rel} of the TFS 110 T 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 centre frequency f_c is the arithmetic mean value of the upper and lower frequencies at the 3dB filter attenuation level relative to the insertion loss a_e. The nominal frequency f_N is fixed on 110.592 MHz without tolerance. The given values for the relative attenuation a_{rel} and for the group delay ripple have to be reached at the frequencies given below also if the centre frequency f_c is shifted due to the temperature coefficient of frequency TC_f in the operating temperature range and due to a production tolerance for the centre frequency f_c.

D a t a		typ. value	tolerance / limit
Insertion loss (reference level)	$a_e = a_{min}$	7,5 dB	max. 14,0 dB
Nominal frequency	f_N	-	110,592 MHz
Centre frequency	f_c	110,592 MHz	
Relative attenuation a_{rel}			
f_N ... $f_N \pm$ 0,3 MHz		-	max. 3 dB
$f_N \pm$ 0,6 MHz ... $f_N \pm$ 5 MHz		38 dB	min. 30 dB
Group delay ripple in PB		380 ns	max. 800 nsec
Temperature coefficient		0,032 ppm/K²	
Operating temperature range			- 40 °C ... + 85 °C
Storage temperature range			- 40 °C ... + 85 °C
Input power			max. 10 dBm

*) 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:

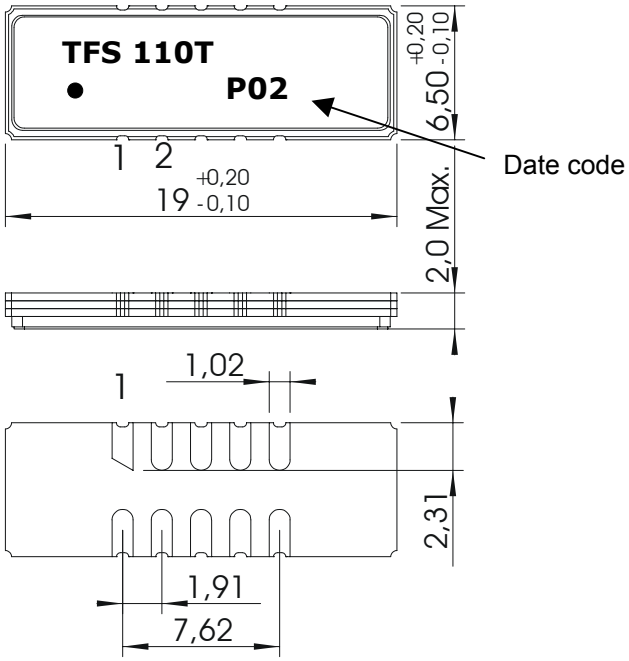
Checked / approved:

Construction and Pin Connection

VI TELEFILTER
Potsdamer Straße 18
D 14 513 TELTOW / Germany
Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30
E-Mail: tft@telefilter.com

Vectron International, Inc.
267 Lowell Road
Hudson, NH 03051 / USA
Tel: (603) 598-0070 Fax: (603) 598-0075
E-Mail: vti@vtinh.com

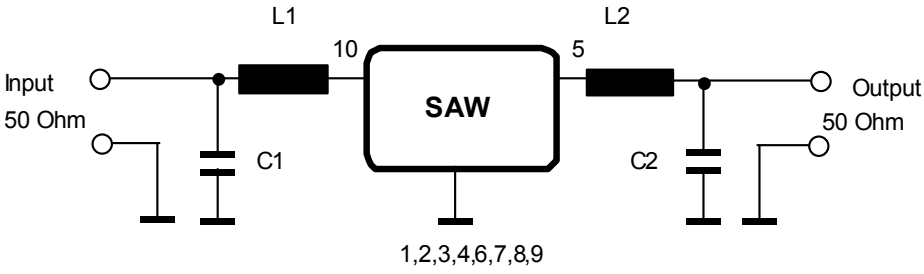
(All dimensions in mm)



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

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

50 Ω test circut



Stability characteristics

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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;

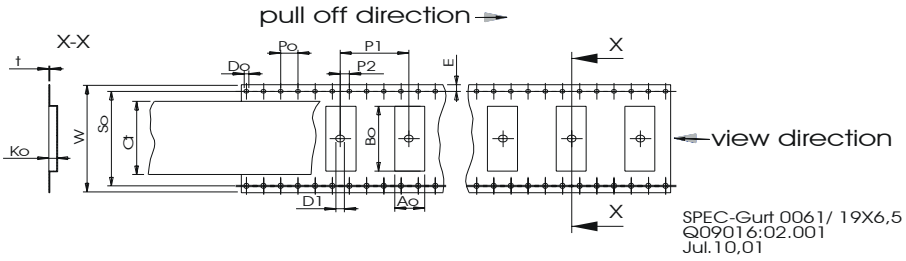
Packing

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:	2000
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)

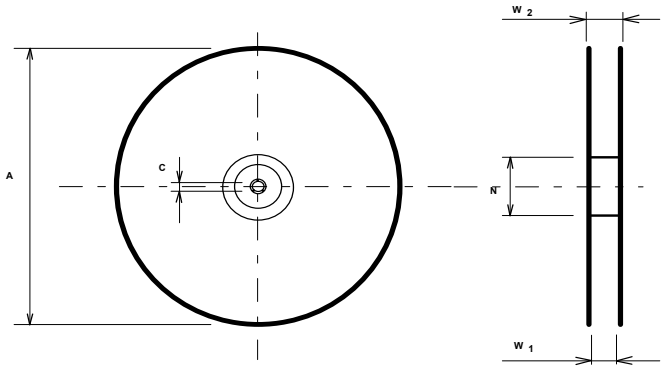
W	:	32 ± 0,3
Po	:	4 ± 0,1
Do	:	1,5 + 0,5
E	:	1,75 ± 0,1
So	:	28,4 ± 0,1
P2	:	2 ± 0,1
P1	:	12 ± 0,1
D1(min)	:	1,5
Ao	:	7,1 ± 0,1
Bo	:	19.6 ± 0,1
Ko	:	2,0 ± 0,1
t	:	0,35 ± 0,05
Ct	:	25,5 ± 0,1



SPEC-Gurt 0061/ 19X6,5
Q09016:02.001
Jul.10,01

Reel (all dimensions in mm):

A	:	330
W1	:	32,4 +2
W2 (max)	:	38,4
N (min)	:	100
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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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

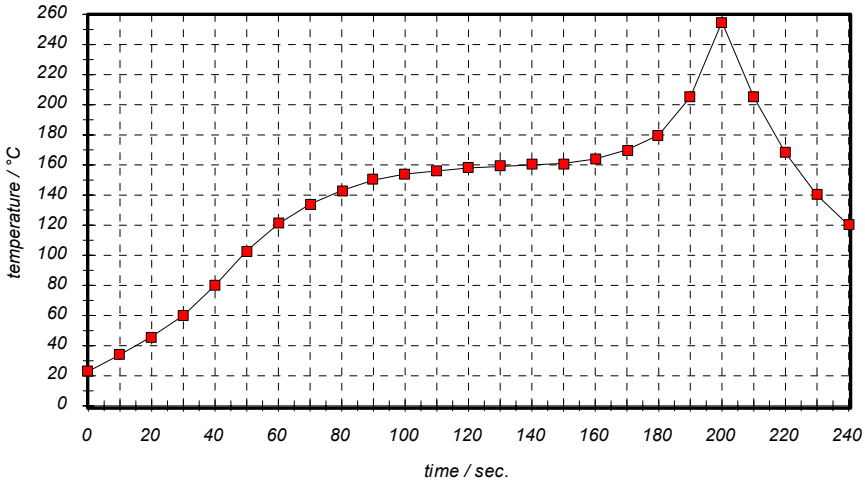

Table for temperature vs. time during the air reflow process

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

History

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Version	Reason of Changes	Name	Date
1.0	- identical with specification from hudson	Sabah	06.01.2000
1.1	- history added	Steiner	13.07.2000
1.2	- Change package to 15mm x 6mm - use harder conditions for “Stability characteristics”	Herrler	17.08.2001
1.3	- change to centre frequency reference for attenuation - add additional attenuation requirements	Steiner	29.08.2001
development specification			
2.0	changes requested by customer introduced - wider passband - 10dB/20dB attenuation demands removed - temperature range corrected according to TFS110B specification - change 30 dB edge frequencies	Steiner	23.11.2001
2.1	- changed values of rejection, group delay, operating temperature - changed package	Pfeiffer	10.01.2002
2.2	- terminating impedance added - typical values added	Pfeiffer	12.03.2002
2.3	- limit of max. input power added	Pfeiffer	13.03.2002

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