

**VI TELEFILTER****Filter specification****TFS 246 K1****1/4****Measurement condition**

Ambient temperature: 23 °C  
 Input power level: 0 dBm  
 Terminating impedance: 450 Ω || -3.4 pF

**Construction and pin connection**

see page 2

**Characteristics****Remark:**

Reference level for the relative attenuation  $a_{rel}$  of the TFS 246 K1 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  $f_0$  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 on 246 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  $f_0$  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  $f_0$ .

<b>Preliminary Data</b>		<b>typ. value</b>		<b>limit</b>	
<b>Insertion loss</b> (Reference level)	$a_e = a_{min}$	6	dB	max 7	dB
<b>Center frequency</b>	$f_0$	246	MHz	-	
<b>Norminal frequency</b>	$f_N$	-		246	MHz
<b>Relative attenuation</b>	$a_{rel}$				
246,0 MHz ± 80	kHz			max 3	dB
246,0 MHz ± 200	kHz ... 246,0 MHz ± 400	12		min 10	dB
246,0 MHz ± 400	kHz ... 246,0 MHz ± 600	30		min 25	dB
246,0 MHz ± 600	kHz ... 246,0 MHz ± 1,6	35	kHz	min 31	dB
246,0 MHz ± 1,6	MHz ... 246,0 MHz ± 3	50	MHz	min 41	dB
246,0 MHz ± 3	MHz ... 246,0 MHz ± 25	55	MHz	min 50	dB
<b>Group delay distortion</b>	GDD				
246,0 MHz ± 50	kHz	0,7	µs	max 1,2	µs
246,0 MHz ± 75	kHz	1,1	µs	max 2,5	µs
<b>Operating temperature range</b>		- 20 °C ... + 85 °C			
<b>Temperature coefficient of frequency</b>	TC	ca. - 0,036 ppm/K <sup>2</sup>			
<b>Frequency inversion temperature</b>		+ 20 ... + 30 °C			

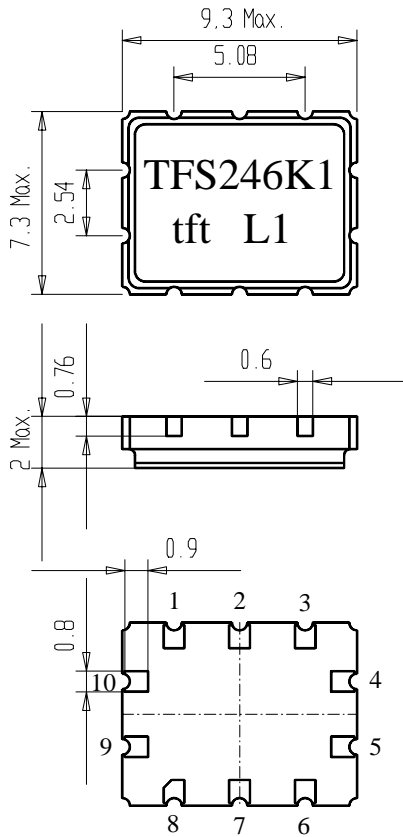
**Generated:****Checked / approved:**

**VI TELEFILTER**  
 Potsdamer Straße 18  
 D 14 513 TELTOW / Germany  
 Tel: (+49) 3328 4784-52 / 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

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.

**Construction, pin connection and 50 Ω matching network**



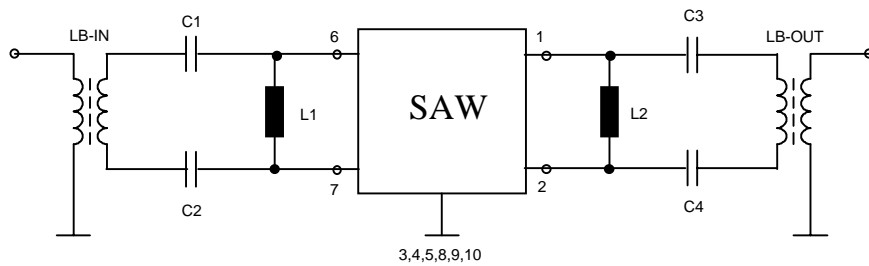
**Pinning - balanced**

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

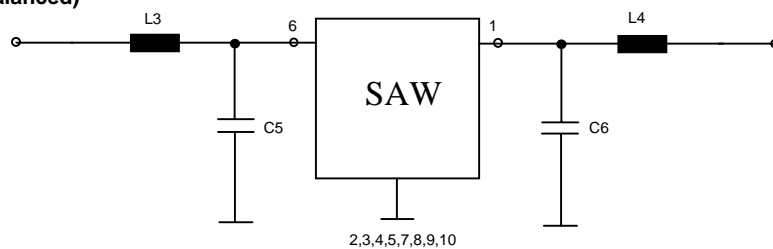
**Pinning - unbalanced**

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

**50 Ω test circuit (balanced)**



**50 Ω test circuit (unbalanced)**



**VI TELEFILTER**  
 Potsdamer Straße 18  
 D 14 513 TELTOW / Germany  
 Tel: (+49) 3328 4784-52 / Fax: (+49) 3328 4784-30  
 E-Mail: [tft@telefilter.com](mailto: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](mailto:vti@vtinh.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.

**Stability characteristics**

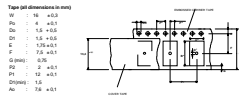
After the following tests the filter shall meet the whole specification:

1. Shock: 30g, 18 ms, half sine wave, 3 shocks each plane;  
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 150 Hz, 0.35 mm amplitude, 5g; 2 hours for 3 planes;  
DIN IEC 68 T2 - 6
3. Damp heat: 90 % to 95 % rel. humidity, 40 °C, 10 days;  
IEC Pub. 68 - 2 - 3
4. Resistance to solder heat (Reflow): 260 °C for 10 sec;

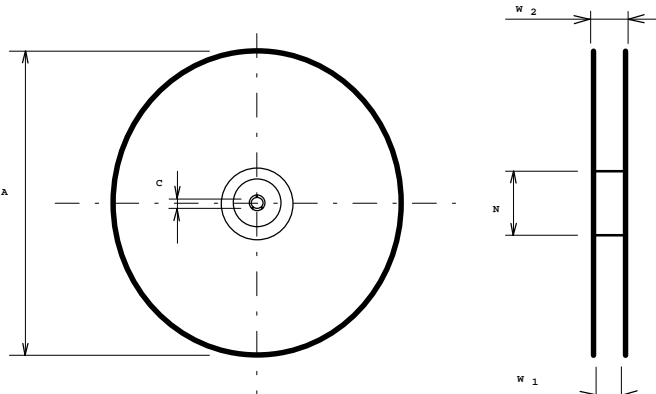
**Packing**

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;

pcs per reel: 2000

**Reel (all dimensions in mm):**

A	:	330
W1	:	16,4 +2
W2 (max)	:	22,4
N (min)	:	>= 90
C	:	13 ± 0,25 <sup>A</sup>



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.

**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.	

**VI TELEFILTER**  
**Potsdamer Straße 18**  
**D 14 513 TELLTOW / Germany**  
**Tel: (+49) 3328 4784-52 / 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**

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.

## Chip-mount air reflow profile

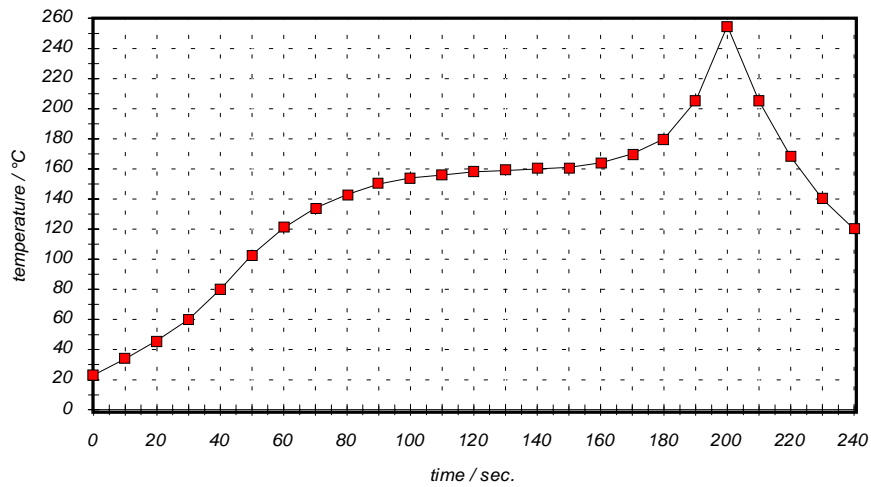


Table for temperature vs. time during the air reflow process

Tolerance of temperatures:  $\pm 5$  °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