

**VI TELEFILTER****Filter specification****TFS 211 B****1/5****Measurement condition**

Ambient temperature: 20 ... 25 °C  
 Input power level: 5 ± 2 dBm  
 terminating impedances  
     Source: 1000 Ω || -6.8 pF  
     Load: 670 Ω || -6.2 pF

**Construction and pin connection**

see page 2

**Characteristics**

Remark:

Reference level for the relative attenuation  $a_{rel}$  of the TFS 211 B 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 3 dB filter attenuation level relative to the insertion loss  $a_e$ . 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>D a t a</b>		<b>typ. value</b>	<b>limit</b>
<b>Insertion loss</b>	$a_e = a_{min}$	6 dB dB	max. 8 dB
<b>Center frequency</b>	$f_C$	-	210,95 ... 211,05 MHz
<b>Relative attenuation</b>	$a_{rel}$		
$f_C - 100$ kHz ... $f_C + 100$ kHz		0,3...0,5 dB	max. 1 dB
$f_C - 400$ kHz ... $f_C + 400$ kHz			max. 3 dB
$f_C \pm 630$ kHz ... $f_C \pm 1,0$ MHz		-	min. 6 dB
$f_C \pm 1,0$ MHz ... $f_C \pm 2,0$ MHz		-	min. 10 dB
$f_C \pm 2,0$ MHz ... $f_C \pm 80$ MHz		-	min. 30 dB
$f_C + 80$ MHz ...	$2,0$ GHz	-	min. 40 dB
<b>Group delay ripple</b> GD			
$f_C - 100$ kHz ... $f_C + 100$ kHz	-	250ns	max. 350 ns
<b>Input power level</b>		-	max. + 10 dBm
<b>Permissible DC voltage</b>		-	max. 10 V
<b>Operating temperature range</b>			-10 °C ... + 85 °C
<b>Storage temperature range</b>			- 30 °C ... + 85 °C
<b>Temperature coefficient</b>	TC	- 0,036 ppm/K <sup>2</sup> 1)	
<b>Frequency inversion temperature</b>	$T_0$	40 °C	-

Note 1) -  $\Delta f$  (Hz) = TC (ppm/K<sup>2</sup>) x (T - T<sub>0</sub>)<sup>2</sup> x F<sub>T0</sub> (MHz)**Generated:** \_\_\_\_\_**Checked / approved:** \_\_\_\_\_

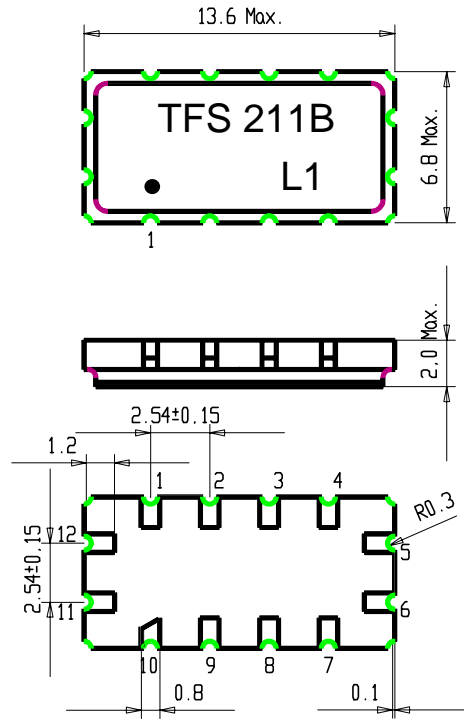
**VI TELEFILTER**  
 Potsdamer Straße 18  
 D 14 513 TELTOW / Germany  
 Tel: (+49) 3328 4784-52 / Fax: (+49) 3328 4784-30  
 E-Mail: tft@telefilter.com

**Vectron International, Inc.**  
 267 Lowell Road  
 Hudson, NH 03051 / USA  
 Tel: (603) 598-0070 Fax: (603) 598-0075  
 E-Mail: vti@vtin.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 and pin connection**

(All dimensions in mm)

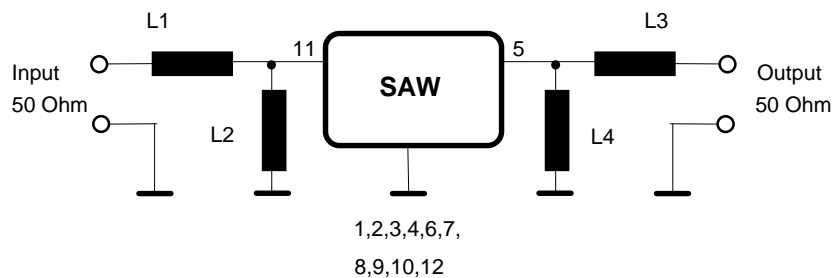


1	Ground
2	Ground
3	Ground
4	Ground
5	Output
6	Output RF Return
7	Ground
8	Ground
9	Ground
10	Ground
11	Input
12	Input RF Return

**50  $\Omega$  test circuit1**

The values of the matching elements which are given below are calculated from the source and load impedance. If the values of the matching elements are not equal to standard values the best standard values are given in brackets. If standard matching elements instead of the exact values are used it can not be guaranteed that the specification will be fulfilled.

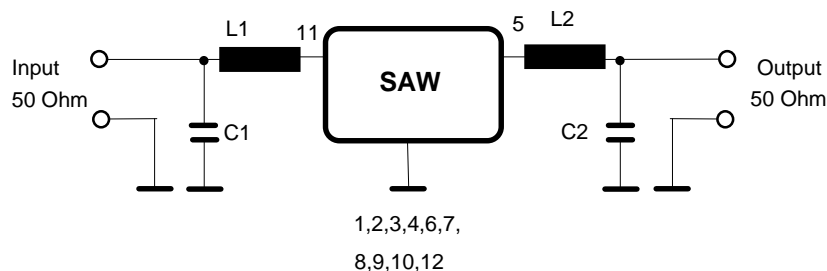
Because these are theoretical values they have to be modified on PCB's corresponding to the existing parasitics.



L1 = 150 nH  
L3 = 140 nH (150 nH)

L2 = 220 nH  
L4 = 220 nH

This circuit is used for all measurements at Telefilter.

**50  $\Omega$  test circuit2**

If this kind of matching circuit is used the filter will also fulfill the specification in passband. But in the stopband at  $f_c + 80\text{MHz} \dots f_c + 2\text{GHz}$  the specification can't be fulfilled without using an additional lowpass. If no lowpass is used the typical attenuation in that area will be about 30 dB.



## Air reflow temperature conditions

1st and 2nd air reflow profile

<b>Name:</b>	pre-heating periods	main-heating periods	peak temperature
<b>Temperature:</b>	150 °C - 170 °C	over 200 °C	255 °C ± 5 °C
<b>Time:</b>	60 sec. - 90 sec.	20 sec. - 25 sec.	

## Chip-mount air reflow profile

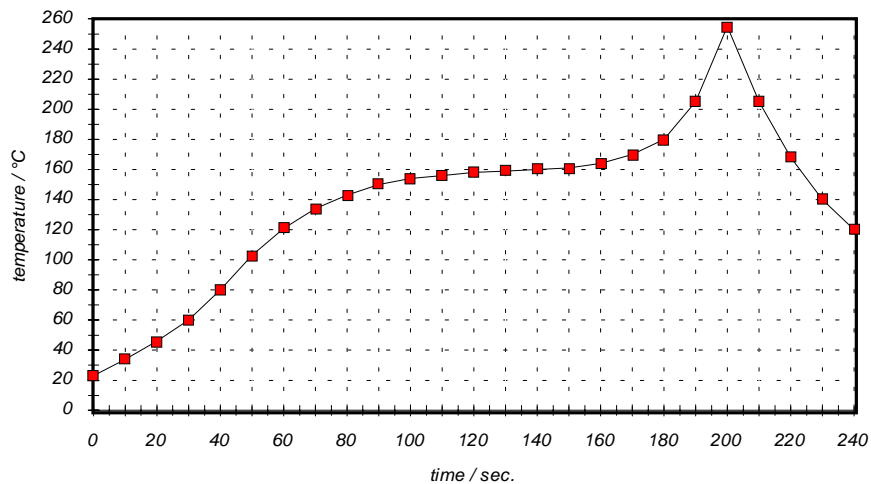


Table for temperature vs. time during the air reflow process

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