

VI TELEFILTER

Filter specification

TFS 211F

1/5

Measurement condition

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	380 Ω -11,5 pF	
Output:	280 Ω -10,6 pF	

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of the TFS 211F 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 temperature coefficient of frequency TC_f is valid for both the reference frequency f_c and the frequency response of the filter in the operating temperature range. The frequency shift of the filter in the operating temperature range is not included in the production tolerance scheme.

D a t a		typ. value		tolerance / limit	
Insertion loss (reference level)	a_e	4,2	dB	max.	6,5 dB
Nominal frequency	f_N	-			211 MHz
Centre frequency at ambient temperature	f_c	211	MHz	± 25	kHz
Passband	PB	-		f_c	± 100 kHz
Bandwidth	BW				
1,5 dB		241	kHz	min.	± 50 kHz
2,0 dB		270	kHz	min.	± 80 kHz
Relative attenuation	a_{rel}				
f_c	... f_c ± 50 kHz	0,25	dB	max.	1,5 dB
f_c ± 50 kHz	... f_c ± 80 kHz	0,6	dB	max.	2 dB
f_c ± 80 kHz	... f_c ± 100 kHz	1	dB	max.	3 dB
f_c ± 0,4 MHz	... f_c ± 0,6 MHz	30	dB	min.	25 dB
f_c ± 0,6 MHz	... f_c ± 0,8 MHz	42	dB	min.	38 dB
f_c ± 0,8 MHz	... f_c ± 20 MHz	48	dB	min.	46 dB
Absolute group delay within PB		2,5	µs	max.	5 µs
Group delay ripple within PB		350	ns	max.	600 ns
Return loss within PB		13	dB	min.	10 dB
Intermodulation	**	- 75	dBc	max.	- 62 dBc
Input power level	***	-		max.	23 dBm
Permissible DC voltage		-		± 30	V
Operating temperature range	OTR	-		0 °C ... + 70 °C	
Storage temperature range		-		- 40 °C ... + 85 °C	
Frequency inversion temperature		23	°C		
Temperature coefficient of frequency	TC_f ****	- 0,036	ppm/K ²		

*) 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.

**) $f_{in1} = 209,4$ MHz; $f_{in2} = 210,2$ MHz; $P_{in} = -10$ dBm and $f_{in1} = 211,8$ MHz; $f_{in2} = 212,6$ MHz; $P_{in} = -10$ dBm.

***) This power level is allowed for short time only (1% of life time), maximum input power for continuous operation is 14,5 dBm.

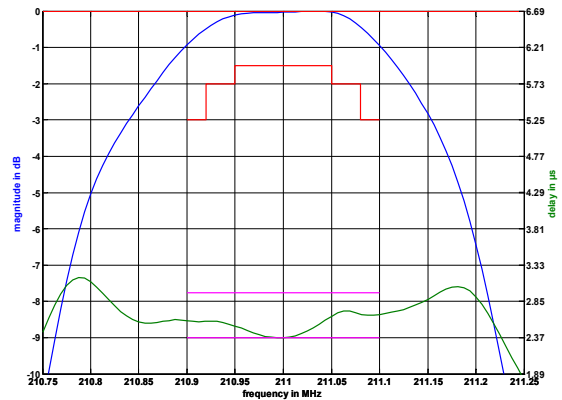
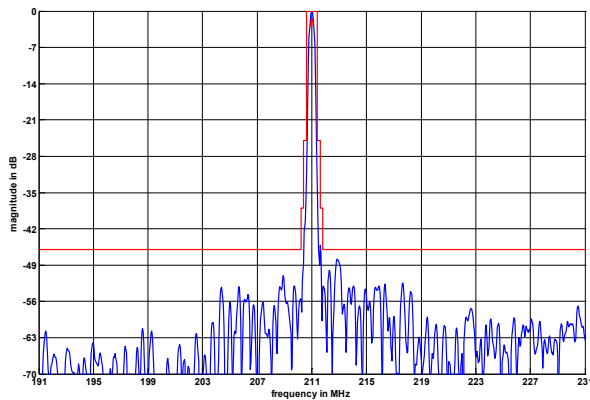
****) $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T - T_0)^2 \times f_{T0}(\text{MHz})$

Generated:

Checked / Approved:

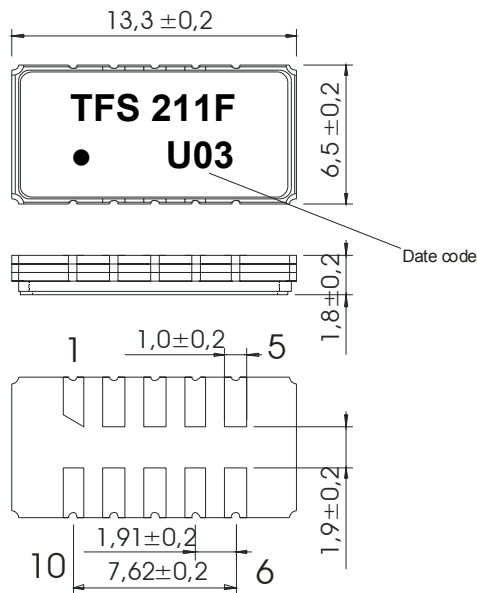
Tele Filter GmbH
 Potsdamer Straße 18
 D 14 513 TELTOW / Germany
 Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30
 E-Mail: tft@telefilter.com

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Construction and pin connection

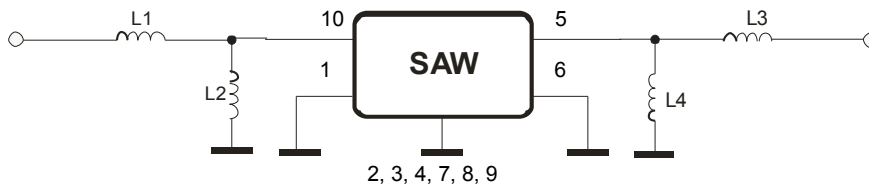
(All dimensions in mm)



- 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
 U 2006
 V 2007
 W 2008
 ...

50 Ω Test circuit



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Stability characteristics, reliability

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

1. Shock: 500g, 1 ms, half sine wave, 3 shocks each plane;
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 500 Hz, 0,35 mm or 5 g 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 refer to the attached "Air reflow temperature conditions" on page 4;

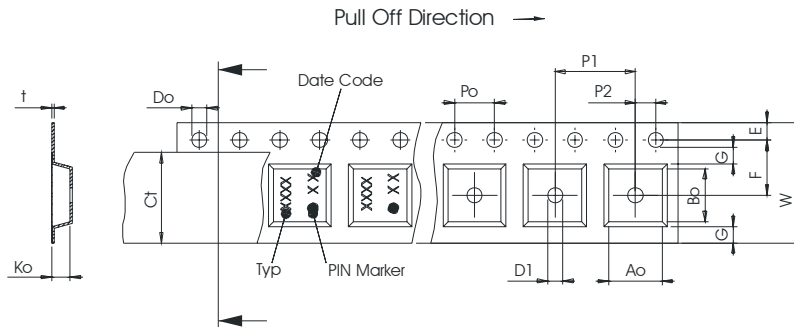
This filter is RoHS compliant (2002/95/EG, 2005/618/EG)

Packing

- Tape & Reel: 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 |

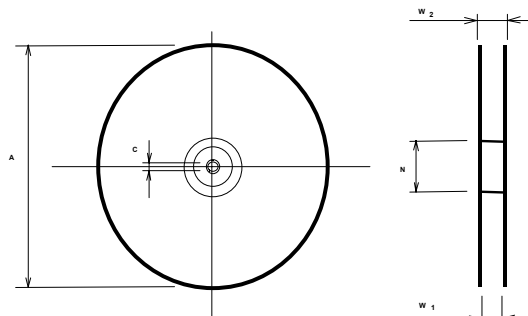
Tape (all dimensions in mm)

- W : 24,00 +0,30/-0,10
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,10
- F : 11,50 ± 0,10
- G(min) : 0,60
- P2 : 2,00 ± 0,1
- P1 : 12,00 ± 0,1
- D1(min) : 1,50
- Ao : 7,10 ± 0,10
- Bo : 13,90 ± 0,10
- Ct : 21,5 ± 0,1



Reel (all dimensions in mm)

- A : 330
- W1 : 24,4 +2/-0
- W2(max) : 30,4
- N(min) : 60
- C : 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

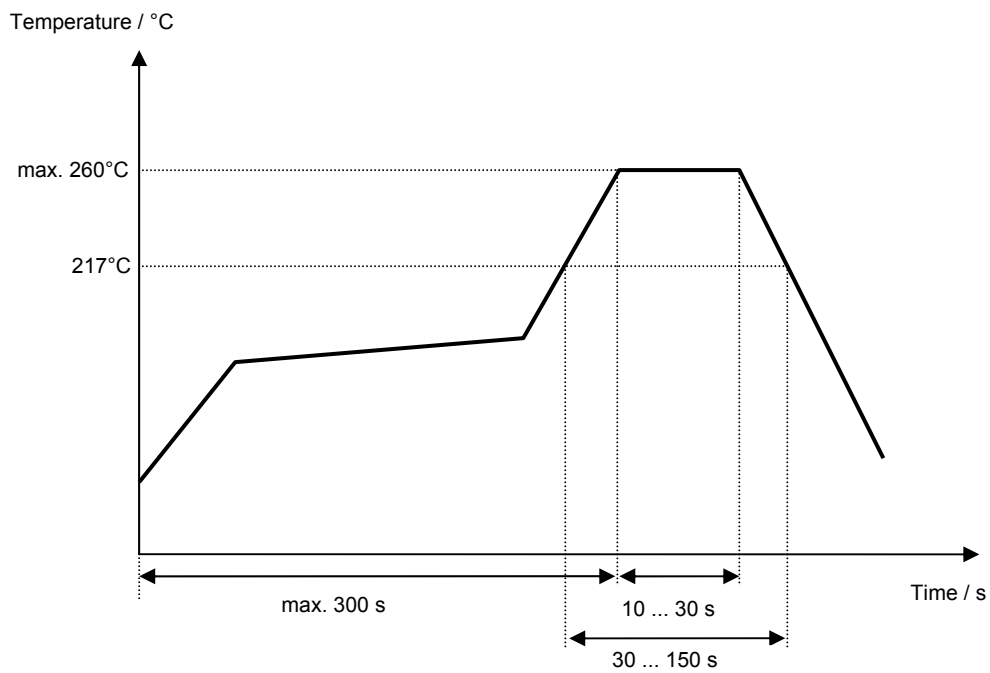
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Air reflow temperature conditions

Conditions	Exposure
Average ramp-up rate (30°C to 217°C)	less than 3°C/second
> 100°C	between 300 and 600 seconds
> 150°C	between 240 and 500 seconds
> 217°C	between 30 and 150 seconds
Peak temperature	max. 260°C
Time within 5°C of actual peak temperature	between 10 and 30 seconds
Cool-down rate (Peak to 50°C)	less than 6°C/second
Time from 30°C to Peak temperature	no greater than 300 seconds

Chip-mount air reflow profile



VI TELEFILTER**Filter specification****TFS 211F****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- generation of development specification	Channaa	16.11.2005
1.1	- terminating impedance, typical values, matching configuration and filter characteristic added	Pfeiffer	02.01.2006
1.2	- pass band changed (related to f_c)	Pfeiffer	19.01.2006