

VI TELEFILTER

Filter specification

TFS 210G

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Measurement condition

Ambient temperature: 23 °C
 Input power level: 0 dBm
 Terminating impedance: *
 Input: 860 Ω || -6,4 pF
 Output: 1160 Ω || -6,7 pF

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of TFS 210G is the minimum of the pass band attenuation a_{min} . This value 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 of both the reference frequency f_c and the frequency response of the filter in the operating temperature range.

D a t a		typ. value	tolerance / limit
Insertion loss (reference level)	a_e	8,3 dB	max. 11 dB**
Centre frequency at ambient temperature	f_c	210,816 MHz	± 50 kHz
Passband	PB	-	f_c ± 0,8 MHz
Relative attenuation	a_{rel}		
f_c	... f_c ± 475 kHz	-	max. 3 dB
f_c ± 475 kHz	... f_c ± 815 kHz	-	max. 10 dB
f_c ± 1,175 MHz	... f_c ± 1,3 MHz	-	min. 20 dB
f_c ± 1,3 MHz	... f_c ± 1,475 MHz	-	min. 30 dB
f_c ± 1,475 MHz	... f_c ± 2,0 MHz	43 dB	min. 40 dB
f_c - 2,0 MHz	... f_c - 5,0 MHz	48 dB	min. 45 dB
f_c + 2,0 MHz	... f_c + 5,0 MHz	46 dB	min. 42 dB
f_c ± 5,0 MHz	... f_c ± 10,0 MHz	52 dB	min. 40 dB
Average group delay within PB		0,88 μs	max. 1,3 μs
Group delay ripple within PB		240 ns	max. 300 ns
Operating temperature range	OTR	-	- 10 °C ... + 55 °C
Storage temperature range		-	- 40 °C ... + 85 °C
Frequency inversion temperature		15 °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.

**) q-values of matching inductors: q=40

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

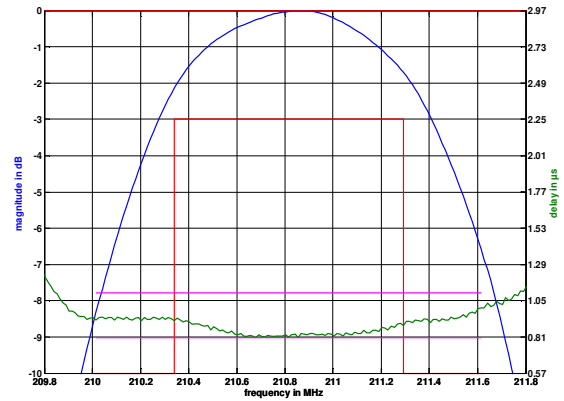
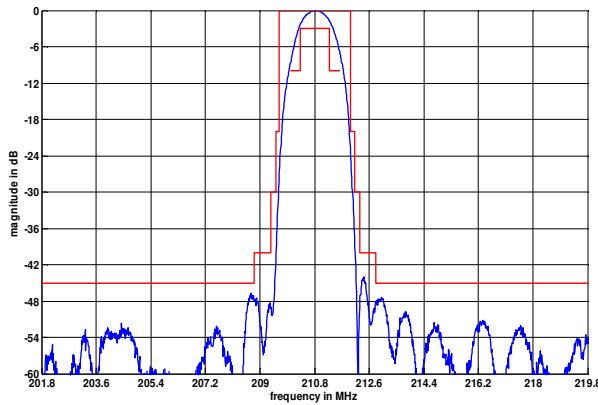
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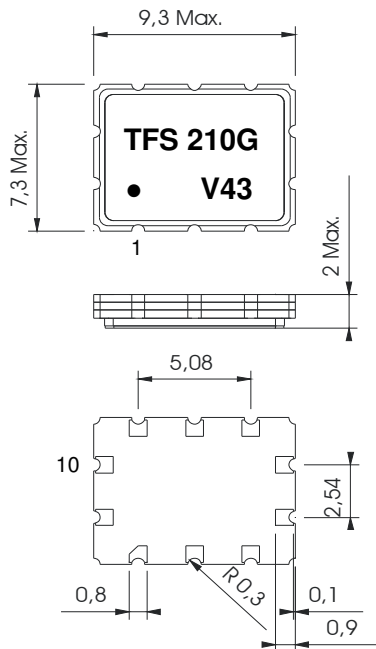
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Filter characteristic



Construction and pin connection

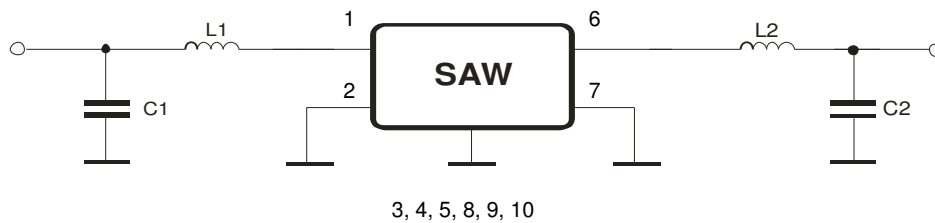
(All dimensions in mm)



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

Date code: Year + week
 V 2007
 W 2008
 X 2009
 ...

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: three times 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)

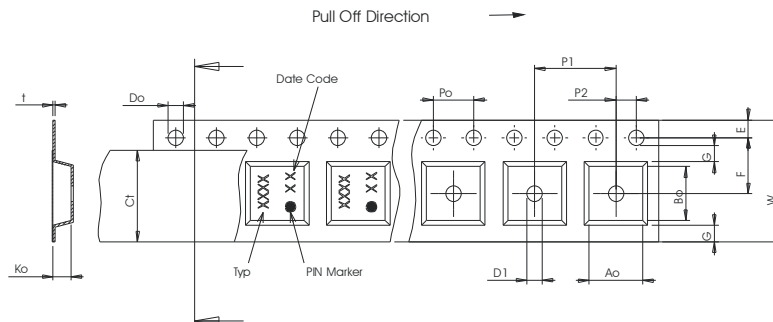
Packing

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:	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

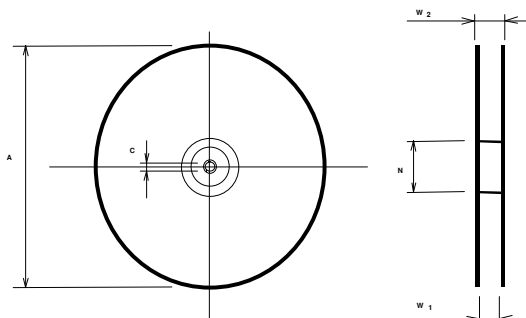
Tape (all dimensions in mm)

- W : 16,00 ± 0,3
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,10
- F : 7,50 ± 0,10
- G(min) : 0,60
- P2 : 2,00 ± 0,1
- P1 : 12,00 ± 0,1
- D1(min) : 1,50 +0,1/-0
- Ao : 7,60 ± 0,10
- Bo : 9,60 ± 0,10
- Ct : 13,5



Reel (all dimensions in mm)

- A : 330
- W1 : 16,4
- W2(max) : 22,4
- N(min) : 50
- C : 13,0



The minimum bending radius is 45 mm.

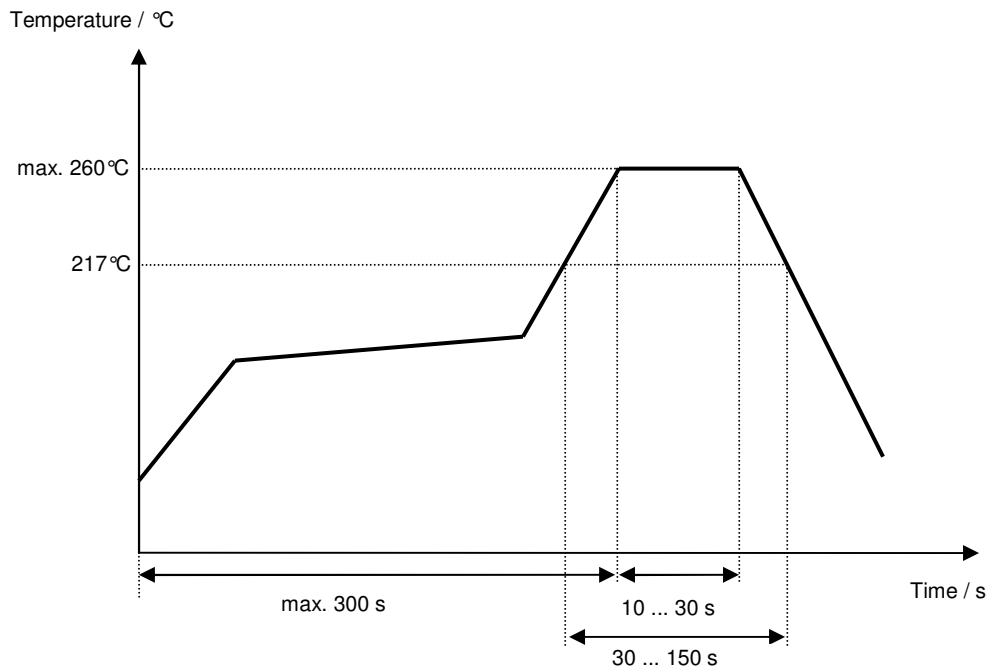
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Air reflow temperature conditions

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 210G****5/5****History**

Version	Reason of Changes	Name	Date
1.0	generate specification according to customer requirements	Pfeiffer	22.02.2002
1.1	changing package changing relative attenuation, operating temperature range	Pfeiffer	11.03.2002
1.2	changing insertion loss	Pfeiffer	18.03.2002
1.3	terminating impedance (preliminary values) and typical values added	Pfeiffer	17.06.2002
1.4	terminating impedance changed changing relative attenuation ($f_C + 2,0\text{MHz}$ $f_C + 5,0\text{MHz}$)	Pfeiffer	03.07.2002
1.5	add filter characteristic and change stability characteristics	Strehl	22.10.2007