

VI TELEFILTER

Filter specification

TFS 211

1/5

Measurement condition

Ambient temperature: 23 °C
 Input power level: 0 dBm
 Terminating impedance: *
 Input: 360 Ω || -3,7 pF
 Output: 360 Ω || -3,7 pF

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of the TFS 211 is the minimum of the pass band attenuation. This value is defined as the insertion loss a_e . The nominal frequency f_N is fixed at MHz without any tolerance. The values of relative attenuation a_{rel} are guaranteed for the whole operating temperature range. The frequency shift of the filter in the operating temperature range is included in the production tolerance scheme.

D a t a		typ. value	tolerance / limit
Insertion loss (reference level)	a_e	4,5 dB	max. 6,5 dB
Nominal frequency	f_N	-	211,0 MHz
Pass band	PB		$f_N \pm 50$ kHz
3 dB Bandwidth		280 kHz	min. 200 kHz
Relative attenuation	a_{rel}		
$f_N \pm 200$ kHz ... $f_N \pm 400$ kHz		10 dB	min. 5 dB
$f_N \pm 400$ kHz ... $f_N \pm 600$ kHz		30 dB	min. 25 dB
$f_N \pm 600$ kHz ... $f_N \pm 800$ kHz		35 dB	min. 30 dB
$f_N \pm 800$ kHz ... $f_N \pm 10$ MHz		40 dB	min. 35 dB
Group delay	at f_N	3,4 μs	max. 5 μs
Group delay ripple within PB		-	max. 0,5 μs
Operating temperature range	OTR	-	- 30 °C ... + 85 °C
Storage temperature range		-	- 40 °C ... + 85 °C
Frequency inversion temperature		+25 °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.

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

Generated:

Checked / Approved:

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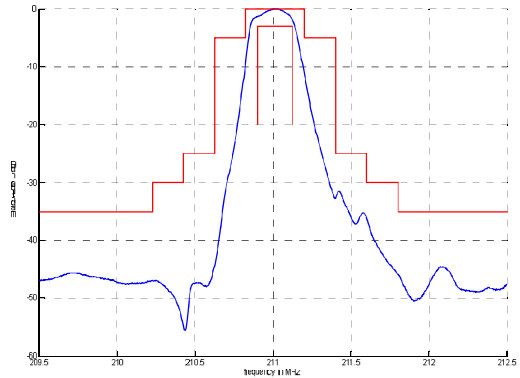
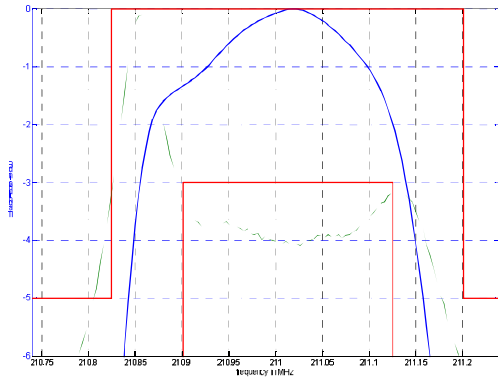
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Filter specification

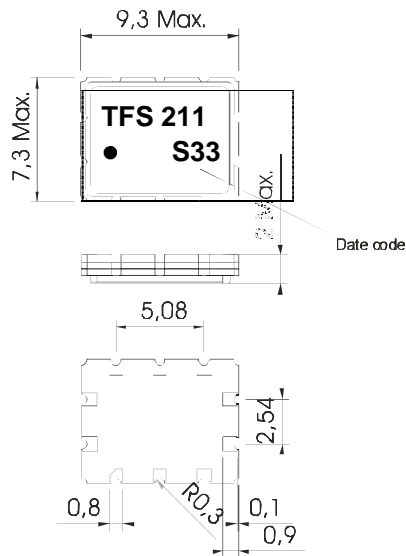
TFS 211

Filter characteristic



Construction and pin connection

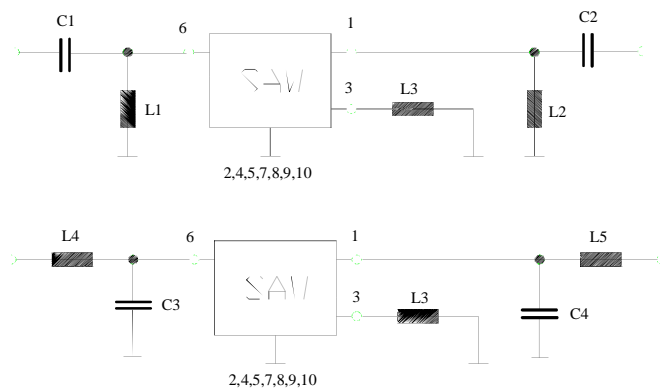
(All dimensions in mm)



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

Date code: Year + week	
S	2004
T	2005
U	2006
...	

50 Ohm Test circuit



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Stability characteristics

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 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;

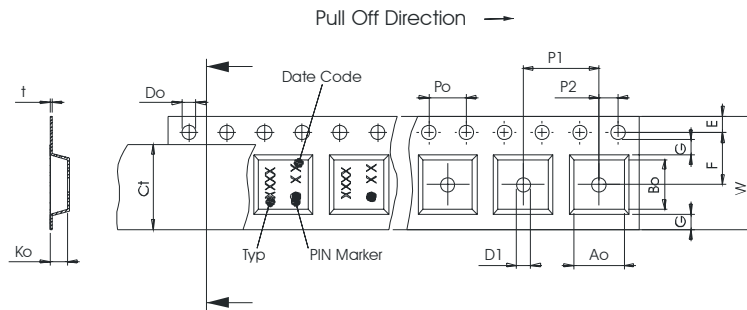
Packing

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 peer reel:	3000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

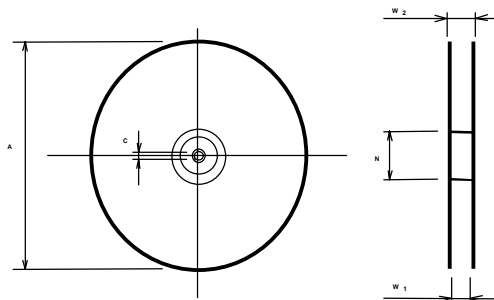
Tape (all dimensions in mm)

- 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

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

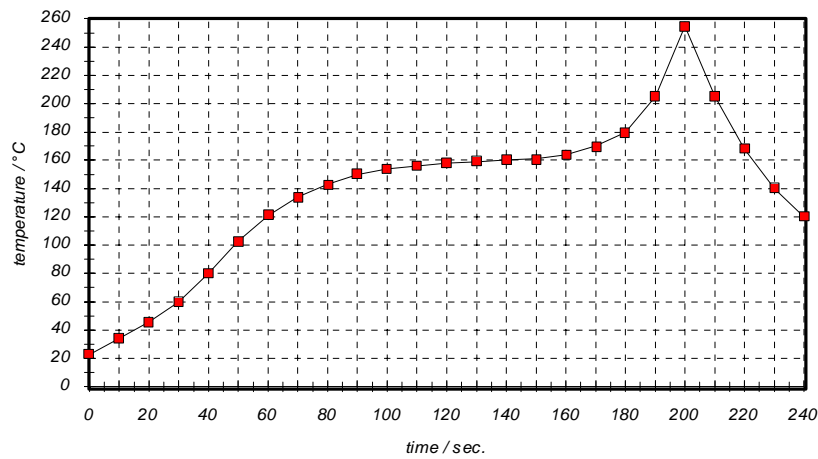


Table for temperature vs. time during the air reflow process

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

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History

Version	Reason of Changes	Name	Date
1.2.	Change Centre frequency to Nominal frequency Change remark Correct tapeand reel Add history	Strehl	13.08.04

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