

Microchip**Filter specification****TFS 153F****1/5****Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	50	Ω
Output:	50	Ω

Characteristics

Remark:

The maximum attenuation in the pass band is defined as the insertion loss a_e . The nominal frequency f_N is fixed at 153,6 MHz without any tolerance or limit. The values of absolute attenuation a_{abs} 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	a_e	1,3 dB	max. 2,0 dB
Nominal frequency	f_N	-	153,6 MHz
Passband	PB	-	f_N ± 25 kHz
Absolute attenuation	a_{abs}		
0,3 MHz ... 113,6 MHz		66 dB	min. 40 dB
118,6 MHz		63 dB	min. 55 dB
133,6 MHz		64 dB	min. 55 dB
143,6 MHz		57 dB	min. 40 dB
163,6 MHz		50 dB	min. 40 dB
173,6 MHz		66 dB	min. 55 dB
188,6 MHz		62 dB	min. 55 dB
193,6 MHz ... 600 MHz		41 dB	min. 35 dB
600 MHz ... 1000 MHz		31 dB	min. 25 dB
Input power level		-	max. 10 ** dBm
Operating temperature range	OTR	-	- 40 °C ... + 85 °C
Storage temperature range		-	- 55 °C ... +125 °C
Temperature coefficient of frequency	TC_f ***	- 33 ppm/K	-

*) 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.

***) max. 20 dBm for short term operation

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

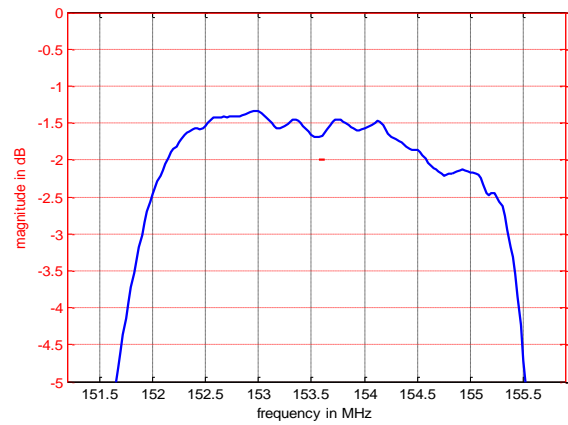
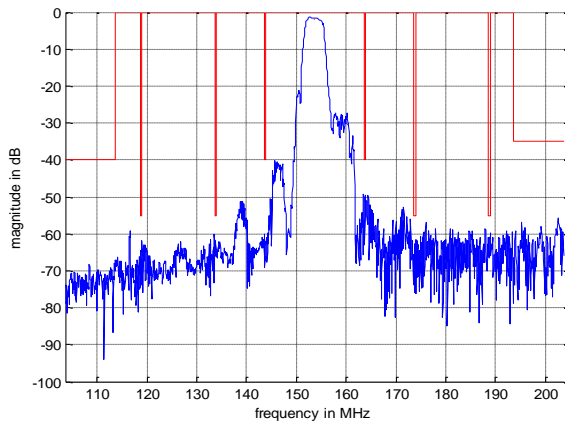
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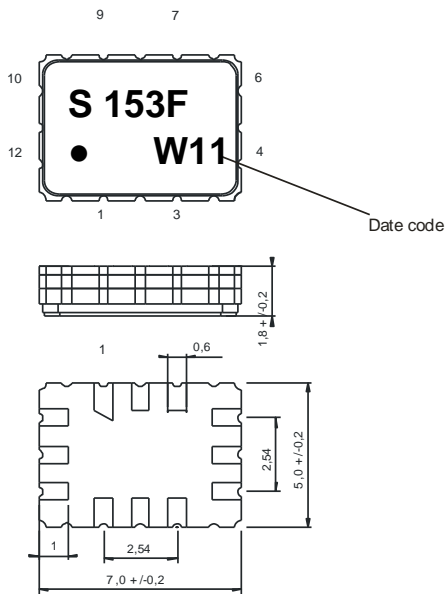
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Filter characteristic



Construction and pin connection

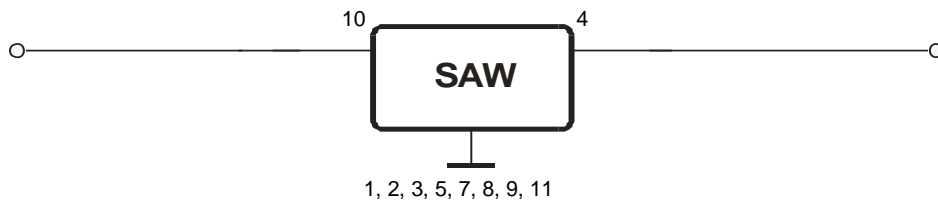
(All dimensions in mm)



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

Date code: Year + week
 W 2008
 X 2009
 A 2010
 ...

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)

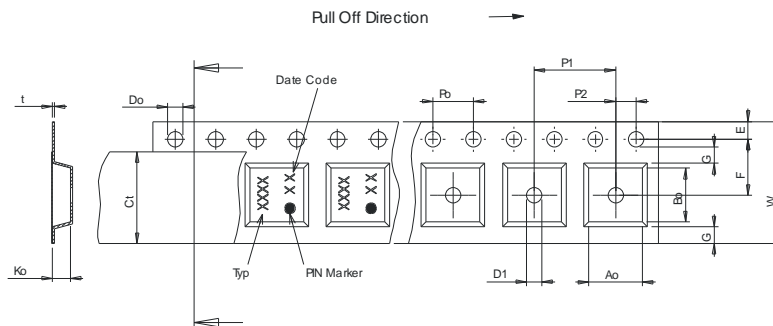
Packing

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:	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

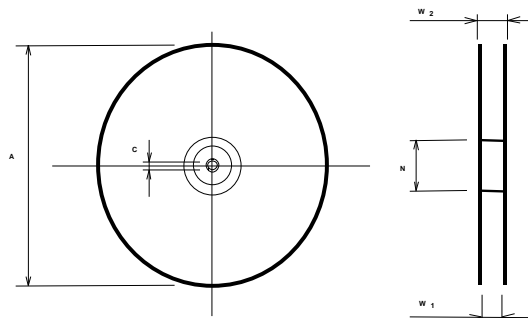
Tape (all dimensions in mm)

- W : 16,00 ± 0,3
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,1
- F : 7,50 ± 0,1
- G(min) : 0,60
- P2 : 2,00 ± 0,1
- P1 : 8,00 ± 0,1
- D1(min) : 1,50
- Ao : 5,50 ± 0,1
- Bo : 7,50 ± 0,1
- Ct : 13,5 ± 0,1



Reel (all dimensions in mm)

- A : 330
- W1 : 16,4 +2/-0
- W2(max) : 22,4
- N(min) : 50
- C : 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

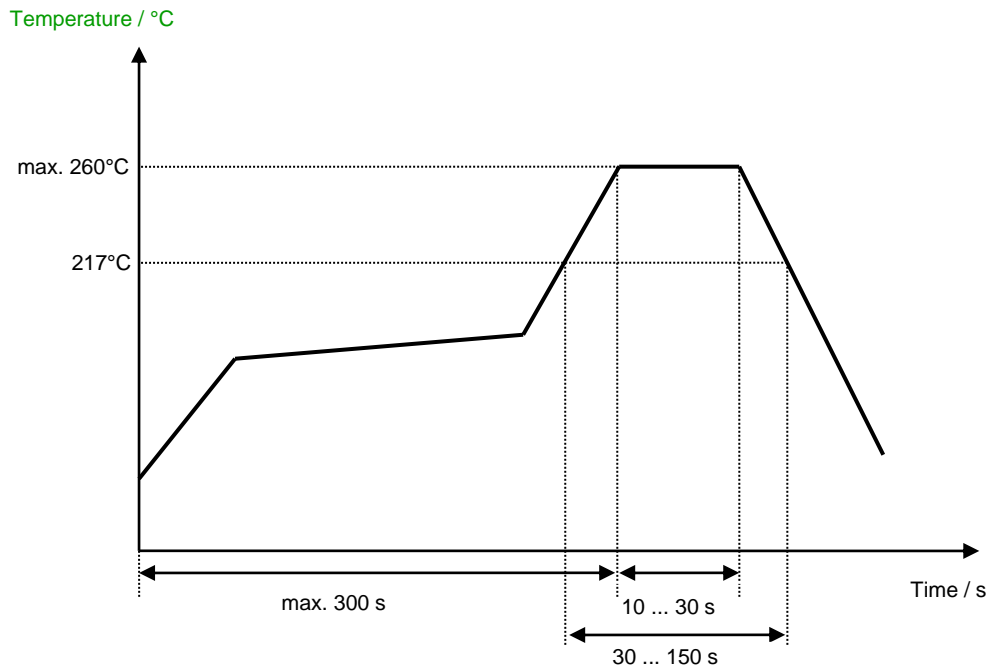
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Air reflow temperature conditions

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



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Microchip**Filter specification****TFS 153F****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	Strehl	10.10.2007
1.1	- Change insertion loss, PB, construction and packing - Add PB2	Strehl	23.10.2007
1.2	- Change insertion loss, construction and packing - Delete PB2 and correct characteristics	Strehl	24.10.2007
1.3	- spec changed back to status 1.0, passband corrected to +/-25kHz including the implementation of the correct remark section	Strehl	25.10.2007
1.4	- change absolute attenuation - add filter characteristic	S. Channaa	13.12.2007
1.5	- add typical values, add test circuit, generation of filter specification	S. Channaa	10.03.2008

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