Measurement condition

Ambient temperature: 23 °C
Input power level: 0 dBm
Source impedance: 50 Ω
Load impedance: 200 Ω

Terminating impedance: *
Input: 478 Ω || -7,8 pF
Output: 236 Ω || -13 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of the TFS 174H 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 174 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	10,5	dB	max.	12,0	dB
Nominal frequency	f_N				174,0	MHz
Passband	PB	35,2	MHz	f_N ±	15,0	MHz
Pass band ripple p-p		0,4	dB	max.	1,0	dB
Bandwidth	BW					
1 dB		35,2	MHz	min.	30,0	MHz
2 dB		36,5	MHz	min.	32,0	MHz
5 dB		38,5	MHz	max.	42,0	MHz
Relative attenuation	a_{rel}					
f_N … f_N ± 15 MHz		0,5	dB	max.	1	dB
f_N ± 21 MHz … f_N ± 24 MHz		8	dB	min.	5	dB
f_N ± 24 MHz … f_N ± 27 MHz		34	dB	min.	30	dB
f_N ± 27 MHz … f_N ± 40 MHz		43	dB	min.	40	dB
Average group delay within PB		400	ns	max.	470	ns
Group delay ripple within PB p-p		25	ns	max.	100	ns
Phase linearity within PB		2,5	°	max.	4	°p-p
Input power level		-		max.	20 **	dBm
Operating temperature range	OTR	-		- 54 °C ... + 85 °C		
Storage temperature range		-		- 54 °C ... + 85 °C		
Temperature coefficient of frequency	TC_f ***	-91	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.
**) This power level is only allowed for short term operation (cycle time 1:1000), the max. input power for continuous operation is max.10dBm only
***) $\Delta f(Hz) = TC_f(ppm/K) \times (T-T_0) \times f_{T0}(MHz)$, f_{T0}: frequency at room temperature

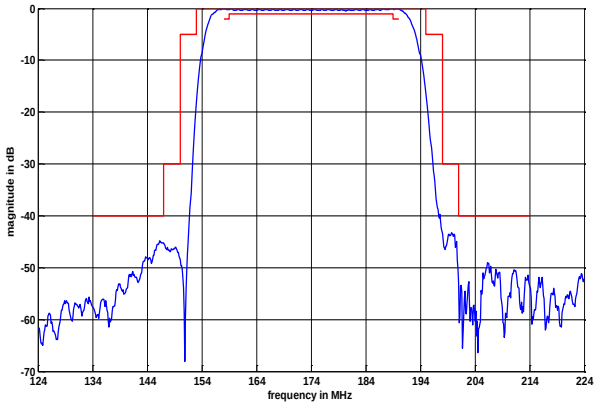
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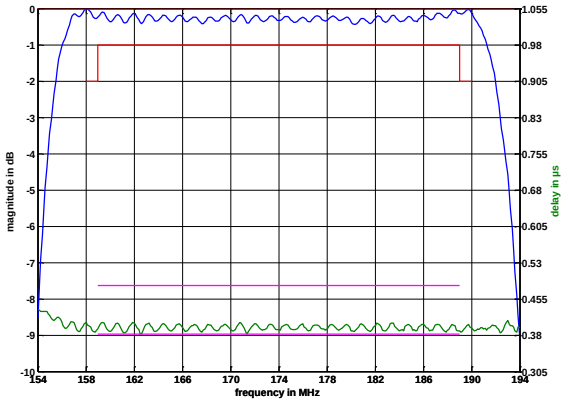
Checked / Approved:

Microchip Frequency Technology GmbH
Potsdamer Straße 18
D 14 513 TELTOW / Germany
Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30

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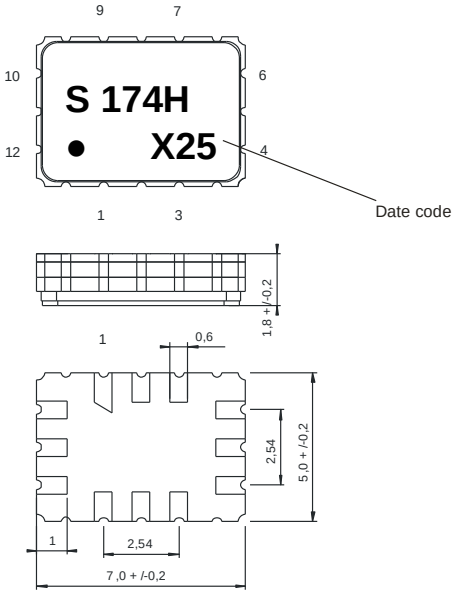
Filter characteristic





Construction and pin connection

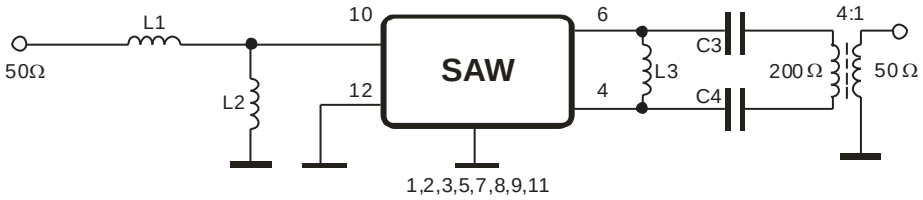
(All dimensions in mm)



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

Date code:	Year + week
X	2009
A	2010
B	2011
...	

50 Ohm Test circuit



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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Stability characteristics, reliability

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

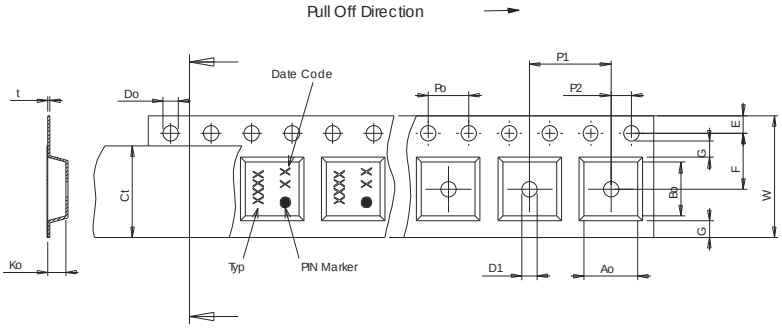
1. Shock:	500g, 1 ms, half sine wave, 3 shocks each plane; DIN IEC 68 T2 - 27
2. Vibration:	10 Hz to 500 Hz, 0,35 mm or 5 g respectively, 1 octave per min, 10 cycles per plan, 3 plans; DIN IEC 68 T2 - 6
3. Change of temperature:	-55 °C to 125°C / 30 min. each / 10 cycles DIN IEC 68 part 2 – 14 Test N
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

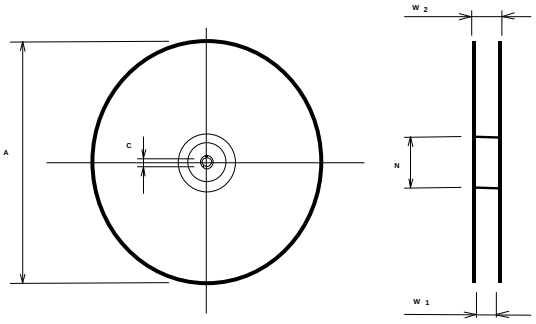
Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

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.

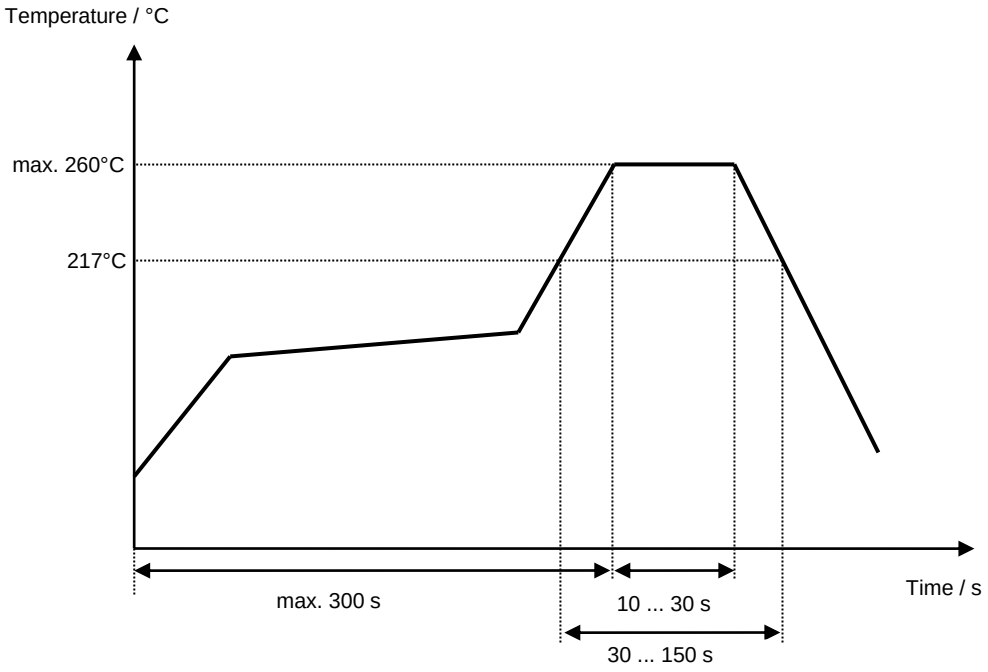
Tele Filter GmbH
Potsdamer Straße 18
D 14 513 TELTOW / Germany
Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30
E-Mail: tft@telefilter.com

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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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History

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	Strehl	07.02.2008
1.1	- Changed source impedance - Changed pin connection - Added test circuit	Chilla	22.10.2008
1.2	- Created filter specification - Added terminating impedance - Added typical values - Added filter characteristic - Added filter test circuit	Chilla	29.01.2009
2.0	- Changed average group delay (max) - Changed TC_f comment - Changed test circuit	Chilla	07.05.2009
2.1	- f_{T0} defined	Pfeiffer	15.06.2009

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