Measurement condition

Ambient temperature: 23 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 120 Ω || -8,4 pF
Output: 180 Ω || -7,6 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of TFS 398B is the minimum of the pass band attenuation a_{min}. This value is defined as the insertion loss a_e. The nominal frequency f_N is fixed at 398,0 MHz without any tolerance. The given values for the relative attenuation a_{rel} and the group delay ripple have to be reached at the frequencies given below, even if the centre frequency f_c is shifted due to the temperature coefficient of frequency TC_f in the operating temperature range and due to a production tolerance for the centre frequency f_c.

D a t a		**typ. value**		**tolerance / limit**		
Insertion loss (Reference level)	a_e	9,7	dB	max. 14,0		dB
Nominal frequency	f_N	-		398,0		MHz
Centre frequency	f_c	398,0	MHz			
1,5 dB Passband width		-		min. ± 17,5		MHz
Relative attenuation	a_{rel}					
f_N ...	f_N ± 13,5 MHz	0,7	dB	max. 1		dB
f_N ± 13,5 MHz ...	f_N ± 17,5 MHz	0,8	dB	max. 1,5		dB
f_N - 298 MHz ...	f_N - 30 MHz	50	dB	min. 40		dB
f_N + 72 MHz ...	f_N + 602 MHz	60	dB	min. 40		dB
Phase linearity						
f_N - 17,5 MHz ...	f_N ± 17,5 MHz	1	°rms	max. 4,0		° rms
Operating temperature range				- 30 °C ... + 70 °C		
Storage temperature range	-	-		- 40 °C ... + 85 °C		
Temperature coefficient of frequency (Tc_f) **)		- 87	ppm/ K			
Input power level:		-		max. 10,0		dBm

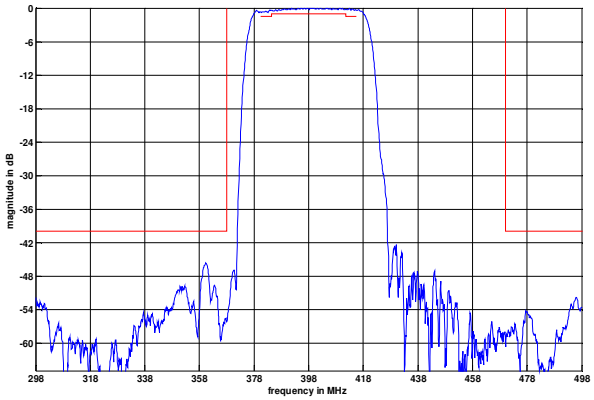
*) The terminating impedances depends on parasitics and q-values of matching elements and the board used, and are to be understood as reference values only. Should there be additional questions do not hesitate to ask for an application note or contact our design team.
**) $\Delta f(Hz) = TC_f(ppm/K) \times (T-T_0) \times f_{To}(MHz)$

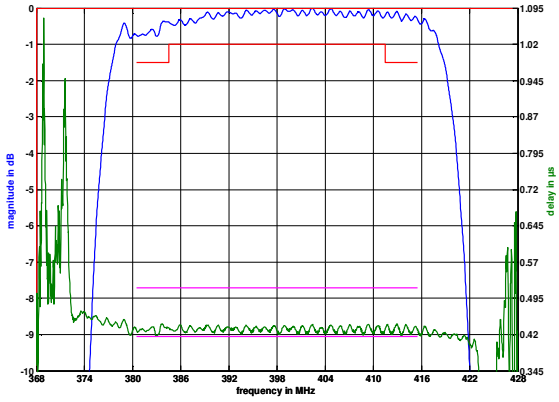
Generated:

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@vectron.com

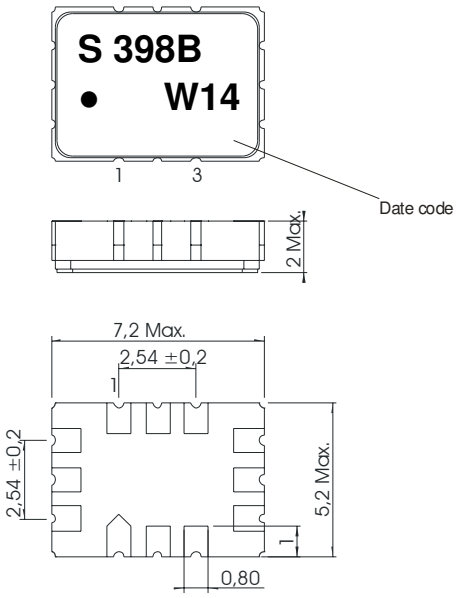
Filter characteristic





Construction and pin connection

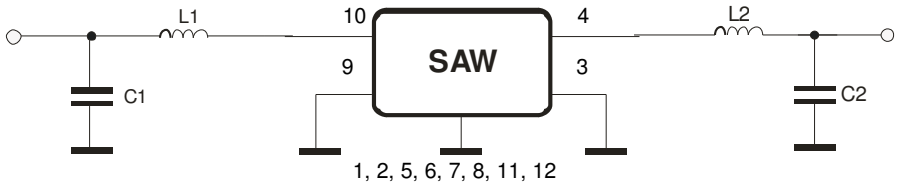
(All dimensions in mm)



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

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)

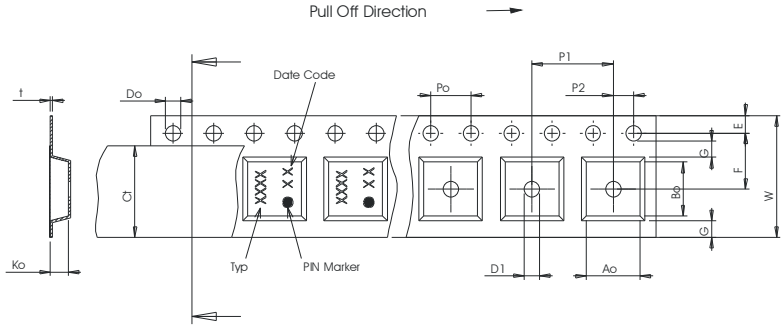
Packing

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

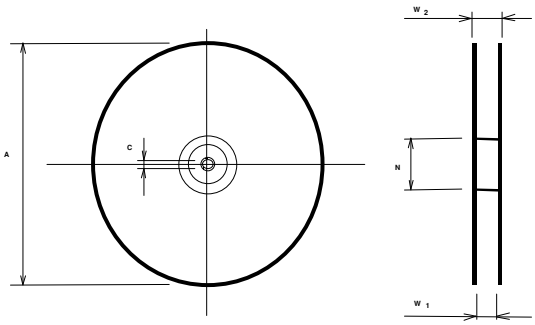
Tape (all dimensions in mm)

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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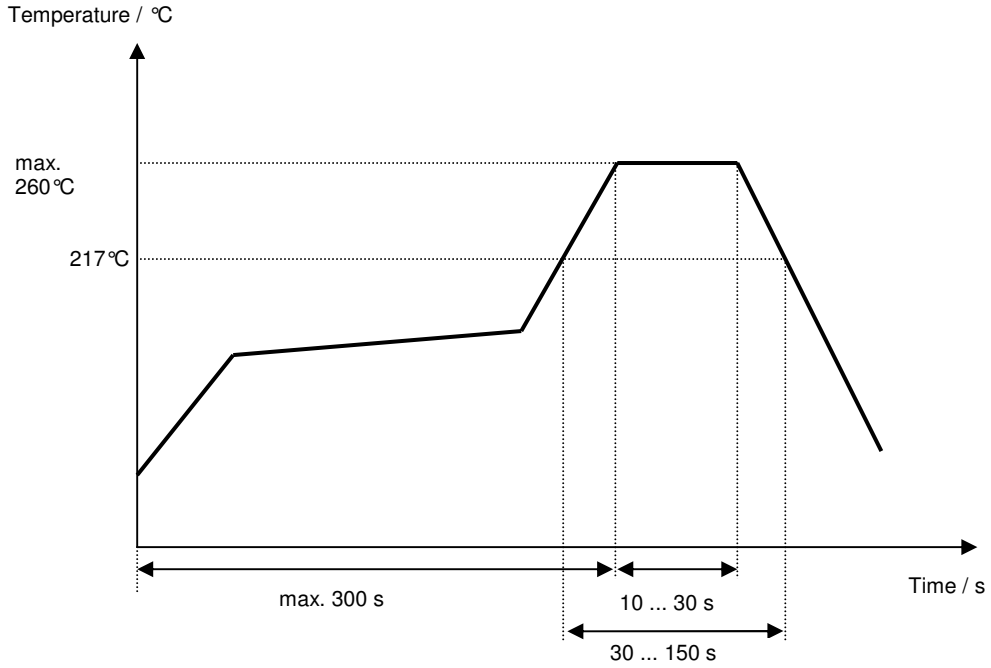
Air reflow temperature conditions

Conditions	Exposure
Average ramp-up rate (30℃ to 217℃)	less than 3℃/second
> 100℃	between 300 and 600 seconds
> 150℃	between 240 and 500 seconds
> 217℃	between 30 and 150 seconds
Peak temperature	max. 260℃
Time within 5℃ of actual peak temperature	between 10 and 30 seconds
Cool-down rate (Peak to 50℃)	less than 6℃/second
Time from 30℃ 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 specification according to customer specification EED/N/WR	Steiner	10.05.2001
1.1	- passband and stopband change according to a customer meeting	Steiner	21.08.2001
2.0	- change package to a 7x5mm one	Steiner	15.04.2002
Filter specification			
2.1	- adjust passband ripple limit specification and near stopband specification	Steiner	17.04.2003
2.2	- add storage temperature range - add terminating impedances	Chilla	23.04.2003
2.3	- add frequency range for phase ripple	Steiner	13.05.2003
2.4	- terminating impedances corrected - change of typical values, stability characteristics and air reflow temperature conditions - add of filter characteristics	Pfeiffer	02.04.2008

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