

VI TELEFILTER

Filter specification

TFS 199G

1/5

Measurement condition

Ambient temperature:	25	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	119 Ω -22.2 pF	
Output:	97 Ω -25.9 pF	

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of the TFS 199G is the minimum of the pass band attenuation a_{min} . The minimum of the pass band attenuation a_{min} 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 1 dB filter attenuation level relative to the insertion loss a_e . The nominal frequency f_N is fixed at 199.68 MHz without any tolerance. The given values for both the relative attenuation a_{rel} and the group delay ripple have to be achieved 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	14,1 -	dB	max.	15,0 dB
Nominal frequency		f_N			199.68	MHz
Pass band		PB	-		f_N	$\pm 4,42$ MHz
Amplitude ripple **		p-p	0,3	dB	max.	1 dB
Relative attenuation		a_{rel}				
f_N -	4,42 MHz ...	f_N +	4,42 MHz	0,3 dB	max.	1 dB
f_N -	199 MHz ...	f_N -	14,68 MHz	55 dB	min.	45 dB
f_N -	14,68 MHz ...	f_N -	9,42 MHz	48 dB	min.	30 dB
f_N -	9,42 MHz ...	f_N -	5,98 MHz	4 dB	min.	3 dB
f_N +	5,98 MHz ...	f_N +	9,42 MHz	4 dB	min.	3 dB
f_N +	9,42 MHz ...	f_N +	14,2 MHz	47 dB	min.	30 dB
f_N +	14,2 MHz ...	f_N +	300 MHz	58 dB	min.	45 dB
Absolute group delay			0.985	μ s		-
Group delay ripple **		p-p	30	ns	max.	100 ns
Phase linearity **		p-p	2	deg	max.	8 deg
Triple transit response suppression			60	dB	min.	35 dB
Third order intercept ***		IP3	40	dBm	min.	35 dBm
Input /Output return loss **			15	dB	min.	10 dB
Input power level ****					max.	23 dBm
Operating temperature range		OTR	-		-25 °C ... + 85 °C	
Storage temperature range			-		-35 °C ... + 85 °C	
Temperature coefficient of frequency		TC_f *****	-20	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.

**) Applies over any 3.84MHz in PB

***) Measured with tones spaced at 7.5 MHz and 17.5 MHz above and below f_c

****) This power level is allowed for short term operation (10% of life time) only, the max. input power for continuous operation is 10 dBm.

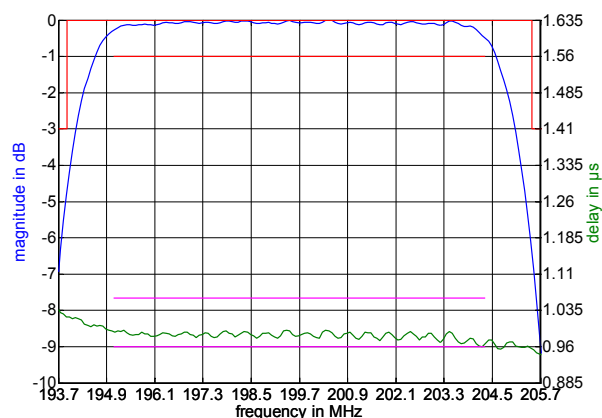
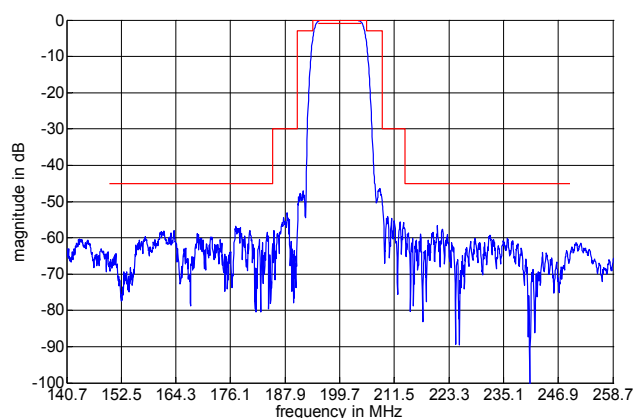
*****) $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_o) \times f_{to}(\text{MHz})$.

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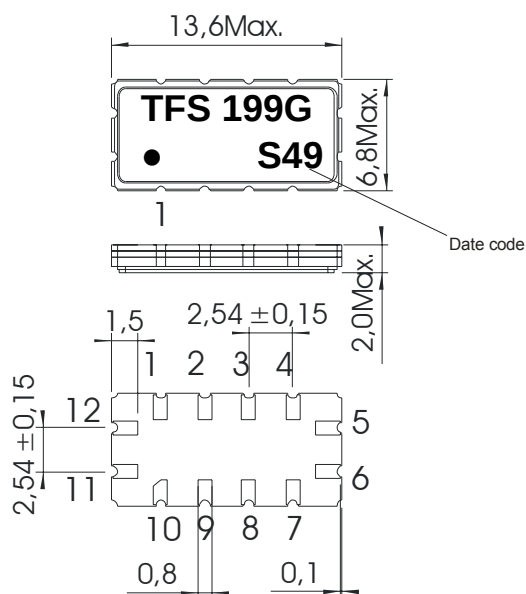
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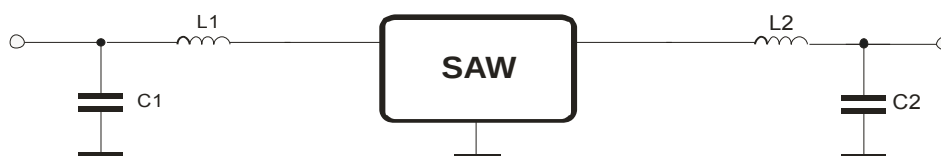
VI TELEFILTER**Filter specification****TFS 199G****2/5****Filter characteristic****Construction and pin connection**

(All dimensions in mm)



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

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

50 Ohm Test circuit

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VI TELEFILTER**Filter specification****TFS 199G****3/5****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;

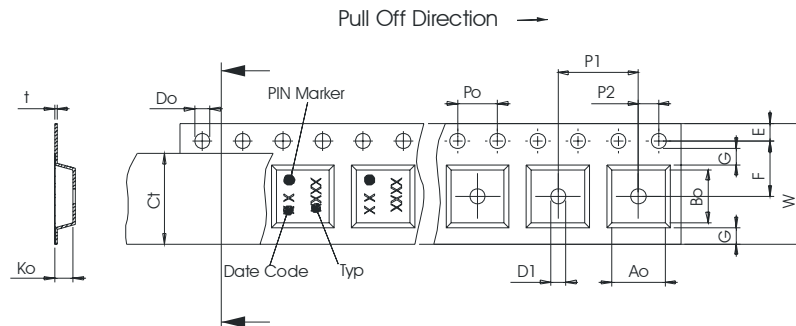
Packing

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

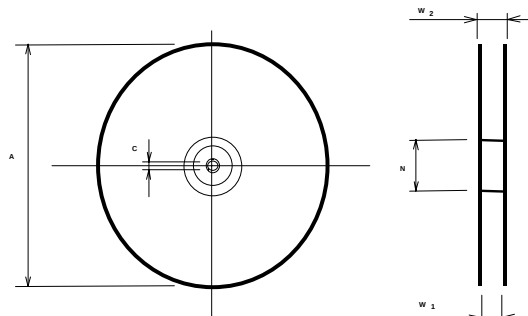
max. pieces of filters peer reel: 1700
reel of empty components at start: min. 300 mm
reel of empty components at start including leader: min. 500 mm
trailer: min. 300 mm

Tape (all dimensions in mm)

W	: 24,00 +0,30/-0,10
Po	: 4,00 ± 0,1
Do	: 1,50 +0,1/-0
E	: 1,75 ± 0,10
F	: 11,50 ± 0,10
G(min)	: 0,60
P2	: 2,00 ± 0,1
P1	: 12,00 ± 0,1
D1(min)	: 1,50
Ao	: 7,10 ± 0,10
Bo	: 13,90 ± 0,10
Ct	: 21,5 ± 0,1

**Reel (all dimensions in mm)**

A	: 330
W1	: 24,4 +2/-0
W2(max)	: 30,4
N(min)	: 60
C	: 13,0 +0,5/-0,2



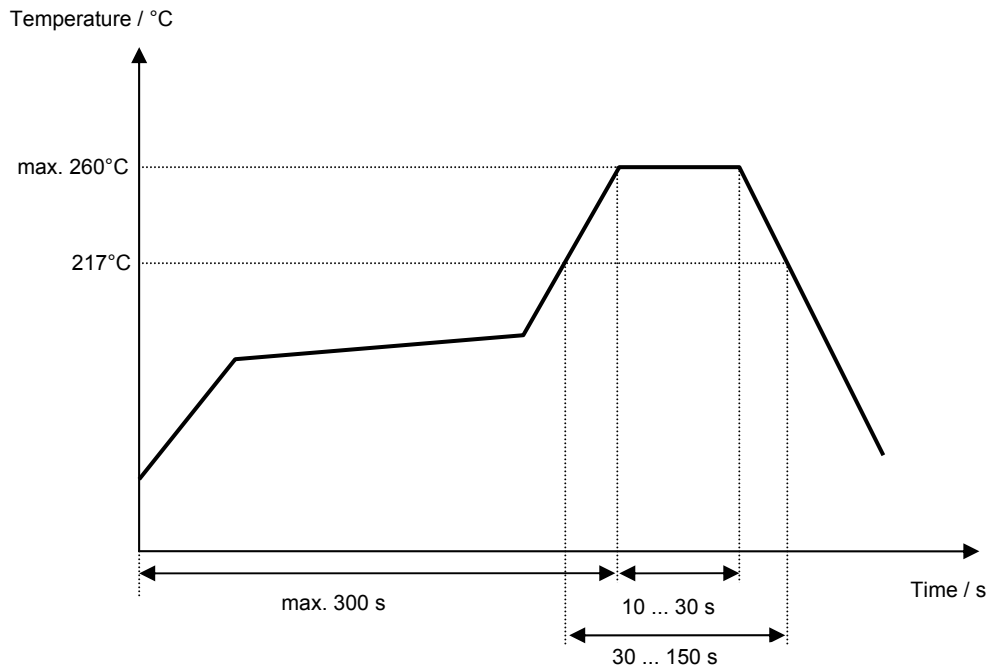
The minimum bending radius is 45 mm.

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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

VI TELEFILTER**Filter specification****TFS 199G****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- generated specification according to customer requirement	Chilla	25.06.2004
1.1	- changed centre frequency and frequency units in relative attenuation	Chilla	16.07.2004
1.2	- created filter specification - added terminating impedance - added typical values - added filter characteristic - added test circuit - modified packing - modified air reflow temperature conditions	Chilla	30.11.2004
1.3	- added typical values of third order intercept - changed operating bandwidth to passband in explanation **) - deleted typical value for passband	Chilla	06.01.2005