

VI TELEFILTER**Filter specification****TFS 199D****1/5****Measurement condition**

Ambient temperature:	20...25 °C
Input power level:	5 ± 2 dBm
Terminating impedance: *	
Input:	740 Ω -7.9 pF single ended
Output:	880 Ω -6.2 pF single ended

Characteristics**Remark:**

The reference level for the relative attenuation a_{rel} of the TFS 199D 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 0,5 dB filter attenuation level relative to the insertion loss a_e . The nominal frequency f_N is fixed at 199 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	max. 7,0 dB
Nominal frequency				f_N	- 199,0 MHz
Relative attenuation				a_{rel}	
f_N	-	100 kHz	... f_N + 100 kHz	-	max. 0,5 dB
f_N	-	80 MHz	... f_N - 30 MHz	-	min. 30 dB
f_N	-	30 MHz	... f_N - 800 kHz	-	min. 25 dB
f_N	±	600 kHz	... f_N ± 800 kHz	-	min. 20 dB
f_N	+	800 kHz	... f_N + 17 MHz	-	min. 25 dB
f_N	+	17 MHz	... f_N + 80 MHz	-	min. 35 dB
Group delay ripple				GD	
f_c	-	100 kHz	... f_c + 100 kHz	-	max. 500 ns
Input power level					
short test				-	max. +18 dB
standard operation				-	max. +10 dB
Permissible DC voltage				-	max. 10 V
Operating temperature range				OTR	- 35 °C ... + 85 °C
Storage temperature range				-	- 35 °C ... + 85 °C
Frequency inversion temperature				23 °C	
Temperature coefficient of frequency				TC_f **	-0,036 ppm/K ²

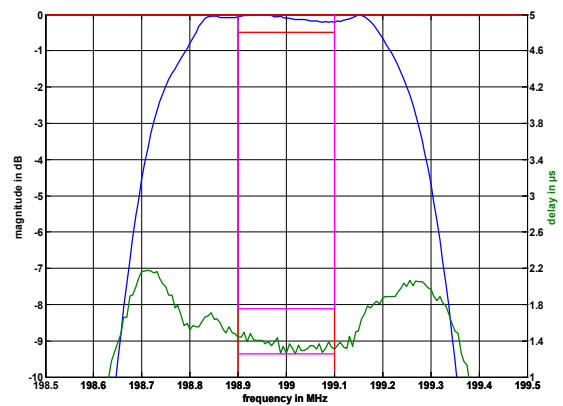
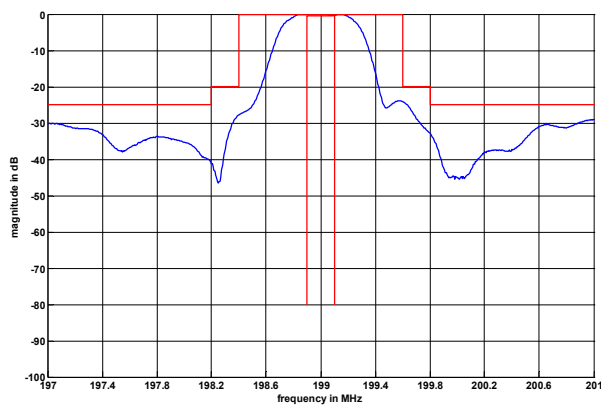
*) The terminating impedances depend on parasitics and q-values of matching elements and the board used, and are to be understood as reference values only. Should there be additional questions do not hesitate to ask for an application note or contact our design team.

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

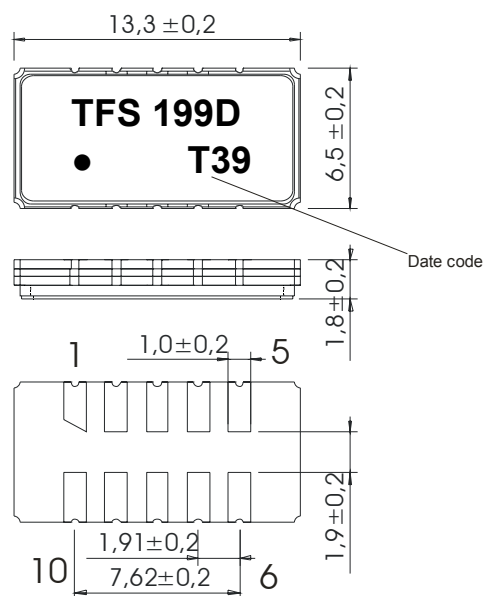
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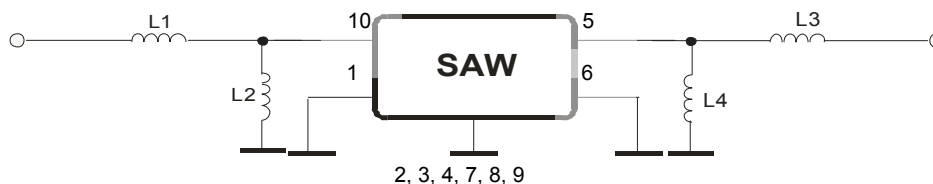
VI TELEFILTER**Filter specification****TFS 199D****2/5****Filter characteristic****Construction and pin connection**

(All dimensions in mm)



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

Date code: Year + week
 T 2005
 U 2006
 V 2007
 ...

50 Ω Test circuit

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VI TELEFILTER**Filter specification****TFS 199D****3/5****Stability characteristics**

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: twice max.;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

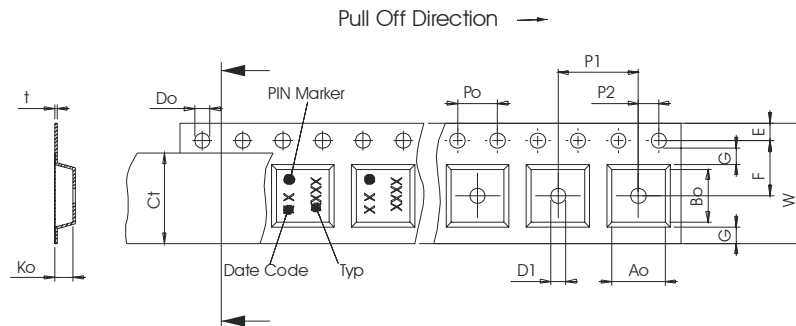
Packing

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;

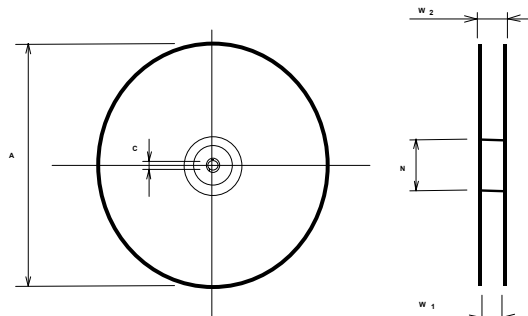
max. pieces of filters peer reel: 1700
reel of empty components at start: min. 300 mm
reel of empty components at start including leader: min. 500 mm
trailer: min. 300 mm

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



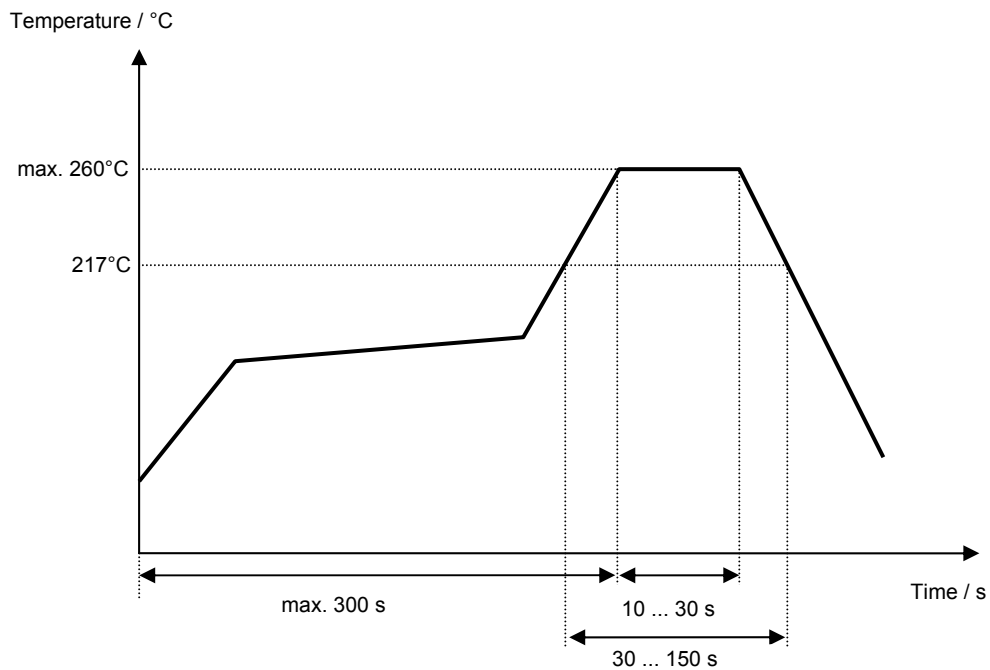
The minimum bending radius is 45 mm.

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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 199D****5/5****History**

Version	Reason of Changes	Name	Date
1.0	-generation of specification	Steiner	05.11.1999
2.0	- change to single ended pinning - new impedances according to single ended design - change attenuation from 30 dB to 25 dB at f_{N-} 30MHz... f_{N-} 800kHz f_{N+} 800kHz... f_{N+} 17MHz	Steiner	16.06.2000
3.0	- change the filter name to TFS199D	Steiner	04.07.2000
3.1	- correct the package dimensions	Steiner	28.07.2000
4.0	- change the insertion loss limit from max. 8dB to max. 7dB as agreed with the customer	Steiner	15.02.2001
4.1	- change packing	Strehl	22.09.2005