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

Measurement condition

Ambient temperature: 20 ... 25 °C
 Input power level: 5 ± 2 dBm
 terminating impedances
 input: 740 Ω || -7.9pF single ended
 output: 880 Ω || -6.2pF single ended

Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the TFS 199 D 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 given values for the relative attenuation a_{rel} and for the group delay ripple have to be reached at the frequencies given below also 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	limit
Insertion loss	$a_e = a_{min}$		max. 7,0 dB
Nominal frequency	f_N	-	199,0 MHz
Relative attenuation	a_{rel}		max. 0,5 dB
$f_N - 100$ kHz ... $f_N + 100$ kHz			
$f_N - 80$ MHz ... $f_N - 30$ MHz			min. 30 dB
$f_N - 30$ MHz ... $f_N - 800$ kHz			min. 25 dB
$f_N \pm 600$ kHz ... $f_N \pm 800$ kHz			min. 20 dB
$f_N + 800$ kHz ... $f_N + 17$ MHz			min. 25 dB
$f_N + 17$ kHz ... $f_N + 80$ 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 dBm
standard operation			max. + 10 dBm
Permissible DC voltage		-	max. 10 V
Operating temperature range			-35 °C ... + 85 °C
Storage temperature range			-35 °C ... + 85 °C
Temperature coefficient	TC	- 0,036 ppm/K ²	
Frequency inversion temperature	T_0	23 °C	

Generated: _____

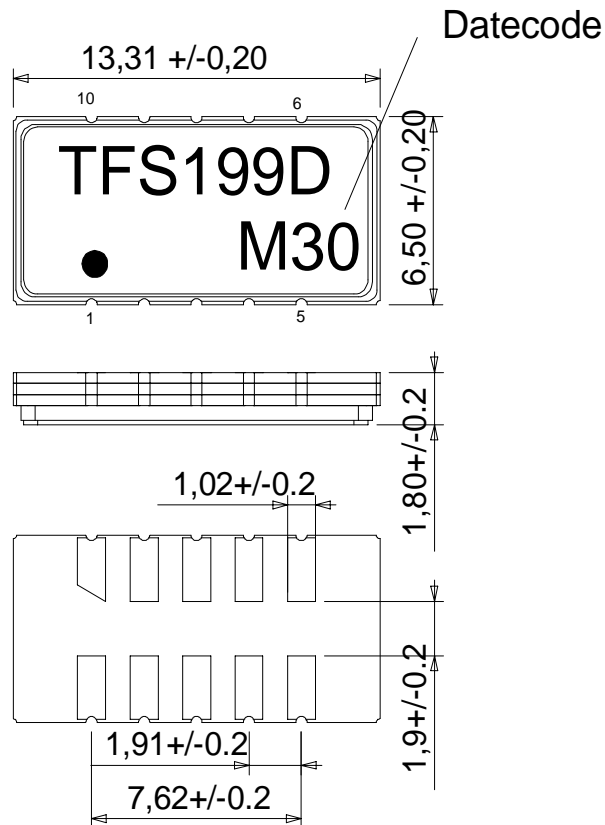
Checked / approved: _____

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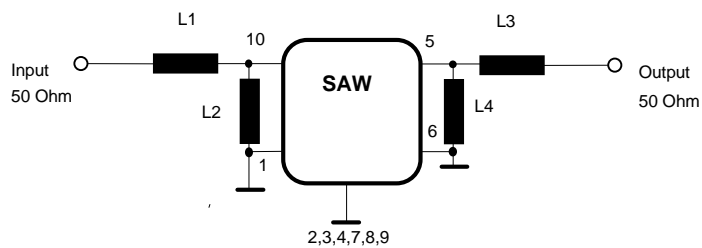
Construction and pin connection

(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

Datecode:	Year+week
K	1998
L	1999
M	2000
...	

50 Ω test circuit

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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 5g respectively, 1 octave per min, 10 cycles per plan, 3 plans;
DIN IEC 68 T2 - 6
3. Damp heat: 25 °C to 55°C / 95% r.H. / 10 cycles
(cycle) DIN IEC 68 - 2 – 30 Db
4. Resistance to solder heat (reflow): max. 2 times reflow process;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

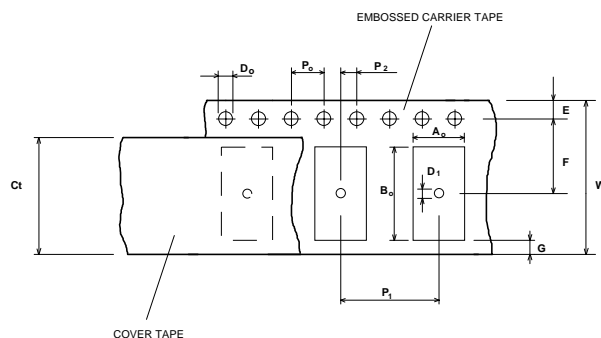
Packing

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;

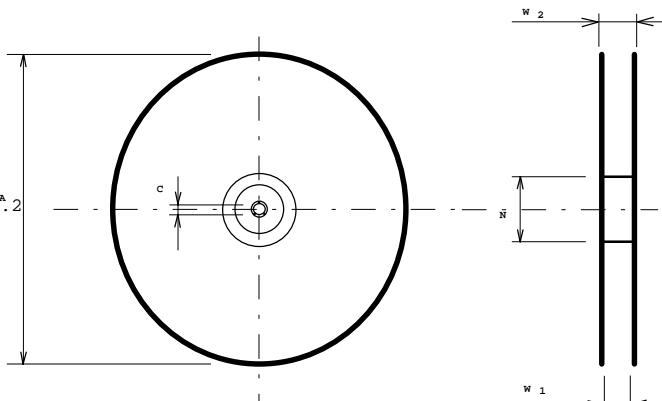
max. pieces of filters per reel: 2000
Reel of empty components at start: min 300 mm
Reel of empty components at start including leader: min 500 mm
Trailer: min 300 mm

Tape (all dimensions in mm)

W	: 24	± 0,3
Po	: 4	± 0,1
Do	: 1,5	+ 0,1
E	: 1,75	± 0,1
F	: 11,5	± 0,1
G (min)	: 0,60	
P2	: 2	± 0,1
P1	: 12	± 0,1
D1(min)	: 1,5	
Ao	: 7,1	± 0,2
Bo	: 13,9	± 0,2
Ct	: 21,5	± 0,1

**Reel (all dimensions in mm):**

A	:	330
W1	:	24,40 +2,0
W2 (max)	:	30,4
N (min)	:	60
C	:	13 ± 0,5 / -0,2



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. The marking of the filters is able to read if the view is directed on the upper side of the carrier tape with the sprocket holes on the right side of the tape.

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Air reflow temperature conditions

1st and 2nd air reflow profile

Name:	pre-heating periods	main-heating periods	peak temperature
Temperature:	150 °C - 170 °C	over 200 °C	255 °C ± 5 °C
Time:	60 sec. - 90 sec.	20 sec. - 25 sec.	

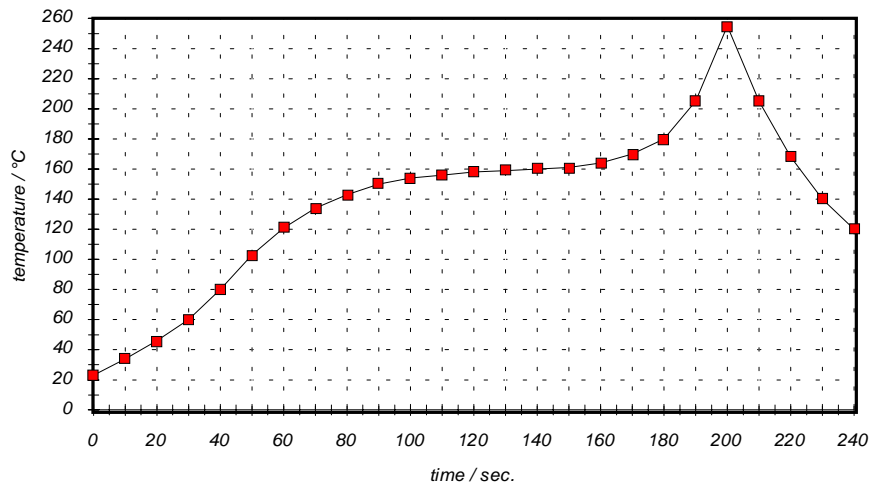
Chip-mount air reflow profile

Table for temperature vs. time during the air reflow process

Tolerance of temperatures: ± 5 °C

time / sec.	temperature / °C	time / sec.	temperature / °C
0	23	140	160
10	34	150	161
20	46	160	164
30	60	170	170
40	80	180	180
50	103	190	205
60	121	195	230
70	134	200	255
80	143	205	230
90	150	210	205
100	154	215	180
110	156	220	165
120	158	230	140
130	159	240	120

VI TELEFILTER**Filter specification****TFS 199 D****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 $f_N - 30\text{MHz} \dots f_N - 800\text{kHz}$ $f_N + 800\text{kHz} \dots f_N + 17\text{MHz}$	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

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