

VI TELEFILTER**Filter Specification****TFS119****1/5****Measurement condition**

Ambient temperature: 23 °C

Input power level: 0 dBm

Terminating impedances*)

for input: 1 kOhm // -1,5 pF

for output: 1 kOhm // -1,5 pF

Characteristics**Remark:**

Reference level for the relative attenuation a_{rel} of the TFS119 is the insertion loss. The insertion loss a_e is defined as the insertion loss at the nominal frequency f_N . The centre frequency f_C is the arithmetic mean value of the upper and lower frequencies at the 3 dB filter attenuation level relative to the insertion loss a_e . The nominal frequency f_N is fixed at 119.6 MHz without tolerance. The specified values have to be reached in operating temperature range.

D a t a		typ. Value	tolerance/limit
Insertion loss (Reference level)	a_e	2,8 dB	1,95 ... 4,5 dB
Nominal frequency	f_N	-	119,600 MHz
Centre frequency	f_C	119,605 MHz	-
1 dB bandwidth	BW	61 kHz	-
Relative attenuation	a_{rel}		
$f_N \pm 0,8 \text{ MHz} \dots f_N \pm 1,8 \text{ MHz}$		59 dB	min. 20 dB
$f_N \pm 1,8 \text{ MHz} \dots f_N \pm 6 \text{ MHz}$		58...72 dB	min. 30 dB
$f_N \pm 6 \text{ MHz} \dots f_N \pm 100 \text{ MHz}$		70...90 dB	min. 10 dB
VSWR @ f_N		1,2 : 1	min. 1,8 : 1
Group delay @ f_N	GD	10,8 μ s	max. 16,5 μ s
Input power		-	max. 5 dBm
Operating temperature range		-	- 5 °C ... + 80 °C
Storage temperature range		-	- 5 °C ... + 80 °C
Temperature coefficient of frequency	$TC_f^{**})$	- 0,036 ppm/K ²	-
Frequency inversion temperature	T_o	+ 30 °C	-

*) 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.

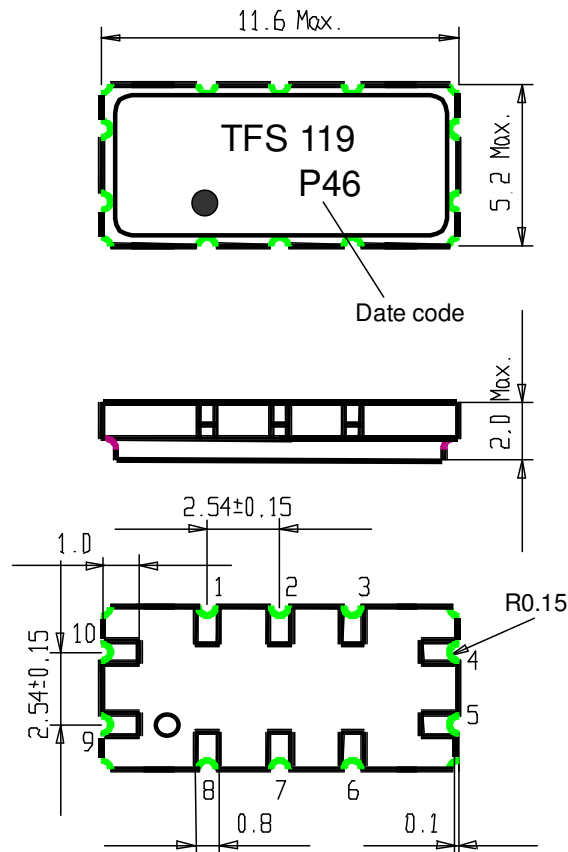
**) $\Delta f_C(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T_o - T_A)^2 \times f_{CAT}(\text{MHz})$

Generated:**Checked / approved:****VI TELEFILTER****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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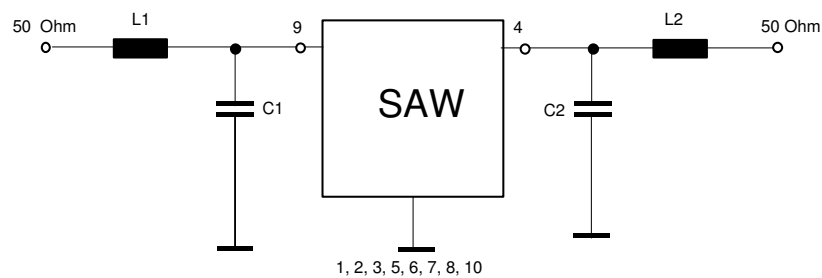
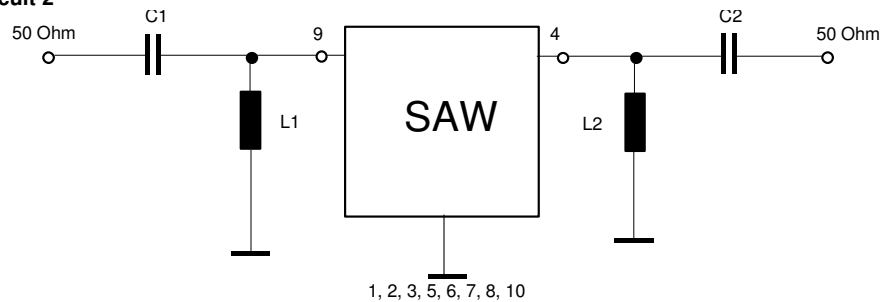
VI TELEFILTER**Filter Specification****TFS119****2/5****Construction, pin configuration and 50 Ω - matching network**

(All dimensions in mm)



Datecode: Year+week
 M 2000
 N 2001
 P 2002
 ...

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

50 Ohm Test circuit 1**50 Ohm Test circuit 2****VI TELEFILTER****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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VI TELEFILTER**Filter Specification****TFS119****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 5g 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 older heat (reflow): reflow possible: twice max.;
for temperature conditions, please refer to the attached "Air reflow temperature conditions" on page 4

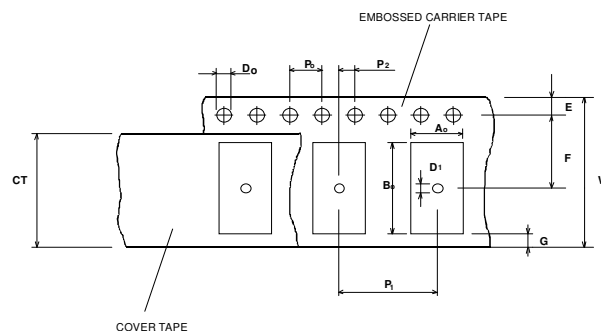
Packing

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;

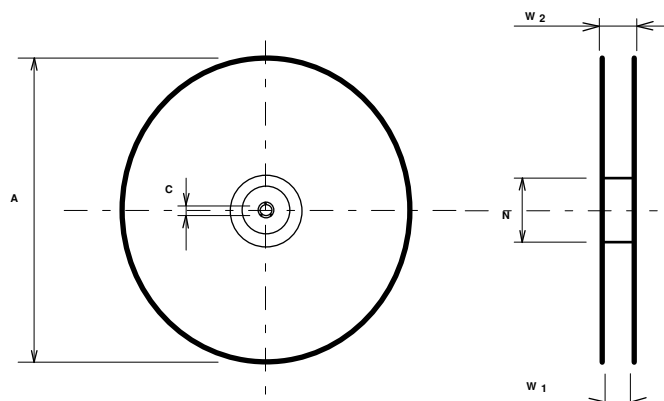
max. pieces of filters per reel: 3000
reel of empty components at start: min 300 mm
reel of empty components at start including leader: min 500 mm
trailer: min 300 mm

Tape (all dimensions in mm)

W	: 24	± 0,3
Po	: 4	± 0,1
Do	: 1,5	+ 0,1
E	: 1,75	± 0,1
F	: 11,5	± 0,1
G (min)	: 0,6	
P2	: 2	± 0,1
P1	: 8	± 0,1
D1(min)	: 1,5	
Ao	: 5,6	± 0,1
Bo	: 11,8	± 0,1
CT	: 21,5	± 0,1

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

A	: 330
W1	: 24,4 +2
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. Markings on the filters can be read if the upper side of the carrier tape is regarded with the sprocket holes on its right.

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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.	

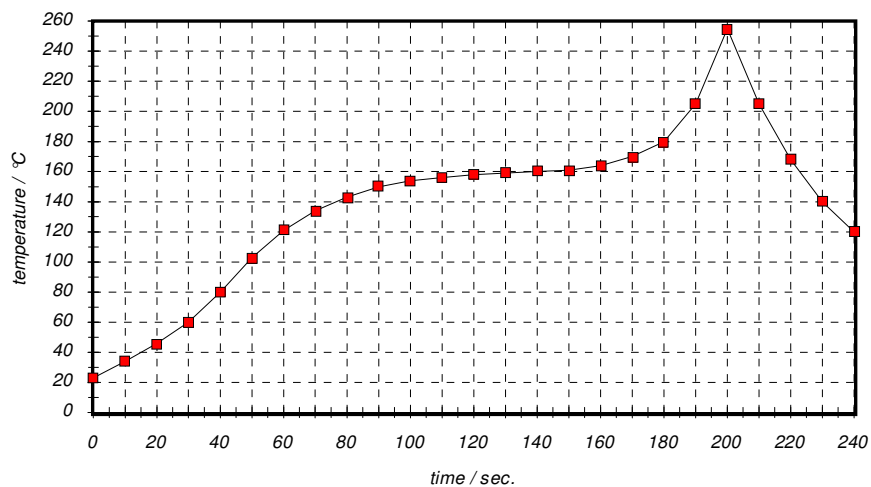
Chip-mount air reflow profile

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

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VI TELEFILTER	Filter Specification	TFS119	5/5
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History

Version	Reason of Changes	Name	Date
1.2	Add preliminary values for termination impedance Add history Modify monthly date code into weekly date code Corrected tape and reel information	Dr. Wall	09.05.2000
1.3	Add final termination conditions Add typical filter data Add limits for insertion loss	Dr. Wall	16.06.2000
1.4	Add maximum input power Add relative attenuation value for $F_N \pm 6 \text{ MHz} \dots F_N \pm 100 \text{ MHz}$ Add group delay Notice 1 dB bandwidth instead of 3 dB bandwidth Increase window for insertion loss to two dB	Dr. Wall	28.06.2000
1.5	Add comment for terminating impedances Add operating temperature range Add comment for parabolic temperature dependence Increase insertion loss range Correct tape and reel information	Dr. Wall	15.11.2002