

VI TELEFILTER**Filter specification****TFS 190 C****1/5****Measurement condition**

Ambient temperature T_A : 23 °C
 Input power level: 0 dBm
 Terminating impedance*: input 610 Ω // -10,4 pF
 output 560 Ω // -10,3 pF

Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the TFS 190 C 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 nominal frequency f_N is fixed at 190,0 MHz without tolerance. The values of the pass band ripple and the relative attenuation a_{rel} are guaranteed in the whole operating temperature range. The frequency shift of the filter in the operating temperature range is included in the measurement tolerance scheme.

D a t a		typ. value		tolerance / limit		
Insertion loss (Reference level)	$a_e = a_{min}$	8,2	dB	max	12	dB
Nominal frequency	f_N	-			190	MHz
Pass band	PB				$f_N \pm 2$	MHz
Relative attenuation	a_{rel}					
f_N $f_N \pm 2$ MHz		1	dB	max	2	dB
$f_N \pm 2,0$ MHz ... $f_N \pm 2,5$ MHz		-		max	5	dB
$f_N - 5,0$ MHz ... $f_N - 12$ MHz		36	dB	min	32	dB
$f_N - 12,0$ MHz ... $f_N - 190$ MHz		40	dB	min	36	dB
$f_N + 5,0$ MHz ... $f_N + 12$ MHz		36	dB	min	32	dB
$f_N + 12,0$ MHz ... $f_N + 270$ MHz		45	dB	min	36	dB
Phase variation						
$f_N \pm 2,5$ MHz		1,2	°rms	max	4	°rms
Input power level		-		max	10	dBm
Operating temperature range					- 30 °C ... + 85 °C	
Storage temperature range					- 55 °C ... + 125 °C	
Temperature coefficient of frequency	TC_f^{**}	-25	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.

**) $\Delta f_C(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_A) \times f_{CTA}(\text{MHz})$

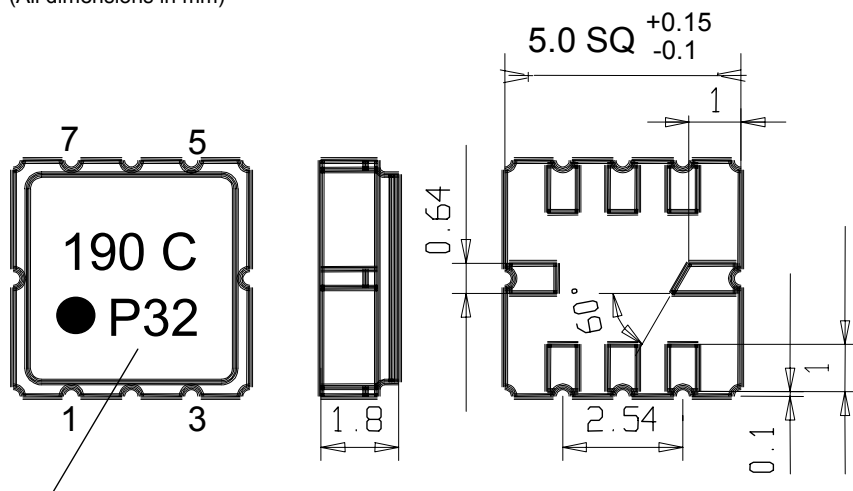
generated:**checked / approved:****VI TELEFILTER****Potsdamer Straße 18****D 14 513 TELTOW / Germany****Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30****E-mail: info@telefilter.com**

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VI TELEFILTER**Filter specification****TFS 190 C****2/5****Construction, pin configuration and 50 Ω - matching network**

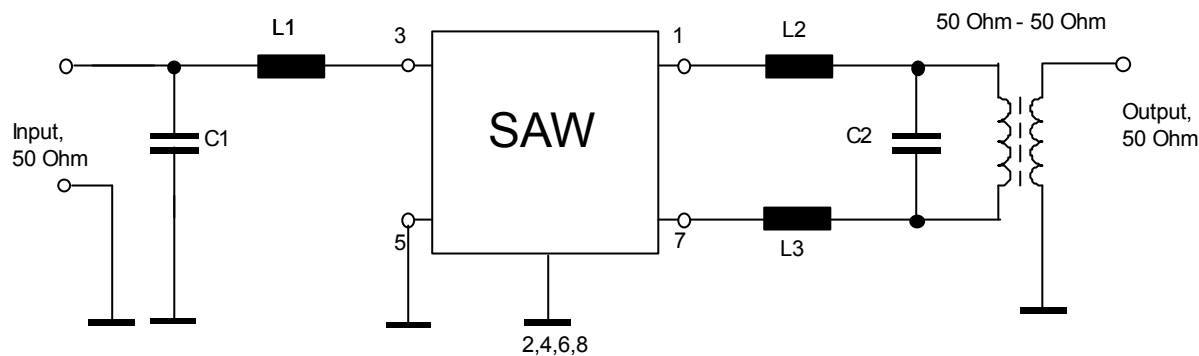
(All dimensions in mm)

**Date code**

Pin 1 Output
Pin 2 Ground
Pin 3 Input
Pin 4 Ground

Pin 5 Input RF return
Pin 6 Ground
Pin 7 Output
Pin 8 Ground

date code: year + week
M 2000
N 2001
P 2002
...

50 Ohm Test circuit

VI TELEFILTER**Filter specification****TFS 190 C****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 solder heat (reflow): reflow possible: twice max.;
for temperature conditions, please refer to the attached "Air reflow temperature conditions" on page 4

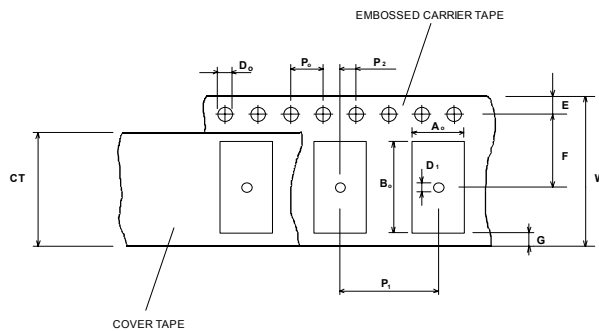
Packing

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:
reel of empty components at start:
reel of empty components at start including leader:
trailer

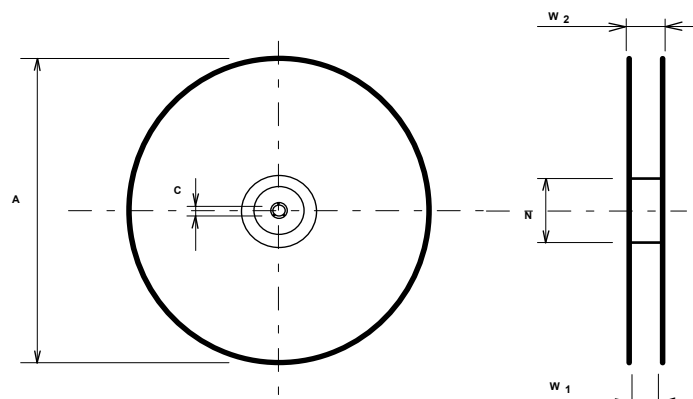
3000
min 300 mm
min 500 mm
min 300 mm

Tape (all dimensions in mm)

W	: 12 ± 0,3
Po	: 4 ± 0,1
Do	: 1,5 ± 0,1
E	: 1,75 ± 0,1
F	: 5,5 ± 0,05
G (min)	: 0,75
P2	: 2 ± 0,05
P1	: 8 ± 0,1
D1(min)	: 1,5
Ao	: 5,3 ± 0,1
Bo	: 5,3 ± 0,1
CT	: 9,5 ± 0,1

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

A	: 330
W1	: 12,4 ± 0,2
W2 (max)	: 18,4
N (min)	: 50
C	: 13 ± 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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VI TELEFILTER**Filter specification****TFS 190 C****4/5****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.	

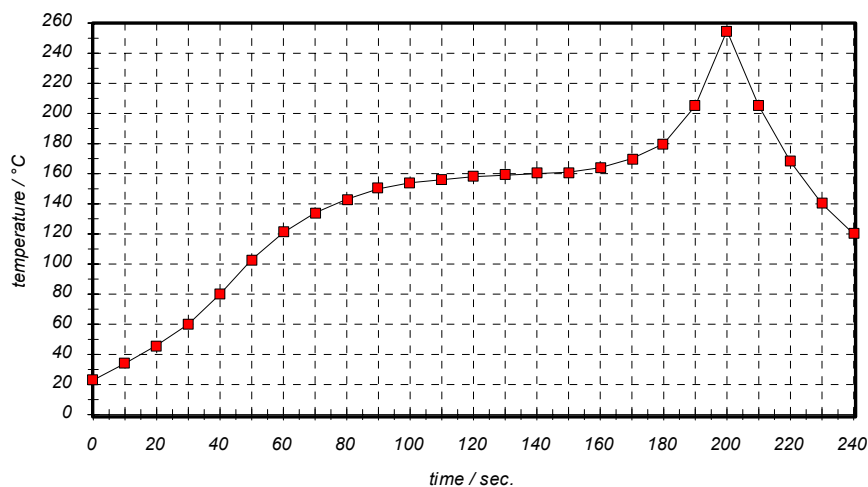
Chip-mount air reflow profile

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 190 C****5/5****History**

Version	Reason of Changes	Name	Date
1.0	Generation of specification according to customer requirements	Herrler	25.07.2001
1.1	change of pinning according to customer proposal	Steiner	20.09.2001
1.2	new Development specification Change of relative rejection and phase variation in pass band	Dr. Sabah	08.03.2002
1.3	Add of rejection typical values	Dr. Sabah	15.03.2002
1.4	Add of typical values and change to filter specification	Dr. Sabah	26.04.2002
1.5	correct relative attenuation	Dr. Sabah	29.05.2002
1.6	changing typical values of insertion loss, relative attenuation and temperature coefficient of frequency	Pfeiffer	07.08.2002