

**VI TELEFILTER**

**Filter specification**

**TFS 248C1**

**Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	63 Ω    -1,7 pF	
Output:	63 Ω    -1,7 pF	

**Characteristics**

**Remark:**

Reference level for the relative attenuation  $a_{rel}$  of the TFS248C1 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 to 248,6 MHz. 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  $f_C$ .

<b>D a t a</b>		<b>typ. Value</b>	<b>Tolerance / Limit</b>
<b>Insertion Loss</b> (reference level)	$a_e = a_{min}$	3,0 dB	3,5 dB
<b>Nominal Frequency</b>	$f_N$	-	248,6 MHz
<b>Centre Frequency</b>	$f_C$	248,6 MHz	-
<b>3 dB Band width</b>		6,6 MHz	5,0 MHz
<b>Pass Band Ripple</b> $f_N \pm 120$ kHz		0,1 dB	0,5 dB
<b>Relative Attenuation</b>	$a_{rel}$		
$f_N - 248,5$ MHz ... $f_N - 12$ MHz		57 dB	min. 25 dB
$f_N + 10$ MHz ... $f_N + 21$ MHz		19 dB	min. 10 dB
$f_N + 21$ MHz ... $f_N + 251,4$ MHz		67 dB	min. 25 dB
@ $f_N + 22,8$ MHz		56 dB	min. 50 dB
@ $f_N + 52,0$ MHz		56 dB	min. 50 dB
@ $f_N + 74,8$ MHz		56 dB	min. 50 dB
@ $f_N + 104,0$ MHz		56 dB	min. 50 dB
@ $f_N + 126,8$ MHz		56 dB	min. 50 dB
<b>Group Delay</b> GD		150 ns	max. 300 ns
<b>Group Delay Ripple</b> $f_N \pm 120$ kHz		20 ns	max. 100 ns
<b>Input Power Level</b>		-	max. 20 dBm
<b>Operating Temperature Range</b>		-	- 25 °C ... + 75 °C
<b>Storage Temperature Range</b>		-	- 40 °C ... + 85 °C
<b>Temperature Coefficient</b>		- 36 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.

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

**Generated:**

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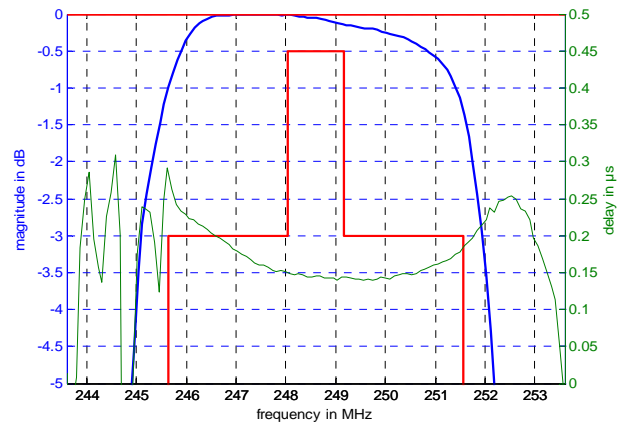
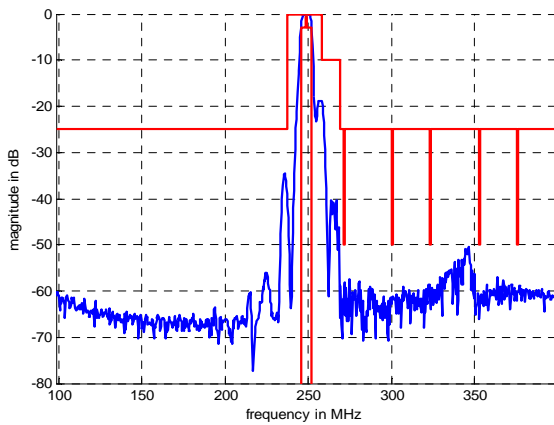
**Checked / Approved:**

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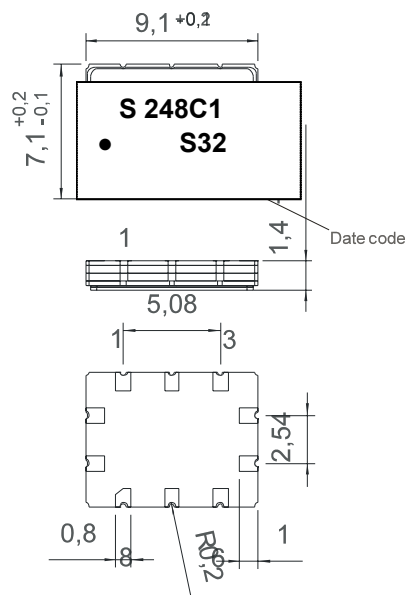
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**Filter characteristic**



**Construction and pin connection**

(All dimensions in mm)

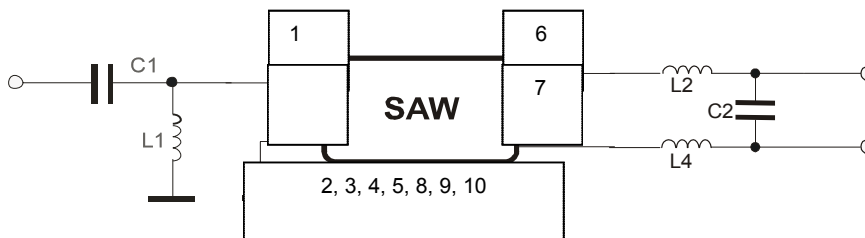


1	Input
2	Ground
3	Ground
4	Ground
5	Ground
6	Output
7	Output
8	Ground
9	Ground
10	Ground

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

**50/200 Ohm 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 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;

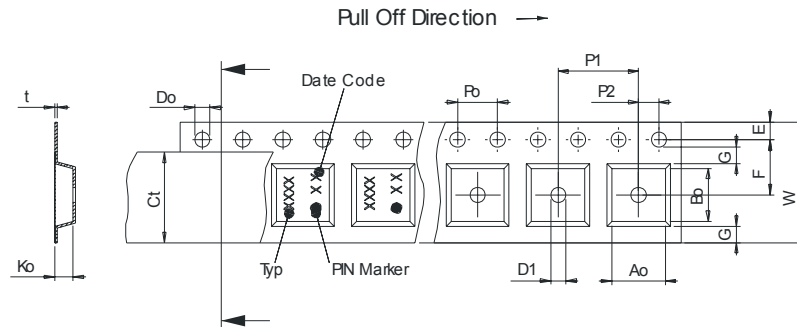
**Packing**

Tape & Reel: IEC 286 – 3, with 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 peer 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

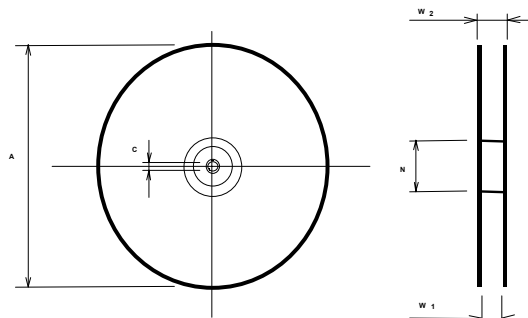
**Tape (all dimensions in mm)**

- W : 16,00 ± 0,3
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,10
- F : 7,50 ± 0,10
- G(min) : 0,60
- P2 : 2,00 ± 0,1
- P1 : 12,00 ± 0,1
- D1(min) : 1,50 +0,1/-0
- Ao : 7,60 ± 0,10
- Bo : 9,60 ± 0,10
- Ct : 13,5



**Reel (all dimensions in mm)**

- A : 330
- W1 : 16,4
- W2(max) : 22,4
- N(min) : 50
- C : 13,0



The minimum bending radius is 45 mm.

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**Air reflow temperature conditions**

1st and 2nd air reflow profile

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

**Chip-mount air reflow profile**

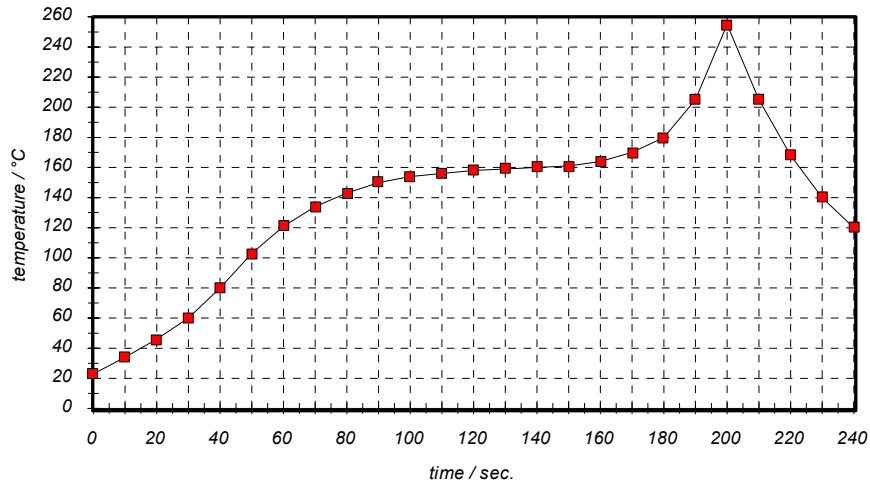


Table for temperature vs. time during the air reflow process

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****TFS 248C1****5/5**

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<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	- generate according to customer specification	Dr. Sabah	25.09.01
1.1	- correct of pin connections	Dr. Sabah	12.11.01
1.2	- add of input power level - change of development specification to Filter specification - add of typical filter data and terminating impedance	Dr. Sabah	08.01.02
1.3	- add filter characteristic - change drawing of package (construction, pin connection) - change drawing of test circuit - change drawing of packing (tape and reel)	Noack	04.08.04
1.4	-change marking of package	Noack	24.08.04

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