

**VI TELEFILTER****Filter specification****TFS 240P****1/5****Measurement condition**

Ambient temperature:	25	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	400 Ω	-11,8 pF
Output:	400 Ω	-11,5 pF

**Characteristics**

## Remark:

The nominal frequency  $f_N$  is fixed at 240,0 MHz. The insertion loss  $a_e$  is defined as loss value determined at  $f_N$ . Reference level for the relative attenuation  $a_{rel}$  of the TFS 240P is the insertion loss  $a_e$ . 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  $a_e$ . All specified data are met within the operating temperature range.

<b>Data</b>		<b>typ. value</b>	<b>tolerance / limit</b>
<b>Insertion loss</b> (reference level)	$a_e$	7,5 dB	max. 11,0 dB
<b>Nominal frequency</b>	$f_N$		240,0 MHz
<b>Centre frequency at ambient temperature</b>	$f_c$	-	240,00 ± 0,05 MHz
<b>Passband</b>	PB	-	$f_c$ ± 0,5 MHz
<b>Pass band ripple</b>	in any 20 kHz increment within the passband	0,1 dB	max. 1,0 dB
<b>Relative attenuation</b>	$a_{rel}$		
$f_c$	... $f_c$ ± 0,5 MHz	1,3 dB	max. 3,0 dB
	... $f_c$ ± 1,0 MHz	18 dB	min. 9 dB
$f_c$ ± 1,75 MHz	... $f_c$ ± 2,5 MHz	54 dB	min. 44 dB
$f_c$ + 2,5 MHz	... $f_c$ + 5,0 MHz	51 dB	min. 48 dB
$f_c$ - 2,5 MHz	... $f_c$ - 3,5 MHz	60 dB	min. 48 dB
$f_c$ - 3,5 MHz	... $f_c$ - 5,0 MHz	53 dB	min. 50 dB
<b>Group delay ripple within PB</b>		70 ns	max. 200 ns
<b>Operating temperature range</b>	OTR	-	- 10 °C ... + 55°C
<b>Storage temperature range</b>		-	- 40 °C ... + 85°C
<b>Frequency inversion temperature</b>		20 °C	-
<b>Temperature coefficient of frequency</b>	$TC_f$ **	-0,036 ppm/K <sup>2</sup>	-

\*) 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.

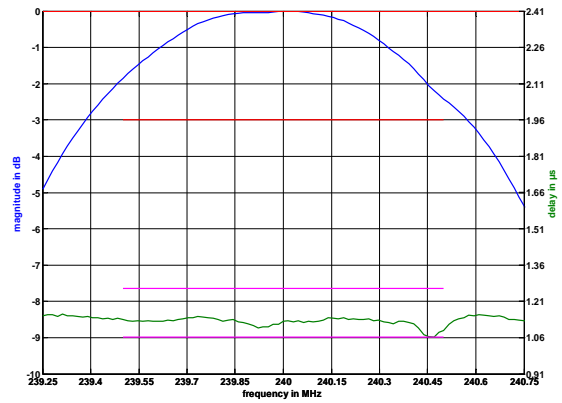
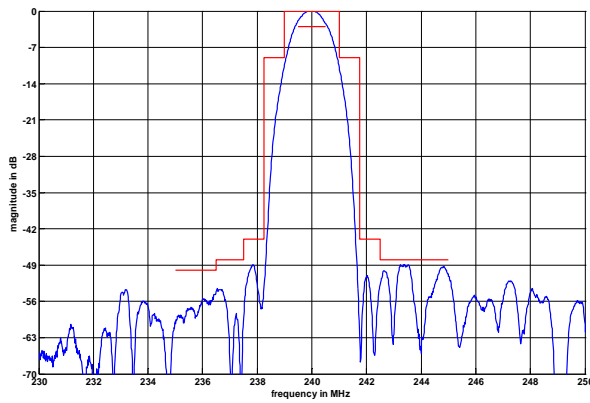
\*\*\*)  $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T - T_0)^2 \times f_{T0}(\text{MHz})$

**Generated:****Checked / Approved:**

**Tele Filter GmbH**  
**Potsdamer Straße 18**  
**D 14 513 TELTOW / Germany**  
**Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30**  
**E-Mail: [tft@telefilter.com](mailto:tft@telefilter.com)**

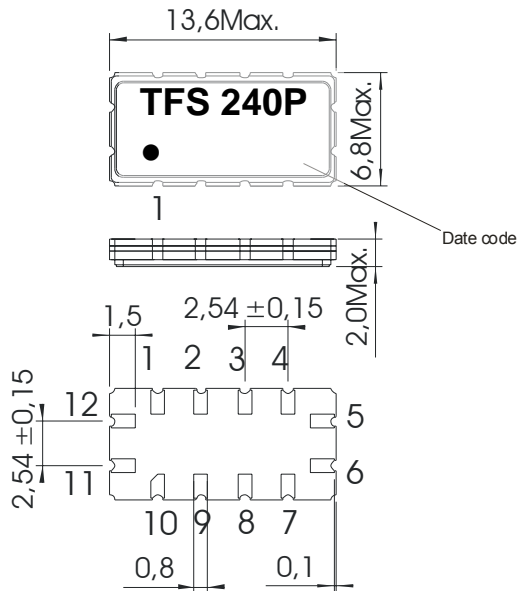
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**Filter characteristic**



**Construction and pin connection**

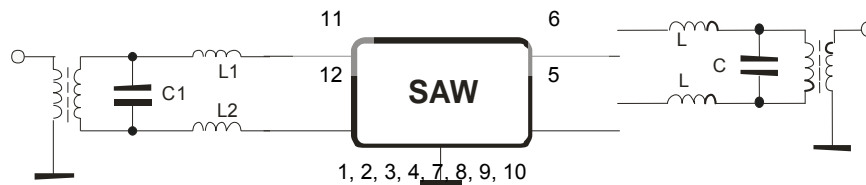
(All dimensions in mm)



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

Date code: Year + week  
 U 2006  
 V 2007  
 W 2008  
 ...

**Test circuit, balanced driven**



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 E-Mail: [tft@telefilter.com](mailto:tft@telefilter.com)

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**Stability characteristics, reliability**

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;

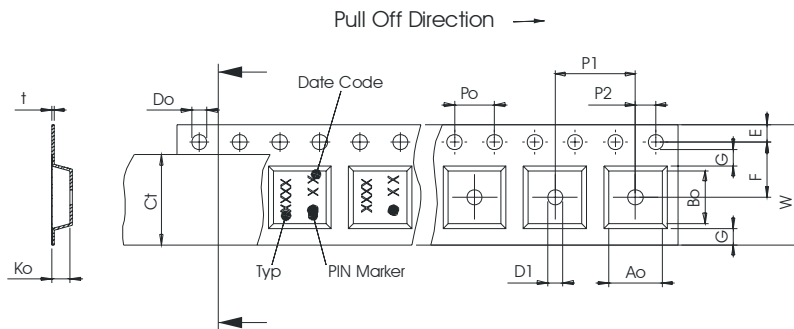
This filter is RoHS compliant (2002/95/EG, 2005/618/EG)

**Packing**

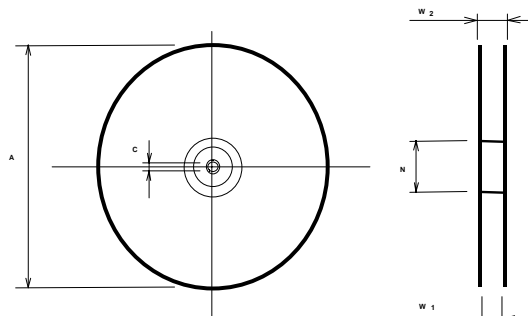
Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;  
tape type II, embossed carrier tape with top cover tape on the upper side;

max. pieces of filters per reel: <MAXPIECESPERREEL>  
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**



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**VI TELEFILTER****Filter specification****TFS 240P****5/5****History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	- Generation of development specification	Strehl	06.09.2005
1.1	- relative attenuation in upper stop band changed - terminating impedance, typical values and filter characteristic added - stability characteristics modified	Pfeiffer	25.11.2005
1.2	- pinning and matching configuration changed for balanced driven applications	Pfeiffer	08.02.2006

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