

**VI TELEFILTER**

**Filter specification**

**TFS 70AC**

**Measurement condition**

Ambient temperature  $T_A$ : 25 °C  
 Input power level: 0 dBm  
 Terminating impedances at  $f_C$  \*):  
     Input: 484  $\Omega$  || -22,0pF  
     Output: 127  $\Omega$  || -33,4pF

**Characteristics**

Remark: Reference level for the relative attenuation  $a_{rel}$  of the **TFS 70AC** 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 3 dB filter attenuation level relative to the insertion loss  $a_e$ . The temperature coefficient of frequency  $T_{Cf}$  is valid for both the reference frequency  $f_C$  and the frequency response of the filter in the operating temperature range.

Data		typ. value	tolerance / limit
<b>Insertion loss</b> (reference level)	$a_e$	7,5 dB	max. 9,5 dB
<b>Centre frequency</b> at ambient temperature	$f_C$	70 MHz	70,0 ± 0,1 MHz
<b>Pass band</b> <b>Amplitude ripple</b> within PB	PB	$f_C \pm 3,6$ MHz 0.3 dB	$f_C \pm 2,8$ MHz max. 1 dB
<b>Relative attenuation</b>	$a_{rel}$		
$f_C$ .....	$f_C \pm 3,1$ MHz	0,5 dB	max. 1 dB
$f_C \pm 3,1$ MHz .....	$f_C \pm 3,5$ MHz	2 dB	max. 3 dB
$f_C \pm 5,975$ MHz .....	$f_C \pm 20$ MHz	50 dB	min. 40 dB
<b>Group delay</b> at $f_C$		1,21 $\mu$ s	
<b>Group delay ripple</b> in PB		68 ns	max. 120 ns
<b>Phase linearity</b> in $f_C \pm 2,45$ MHz		4 deg p-p	max.8 deg p-p
<b>Operating temperature range</b>		-	- 30 °C ... + 80 °C
<b>Storage temperature range</b>		-	- 40 °C ... + 85 °C
<b>Temperature coefficient of frequency</b> $T_{Cf}$ **		- 94 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.

\*\*\*)  $\Delta f_C(\text{Hz}) = T_{Cf}(\text{ppm/K}) \times (T - T_A) \times f_N (\text{MHz})$

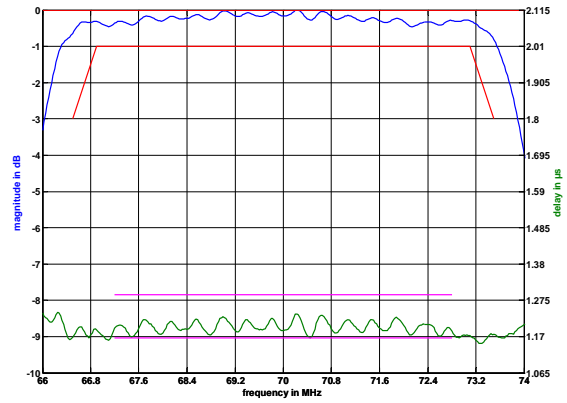
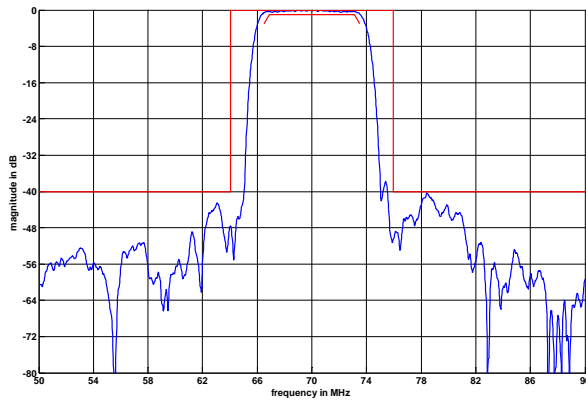
**Generated:** \_\_\_\_\_

**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)**

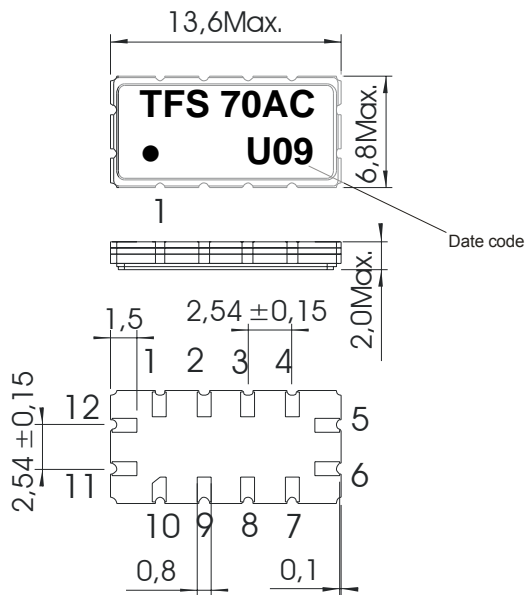
VI TELEFILTER reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

**Filter characteristic**



**Construction and pin connection**

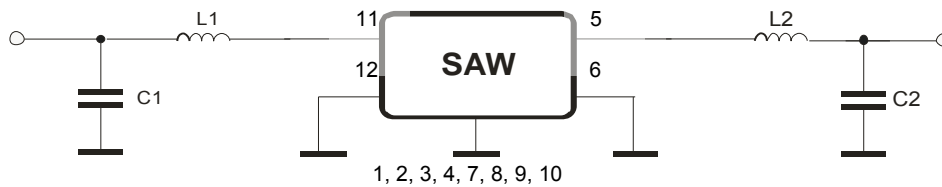
(All dimensions in mm)



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

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

**50 Ohm Test circuit**



**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)

VI TELEFILTER reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

**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)

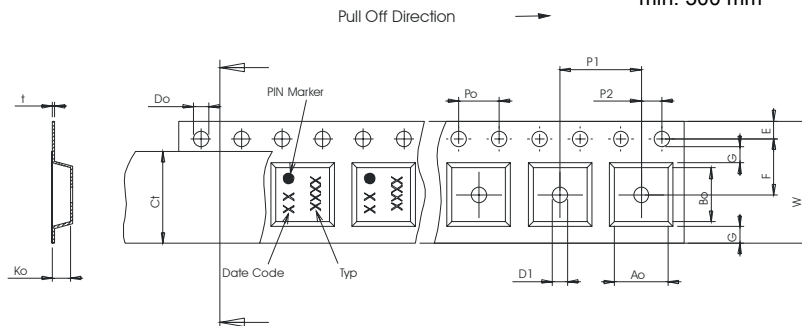
**Packing**

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: 1700  
 reel of empty components at start: min. 300 mm  
 reel of empty components at start including leader: min. 500 mm  
 trailer: min. 300 mm

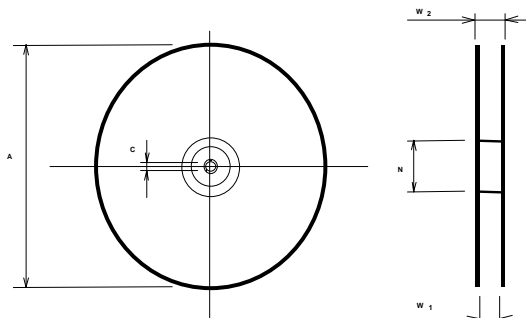
**Tape (all dimensions in mm)**

- 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
- W2(max) : 30,4
- N(min) : 60
- C : 13,0



The minimum bending radius is 45 mm.

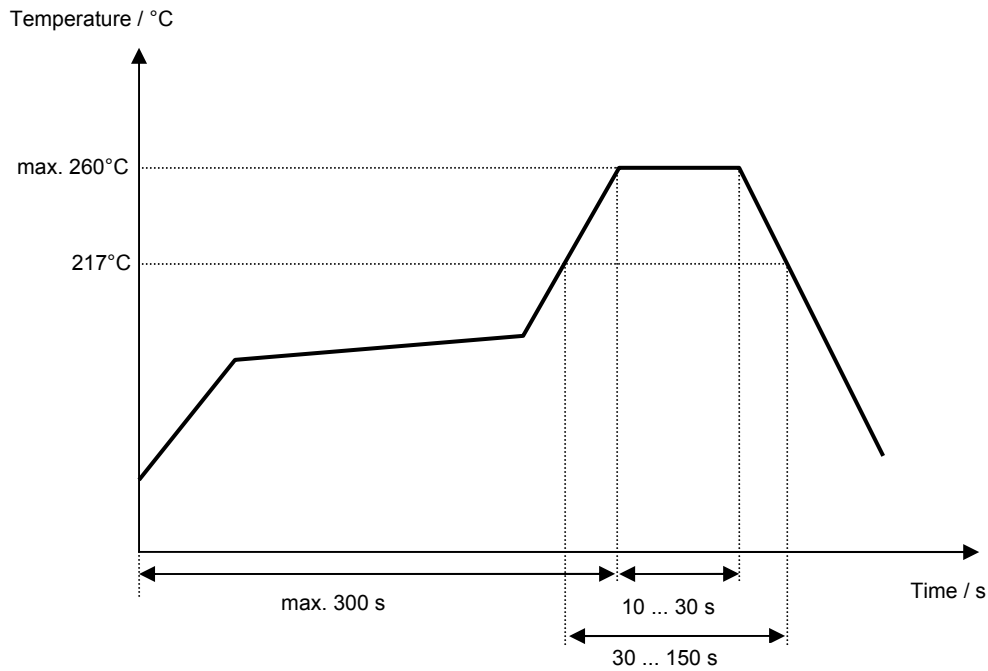
**Tele Filter GmbH**  
**Potsdamer Straße 18**  
**D 14 513 TELTOW / Germany**  
**Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30**  
**E-Mail: [tft@telefilter.com](mailto:tft@telefilter.com)**

VI TELEFILTER reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

**Air reflow temperature conditions**

<b>Conditions</b>	<b>Exposure</b>
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**



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)

VI TELEFILTER reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

**History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	- generate development specification	Pfeiffer	14.05.2003
1.1	- $f_N$ changed to $f_c$ generate development specification - remove nominal frequency $f_N$	Chilla	08.09.2003
1.2	- changed to filter specification - terminating impedances added - typical values added - group delay at $f_N$ changed to 1,21 $\mu$ s typical value - matching network added	Chilla	24.11.2003
1.3	- filter characteristics added - test circuit updated - RoHS compliant added - air reflow temperature conditions updated	Chilla	03.03.2006