

**VI TELEFILTER****Filter specification****TFS 70AT****1/5****Measurement condition**

|                          |             |        |
|--------------------------|-------------|--------|
| Ambient temperature:     | 25          | °C     |
| Input power level:       | 0           | dBm    |
| Terminating impedance: * |             |        |
| Input:                   | 88 $\Omega$ | -30 pF |
| Output:                  | 88 $\Omega$ | -32 pF |

**Characteristics****Remark:**

The reference level for the relative attenuation  $a_{rel}$  of the TFS 70AT 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 70 MHz. The values for relative attenuation are guaranteed at ambient temperature. The frequency shift of the filter over temperature defined by the temperature coefficient of frequency  $T_{CF}$  is not included in the production tolerance scheme.

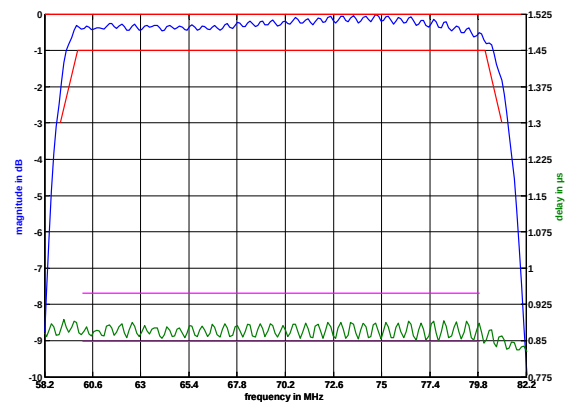
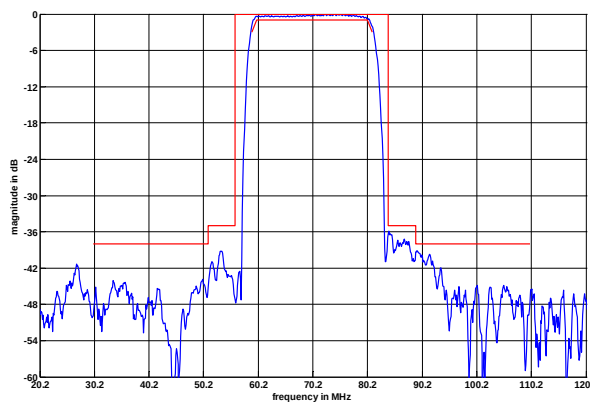
| <b>D a t a</b>                                                      |                                                                                                 | <b>typ. value</b> |         | <b>tolerance / limit</b> |         |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------|---------|--------------------------|---------|
| <b>Insertion loss :</b><br>( reference level )                      | $a_e$                                                                                           | 14,9              | dB      | 16                       | dB      |
| <b>Nominal frequency :</b>                                          | $f_N$                                                                                           | -                 |         | 70                       | MHz     |
| <b>Centre frequency :</b>                                           | $f_C$ at ambient temperature ( $f_{CTA}$ )                                                      | 70,1              | MHz     |                          |         |
| <b>Pass band :</b>                                                  | <b>PB</b>                                                                                       |                   |         | $f_N \pm 11$             | MHz     |
| <b>Relative attenuation :</b>                                       | $a_{rel}$                                                                                       |                   |         |                          |         |
| $f_N$ ... $f_N \pm 10,15$ MHz                                       |                                                                                                 | 0,4               | dB      | max. 1                   | dB      |
| $f_N \pm 10,15$ MHz ... $f_N \pm 11$ MHz                            |                                                                                                 | 2                 | dB      | max. 3                   | dB      |
| $f_N \pm 14$ MHz ... $f_N \pm 19$ MHz                               |                                                                                                 | 38                | dB      | min. 35                  | dB      |
| $f_N \pm 19$ MHz ... $f_N \pm 40$ MHz                               |                                                                                                 | 45                | dB      | min. 38                  | dB      |
| <b>Group delay</b> (mean value in PB )                              |                                                                                                 | 0,88              | $\mu$ m | max. 1,12                | $\mu$ s |
| <b>Group delay ripple (p-p)</b> in 90%of PB                         |                                                                                                 | 35                | ns      | max. 100                 | ns      |
| <b>Phase linearity (p-p)</b> in 90%of PB                            |                                                                                                 | 3,3               | deg     | max. 11                  | deg     |
| <b>Temperature coefficient of frequency ( <math>T_{CF}</math> )</b> |                                                                                                 | - 94              | ppm/K   | -                        |         |
| <b>Frequency deviation of <math>f_C</math> over temperature</b>     | $\Delta f_C(\text{Hz}) = T_{CF}(\text{ppm/K}) \times (T - T_{CTA}) \times f_{CTA} (\text{MHz})$ |                   |         |                          |         |
| <b>Operating temperature range</b>                                  | <b>OTR</b>                                                                                      |                   |         | - 40 °C ... + 80 °C      |         |
| <b>Storage temperature range</b>                                    |                                                                                                 |                   |         | - 40 °C ... + 85 °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.

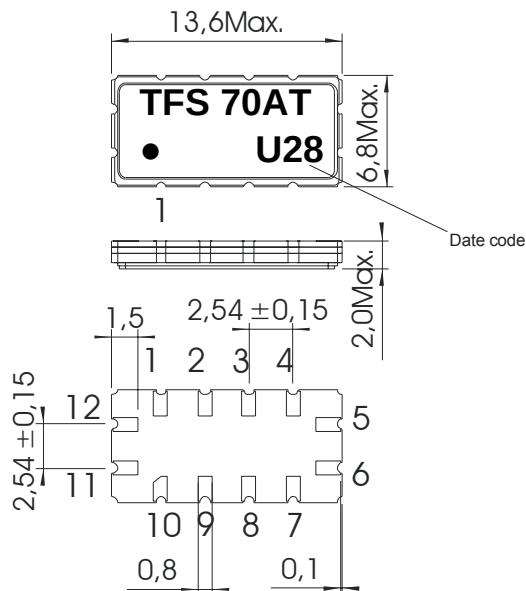
**Generated:****Checked / Approved:**

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.

**VI TELEFILTER****Filter specification****TFS 70AT****2/5****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  |

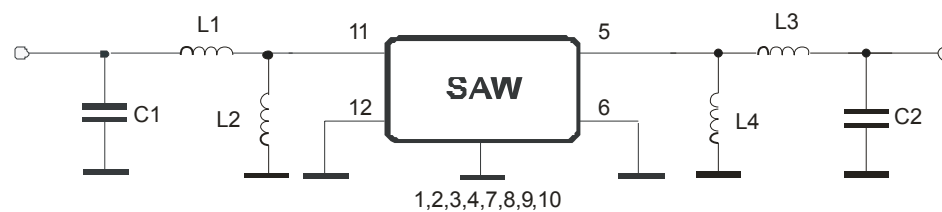
Date code: Year + week

T 2005

U 2006

V 2007

...

**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.

**VI TELEFILTER****Filter specification****TFS 70AT****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 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;

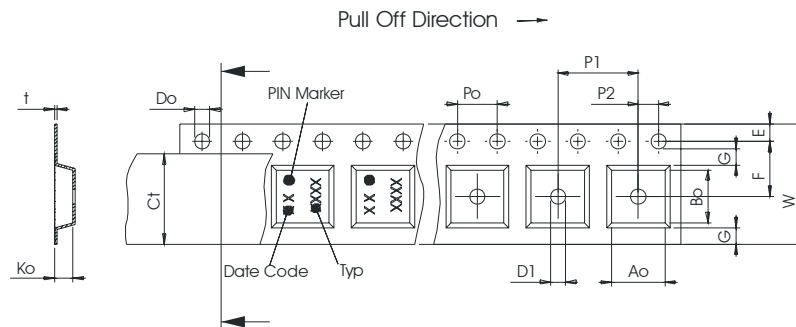
**Packing**

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

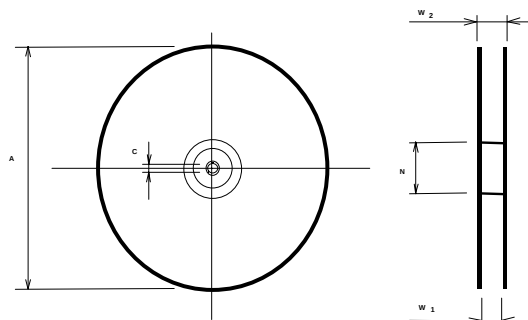
|                                                     |             |
|-----------------------------------------------------|-------------|
| max. pieces of filters peer reel:                   | 1700        |
| reel of empty components at start:                  | min. 300 mm |
| reel of empty components 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 +2/-0     |
| W2(max) | : 30,4           |
| N(min)  | : 60             |
| C       | : 13,0 +0,5/-0,2 |



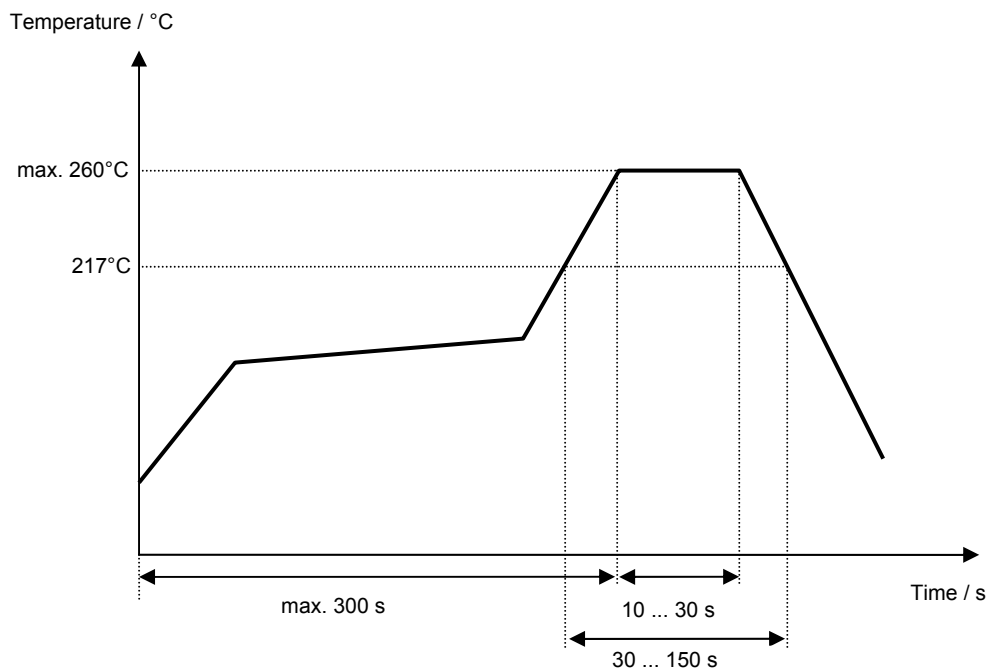
The minimum bending radius is 45 mm.

**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**

**VI TELEFILTER****Filter specification****TFS 70AT****5/5****History :**

| <b>Version</b> | <b>Reason of Changes</b>                                                                                                                                                                                             | <b>Name</b> | <b>Date</b> |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|
| 1.0            | generating specification according to customer requirements                                                                                                                                                          | Chilla      | 10.12.2004  |
| 1.1            | generating filter specification<br>added terminating impedance<br>changed relative attenuation<br>added typical values<br>added filter characteristic<br>added test circuit<br>changed chip-mount air reflow profile | Chilla      | 28.06.2005  |
| 1.2            | changed relative attenuation                                                                                                                                                                                         | Chilla      | 13.07.2006  |