

**VI TELEFILTER**

**Filter specification**

**TFS 300F**

**Measurement condition**

Ambient temperature: 23 °C  
 Input power level: 0 dBm  
 Terminating impedance: \*  
     Input: 820 Ω || -6,6 pF  
     Output: 670 Ω || -6,5 pF

**Characteristics**

**Remark:**

The reference level for the relative attenuation  $a_{rel}$  of TFS 300F is the minimum of the pass band attenuation  $a_{min}$ . This value 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 given values for the relative attenuation  $a_{rel}$  and the group delay ripple have to be reached at the frequencies given below, even 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>Limit</b>         |
|---|--------------------------|----------------------|
| <b>Insertion loss</b> $a_e = a_{min}$<br>(at ambient temperature) | 13,5 dB                  | max. 19 dB           |
| <b>Centre frequency</b> $f_C$<br>(at ambient temperature)         | -                        | 300 MHz ± 0,09 MHz   |
| <b>Passband ripple (p-p)</b> within $f_C \pm 1,2$ MHz             | 0,3 dB                   | max. 1,1 dB          |
| <b>Relative attenuation</b> $a_{rel}$                             |                          |                      |
| $f_C$ ... $f_C \pm 1,2$ MHz                                       | 0,3 dB                   | max. 1,1 dB          |
| $f_C \pm 1,2$ MHz ... $f_C \pm 1,65$ MHz                          | 2 dB                     | max. 3 dB            |
| $f_C \pm 2,4$ MHz ... $f_C \pm 6$ MHz                             | 45 dB                    | min. 40 dB           |
| $f_C \pm 6$ MHz ... $f_C \pm 40$ MHz                              | 52 dB                    | min. 45 dB           |
| <b>Group delay ripple (p-p)</b> within $f_C \pm 1,6$ MHz          | 105 ns                   | max. 200 ns          |
| <b>Absolute group delay</b> at $f_C$                              | 1,4 µs                   | max. 1,8 µs          |
| <b>Phase ripple (p-p)</b> within $f_C \pm 1,6$ MHz                | 4,5 °                    | max. 10 °            |
| <b>Triple transit suppression</b> compared to main signal         | 50 dB                    | min. 37 dB           |
| <b>Return loss</b> within $f_C \pm 1,6$ MHz                       | 15 dB                    | min. 10 dB           |
| <b>Operable temperature range</b>                                 | -                        | - 40 °C ... + 85 °C  |
| <b>Operating temperature range</b>                                | -                        | - 30 °C ... + 70 °C  |
| <b>Storage temperature range</b>                                  | -                        | - 40 °C .....+ 85 °C |
| <b>Temperature coefficient **)</b> TC                             | -0,04 ppm/K <sup>2</sup> | -                    |
| <b>Frequency inversion temperature (T<sub>0</sub>)</b>            | 28 °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.

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

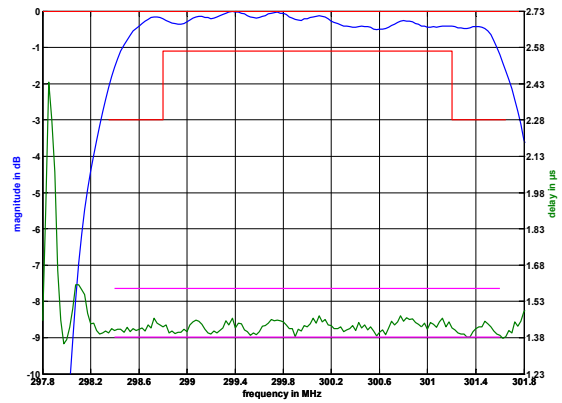
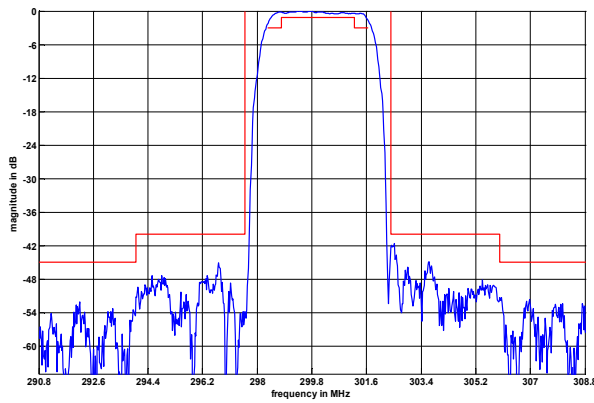
**generated:** \_\_\_\_\_

**checked / approved:** \_\_\_\_\_

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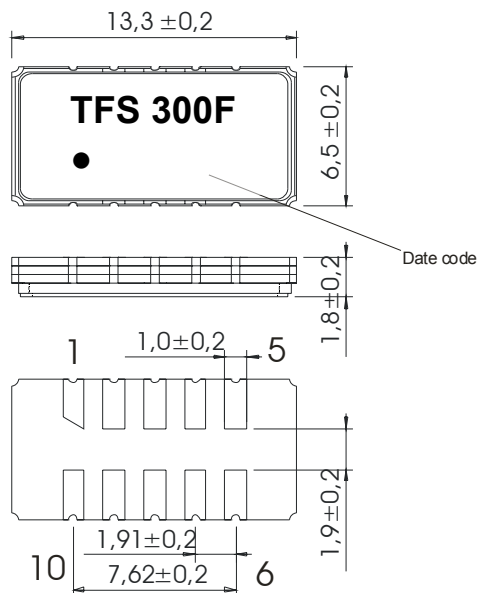
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**Filter characteristic**



**Construction and pin connection**

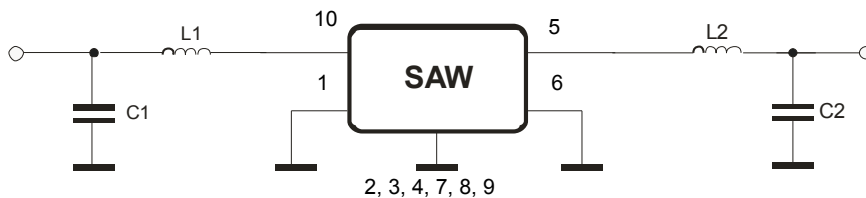
(All dimensions in mm)



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

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

**50 Ω Test circuit**



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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: three times max.;  
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

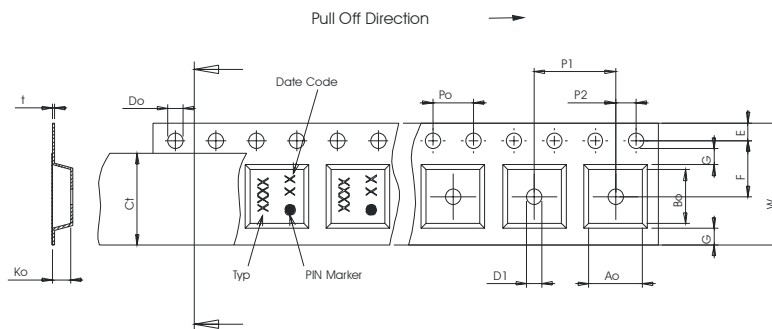
This filter is RoHS compliant (2002/95/EG, 2005/618/EG)

**Packing**

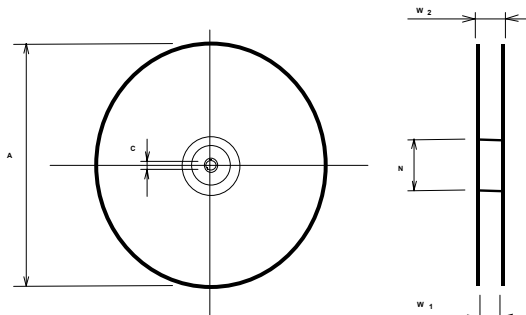
Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;  
tape type II, embossed carrier tape with top cover tape on the upper side;

|   |             |
|---|-------------|
| 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 +2/-0
  - W2(max) : 30,4
  - N(min) : 60
  - C : 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

**Air reflow temperature conditions**

1st and 2nd air reflow profile

**Name:** \_\_\_\_\_ pre-heating periods \_\_\_\_\_ main-heating periods

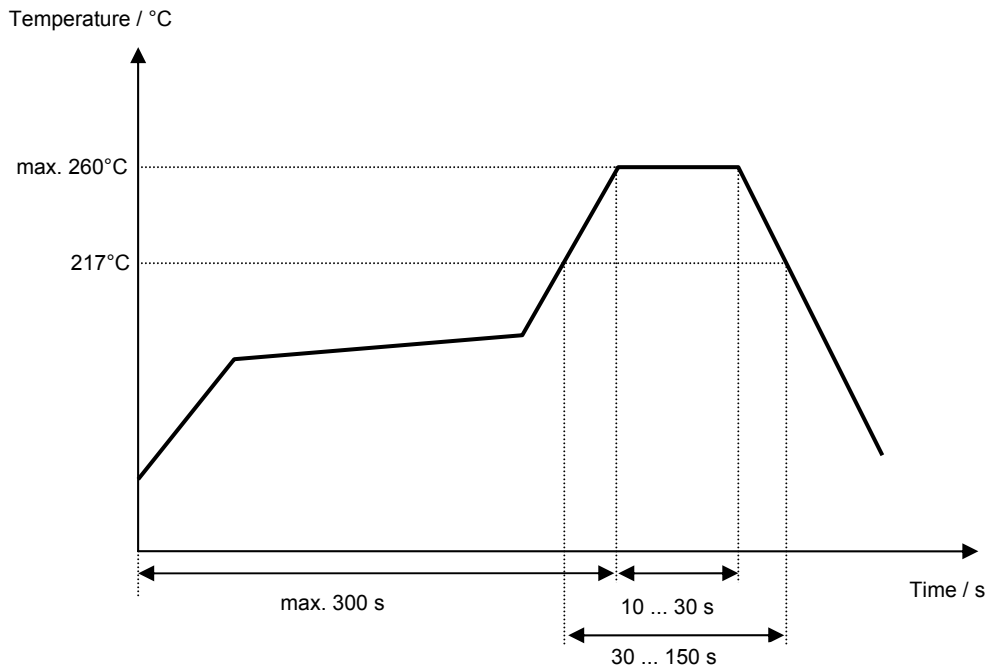
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**Air reflow temperature conditions**

| 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 300F****5/5****History**

| <b>Version</b> | <b>Reason of Changes</b>   | <b>Name</b> | <b>Date</b> |
|----------------|--|-------------|-------------|
| 1.0            | generate development specification according to customer requirements.   | Dunzow W.   | 22.11.2001  |
| 1.1            | change operating temperature range from [ 0°C...70°C ] to [ -30°C...70°C ].  | Dunzow W.   | 30.11.2001  |
| 1.2            | change of package, insertion loss, requirements in pass band and relative attenuation<br>30.01.2003                  | Pfeiffer    |             |
| 1.3            | absolute value of group delay and operable temperature added   | Pfeiffer    | 26.02.2003  |
| 1.4            | typical values and terminating impedances added  | Pfeiffer    | 04.06.2003  |
| 1.5            | - filter characteristic added<br>- air reflow temperature conditions changed<br>- stability characteristics modified | Pfeiffer    | 16.05.2006  |

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