

**VI TELEFILTER****Filter Specification****TFS 174 C****1/5****Measurement condition**

Ambient temperature  $T_A$ : 25 °C ± 2°C  
 Input power level: 0 dBm  
 Terminating impedances at  $f_C$ : \*  
 input: 840 Ω || -9,2 pF  
 output: 940 Ω || -8,0 pF

**Characteristics**

Remark: Reference level for the relative attenuation  $a_{rel}$  of the TFS 174C 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 nominal frequency  $f_N$  is fixed at 174,2 MHz without tolerance. The given values for the relative attenuation  $a_{rel}$  and for 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  $f_C$ .

| Data   | typ. value                | tolerance / limit   |
|--|---------------------------|---------------------|
| <b>Insertion loss</b><br>(reference level) $a_e$                 | 5,2 dB                    | max. 7,0 dB         |
| <b>Nominal frequency</b> $f_N$                                   | -                         | 174,2 MHz           |
| <b>Centre frequency</b> $f_C$                                    | 174,2 MHz                 | -                   |
| <b>Relative attenuation</b> $a_{rel}$                            |                           |                     |
| $f_N$ ..... $f_N \pm 0,067$ MHz                                  | 0,07 dB                   | max. 0,25 dB        |
| $f_N \pm 0,067$ MHz ..... $f_N \pm 0,125$ MHz                    | 0,10 dB                   | max. 1,00 dB        |
| $f_N \pm 0,125$ MHz ..... $f_N \pm 0,200$ MHz                    | 0,15 dB                   | max. 1,20 dB        |
| $f_N \pm 0,2$ MHz ..... $f_N \pm 0,330$ MHz                      | 1,2 dB                    | max. 3 dB           |
| $f_N \pm 0,469$ MHz ..... $f_N \pm 0,600$ MHz                    | 6,5 dB                    | min. 4 dB           |
| $f_N \pm 0,600$ MHz ..... $f_N \pm 0,860$ MHz                    | 22 dB                     | min. 11 dB          |
| $f_N \pm 0,860$ MHz ..... $f_N \pm 1,200$ MHz                    | 40 dB                     | min. 20 dB          |
| $f_N \pm 1,200$ MHz ..... $f_N \pm 6,000$ MHz                    | 44 dB                     | min. 40 dB          |
| $f_N - 154,200$ MHz ..... $f_N - 6,000$ MHz                      | 80 dB                     | min. 50 dB          |
| $f_N + 6,000$ MHz ..... $f_N + 225,800$ MHz                      | 80 dB                     | min. 50 dB          |
| <b>Absolute group delay in PB</b>                                | 2,2 µs                    | max. 2,6 µs         |
| <b>Group delay variation in PB</b>                               | 80 ns                     | max. 260 ns         |
| <b>Input power level</b>   | -                         | max. 20 dBm (***)   |
| <b>Return loss in PB</b>   | 20 dB                     | min. 10 dB          |
| <b>Temperature coefficient of frequency <math>Tc_f</math> **</b> | - 0,04 ppm/K <sup>2</sup> | -                   |
| <b>Operating temperature range</b>                               | -                         | -5 °C ... + 85 °C   |
| <b>Storage temperature range</b>                                 | -                         | - 40 °C ... + 85 °C |
| <b>Frequency inversion temperature <math>T_0</math></b>          | 32 °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.

\*\*\*) This power level is allowed for short term operation only. The max. input power for continuous operation is max. 15 dBm only.

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

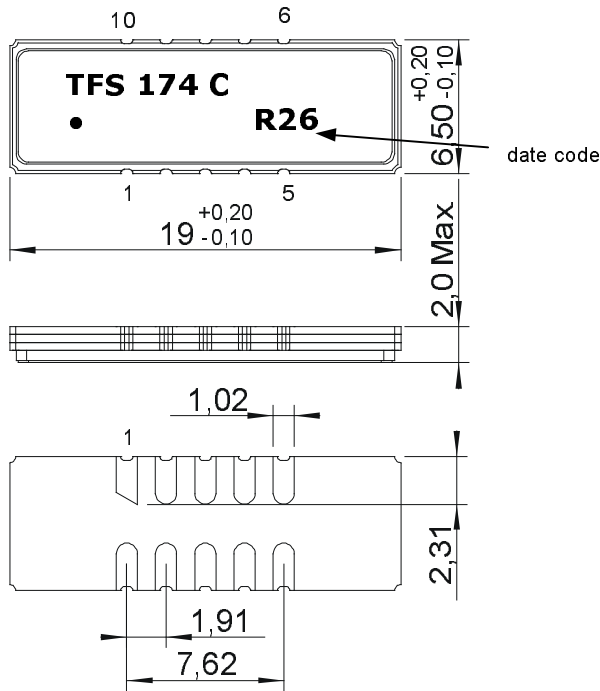
checked / approved: \_\_\_\_\_

**TELEFILTER 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.

**Construction and pin connection**

(all dimensions in mm)

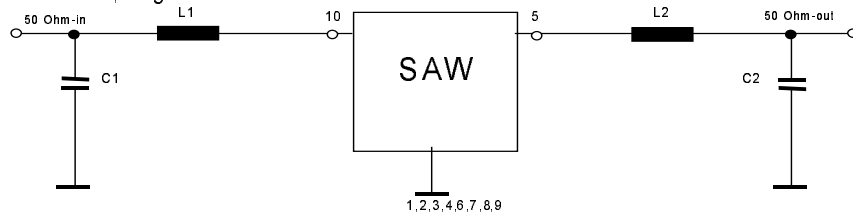


- 1 Input
- 2 Ground
- 3 Ground
- 4 Ground
- 5 Output
- 6 Output
- 7 Ground
- 8 Ground
- 9 Ground
- 10 Input

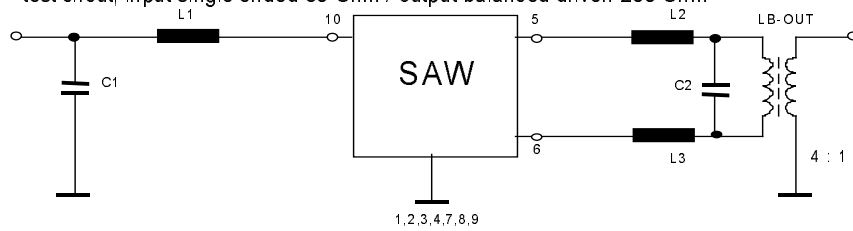
Date code: year + week  
 N 2001  
 P 2002  
 R 2003  
 ...

**matching circuit**

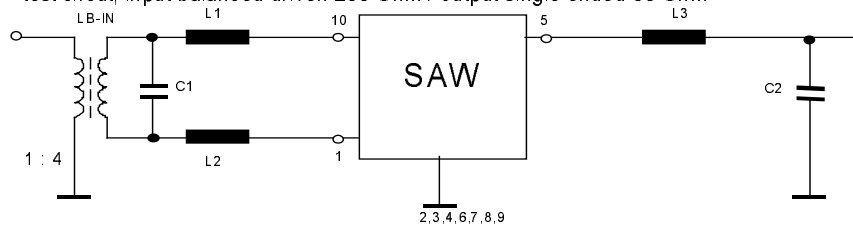
- test circuit, single ended 50 Ohm



- test circuit, input single ended 50 Ohm / output balanced driven 200 Ohm



- test circuit, input balanced driven 200 Ohm / output single ended 50 Ohm



**TELEFILTER 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**

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 5g 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, please refer to the attached "Air reflow temperature conditions" on page 4;

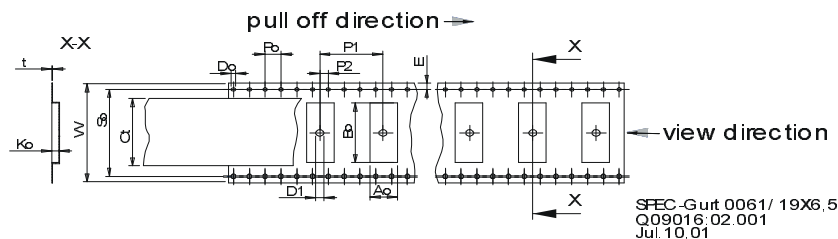
**Packing**

Tape & Reel: DIN 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;

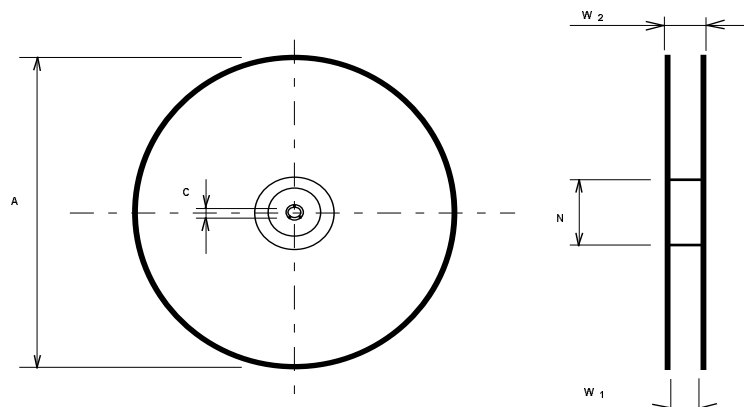
|   |            |
|---|------------|
| max. pieces of filters per reel:                    | 2000       |
| reel of empty components at start:                  | min 300 mm |
| reel of empty components at start including leader: | min 500 mm |
| trailer   | min 300 mm |

**Tape (all dimensions in mm)**

W : 32 ± 0,3  
 Po : 4 ± 0,1  
 Do : 1,5 + 0,5  
 E : 1,75 ± 0,1  
 S0 : 28,4 ± 0,1  
 P2 : 2 ± 0,1  
 P1 : 12 ± 0,1  
 D1 (min) : 1,5  
 Ao : 7,1 ± 0,1  
 Bo : 19,6 ± 0,1  
 Ko : 2,0 ± 0,1  
 t : 0,35 ± 0,05  
 Ct : 25,5 ± 0,1

**Reel (all dimensions in mm):**

A : 330  
 W1 : 32,4 +2  
 W2 (max) : 38,4  
 N (min) : 100  
 C : 13 + 0,5/-0,2



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. The marking of the filters is able to read if the view is directed on the upper side of the carrier tape in the above shown direction.

**TELEFILTER 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**

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.    |                  |

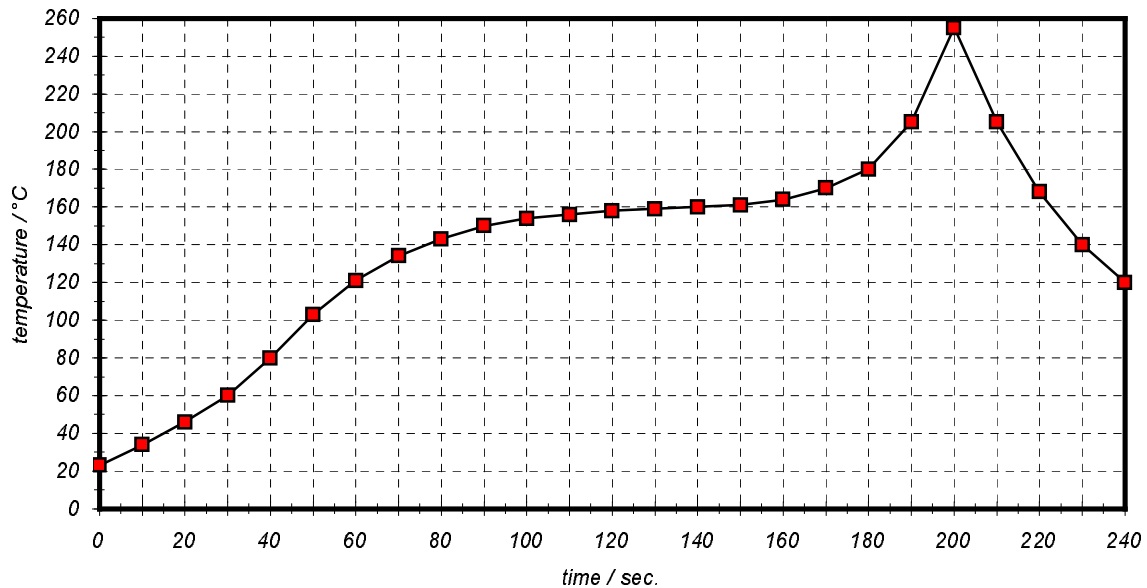
**Air reflow profile**

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              |

TELEFILTER 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 174 C****5/5**

---

**History**

| <b>Version</b> | <b>Reason of Changes</b>   | <b>Name</b> | <b>Date</b> |
|----------------|--|-------------|-------------|
| 1.0            | - generate development specification   | Pfeiffer    | 12.05.2003  |
| 1.1            | - typical values and terminating impedances added<br>- additional matching configurations attached | Pfeiffer    | 27.06.2003  |

---

**TELEFILTER 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.