

**VI TELEFILTER****Filter specification****TFS57****1/5****Measurement condition**

|                           |              |          |
|---------------------------|--------------|----------|
| Ambient temperature:      | 23           | °C       |
| Input power level:        | 0            | dBm      |
| Terminating impedance: *) |              |          |
| Input:                    | 260 $\Omega$ | -19,5 pF |
| Output:                   | 260 $\Omega$ | -19,5 pF |

**Characteristics****Remark:**

Reference level for the relative attenuation  $a_{rel}$  of the TFS 57 is the maximum of the pass band attenuation  $a_{max}$ . The maximum of the pass band attenuation  $a_{max}$  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 1,5 dB filter attenuation level relative to the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 57.6 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 also 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>tolerance / limit</b> |                     |
|---------------------------------------------|------------|-------------------|-------|--------------------------|---------------------|
| <b>Insertion loss</b><br>(reference level)  | $a_e$      | 13,5              | -     | max.                     | 15 dB               |
| <b>Nominal frequency</b>                    | $f_N$      | -                 |       |                          | 57,6 MHz            |
| <b>Centre frequency</b>                     | $f_c$      | 57,6              | MHz   |                          |                     |
| <b>Pass band</b>                            |            |                   |       |                          |                     |
| $f_N - 10,6$ MHz ... $f_N + 10,6$ MHz       |            |                   |       |                          |                     |
| <b>Pass band ripple</b>                     |            | 0,7               | dB    | max.                     | 1,5 dB              |
| <b>Relative attenuation</b>                 | $a_{rel}$  |                   |       |                          |                     |
| $f_N - 10,6$ MHz ... $f_N + 10,6$ MHz       |            | 0,7               | dB    | max.                     | 1,5 dB              |
| $f_N - 56,6$ MHz ... $f_N - 27,8$           |            | 55                | dB    | min.                     | 45 dB               |
| $f_N + 27,8$ MHz ... $f_N + 192,4$          |            | 48                | dB    | min.                     | 45 dB               |
| $f_N + 192,4$ MHz ... $f_N + 942,4$         |            | 55                | dB    | min.                     | 35 dB               |
| <b>Group delay ripple within PB</b>         | ***)       | 100               | ns    | max.                     | 110 ns              |
| <b>Intermodulation IP3</b>                  | ****)      | -                 |       | min.                     | 30 dBm              |
| <b>1 dB compression point</b>               |            | -                 |       | min.                     | 12 dBm              |
| <b>Input power level</b>                    |            | -                 |       | max.                     | 13 dBm              |
| <b>Temperature coefficient of frequency</b> | $TC_f$ **) | -72               | ppm/K |                          |                     |
| <b>Operating temperature range</b>          | OTR        | -                 |       |                          | - 25 °C ... + 85 °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.

\*\*)  $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_0) \times f_{cAT}(\text{MHz})$ .

\*\*\*) to be fulfilled in any 5 MHz segment of the passband; measurement conditions are: 5MHz span, 1601 points, 10 x averaging

\*\*\*\*)  $f_{in1} = 56,0$  MHz;  $f_{in2} = 59,2$  MHz;  $P_{in} = 0$  dBm  $f_{measurement1} = 2 \times f_{in1} - f_{in2} = 52,8$  MHz;  $f_{measurement2} = 2 \times f_{in2} - f_{in1} = 62,4$  MHz

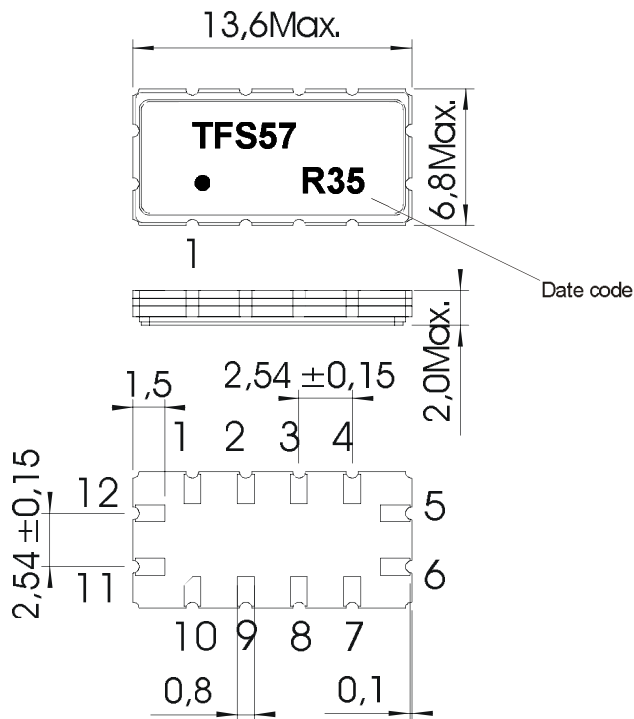
**Generated:****Checked / Approved:**

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.

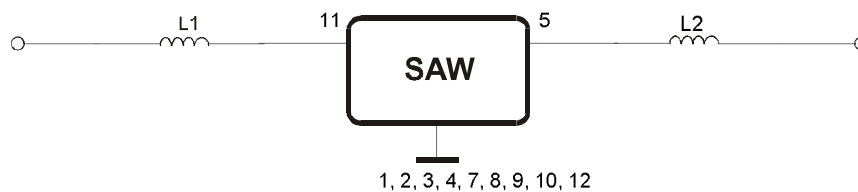
**VI TELEFILTER****Filter specification****TFS57****2/5****Construction and pin connection**

(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 |
| N          | 2001        |
| P          | 2002        |
| R          | 2003        |
| ...        |             |

**50 Ω 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****TFS57****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;

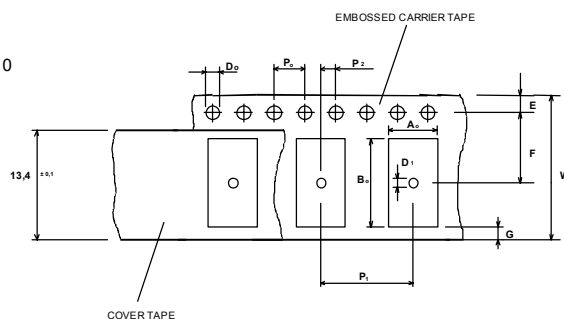
**Packing**

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

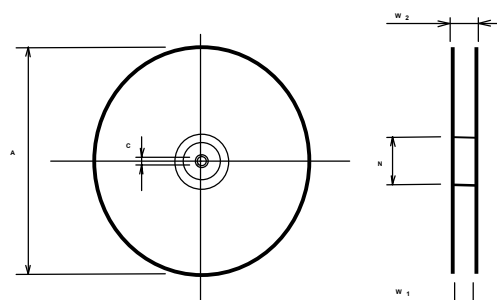
max. pieces of filters peer reel: 1700  
reel of empty components at start: min. 300 mm  
reel of empty components at start including leader: min. 500 mm  
trailer: min. 300 mm

**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. The mounting surface of the filters faces the bottom side of the embossed carrier tape. Marking of the filters can be read if the upper side of the carrier tape is regarded with the sprocket holes on the right.

**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****TFS57****4/5****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.    |                  |

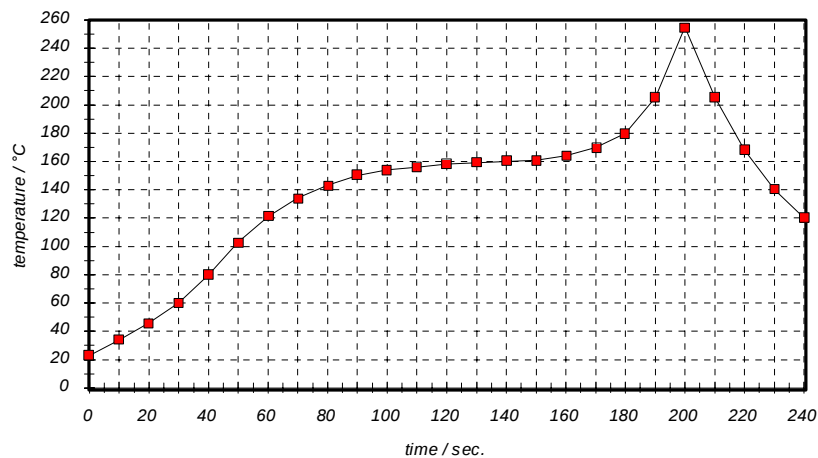
**Chip-mount air reflow profile**

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              |

**VI TELEFILTER****Filter specification****TFS57****5/5****History**

| <b>Version</b> | <b>Reason of Changes</b>                                                                                                   | <b>Name</b> | <b>Date</b> |
|----------------|----------------------------------------------------------------------------------------------------------------------------|-------------|-------------|
| 1.0            | - new generation                                                                                                           | Steiner     | 17.11.2000  |
| 2.0            | - extend specification to filter specification<br>- adjust loss and group delay ripple to the final customer specification | Steiner     | 29.08.2003  |
| 2.1            | - intermodulation and compression parameter adjusted to customer requirement                                               | Steiner     | 05.09.2003  |
| 2.2            | - package and reel dimensions corrected<br>- terminating impedance adjusted to final samples                               | Steiner     | 18.09.2003  |

**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.