

**VI TELEFILTER****Filter specification****TFS 400 1/4****Application**

The filter is suitable for GSM, DCS 1800 and dual band receivers. It can especially be used in the first IF in which full channel selectivity is not necessary. Due to the high frequency the filter is small, thus it saves cost and space on the printed circuit board. As it has symmetrical input and output it does not need any transformation networks in state of the art IC transceiver concepts in which symmetrical inputs and outputs are favourable.

**Measurement condition**

Ambient temperature: 23 °C  
 Input power level: 0 dBm  
 Source impedance: balanced 800 Ω II - 0.7 pF  
 Load impedance: balanced 800 Ω II - 0.7 pF

**Construction and pin configuration**

see page 2

**Characteristics**

Remark:

Reference level for the relative attenuation  $a_{rel}$  of the TFS 400\_1 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  $f_0$  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 on 400,000 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  $f_0$  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  $f_0$ .

| D a t a                                     |                 | typ. value                     |    | tolerance/limit |    |
|---|-----------------|--------------------------------|----|-----------------|----|
| <b>Insertion loss</b><br>(Reference level)  | $a_e = a_{min}$ | 4,5                            |    | max. 6,5 dB     |    |
| <b>Centre frequency</b>                     | $f_0$           | 400,000 MHz                    |    | -               |    |
| <b>usable signal bandwidth</b>              |                 | -                              |    | min 140 kHz     |    |
| <b>3 dB bandwidth</b>                       | BW              | 360 kHz                        |    | min 280 kHz     |    |
| <b>Relative attenuation</b>                 | $a_{rel}$       |                                |    |                 |    |
| 400 MHz ± 400 kHz                           |                 | 25                             | dB | min 15          | dB |
| 400 MHz ± 600 kHz                           |                 | 35                             | dB | min 27          | dB |
| 400 MHz ± >1 MHz ... $f \pm 13$ MHz         |                 | 44                             | dB | min 35          | dB |
| <b>Group delay ripple</b>                   | GD              |                                |    |                 |    |
| 400 MHz ± 70 kHz                            |                 | 0,5                            | µs | max. 2          | µs |
| <b>Operating temperature range</b>          |                 | - 20 °C ... + 70 °C            |    |                 |    |
| <b>Temperature coefficient of frequency</b> | TC              | ca. - 0.036 ppm/K <sup>2</sup> |    |                 |    |
| <b>Frequency inversion temperature</b>      |                 | + 20 °C                        |    |                 |    |

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

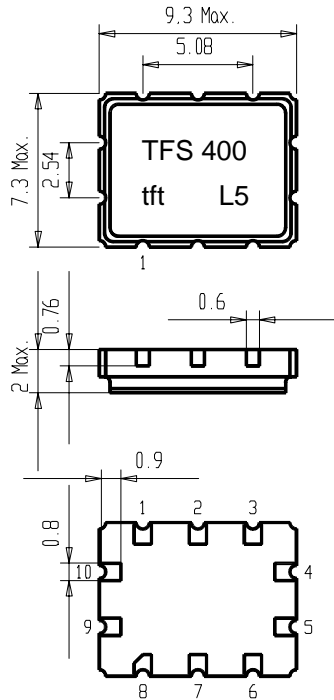
Checked / approved: \_\_\_\_\_

VI TELEFILTER  
 Potsdamer Straße 18  
 D 14 513 TELTOW / Germany  
 Tel: (+49) 3328 4784-52 / Fax: (+49) 3328 4784-30  
 E-Mail: tft@telefilter.com

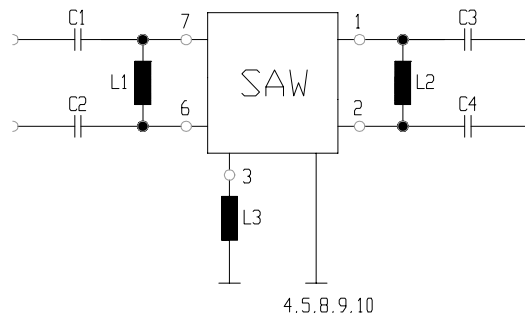
Vectron International, Inc.  
 267 Lowell Road  
 Hudson, NH 03051 / USA  
 Tel: (603) 598-0070 Fax: (603) 598-0075  
 E-Mail: vti@vtinh.com

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, pin configuration and 50 $\Omega$ - matching network



|                 |              |
|-----------------|--------------|
| 1 Sym. Output   | 6 Sym. Input |
| 2 Sym. Output   | 7 Sym. Input |
| 3 External Coil | 8 Ground     |
| 4 Ground        | 9 Ground     |
| 5 Ground        | 10 Ground    |



### Stability characteristics

After the following tests the filter shall meet the whole specification:

**VI TELEFILTER**  
 Potsdamer Straße 18  
 D 14 513 TELTOW / Germany  
 Tel: (+49) 3328 4784-52 / Fax: (+49) 3328 4784-30  
 E-Mail: tft@telefilter.com

**Vectron International, Inc.**  
 267 Lowell Road  
 Hudson, NH 03051 / USA  
 Tel: (603) 598-0070 Fax: (603) 598-0075  
 E-Mail: vti@vtinh.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 400 3/4**

1. Shock: 30g, 18 ms, half sine wave, 3 shocks each plane;  
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 150 Hz, 0.35 mm amplitude, 5g; 2 hours for 3 planes;  
DIN IEC 68 T2 - 6
3. Damp heat: 90 % to 95 % rel. humidity, 40 °C, 10 days;  
IEC Pub. 68 - 2 - 3
4. Resistance to solder heat (Reflow): 260 °C for 10 sec;

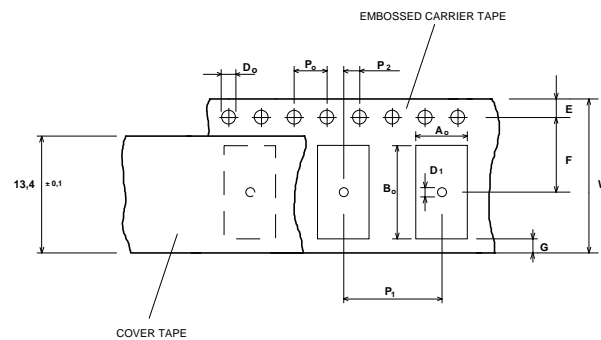
**Packing**

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;

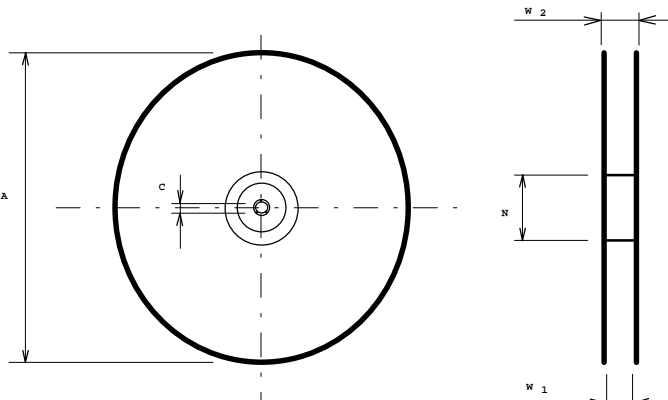
max. pieces of filters per reel: 2300

**Tape (all dimensions in mm)**

|         |              |
|---------|--------------|
| W       | : 16 ± 0,3   |
| Po      | : 4 ± 0,1    |
| Do      | : 1,5 + 0,5  |
| D1      | : 1,5 + 0,5  |
| E       | : 1,75 ± 0,1 |
| F       | : 7,5 ± 0,1  |
| G (min) | : 0,75       |
| P2      | : 2 ± 0,1    |
| P1      | : 12 ± 0,1   |
| D1(min) | : 1,5        |
| Ao      | : 7,6 ± 0,1  |
| Bo      | : 9,6 ± 0,1  |

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

|          |   |           |
|----------|---|-----------|
| A        | : | 330       |
| W1       | : | 16,4 +2   |
| W2 (max) | : | 22,4      |
| N (min)  | : | $\geq 90$ |
| C        | : | 13 ± 0,25 |



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 with the sprocket holes on the right side of the tape.

**Air reflow temperature conditions**

1st and 2nd air reflow profile

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

**VI TELEFILTER**  
Potsdamer Straße 18  
D 14 513 TELTOW / Germany  
Tel: (+49) 3328 4784-52 / Fax: (+49) 3328 4784-30  
E-Mail: tft@telefilter.com

**Vectron International, Inc.**  
267 Lowell Road  
Hudson, NH 03051 / USA  
Tel: (603) 598-0070 Fax: (603) 598-0075  
E-Mail: vti@vtinh.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 400****4/4**

**Temperature:** 150 °C - 170 °C                      over 200 °C                      255 °C ± 5 °C  
**Time:** 60 sec. - 90 sec.                      20 sec. - 25 sec.

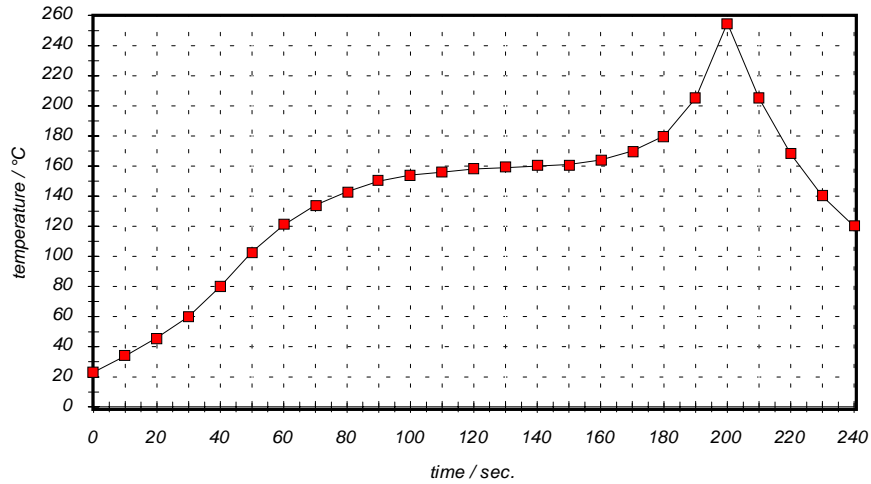
**Chip-mount air reflow profile**

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**  
 Potsdamer Straße 18  
 D 14 513 TELTOW / Germany  
 Tel: (+49) 3328 4784-52 / Fax: (+49) 3328 4784-30  
 E-Mail: tft@telefilter.com

**Vectron International, Inc.**  
 267 Lowell Road  
 Hudson, NH 03051 / USA  
 Tel: (603) 598-0070 Fax: (603) 598-0075  
 E-Mail: vti@vtinh.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