

**VI TELEFILTER****Filter specification****TFS 433 C 1/4****Measurement condition**

Ambient temperature: 23 °C  
 Input power level: 0 dBm  
 Terminating impedances:  
     input: 50 Ω  
     output: 50 Ω

**Construction and pin connection (see page 2)****Characteristics****Remark:**

Reference level for the relative attenuation  $a_{rel}$  of the TFS 433 C 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 433,92 MHz without tolerance. The given values for the relative attenuation  $a_{rel}$  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  $f_0$ .

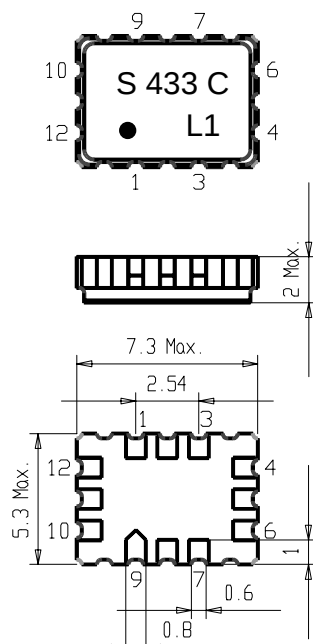
| <b>D a t a</b>                                  |                 | <b>typ. value</b>   | <b>Variation/ Limitation</b> |
|-------------------------------------------------|-----------------|---------------------|------------------------------|
| <b>Insertion loss</b><br>(Reference level)      | $a_e = a_{min}$ | 2,5 dB              | max. 3,5 dB                  |
| <b>Nominal frequency</b>                        | $f_N$           |                     | 433,92 MHz                   |
| <b>Centre frequency</b>                         | $f_0$           | 433,92 MHz          |                              |
| <b>3 dB - bandwidth</b>                         | BW              | 8,5 MHz             | min. 4 MHz                   |
| <b>Relative attenuation</b>                     | $a_{rel}$       |                     |                              |
| $f_N \pm 25$ MHz ... $f_N \pm 100$ MHz          |                 | 70 dB               | min. 40 dB                   |
| $f_N \pm 100$ MHz ... $f_N \pm 200$ MHz         |                 | 70 dB               | min. 60 dB                   |
| $f_N - 10,7$ MHz                                |                 | 70 dB               | min. 60 dB                   |
| <b>Temperature coefficient of the frequency</b> | $TC_f$          | -32 ppm/K           | -                            |
| <b>Operating temperature range</b>              |                 | - 15 °C ... + 60 °C |                              |

**Generated :****Checked / approved :**

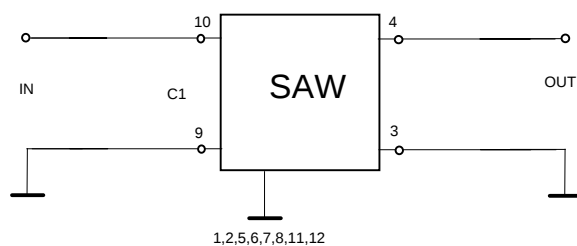
**VI TELEFILTER**  
**Potsdamer Straße 18**  
**D 14 513 TELTOW / Germany**  
**Tel: (+49) 3328 4784-52 / Fax: (+49) 3328 4784-30**  
**E-Mail: tft@telefilter.com**

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

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**VI TELEFILTER****Filter specification****TFS 433 C 2/4****Construction and pin connection**

- |    |                  |
|----|------------------|
| 1  | Ground           |
| 2  | Ground           |
| 3  | Output RF Return |
| 4  | Output           |
| 5  | Package Ground   |
| 6  | Ground           |
| 7  | Ground           |
| 8  | Ground           |
| 9  | Input RF Return  |
| 10 | Input            |
| 11 | Package Ground   |
| 12 | Ground           |

**50  $\Omega$  test circuit**

**VI TELEFILTER****Filter specification****TFS 433 C 3/4****Stability characteristics**

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

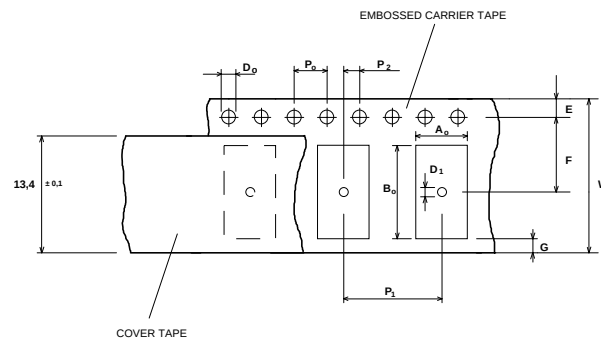
1. Shock: 100g, 18 ms, half sine wave, 3 shocks each plane;  
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 500 Hz, 0.35 mm amplitude, 5g; 2 hours for 3 planes;  
DIN IEC 68 T2 - 6
3. Damp heat: 90 % to 95 % rel. humidity, 40 °C, 10 days;  
IEC Pub. 68 - 2 - 3
4. Resistance to solder heat (Reflow): 260 °C for 10 sec;

**Packing**

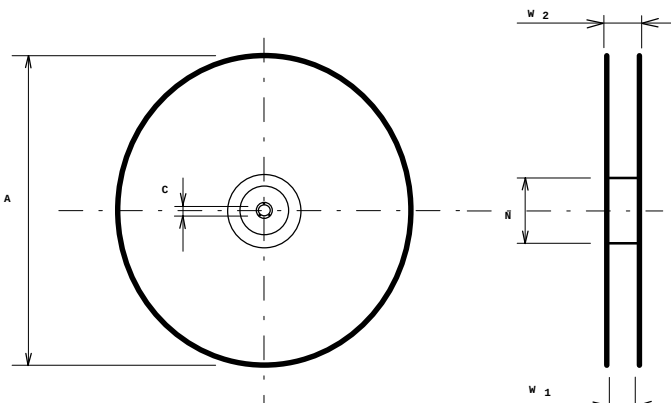
Tape & Reel: IEC 286 - 3, with exception of value for N and minimum bending radius;  
tape type II, embossed carrier tape with top cover tape on the upper side;  
  
max. pieces of filters per reel: 3000

**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 ± 0,05   |
| P1      | : 8 ± 0,1    |
| D1(min) | : 1,5        |
| Ao      | : 5,4 ± 0,1  |
| Bo      | : 7,4 ± 0,1  |

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

|          |   |           |
|----------|---|-----------|
| A        | : | 330       |
| W1       | : | 16,4 +2   |
| W2 (max) | : | 22,4      |
| N (min)  | : | >= 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.

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**VI TELEFILTER****Filter specification****TFS 433 C 4/4****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.    |                  |

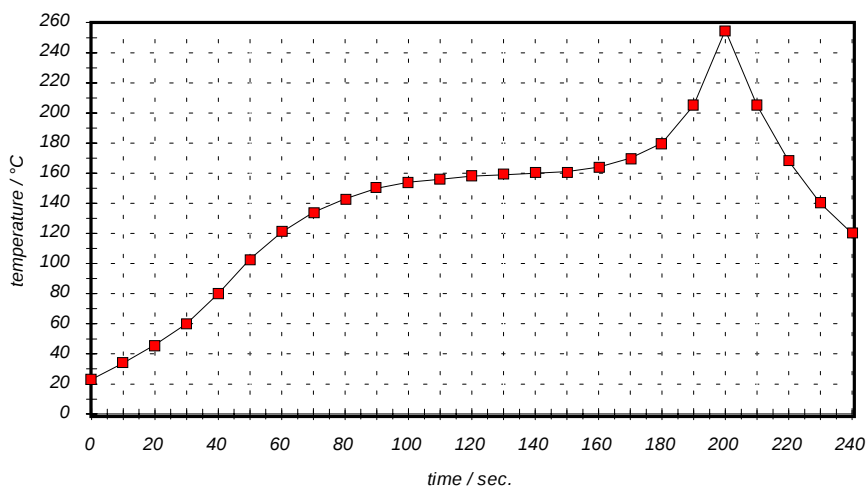
**Chip-mount air reflow profile**

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              |