

**VI TELEFILTER**

**Filter specification**

**TFS 433H**

**1/5**

**Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	50	Ω
Output:	50	Ω

**Characteristics**

Remark:

The reference level for the relative attenuation  $a_{rel}$  of the TFS 433H 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 dB filter attenuation level relative to the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 433,92 MHz without any tolerance. The given values for the relative attenuation  $a_{rel}$  have to be achieved 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>Data</b>		<b>typ. value</b>	<b>tolerance / limit</b>
<b>Insertion loss</b> (reference level)	$a_e = a_{min}$	2,7 dB	max. 3,5 dB
<b>Centre frequency</b>	$f_c$	433,92 MHz	-
<b>Nominal frequency</b>	$f_N$	-	433,92 MHz
<b>3 dB - bandwidth</b>		-	min. 5 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>Operating temperature range</b>	OTR	-	- 15 °C ... + 60 °C
<b>Storage temperature range</b>		-	- 40 °C ... + 85 °C
<b>Temperature coefficient of frequency</b>	$TC_f$ *	-32 ppm/K	-

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

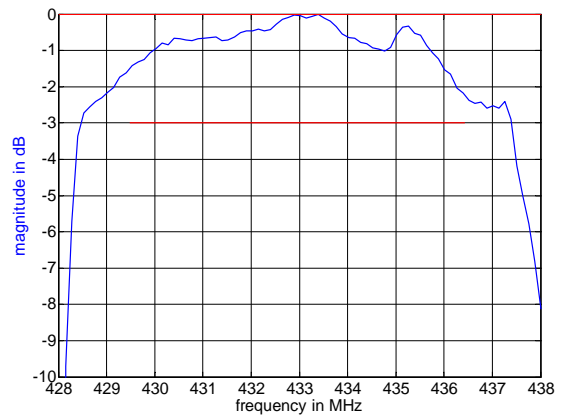
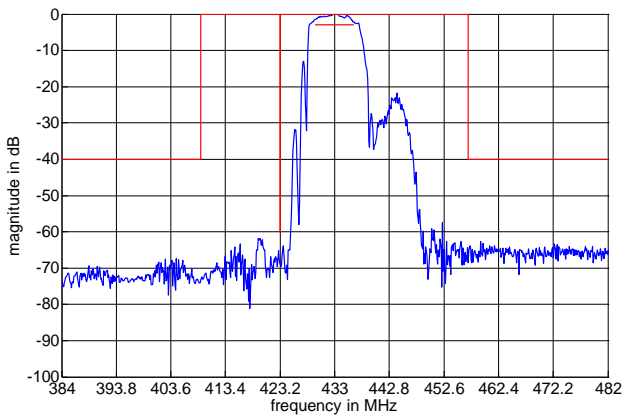
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**Checked / Approved:** \_\_\_\_\_

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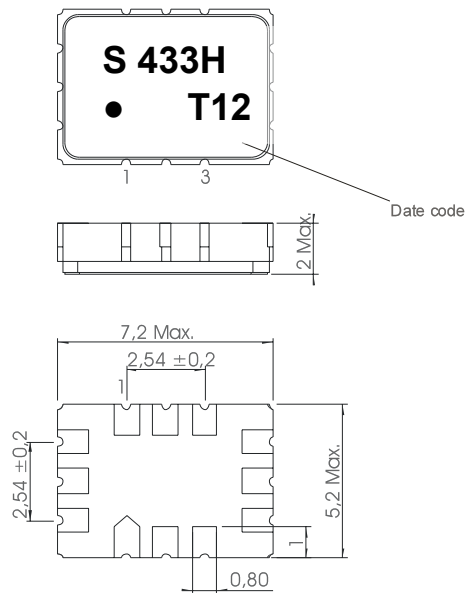
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**Filter characteristic**



**Construction and pin connection**

(All dimensions in mm)

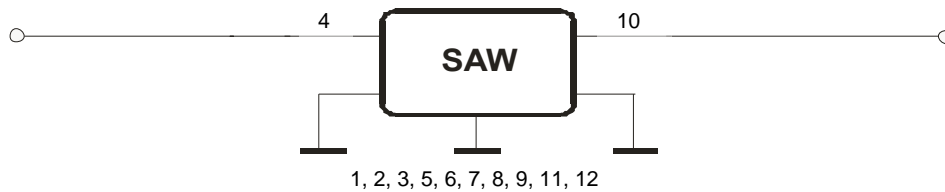


1	Ground
2	Ground
3	Ground
4	Input
5	Ground
6	Ground
7	Ground
8	Ground
9	Ground
10	Output
11	Ground
12	Ground

Date code: Year + week

T	2005
U	2006
V	2007
...	

**50 Ω Test circuit**



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**Stability characteristics**

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

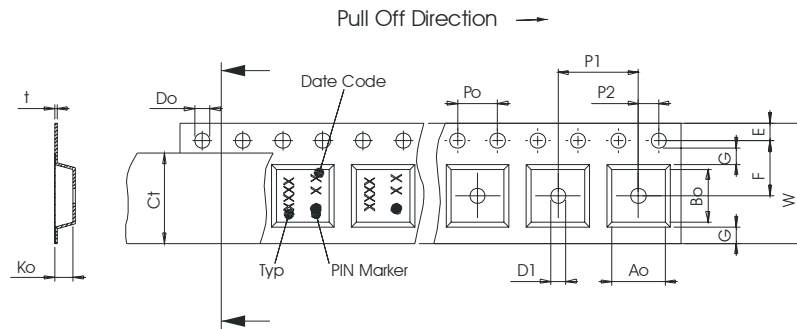
**Packing**

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: 3000  
 reel of empty components at start: min. 300 mm  
 reel of empty components at start including leader: min. 500 mm  
 trailer: min. 300 mm

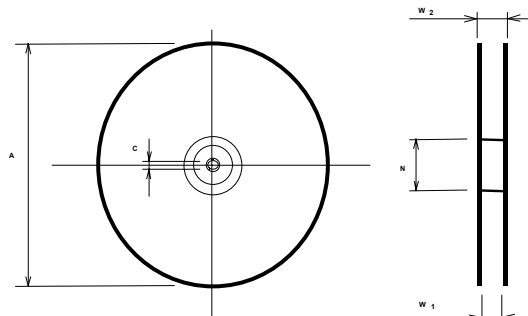
**Tape (all dimensions in mm)**

- W : 16,00 ± 0,3
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,1
- F : 7,50 ± 0,1
- G(min) : 0,60
- P2 : 2,00 ± 0,1
- P1 : 8,00 ± 0,1
- D1(min) : 1,50
- Ao : 5,50 ± 0,1
- Bo : 7,50 ± 0,1
- Ct : 13,5 ± 0,1



**Reel (all dimensions in mm)**

- A : 330
- W1 : 16,4 +2/-0
- W2(max) : 22,4
- N(min) : 50
- C : 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

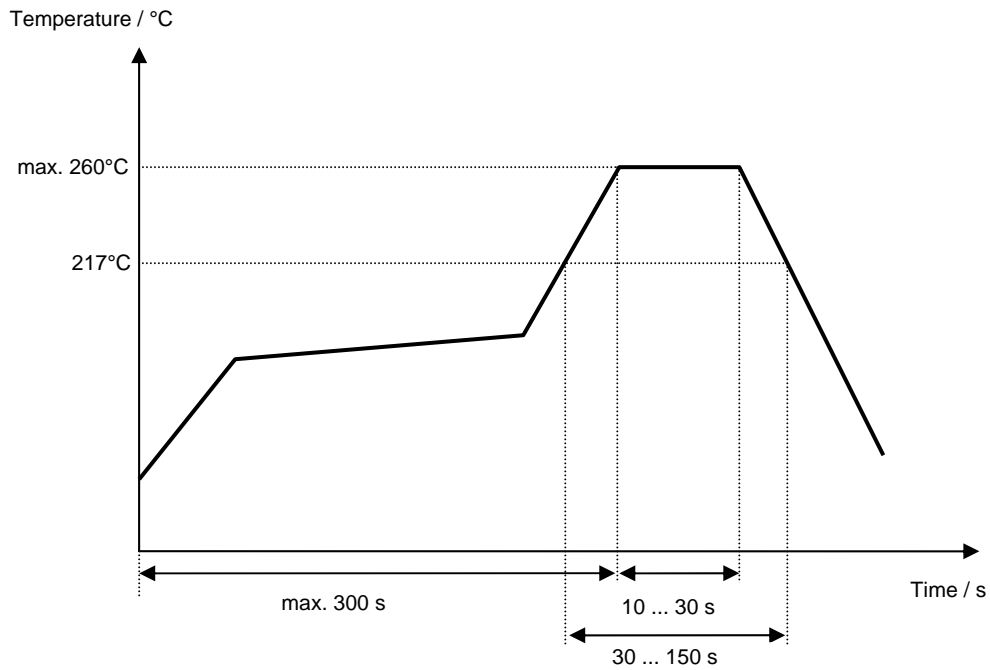
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**Air reflow temperature conditions**

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 433H****5/5****History :**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	Generate development specification	Chilla	08.10.2004
1.1	Change of TK, test circuit, filter characteristic	Martens	28.10.2004
1.2	Changed insertion loss to be measured at minimum in PB	Martens	12.11.2004
1.3	Corrected relative attenuation, changed layout	Martens	15.03.2005

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