

VI TELEFILTER**Filter specification****TFS 433L 1/5****Measurement condition**

Ambient temperature: 23 °C
 Input power level: 0 dBm
 Terminating impedances: Input: 90Ω // -3,9 pF
 Output: 90Ω // -3,9 pF

Characteristics**Remark:**

Reference level for the relative attenuation a_{rel} of the TFS 433L 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 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_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 .

D a t a	typ. value	Variation/ Limitation
Insertion loss (Reference level)	$a_e = a_{min}$ -	max 3,5 dB
Nominal frequency	f_N -	433,92 MHz
Centre frequency	f_c 433,92MHz	
2 dB bandwidth	BW -	min 400 kHz
3 dB bandwidth	BW -	min 440 kHz
6 dB bandwidth	BW -	min 560 kHz
Relative attenuation	a_{rel}	
$f_N \pm 200$ KHz	-	max 2 dB
$f_N \pm 200$ KHz $f_N \pm 220$ KHz	-	max 3 dB
$f_N \pm 220$ KHz $f_N \pm 280$ KHz	-	max 6 dB
$f_N - 1,0$ MHz $f_N - 5,92$ MHz	-	min 15 dB
$f_N - 5,92$ MHz $f_N - 19,92$ MHz	-	min 40 dB
$f_N - 19,92$ MHz $f_N - 423,92$ MHz	-	min 45 dB
$f_N + 1,0$ MHz $f_N + 8,0$ MHz	-	min 10 dB
$f_N + 8,08$ MHz $f_N + 116,0$ MHz	-	min 35 dB
$f_N + 116,08$ MHz . $f_N + 566,0$ MHz	-	min 45 dB
Temperature coefficient of the frequency TC_f*)	-0,028 [ppm/K ²]	
Frequency inversion temperature T_0)	5 °C	
Operating temperature range		- 25 °C ... + 80 °C
Storage temperature range	- 45 °C ... + 120 °C	
Input power level		max 10 dBm

*) $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T_0 - T_a)^2 \times f_{CAT}(\text{MHz})$

Generated :**Checked / approved :**

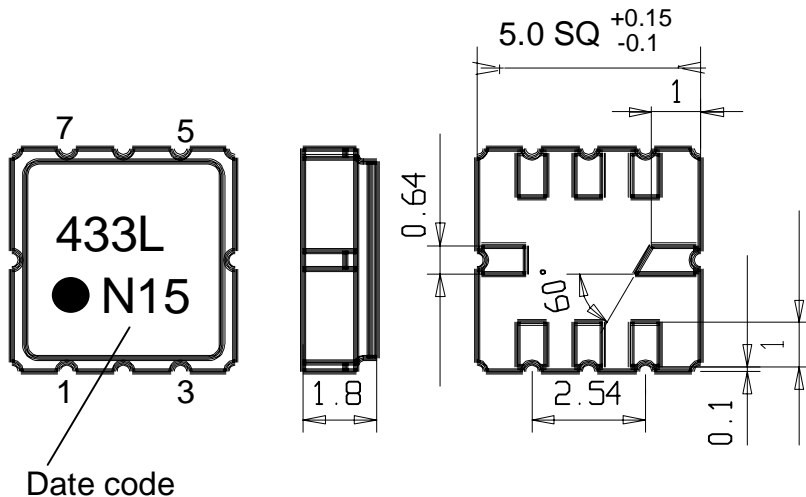
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Construction and pin configuration

(All dimensions in mm)



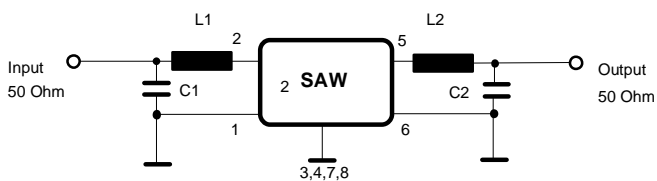
Date code

Pin 1 Input RF Return
 Pin 2 Input
 Pin 3 Ground
 Pin 4 Ground

Pin 5 Output
 Pin 6 Output RF Return
 Pin 7 Ground
 Pin 8 Ground

Datecode: Year+week
 L 1999
 M 2000
 N 2001

50 Ohm Test circuit



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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. Damp heat: 25 °C to 55°C / 95% r.H. / 10 cycles
(cycle) DIN IEC 68 - 2 – 30 Db
4. Resistance to solder heat (reflow): max. 2 times reflow process;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

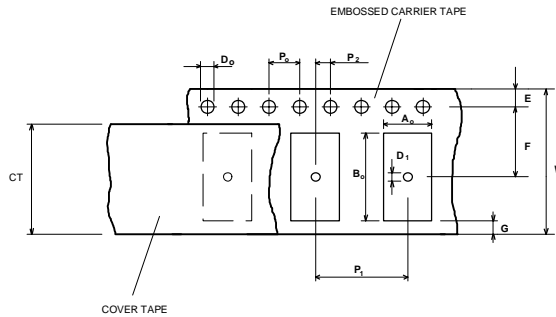
Packing

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 per reel:
reel of empty components at start:
reel of empty components at start including leader:
trailer

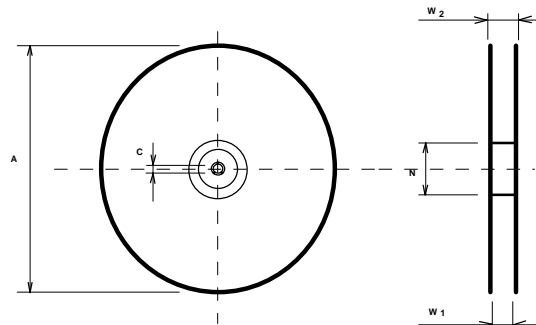
3000
min 300 mm
min 500 mm
min 300 mm

Tape (all dimensions in mm)

W : 12 ± 0,3
Po : 4 ± 0,1
Do : 1,5 + 0,1
E : 1,75 ± 0,1
F : 5,5 ± 0,05
G (min) : 0,75
P2 : 2 ± 0,05
P1 : 8 ± 0,10
D1(min) : 1,5
Ao : 5,30 ± 0,1
Bo : 5,30 ± 0,1
CT : 13,0 ± 0,2

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

A : 330
W1 : 12,4 ± 2,0
W2 (max) : 18,4
N (min) : 50
C : 13 ± 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 with the sprocket holes on the right side of the tape.

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Air reflow temperature conditions

1st and 2nd air reflow profile

Name:	pre-heating periods	main-heating periods	peak temperature
Temperature:	150 °C - 170 °C	over 200 °C	255 °C ± 5 °C
Time:	60 sec. - 90 sec.	20 sec. - 25 sec.	

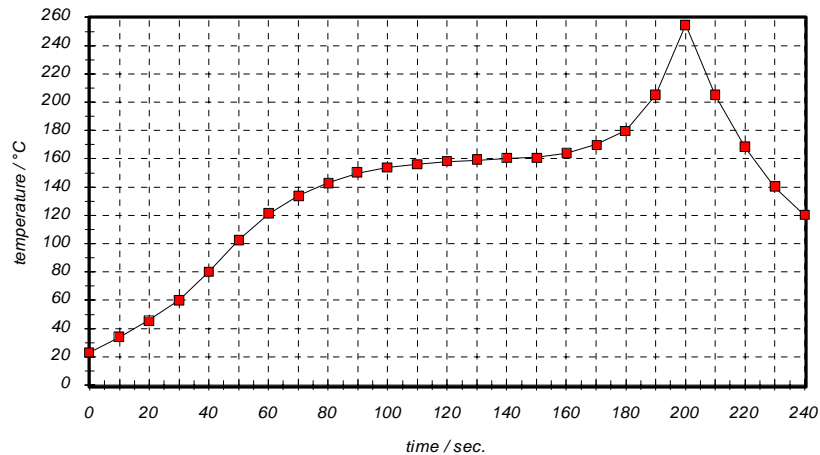
Chip-mount air reflow profile

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

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History

Version	Reason of Changes	Name	Date
1.0	- generated specification according to customer requirement	Dr. Sabah	17.05.2000
1.1	- changing of input connection pin to 2	Dr. Sabah	15.11.2000
1.2	- changing of operating temperature rang	Dr. Sabah	01.12.2000
1.3	- changing of tape size P1	Dr. Sabah	10.01.2001
1.4	- chaging from developmet filter to filter specification		
	- add of terminating impedance	Dr. Sabah	10.04.2001

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