

Microchip**Filter specification****TFS 433 F****1/5****Measurement condition**

Ambient temperature: 23 °C
 Input power level: 0 dBm
 Source impedance: 370 Ω || - 0.9 pF
 Load impedance: 370 Ω || - 0.9 pF

Construction and pin connection

see page 2

50 Ω test circuit and theoretical values of matching elements

see page 3

Stability characteristics and packing

see page 4

Air reflow temperature conditions

see page 5

Characteristics

Remark:

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

D a t a		typ. value	limit
Insertion loss (Reference level)	$a_e = a_{min}$	4 dB	max. 6 dB
Nominal frequency	f_N		433,32 MHz
3 dB - bandwidth	BW	260 kHz	min. 50 kHz
Relative attenuation	a_{rel}		
$f_N - 10$ MHz ... $f_N - 1,2$ MHz		49	min. 45 dB
$f_N - 1,2$ MHz ... $f_N - 600$ kHz		45	min. 35 dB
$f_N - 25$ kHz ... $f_N + 25$ kHz		-	max. 3 dB
$f_N + 600$ kHz ... $f_N + 1,2$ MHz		52	min. 35 dB
$f_N + 1,2$ MHz ... $f_N + 10$ MHz		52	min. 45 dB
Temperature coefficient of the frequency	TC_f	- 0.032	ppm/K ²
Operating temperature range		- 30 °C ... + 70 °C	
Storage temperature range		- 30 °C ... + 85 °C	
Frequency inversion temperature	T_0	10 °C	-

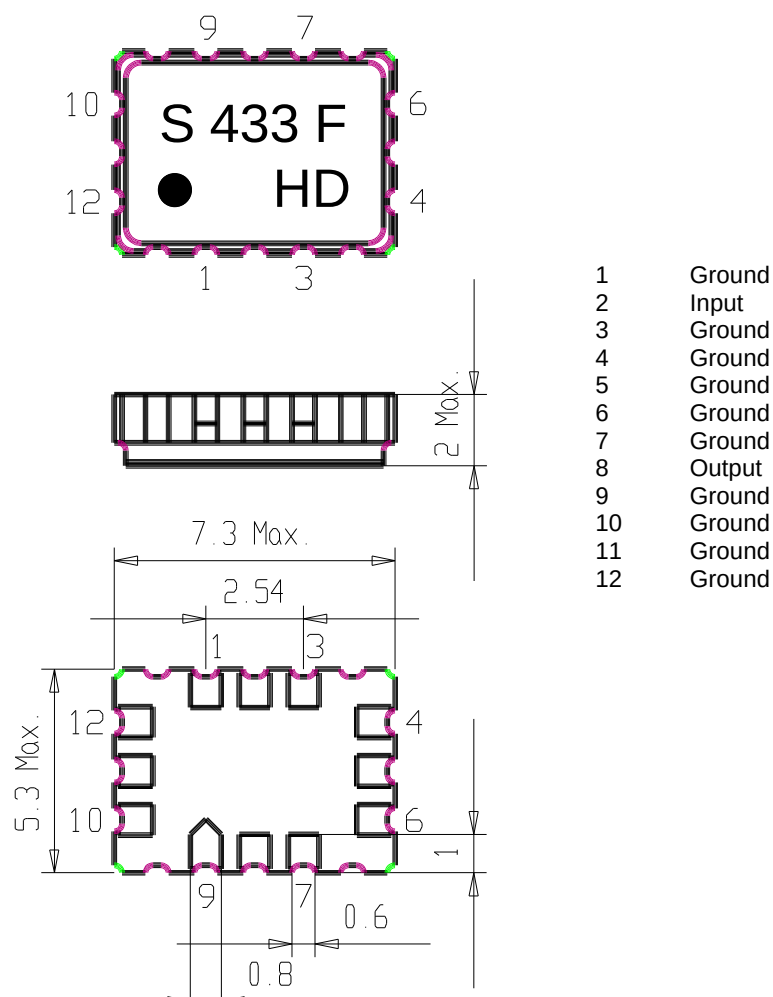
Note 1) - Δf (Hz) = TC (ppm/K²) x (T - T₀)² x F_{T0} (MHz)

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Construction and pin connection

(All dimensions in mm)

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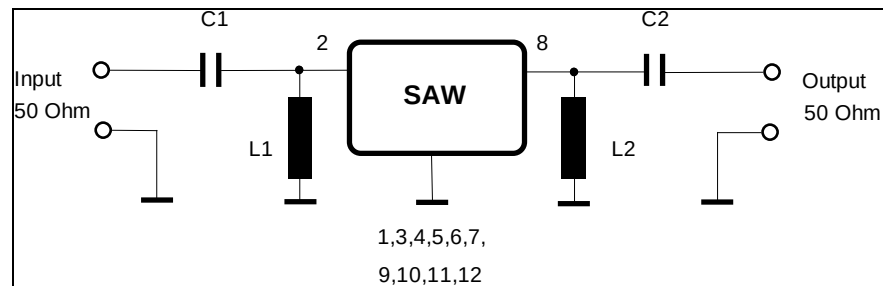
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50 Ω test circuit and theoretical values of matching elements

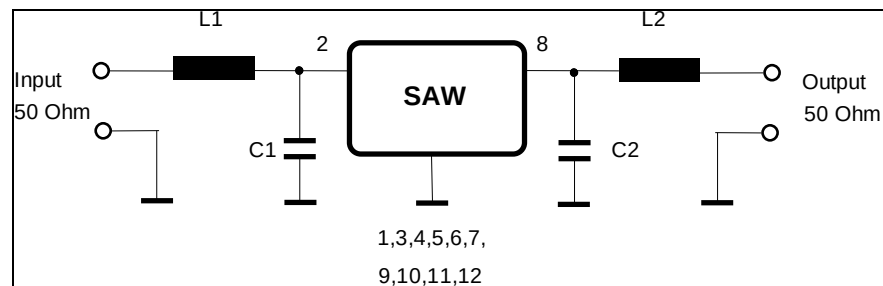
Remark:

The values of the matching elements which are given below are calculated from the source and load impedance. If the values of the matching elements are not equal to standard values the best standard values are given in brackets. If standard matching elements instead of the exact values are used it can not be guaranteed that the specification will be fulfilled.

Because these are theoretical values they have to be modified on PCB's corresponding to the existing parasitics.

50 Ω test circuit1

C1 = 2,9 pF	(2,7 pF)	L1 = 40 nH	(39 nH)
C2 = 2,9 pF	(2,7 pF)	L2 = 40 nH	(39 nH)

50 Ω test circuit2

L1 = 47 nH		C1 = 1,6 pF	(1,5 pF)
L2 = 47 nH		C2 = 1,6 pF	(1,5 pF)

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, 0.075 mm amplitude, 1g; 2 hours for 3 planes;
DIN IEC 68 T2 - 6
3. Damp heat: 90 % to 95 % rel. humidity, 55 °C, 10 cycles;
DIN IEC 68-2-30.
4. Resistance to solder heat (Reflow): 260 °C for 10 sec;

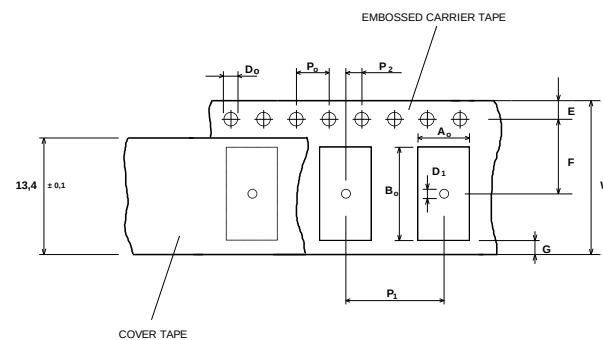
Packing

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;

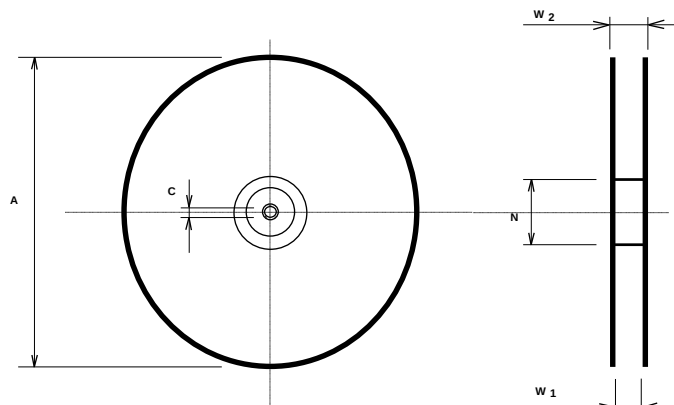
max. pieces of filters per reel: 3400

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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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.	

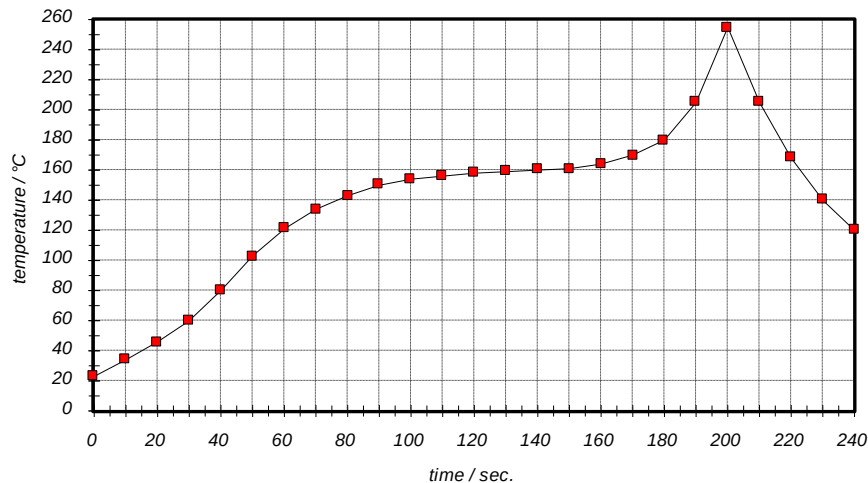
Chip-mount air reflow profile

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