

Vectron International**Filter specification****TFS 433AH****1/5****Measurement condition**

Ambient temperature T_A :	23	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	190 Ω	-3.4 pF
Output:	190 Ω	-3.4 pF

Characteristics**Remark:**

The reference level for the relative attenuation a_{rel} of the TFS 433AH 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 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 .

D a t a		typ. value		tolerance / limit		
Insertion loss (reference level)	a_e	2.6	dB	max.	3.5	dB
Nominal frequency	f_N	-			433.92	MHz
Centre frequency	f_C	433.92	MHz		-	
Bandwidth	BW					
2 dB		700	kHz	min.	400	kHz
3 dB		800	kHz	min.	440	kHz
6 dB		955	kHz	min.	560	kHz
Relative attenuation	a_{rel}					
f_N ... $f_N \pm 200.00$ kHz		-	dB	max.	2.0	dB
$f_N \pm 200.00$ kHz ... $f_N \pm 220.00$ kHz		-	dB	max.	3.0	dB
$f_N \pm 220.00$ kHz ... $f_N \pm 280.00$ kHz		-	dB	max.	6.0	dB
$f_N - 1.0$ MHz ... $f_N - 5.92$ MHz		17	dB	min.	15	dB
$f_N - 5.92$ MHz ... $f_N - 19.92$ MHz		42	dB	min.	40	dB
$f_N - 19.92$ MHz ... $f_N - 423.92$ MHz		55	dB	min.	45	dB
$f_N + 1.00$ MHz ... $f_N + 8.00$ MHz		14	dB	min.	10	dB
$f_N + 116.08$ MHz ... $f_N + 566.00$ MHz		60	dB	min.	45	dB
Input power level		-		max.	0	dBm
Operating temperature range	OTR	-			-25 ... +80	°C
Storage temperature range		-			-55 ... +125	°C
Frequency inversion temperature		10	°C		-	
Temperature coefficient of frequency	TC_f *)	-0.04	ppm/K ²		-	

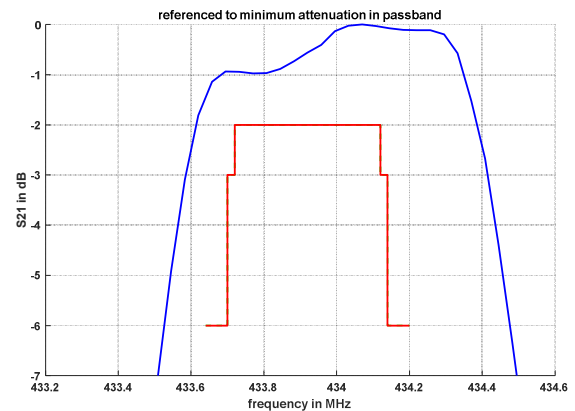
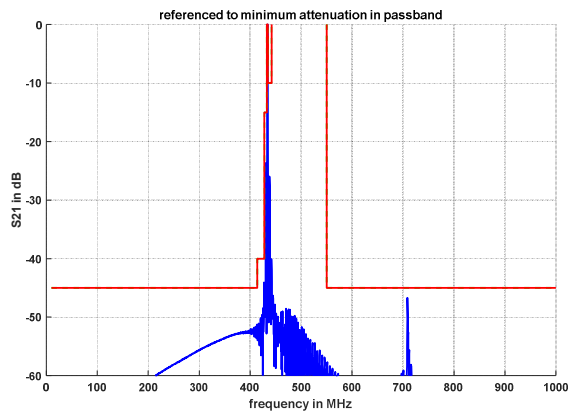
*) $\Delta f = TC_f(T - T_0)^2 f_N$

Generated:**Checked / Approved:**

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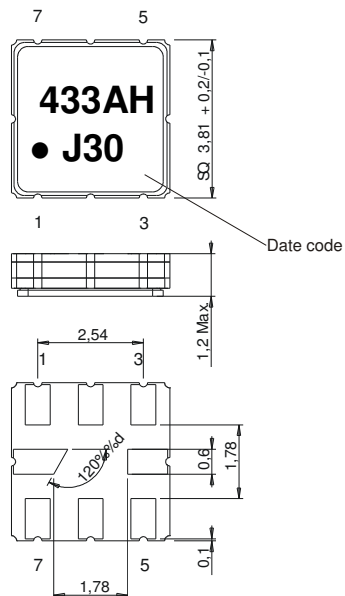
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Filter characteristic



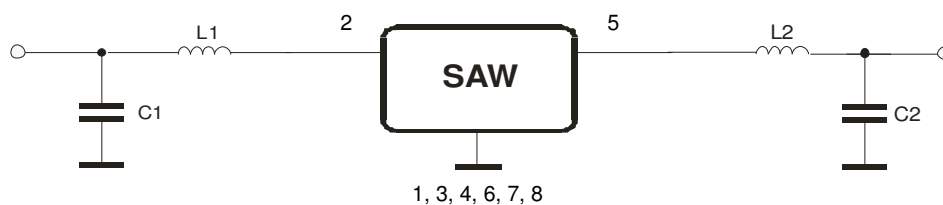
Construction and pin connection

(All dimensions in mm)



1	Ground
2	Input
3	Ground
4	Ground
5	Output
6	Ground
7	Ground
8	Ground

Date code: Year + week
 J 2017
 K 2018
 L 2019
 ...

50 Ω Test circuit

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Stability characteristics, reliability

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

1. Shock: 500 g, 1 ms, half sine wave, 3 shocks each plane;
DIN IEC 60068 T2 - 27
2. Vibration: 10 Hz to 2000 Hz, 0.35 mm or 5 g respectively, 1 octave per min, 10 cycles per plane, 3 planes; DIN IEC 60068 T2 - 6
3. Change of temperature: -55 °C to 125 °C / 15 min. each / 100 cycles
DIN IEC 60068 part 2 – 14 Test N
4. Resistance to solder heat (reflow): reflow possible: three times max.;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;
5. SAW devices are Electrostatic Discharge (ESD) sensitive devices.

This filter is RoHS compliant (2011/65/EU)

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;

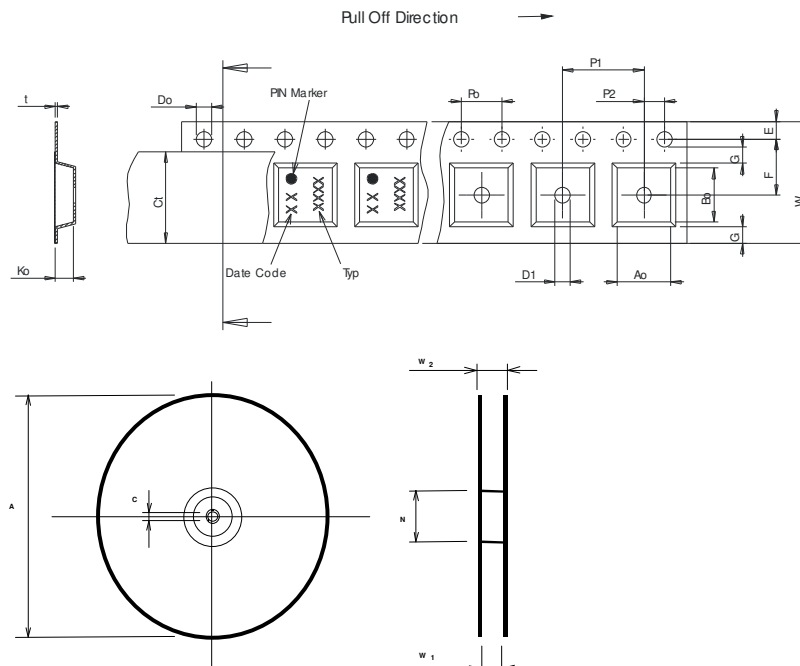
reel of empty components at start: min. 300 mm
reel of empty components at start including leader: min. 500 mm
trailer: min. 300 mm

Tape (all dimensions in mm)

W	: 12.00 ±0.3
Po	: 4.00 ±0.1
Do	: 1.50 +0.1/-0
E	: 1.75 ±0.1
F	: 5.50 ±0.05
G(min)	: 0.75
P2	: 2.00 ±0.05
P1	: 8.00 ±0.1
D1(min)	: 1.50
Ao	: 4.30 ±0.1
Bo	: 4.30 ±0.1
Ct	: 9.2 ±0.1
Ko	: 1.80 ±0.1
t	: 0.30 ±0.05

Reel (all dimensions in mm)

A	: 330 or 180
W1	: 12.4 +2/-0
W2(max)	: 18.40
N(min)	: 50.00
C	: 13.0 +0.5/-0.2



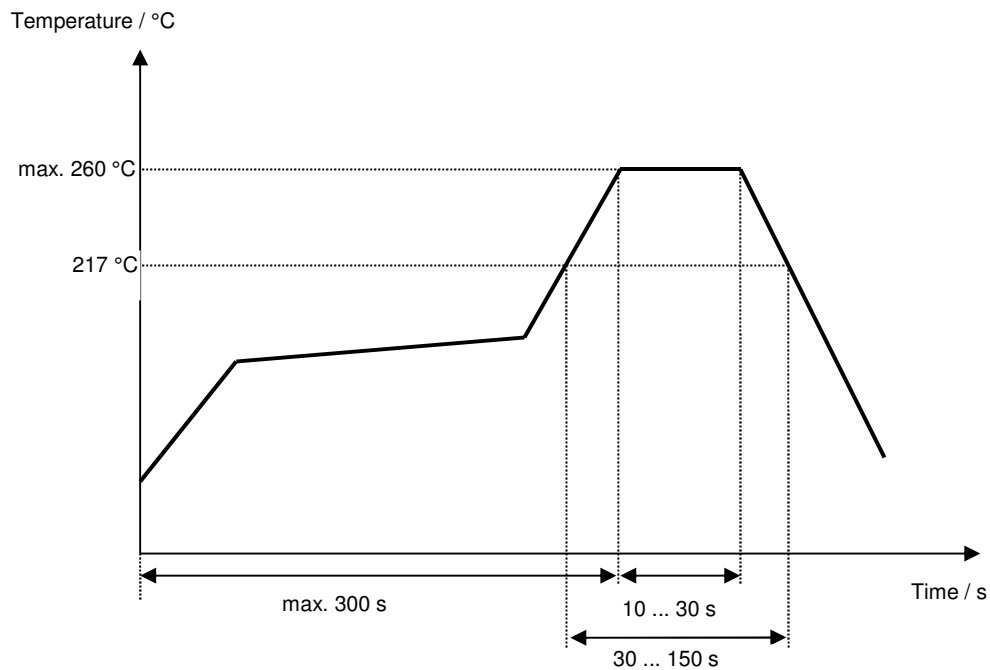
The minimum bending radius is 45 mm.

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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

Vectron International**Filter specification****TFS 433AH****5/5****History**

Version	Reason of Changes	Name	Date
1.0	Generation of filter specification.	Abutaimah	08.03.2017
1.1	update typos update storage temperature range update tape & reel	Schönbein	26.07.2017