

Vectron International

Filter specification

TFS 433S

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 TFS 433S is the minimum of the pass band attenuation a_{min} . This value 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 given values for the relative attenuation a_{rel} and the group delay ripple have to be reached 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	3,1 dB	3,8 dB
Nominal Frequency	f_N	-	433,92 MHz
Centre Frequency	f_c	433,92 MHz	-
Passband 1 dB	PB	5 MHz	min. 1,71 MHz
Relative Attenuation	a_{rel}		
$f_N - 0,92$ MHz ... $f_N + 0,79$ MHz		0,45 dB	max. 1 dB
$f_N - 8,42$ MHz ... $f_N - 18,92$ MHz		50 dB	min. 37 dB
$f_N - 18,92$ MHz ... $f_N - 25,92$ MHz		60 dB	min. 52 dB
$f_N - 25,92$ MHz ... $f_N - 40,92$ MHz		65 dB	min. 42 dB
$f_N - 40,92$ MHz ... $f_N - 83,92$ MHz		70 dB	min. 52 dB
$f_N - 83,92$ MHz ... $f_N - 423,92$ MHz		68 dB	min. 37 dB
$f_N + 9,58$ MHz ... $f_N + 20,08$ MHz		25 dB	min. 12 dB
$f_N + 20,08$ MHz ... $f_N + 41,08$ MHz		50 dB	min. 34 dB
$f_N + 41,08$ MHz ... $f_N + 141,08$ MHz		65 dB	min. 50 dB
$f_N + 141,08$ MHz ... $f_N + 566,08$ MHz		45 dB	min. 40 dB
Operating Temperature Range	OTR	-	- 40 °C ... + 85 °C
Storage Temperature Range		-	- 45 °C ... + 90 °C
Temperature Coefficient of Frequency	TC_f *	-35 ppm/K	-
Input Power Level		-	max. 5 dBm

*) $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_0) \times f_{T0}(\text{MHz})$.

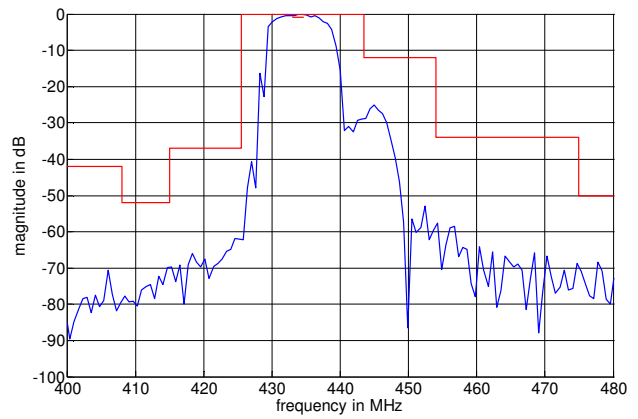
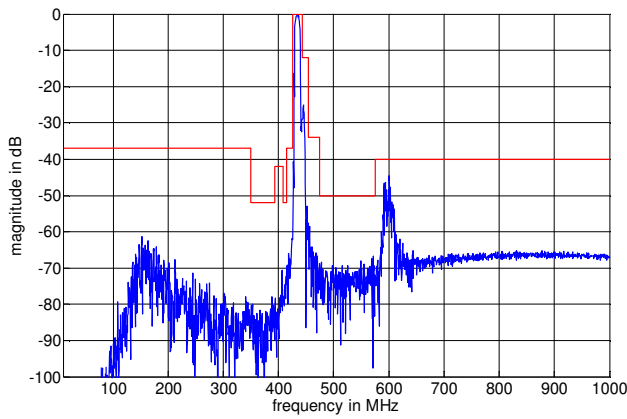
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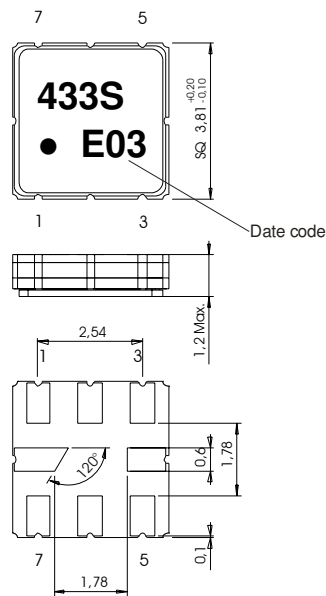
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Filter characteristic



Construction and pin connection

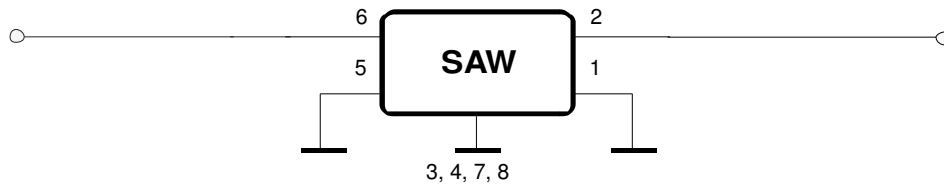
(All dimensions in mm)



- 1 Output RF Return
- 2 Output
- 3 Ground
- 4 Ground
- 5 Input RF Return
- 6 Input
- 7 Ground
- 8 Ground

Date code: Year + week
 E 2014
 F 2015
 G 2016
 ...

50 Ohm Test circuit



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Stability characteristics, reliability

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 g respectively, 1 octave per min, 10 cycles per plane, 3 planes; DIN IEC 68 T2 - 6
3. Change of temperature: -55 °C to 125°C / 15 min. each / 100 cycles
DIN IEC 68 part 2 – 14 Test N
4. Resistance to solder heat (reflow): reflow possible: three times max.;
for temperature conditions, see page 4: "Air reflow temperature conditions"

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

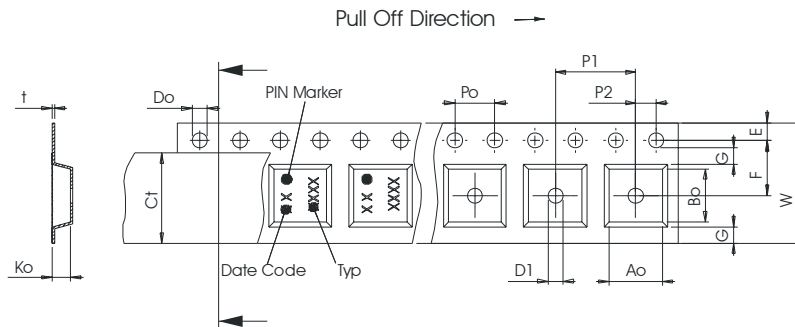
Packing

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;

max. pieces of filters per 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

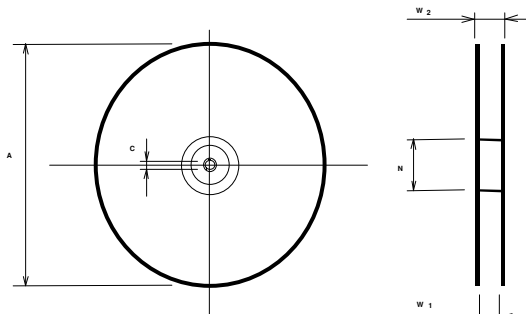
Tape (all dimensions in mm)

- W : 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 : 9,5 ± 0,1



Reel (all dimensions in mm)

- A : 330
- W1 : 12,4 +2/-0
- W2(max) : 18,4
- N(min) : 50
- C : 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

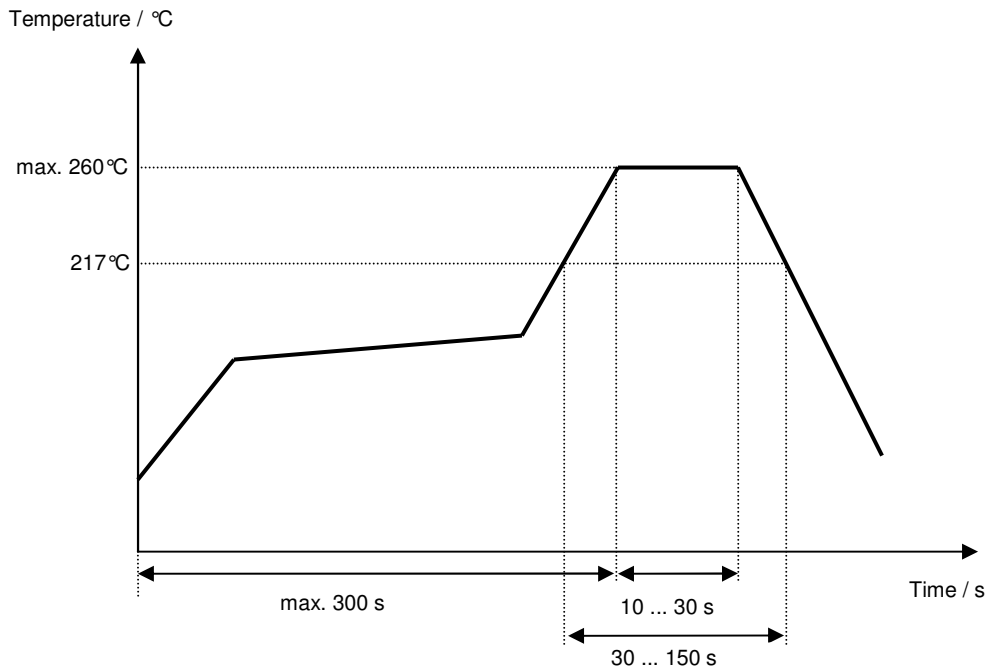
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Air reflow temperature conditions

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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History

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification according to customer specification.	Dr. Sabah	17.06.2003
1.1	- Filter specification, add of typical values	Dr. Sabah	19.08.2003
1.2	- Change relative attenuation - f_{N+} 156,08 MHz ... f_N +566,08 MHz typ. 50dB min. 45dB change to f_{N+} 141,08 MHz ... f_N +566,08 MHz typ. 45dB min. 35dB	M. Springfeldt	12.02.2004
1.3	- Remove mistake in relative attenuation	M. Springfeldt	13.02.2003
1.4	- Change relative attenuation - f_{N+} 156,08 MHz ... f_N +566,08 MHz typ. 50dB min. 45dB change to f_{N+} 141,08 MHz ... f_N +566,08 MHz typ. 45dB min. 40dB	M. Springfeldt	26.02.2004
1.5	- Change Temperature Coefficient of Frequency - Change Packing	M. Springfeldt	14.07.2004
1.6	- maximum input power updated	Kortenbeutel	16.01.2014