Measurement condition

Ambient temperature T_A: 23 °C
Input power level: 0 dBm
Terminating impedance:
Input: 240 Ω || -2.5 pF
Output: 240 Ω || -2.5 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of the TFS 433AG is the minimum of the pass band attenuation. This value is defined as the insertion loss a_e. The nominal frequency f_N is fixed at 433.92 MHz without any tolerance. The values of relative attenuation a_{rel} are guaranteed for the whole operating temperature range. The frequency shift of the filter in the operating temperature range is included in the production tolerance scheme.

D a t a		**typ. value**		**tolerance / limit**		
Insertion loss (reference level)	$a_e = a_{min}$	1.78	dB	max.	3.0	dB
Nominal frequency	f_N	-			433.92	MHz
Centre frequency 3dB	f_C	433.92	MHz		-	
Passband	PB				$f_N \pm 0.16$	MHz
Relative attenuation	a_{rel}					
f_N - 0.16 MHz … f_N + 0.16 MHz		0.45	dB	max.	2	dB
f_N - 0.18 MHz … f_N + 0.18 MHz		0.50	dB	max.	3	dB
f_N - 0.22 MHz … f_N + 0.22 MHz		0.70	dB	max.	6	dB
f_N - 423.92 MHz … f_N - 19.92 MHz		58	dB	min.	52	dB
f_N - 19.92 MHz … f_N - 10.42 MHz		56	dB	min.	48	dB
f_N - 10.42 MHz … f_N - 2.20 MHz		46	dB	min.	29	dB
f_N - 2.20 MHz … f_N - 1.80 MHz		46	dB	min.	26	dB
f_N - 1.80 MHz … f_N - 0.82 MHz		18	dB	min.	17	dB
f_N + 1.00 MHz … f_N + 8.08 MHz		40	dB	min.	18	dB
f_N + 8.08 MHz … f_N + 66.08 MHz		47	dB	min.	40	dB
f_N + 66.08 MHz … f_N + 266.08 MHz		65	dB	min.	50	dB
f_N + 266.08 MHz … f_N + 371.08 MHz		52	dB	min.	45	dB
f_N + 371.08 MHz … f_N + 566.08 MHz		62	dB	min.	60	dB
DC voltage	V_{DC}	-		max.	6	V
Input power level		-		max.	10	dBm
Operating temperature range	OTR	-			-40 … +95	°C
Storage temperature range		-			-55 … +125	°C
Temperature coefficient of frequency	TC_f *)	-0.03	ppm/K^2			

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

Generated:

Checked / Approved:

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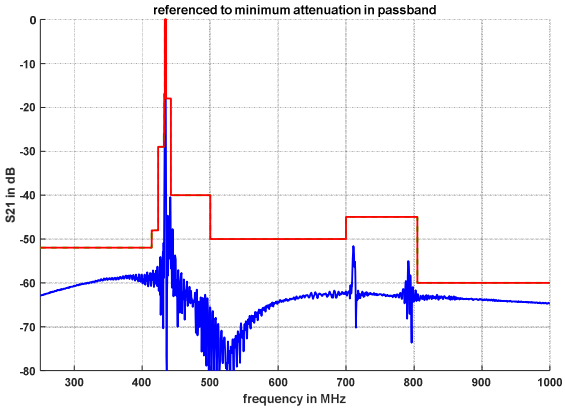
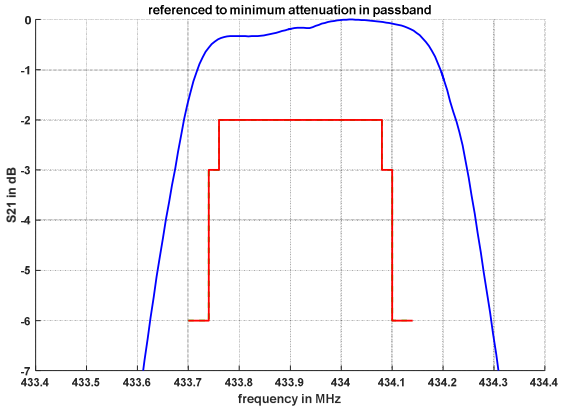
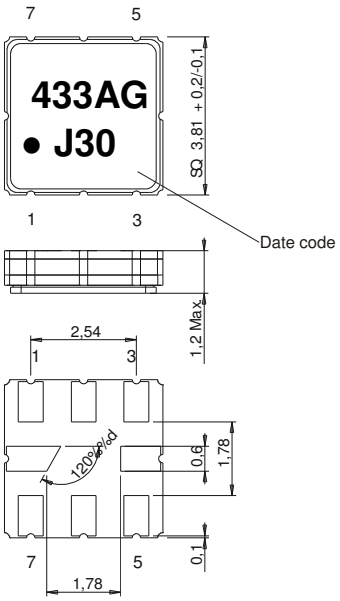
Filter characteristic





Construction and pin connection

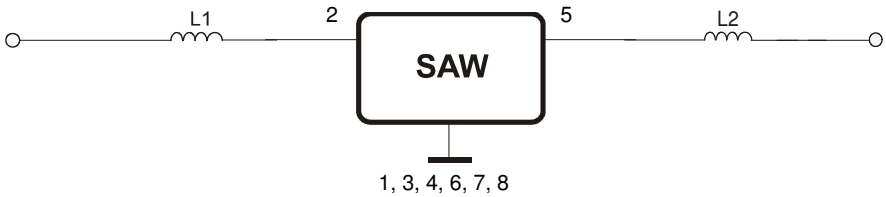
(All dimensions in mm)



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 Ohm 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;

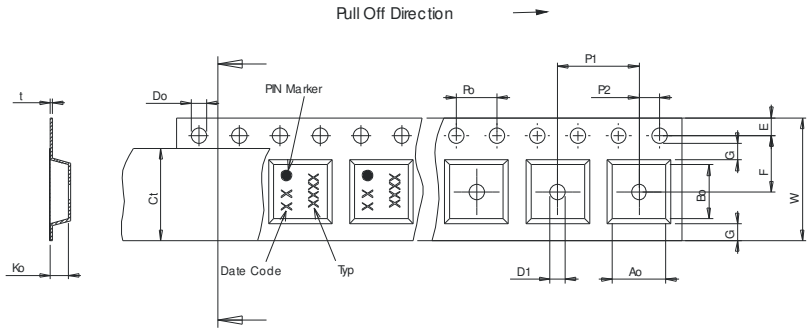
5. SAW devices are Electrostatic Discharge (ESD) sensitive devices.

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

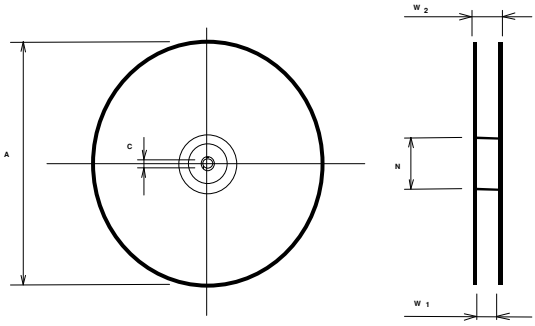


Tape (all dimensions in mm)

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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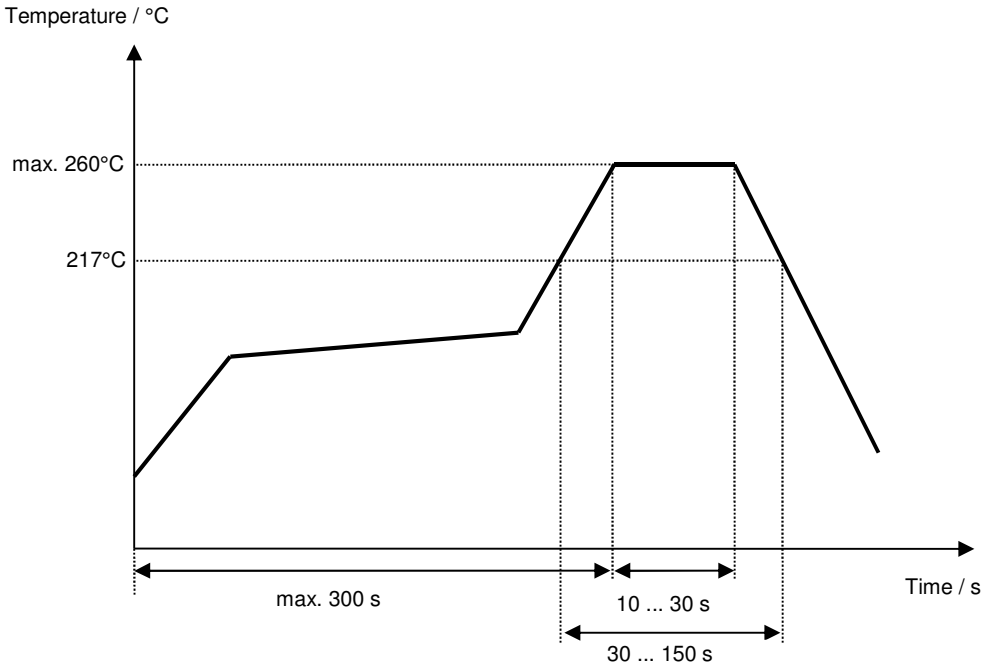
Air reflow temperature conditions

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



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Version	Reason of Changes	Name	Date
1.0	Generation of filter specification.	Abutaimah	09.03.2017
1.1	update storage temperature range update connection and pin connection update 50 Ohm test circuit update tape & reel update typos	Schönbein	26.07.2017

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