VI TELEFILTER — 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	a_e	3,1	dB		3,8	dB
(reference level)		-			-	
Nominal Frequency	f_N	-			433,92	MHz
Centre Frequency	f_C	433,92	MHz		-	
Passband	PB					
1 dB		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.	10	dBm

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

Generated:

Checked / Approved:

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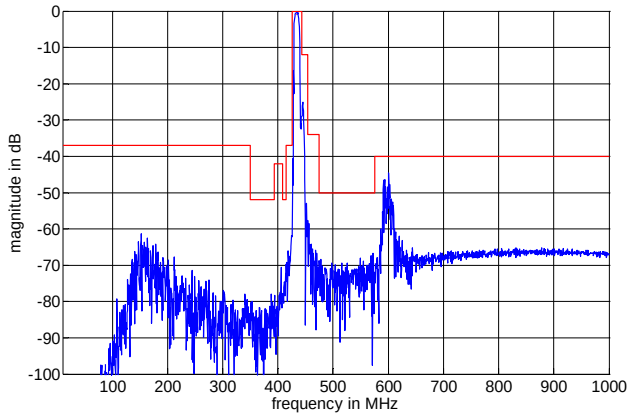
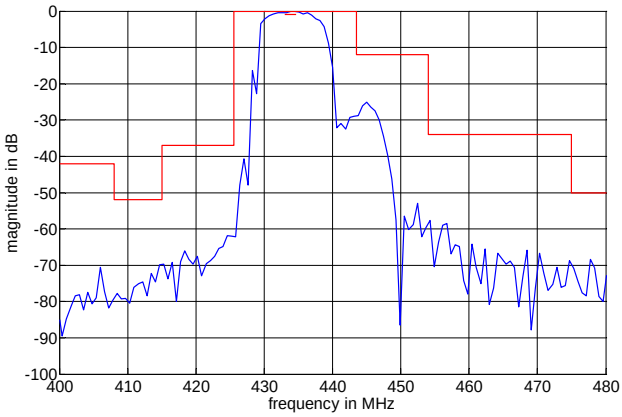
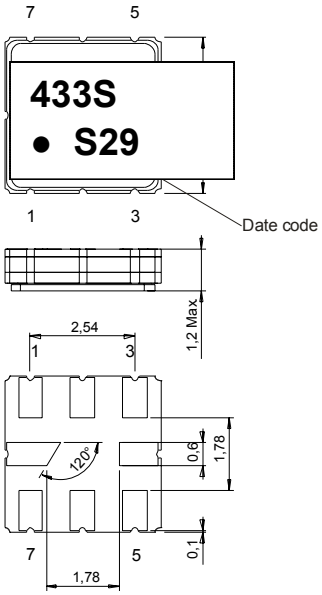
Filter characteristic





Construction and pin connection

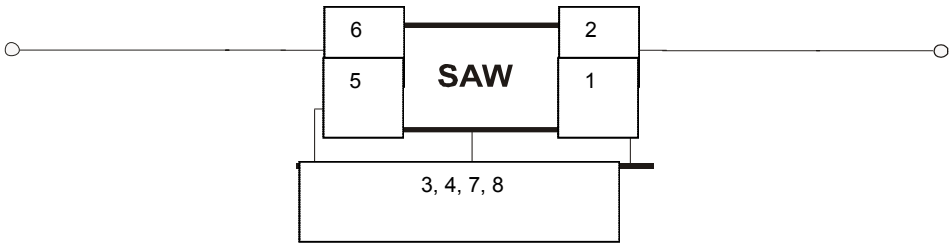
(All dimensions in mm)



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

Date code:	Year + week
S	2004
T	2005
U	2006
...	

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 5 g respectively, 1 octave per min, 10 cycles per plan, 3 plans; DIN IEC 68 T2 - 6
3. Change of temperature:	-55 °C to 125°C / 30 min. each / 10 cycles DIN IEC 68 part 2 – 14 Test N
4. Resistance to solder heat (reflow):	reflow possible: twice max.; for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

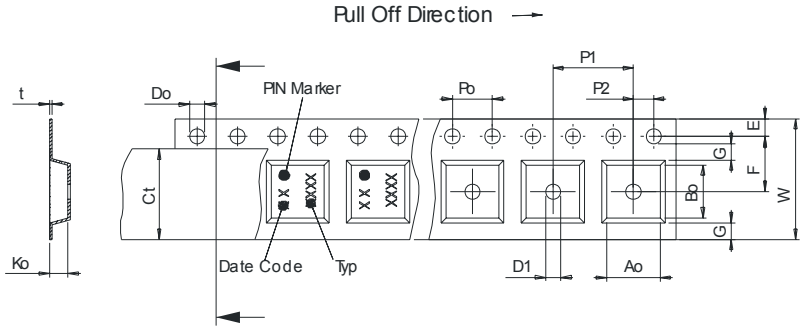
Packing

Tape & Reel: IEC 286 – 3, with exeption 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 peer 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

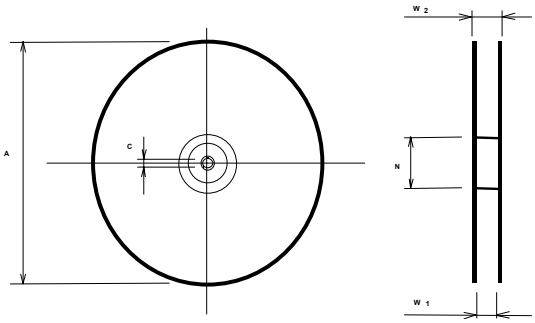
Tape (all dimensions in mm)

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

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

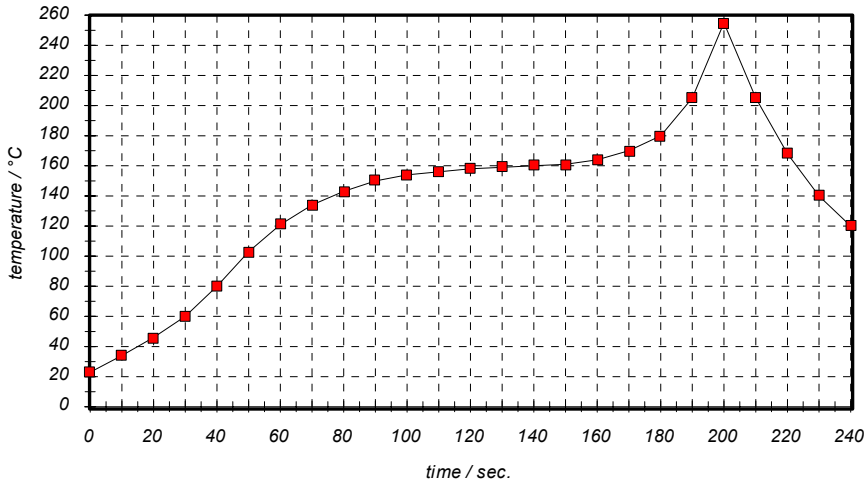

Table for temperature vs. time during the air reflow process

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	- Generation of development specification according to customer specification.	Dr. Sabah	17.06.2003
1.1	- Filter specification, add oft 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 attanuation	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

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