Measurement condition

Ambient temperature T_A: 25 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 480 Ω || -22 pF
Output: 130 Ω || -33 pF

Characteristics

Remark:
Reference level for the relative attenuation a_{rel} of the TFS 70AC 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 temperature coefficient of frequency Tc_f is valid for both the reference frequency f_c and the frequency response of the filter in the operating temperature range.

Data		typ. value		tolerance / limit	
Insertion loss (reference level)	a_e	7.5	dB	max. 9.5	dB
Centre frequency at ambient temperature	f_c	70	MHz	70.0 ± 0.1	MHz
Pass band	PB	f_c ± 3.6	MHz	f_c ± 2.8	MHz
Amplitude ripple within PB		0.3	dB	max. 1	dB
Relative attenuation	a_{rel}				
f_c ..... f_c ± 3.1	MHz	0.5	dB	max. 1	dB
f_c ± 3.1 MHz ..... f_c ± 3.5	MHz	2	dB	max. 3	dB
f_c ± 5.975 MHz ..... f_c ± 20	MHz	50	dB	min. 40	dB
Group delay at f_c		1.21	µs		
Group delay ripple in PB		68	ns	max. 120	ns
Phase linearity in f_c ± 2,45 MHz		4	°p-p	max. 8	°p-p
Operating temperature range		-		- 30 °C ... + 80 °C	
Storage temperature range		-		- 55 °C ... + 125 °C	
Temperature coefficient of frequency TC_f**		- 84	ppm / K	-	

*) The terminating impedances depend on parasitics and q-values of matching elements and the board used, and are to be understood as reference values only. Should there be additional questions, do not hesitate to ask for an application note or contact our design team.
**) $\Delta f = TC_f(T - T_A)f_N$

Generated:

Checked / Approved:

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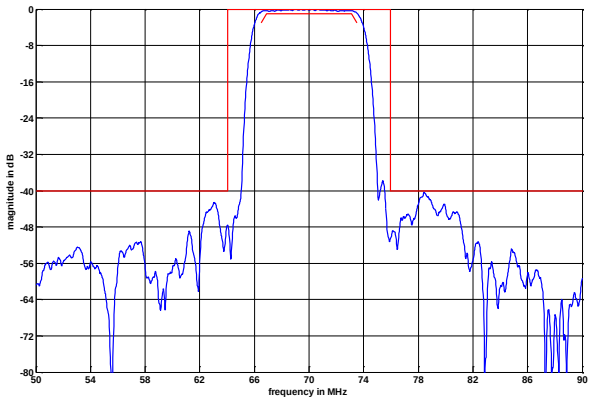
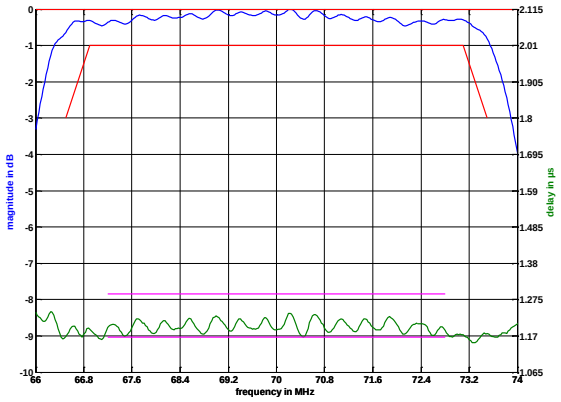
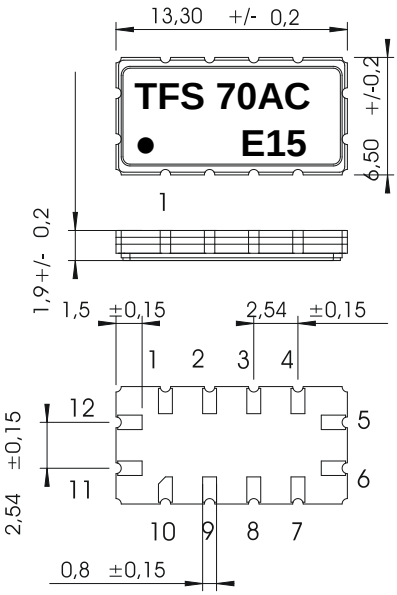
Filter characteristic





Construction and pin connection

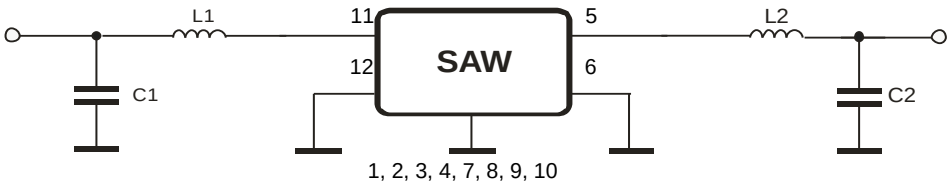
(All dimensions in mm)



1	Ground
2	Ground
3	Ground
4	Ground
5	Output
6	Output RF Return
7	Ground
8	Ground
9	Ground
10	Ground
11	Input
12	Input RF Return

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: 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)

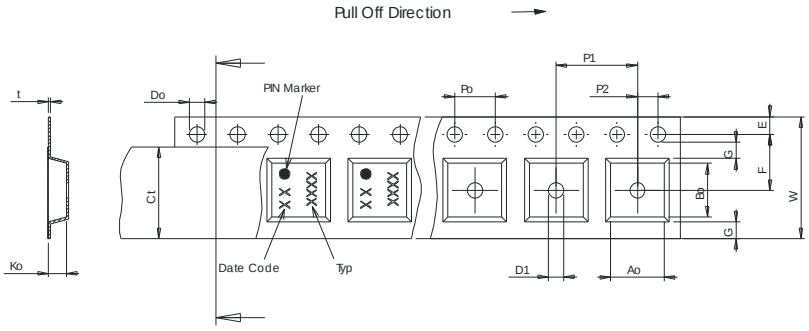
Packing

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;

max. pieces of filters per reel:	1700
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

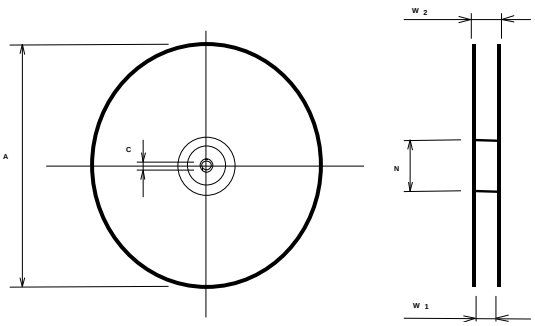
Tape (all dimensions in mm)

W	:	24.00	+0.30/-0.10
Po	:	4.00	±0.1
Do	:	1.50	+0.1/0
E	:	1.75	±0.10
F	:	11.50	±0.10
G(min)	:	0.60	
P2	:	2.00	±0.1
P1	:	12.00	±0.1
D1(min)	:	1.50	
Ao	:	7.00	±0.10
Bo	:	13.80	±0.10
Ct	:	21.00	±0.1
Ko	:	2.10	±0.10
t	:	0.30	±0.05



Reel (all dimensions in mm)

A	:	330	or 180
W1	:	24.4	+2/-0
W2(max)	:	30.40	
N(min)	:	60.00	
C	:	13.0	+0.5/-0.2



The minimum bending radius is 45 mm.

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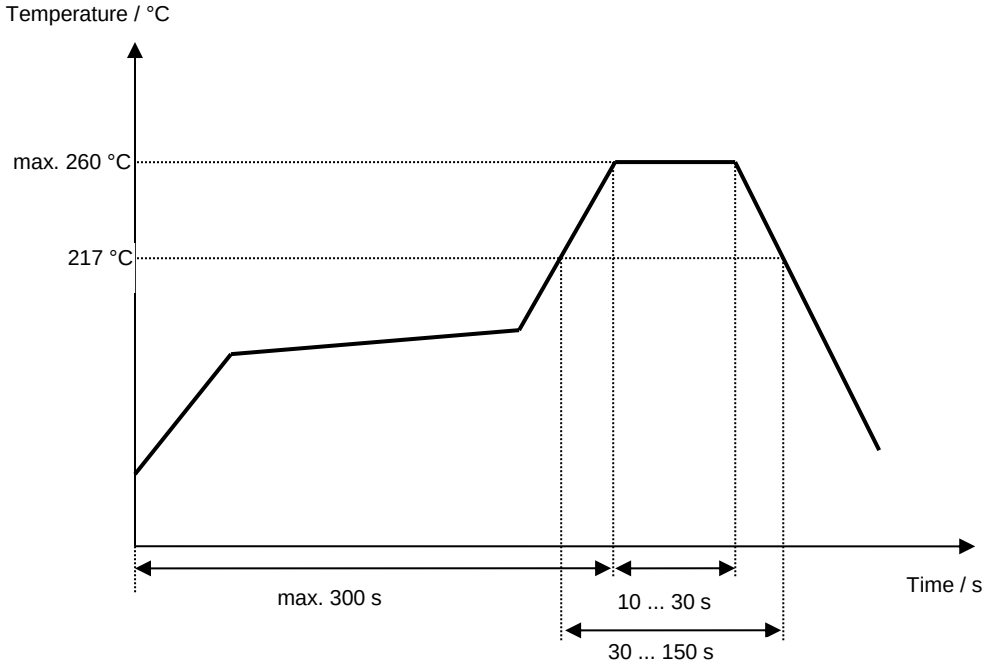
Air reflow temperature conditions

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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History

Version	Reason of Changes	Name	Date
1.0	- generate development specification	Pfeiffer	14.05.2003
1.1	- f_N changed to f_c generate development specification - remove nominal frequency f_N	Chilla	08.09.2003
1.2	- changed to filter specitication - terminating impedances added - typical values added - group delay at f_N changed to 1,21 µs typical value - matching network added	Chilla	24.11.2003
1.3	- filter characteristics added - test circuit updated - RoHS compliant added - air reflow temperature conditions updated	Chilla	03.03.2006
2.0	- added new page 2 - changed passband, relative attenuation - changed operating temperature range	Chilla	08.04.2014
3.0	- Change tape & reel dimensions - Update header and footer sections - Update data section - Update storage temperature range - Update stability characteristics, reliability	Bonnen	04.11.2016

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