Measurement condition

Ambient temperature: 23 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 1083 Ω || -11,4 pF
Output: 1144 Ω || -10,6 pF

Characteristics

Remark:
The nominal frequency f_N is fixed at 110,6 MHz. The insertion loss a_e is defined as loss value determined at f_N. Reference level for the relative attenuation a_{rel} of the TFS 110AB is 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. All specified data are met within the operating temperature range.

D a t a		**typ. value**		**tolerance / limit**		
Insertion loss (reference level)	a_e	7,5	dB	max.	10	dB
Nominal frequency	f_N	-			110,6	MHz
Centre frequency	f_C	110,6	MHz		-	
Passband	PB	-		f_N ±	0,5	MHz
Amplitude ripple within PB		2,5	dB	max.	3	dB
Relative attenuation	a_{rel}					
f_N … f_N ± 0,5 MHz		2,5	dB	max.	3	dB
f_N ± 1 MHz … f_N ± 1,05 MHz		43	dB	min.	35	dB
f_N ± 1,05 MHz … f_N ± 10 MHz		44	dB	min.	40	dB
Group delay ripple within f_N ± 0,4 MHz	p-p	400	ns	max.	700	ns
Group delay ripple within f_N ± 0,5 MHz	p-p	800	ns	max.	1000	ns
Operating temperature range	OTR	-		- 20 °C ... +	70 °C	
Storage temperature range		-		- 40 °C ... +	85 °C	
Frequency inversion temperature		-			-	
Temperature coefficient of frequency	TC_f **	-0,04	ppm/K²		-	

*) 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.
**) $\Delta f(Hz) = TC_f(ppm/K^2) \times (T-T_0)^2 \times f_{cat}(MHz)$.

Generated:

Checked / Approved:

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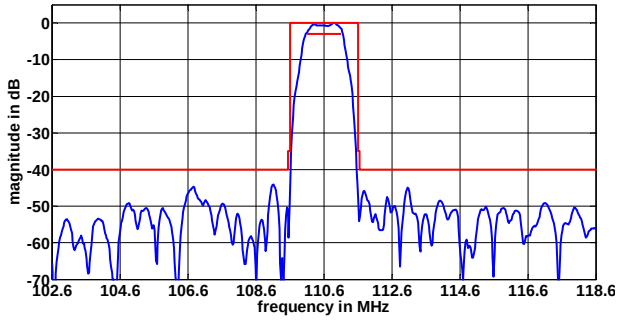
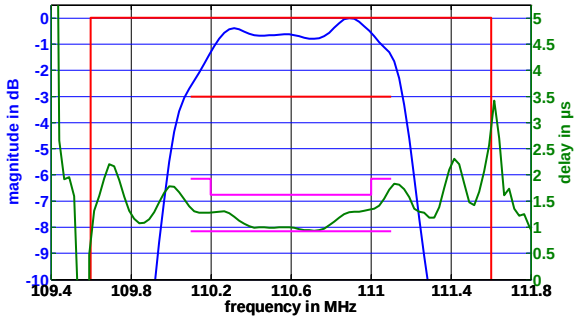
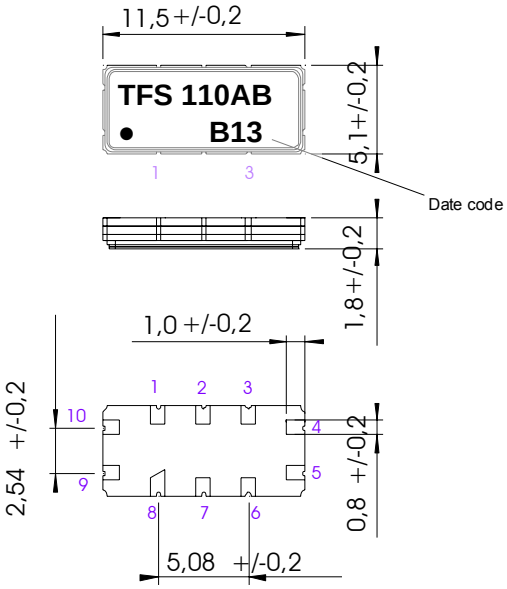
Filter characteristic





Construction and pin connection

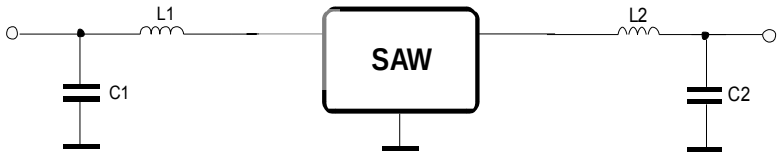
(All dimensions in mm)



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

Date code:	Year + week
B	2011
C	2012
D	2013
...	

50 Ohm Test circuit



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Stability characteristics, reliability

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

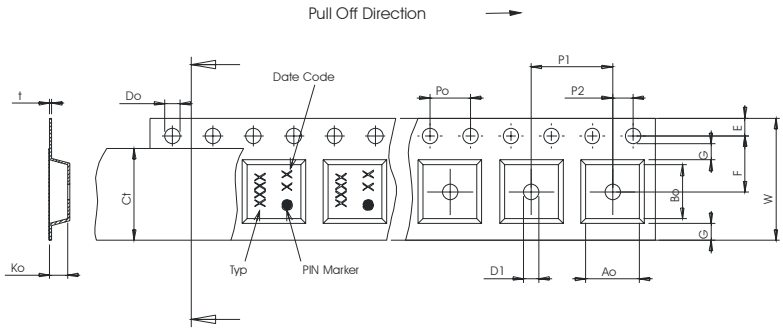
1. Shock:	500g, 1 ms, half sine wave, 3 shocks each plane; DIN IEC 68 T2 - 27
2. Vibration:	10 Hz to 500 Hz, 0,35 mm or 5 g respectively, 1 octave per min, 10 cycles per plan, 3 plans; DIN IEC 68 T2 - 6
3. Change of temperature:	-55 °C to 125°C / 30 min. each / 10 cycles DIN IEC 68 part 2 – 14 Test N
4. Resistance to solder heat (reflow):	reflow possible: three times max.; for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;
5. ESD	ANSI/ESD S20.20-1999**,** class 1A for HBM

This filter is RoHS compliant (2002/95/EG, 2005/618/EG)

Packing

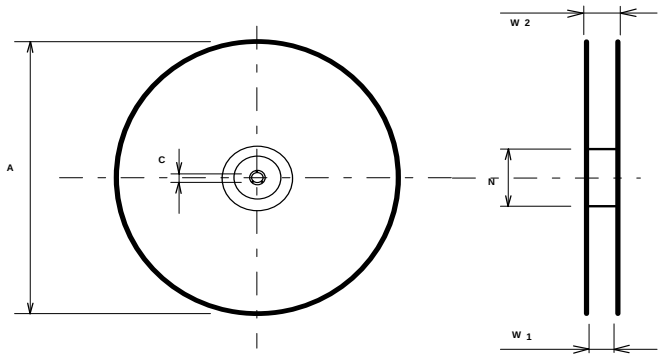
Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

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	:	24± 0,3
Po	:	4 ± 0,1
Do	:	1,5 + 0,1
E	:	1,75 ± 0,1
F	:	11,5 ± 0,1
G (min)	:	0,6
P2	:	2 ± 0,1
P1	:	8 ± 0,1
D1(min)	:	1,5
Ao	:	5,5 ± 0,1
Bo	:	11,9 ± 0,1
CT	:	21,5 ± 0,1



Reel (all dimensions in mm):

A	:	330
W1	:	24,4 +2
W2 (max)	:	30,4
N (min)	:	60
C	:	13 +0,5/-0,2

The minimum bending radius is 45 mm.

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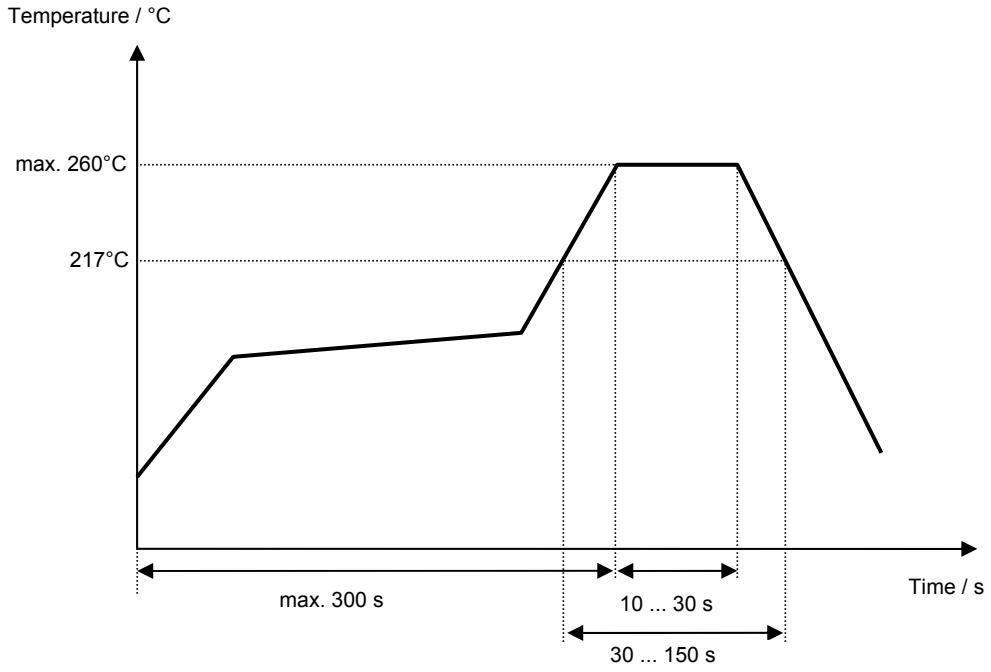
Air reflow temperature conditions

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	- development specification	Pfeiffer	04.02.2010
1.1	- changed centre frequency from 110.592 to 110.6MHz	A. Hodkin	20.04.2010
1.2	- Adjust rejection levels as agreed with the customer	A. Jaffer	13.07.2010
1.3	- Change from development spec to filter spec - Typical values added - Filter characteristic added	Molke	22.03.2011

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