

Microchip	Filter specification	TFS 450A	1/5
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Measurement condition

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	50	Ω
Output:	50	Ω

Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the **TFS 450A** 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 **3dB** filter attenuation level relative to the insertion loss a_e . The nominal frequency f_N is fixed at **450,00 MHz** without tolerance. The given values for the relative attenuation a_{rel} and for 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	max.	4,5	dB
Nominal frequency	f_N	-			450	MHz
Centre frequency	f_c	450	MHz			
Passband	PB			$f_N \pm$	2	MHz
Passband variation		-		max.	3,0	dB
Bandwidth 3 dB	BW	9,2	MHz	min.	4,0	MHz
Relative attenuation	a_{rel}					
f_N - 42,8 MHz		75	dB	min.	55	dB
Operating temperature range	OTR	-		- 40 °C ...+ 85 °C		
Storage temperature range		-		- 40 °C ...+ 85 °C		
Temperature coefficient of frequency	TC_f *	- 34	ppm/K	-		

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

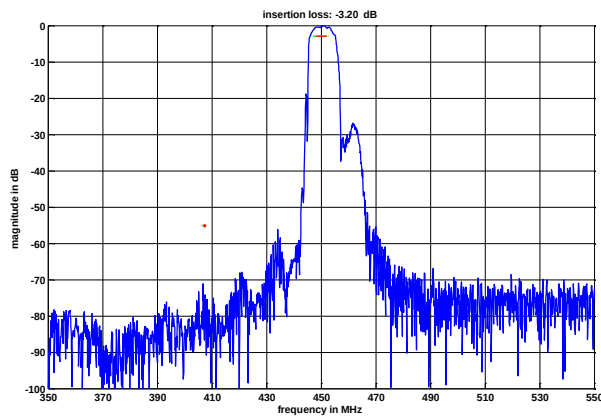
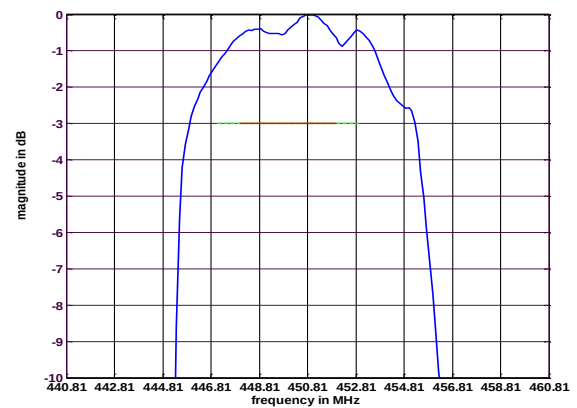
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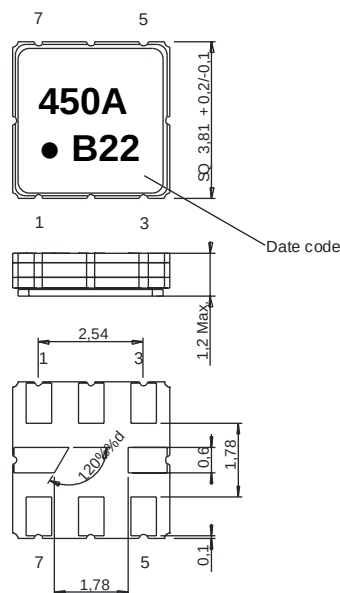
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Filter characteristic



Construction and pin connection

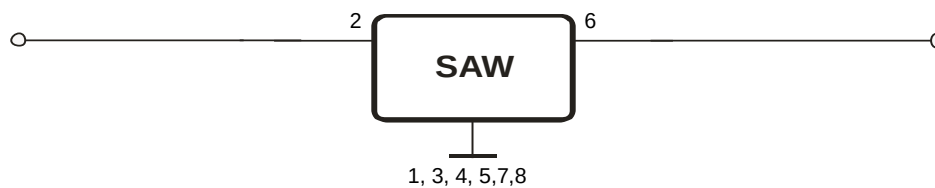
(All dimensions in mm)



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

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

50 Ω Test circuit



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 plane, 3 planes; 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, see page 4: "Air reflow temperature conditions"
5. ESD ANSI/ESD S20.20-1999, class 1A for HBM

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

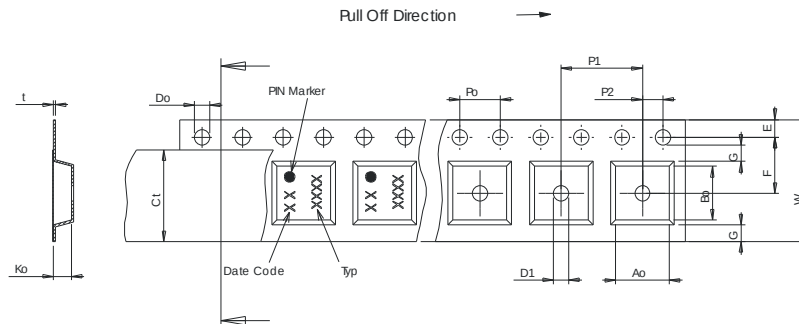
Packing

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;

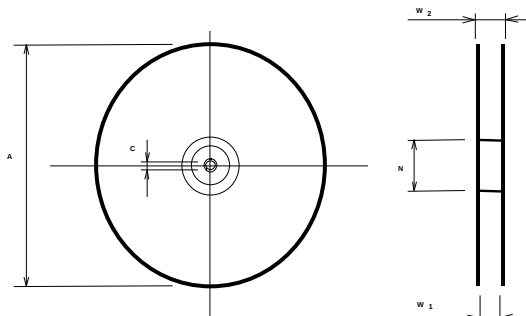
max. pieces of filters per reel:	3000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

Tape (all dimensions in mm)

W	: 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

**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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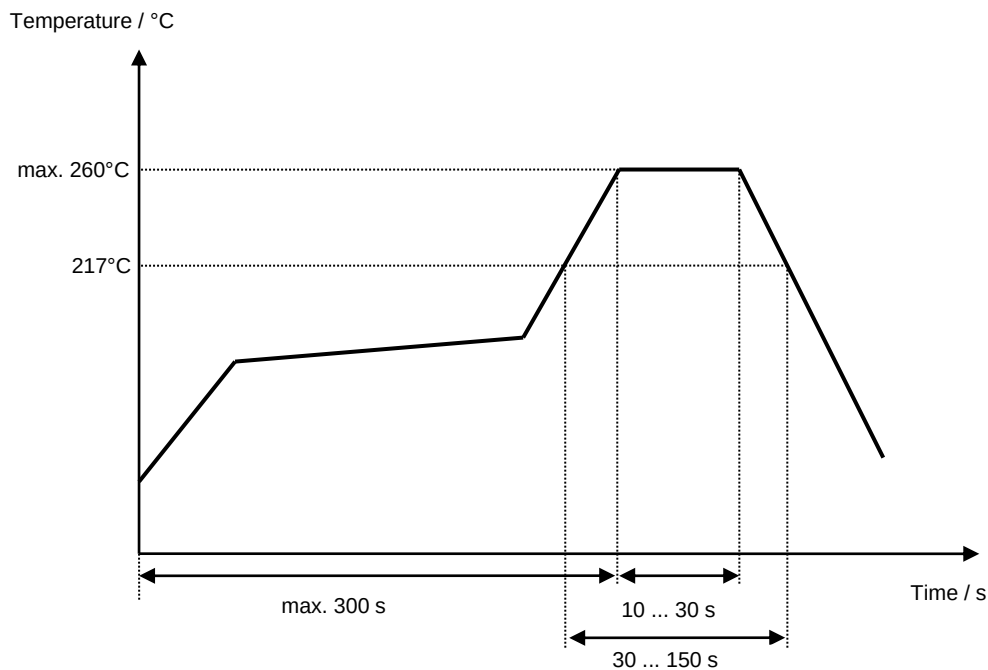
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Air reflow temperature conditions

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

Microchip**Filter specification****TFS 450A****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	Noack	27.05.2004
1.1	- Added typical values and filter characteristic; changed reflow profile generation of filter specification	Noack	01.02.2005
2.0	- Change data table and alignment of tape and reel - Add ESD and reliability	S. Channaa	27.05.2011