

**Microchip****Filter specification****TFS501A****1/5****Measurement condition**

Ambient temperature $T_A$ :	23	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	50	$\Omega$
Output:	50	$\Omega$

**Characteristics**

Remark:

The reference level for the relative attenuation  $a_{rel}$  of the TFS501A is the minimum attenuation in the pass band. The maximum attenuation in the pass band is defined as the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 501.835 MHz without any tolerance or limit. The values of relative attenuation  $a_{rel}$  are guaranteed for the whole operating temperature range. The frequency shift of the filter within the operating temperature range is included in the production tolerance scheme.

<b>D a t a</b>		<b>typ. value</b>	<b>tolerance / limit</b>
<b>Insertion loss</b>	$a_e$	3.0 dB	max. 5 dB
<b>Nominal frequency</b>	$f_N$	-	501.835 MHz
<b>Passband</b>	PB	-	$f_N \pm 8.335$ MHz
<b>Pass band variation</b>		0.3 dB	max. 1 dB
<b>Relative attenuation</b>	$a_{rel}$		
$f_N \pm 19.665$ MHz	@ $T_A$	2 dB	max. 3 dB
$f_N \pm 19.665$ MHz		2 dB	max. 6 dB
$f_N \pm 31.335$ MHz		20 dB	min. 10 dB
$f_N - 55.665$ MHz		40 dB	min. 23 dB
$f_N + 45.335$ MHz		50 dB	min. 23 dB
$f_N \pm 66.335$ MHz		44 dB	min. 35 dB
$f_N - 500.000$ MHz ... $f_N - 66.335$ MHz		33 dB	min. 28 dB
$f_N + 66.335$ MHz ... $f_N + 530.000$ MHz		36 dB	min. 30 dB
<b>Group delay ripple within PB</b>		11 ns	max. 24 ns
<b>Return loss within PB</b>		14 dB	min. 12 dB
<b>Input power level</b>		-	max. 15 dBm
<b>Operating temperature range</b>	OTR	-	-45 °C ... + 90 °C
<b>Storage temperature range</b>		-	-55 °C ... +105 °C
<b>Temperature coefficient of frequency</b>	$TC_f$ *	-72 ppm/K	

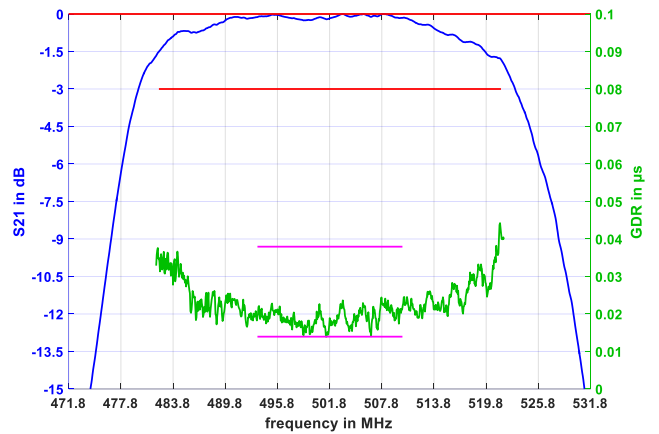
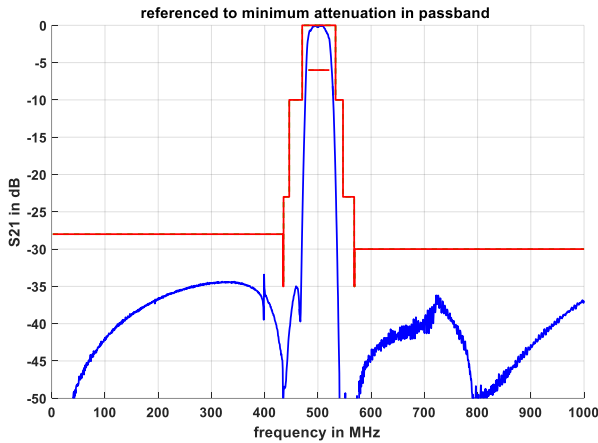
$$*) \Delta f = TC_f(T - T_A)f_N$$

**Generated:****Checked / Approved:**

**Microchip Frequency Technology GmbH**  
**Potsdamer Straße 18**  
**D 14 513 TELTOW / Germany**  
**Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30**

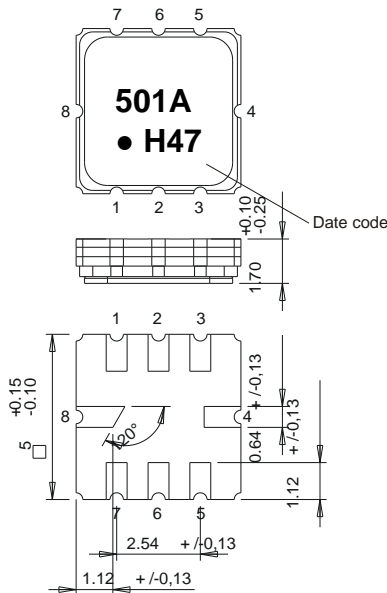
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**Filter characteristic**



**Construction and pin connection**

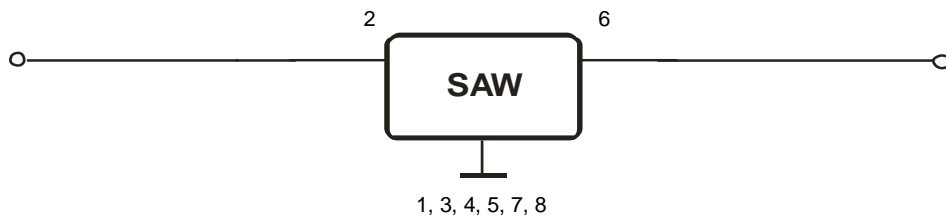
(All dimensions in mm)



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

Date code: Year + week  
 H 2016  
 J 2017  
 K 2018  
 ...

**50 Ω 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)

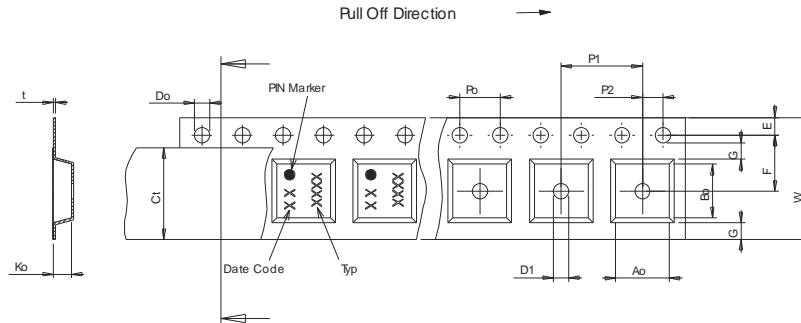
**Packing**

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: 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

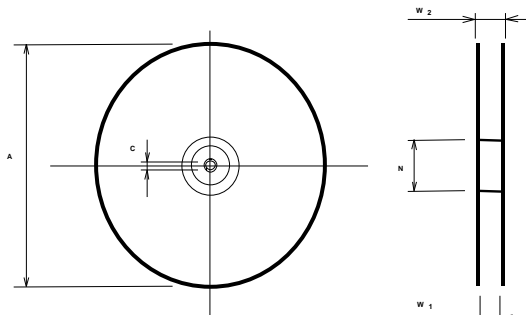
**Tape (all dimensions in mm)**

- W : 12.00 +0.3/-0.1
- Po : 4.00 ±0.1
- Do : 1.50 ±0.10
- E : 1.75 ±0.1
- F : 5.50
- G(min) : 0.75
- P2 : 2.00 ±0.1
- P1 : 8.00
- D1(min) : 1.50
- Ao : 5.30 ±0.1
- Bo : 5.30 ±0.1
- Ct : 9.2 ±0.1



**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



The minimum bending radius is 45 mm.

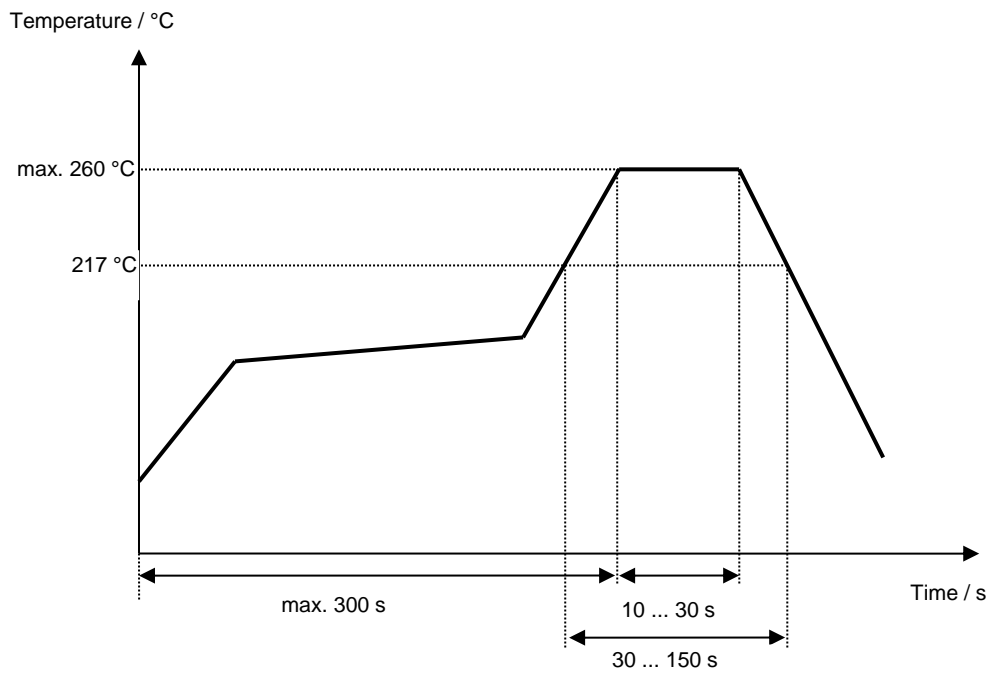
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**Air reflow temperature conditions**

<b>Conditions</b>	<b>Exposure</b>
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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**Microchip****Filter specification****TFS501A****5/5**

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**History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	- Generation of development specification	S. Springfeldt	29.07.2016
2.0	- Generation of filter specification with adjusted data table	S. Springfeldt	17.11.2016