

**Microchip****Filter specification****TFS1312****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 TFS1312 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 1312 MHz without any tolerance or limit. The values of relative attenuation  $a_{rel}$  are guaranteed for the whole operating temperature range (OTR2). 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 in OTR2</b>	$a_e$	3.6	dB	max.	4.5	dB
<b>Nominal frequency</b>	$f_N$	-			1312.0	MHz
<b>Passband</b>	PB	-		$f_N$	$\pm$ 0.1	MHz
<b>Relative attenuation</b>	$a_{rel}$					
$f_N \pm 20$ MHz in OTR 1		44	dB	min.	35	dB
$f_N \pm 20$ MHz in OTR 2		40	dB	min.	30	dB
800 MHz		50	dB	min.	35	dB
1236 MHz		49	dB	min.	40	dB
1388 MHz		48	dB	min.	40	dB
1600 MHz		57	dB	min.	35	dB
<b>VSWR within pass band in OTR2</b>		1.3 : 1		max.	2 : 1	
<b>Input power level</b>				max.	10	dBm
<b>Operating temperature range I</b>	OTR1	-			0 °C ... +60 °C	
<b>Operating temperature range II</b>	OTR2	-			-40 °C ... +85 °C	
<b>Storage temperature range</b>		-			-55 °C ... +125 °C	
<b>Temperature coefficient of frequency</b>	$TC_f^*$	-36	ppm/K			

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

**Generated:**

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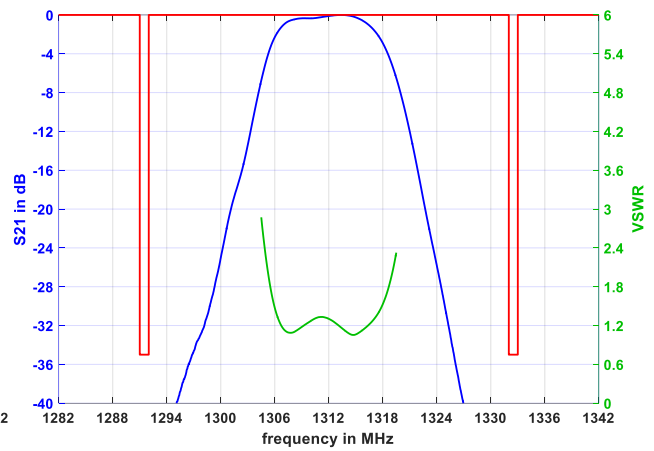
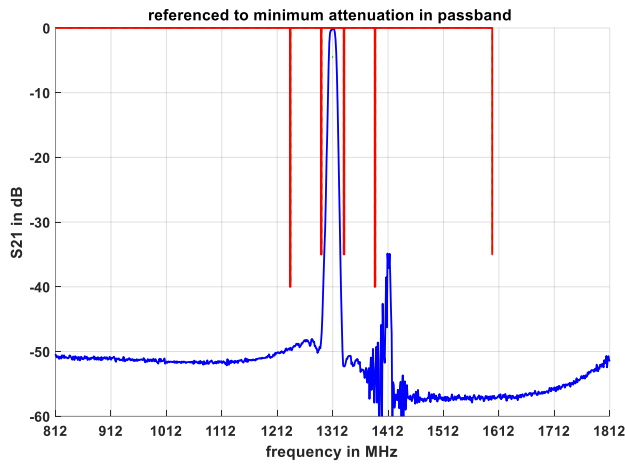
**Checked / Approved:**

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

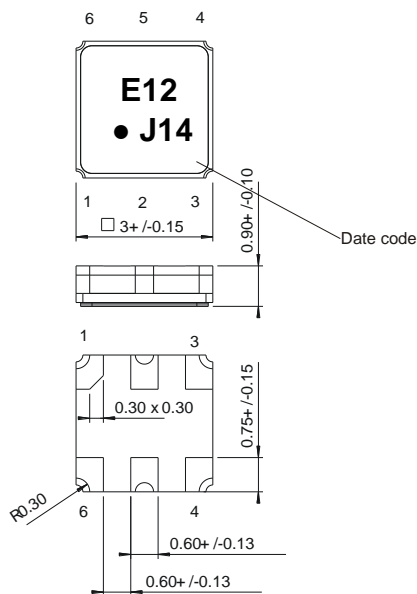
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**Filter characteristic**



**Construction and pin connection**

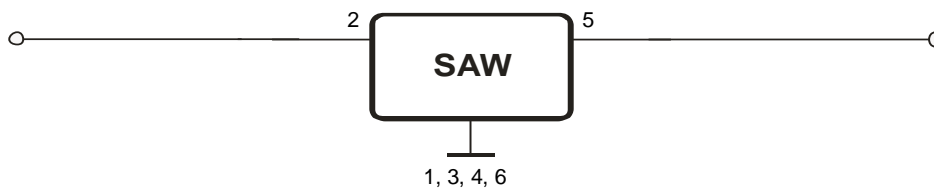
(All dimensions in mm)



- 1 Ground
- 2 Input
- 3 Ground
- 4 Ground
- 5 Output
- 6 Ground

Date code: Year + week  
 J 2017  
 K 2018  
 L 2019  
 ...

**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.

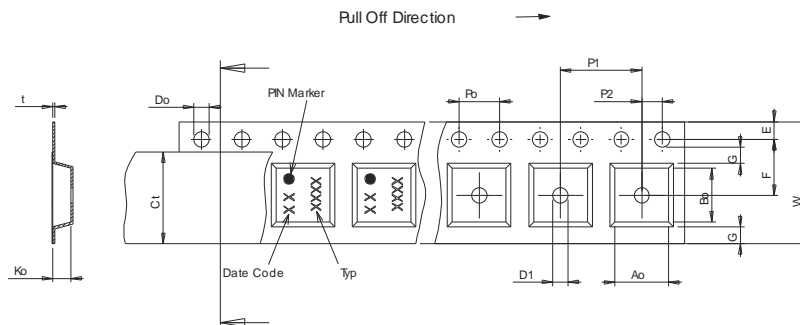
This filter is RoHS compliant (2011/65/EU)

**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 |

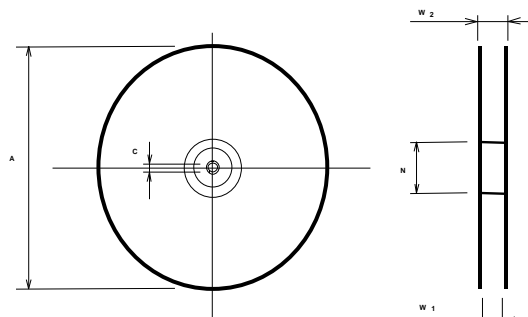
**Tape (all dimensions in mm)**

- W : 8.00 ±0.3
- Po : 4.00 ±0.1
- Do : 1.50 +0.1/-0
- E : 1.75 ±0.1
- F : 3.50 ±0.05
- G(min) : 0.75
- P2 : 2.00 ±0.05
- P1 : 4.00 ±0.1
- D1(min) : 1.50
- Ao : 3.25 ±0.1
- Bo : 3.25 ±0.1
- Ct : 5.30 ±0.1
- Ko : 1.50 ±0.1
- t : 0.25 ±0.05



**Reel (all dimensions in mm)**

- A : 330 or 180
- W1 : 8.40 +1.5/-0
- W2(max) : 14.40
- N(min) : 60.00
- C : 13.0 ±0.2



The minimum bending radius is 45 mm.

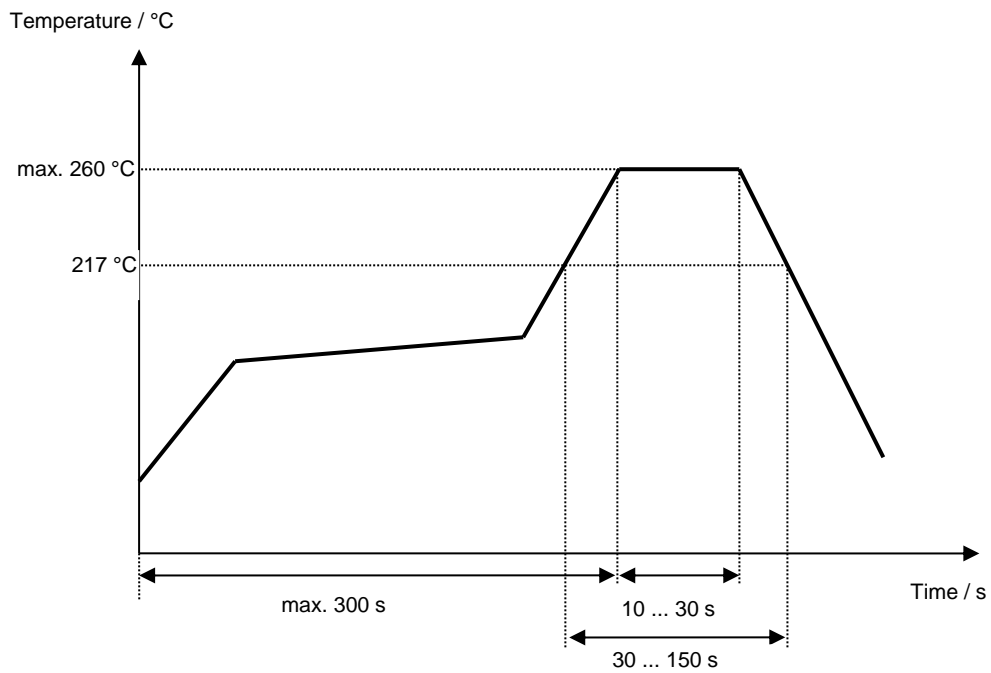
**Microchip Frequency Technology GmbH**  
**Potsdamer Straße 18**  
**D 14 513 TELTOW / Germany**  
**Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30**

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**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****TFS1312****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. Springfieldt	11.05.2016
2.0	- Generation of filter specification	S. Springfieldt	06.04.2017
2.1	- Update <i>storage temperature range</i>	S. Springfieldt	11.04.2017

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