

**Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	295.92 Ω	-8.18 pF
Output:	356.26 Ω	-6.65 pF

**Characteristics**

Remark:

The reference level for the relative attenuation  $a_{rel}$  of the TFS315R is the minimum of the pass band attenuation. This value is defined as the insertion loss  $a_g$ . The nominal frequency  $f_N$  is fixed at 315.0 MHz without any tolerance. The values of relative attenuation  $a_{rel}$  are guaranteed for the whole operating temperature range. The frequency shift of the filter in 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> (reference level)	$a_e$	8.5	dB	max.	12.5 dB
<b>Nominal frequency</b>	$f_N$	-			315 MHz
<b>Centre frequency</b>	$f_c$	315	MHz		-
<b>Passband</b>	PB	-		$f_N \pm$	3.5MHz
Pass band ripple $f_N \dots f_N \pm 3.5\text{MHz}$ (p-p)		0.3	dB	max.	1.0 dB
<b>Relative attenuation</b>	$a_{rel}$				
$f_N$ ... $f_N \pm 3.5$ MHz		0.3	dB	max.	1.0 dB
$f_N \pm 9.0$ MHz ... $f_N \pm 100$ MHz		44	dB	min.	30 dB
<b>Absolute group delay within <math>f_N \dots f_N \pm 3.0\text{MHz}</math> ***</b>		465	ns	max.	$\pm 25$ ns
<b>Return loss within <math>f_N \dots f_N \pm 3.0\text{MHz}</math></b>		18	dB	min.	10 dB
<b>Input Power</b>		-		max.	10 dBm
<b>Operating temperature range</b>	OTR	-			-40 °C ... + 85 °C
<b>Storage temperature range</b>		-			-40 °C ... + 85 °C
<b>Temperature coefficient of frequency</b>	$TC_f$ **	-18	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.

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

\*\*\*) Both delay and ripple variations are to be included, (temperature and manufacturing variations are also included).

**Generated:**

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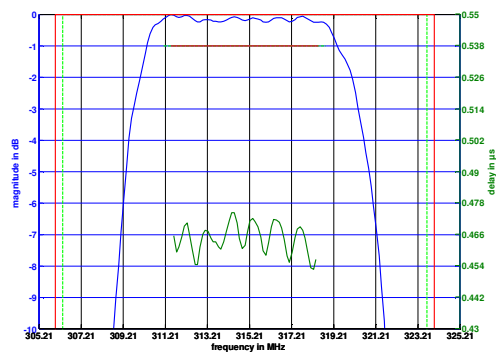
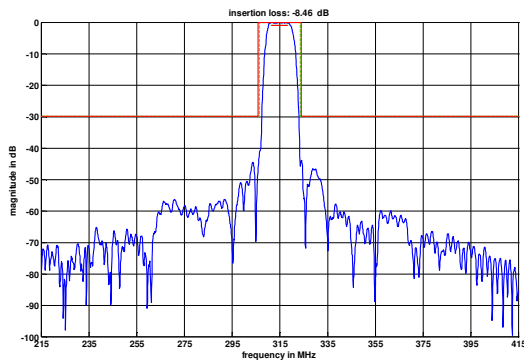
**Checked / Approved:**

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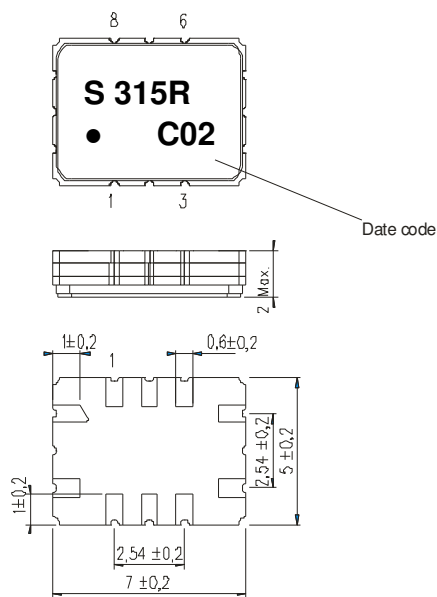
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**Filter characteristic**



**Construction and pin connection**

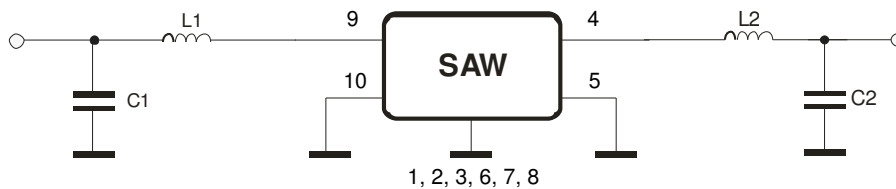
(All dimensions in mm)



- 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  
 C 2012  
 D 2013  
 E 2014  
 ...

**50 Ω 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 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 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)

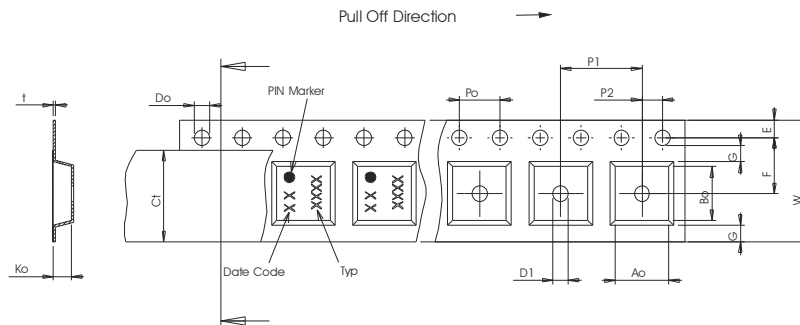
**Packing**

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

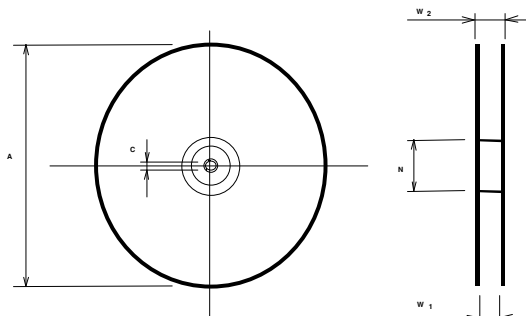
**Tape (all dimensions in mm)**

- W : 16,00 ± 0,3
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,1
- F : 7,50 ± 0,1
- G(min) : 0,60
- P2 : 2,00 ± 0,1
- P1 : 8,00 ± 0,1
- D1(min) : 1,50
- Ao : 5,50 ± 0,1
- Bo : 7,50 ± 0,1
- Ct : 13,5 ± 0,1



**Reel (all dimensions in mm)**

- A : 330
- W1 : 33,5 ± 0,5
- W2(max) : 37,5 ± 0,5
- N(min) : 100
- C : 21,8 ± 0,5



The minimum bending radius is 45 mm.

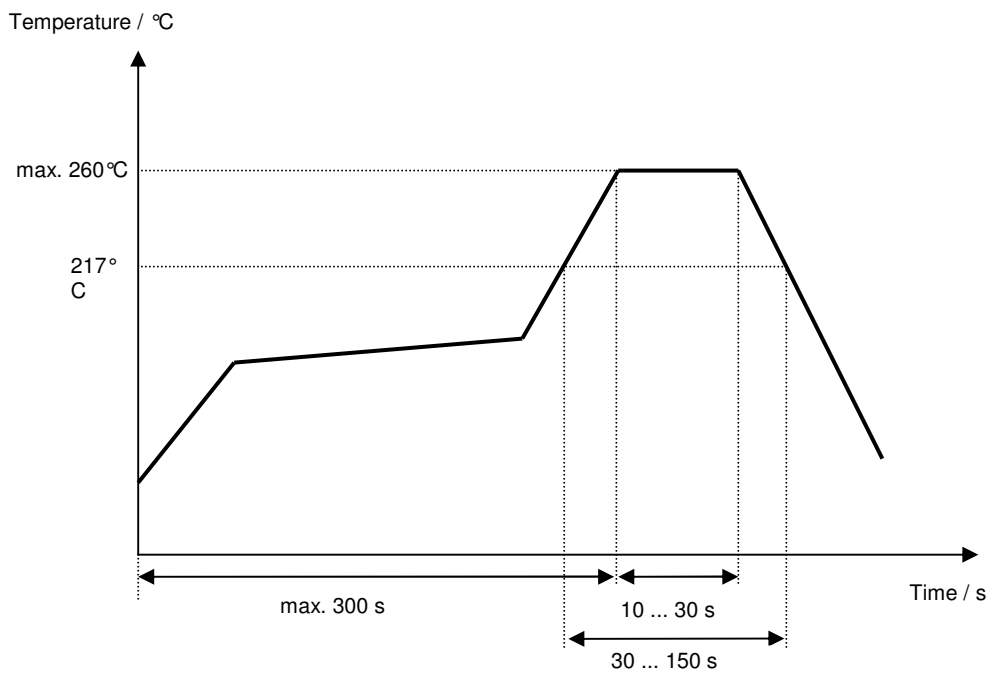
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**Air reflow temperature conditions**

<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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**History**

<b>Version</b>	<b>Reason of changes</b>	<b>Name</b>	<b>Date</b>
1.0	- development specification	TCUK	13.01.2012
1.1	- add typ values, change development to filter specification	TCUK	26.03.2012

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