

**VI TELEFILTER****Filter specification****TFS 330A****1/5****Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	365 $\Omega$	-13,6 pF
Output:	400 $\Omega$	-13,6 pF

**Characteristics**

## Remark:

The reference level for the relative attenuation  $a_{rel}$  of the TFS 330A is the minimum of the pass band attenuation. This value is defined as the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 330, 75 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)	$a_e = a_{min}$	21 dB	max. 22,0 dB
<b>Nominal frequency</b>	$f_N$	-	330,750 MHz
<b>Passband</b>	PB	-	$f_N \pm 4,988$ MHz
<b>Pass band variation</b>		1,2 dB	max. 1,5 dB
<b>Relative attenuation</b>	$a_{rel}$		
$f_N$ ... $f_N \pm 4,988$ MHz		1,2 dB	max. 1,5 dB
$f_N \pm 5,78$ ... $f_N \pm 15,0$ MHz		46 dB	min. 40 dB
<b>Average group delay</b>		2,44 $\mu$ s	max. 2,5 $\mu$ s
<b>Group delay variation within PB</b>		110 ns	max. 130 ns
<b>Triple transit response suppression</b>		43 dB	max. 40 dB
<b>Return loss within PB</b>		12 dB	min. 9 dB
<b>Input power level</b>			max. 10 dBm
<b>Operating temperature range</b>	OTR	-	- 20 °C ... + 85 °C
<b>Storage temperature range</b>		-	- 20 °C ... + 85 °C
<b>Frequency inversion temperature</b>		45 °C	
<b>Temperature coefficient of frequency</b>	$TC_f$ **	0,03 ppm/K <sup>2</sup>	-

\*) The terminating impedances depend on parasites 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.

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

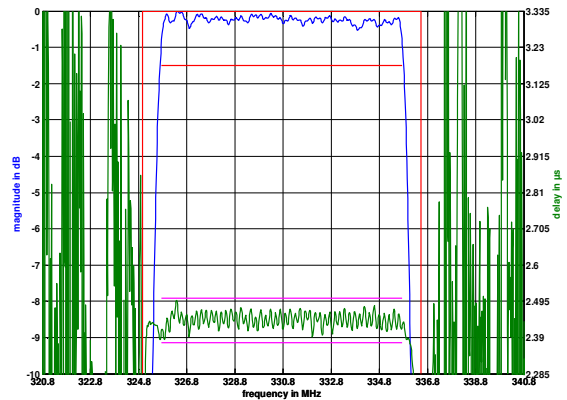
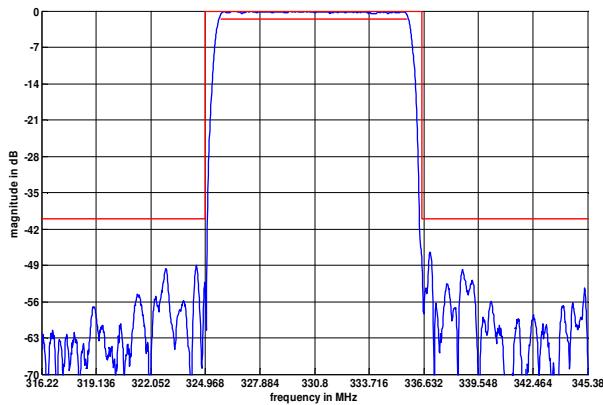
\*\*\*\*) the filter will change the insertion loss about  $\pm 1$  dB over temperature.

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

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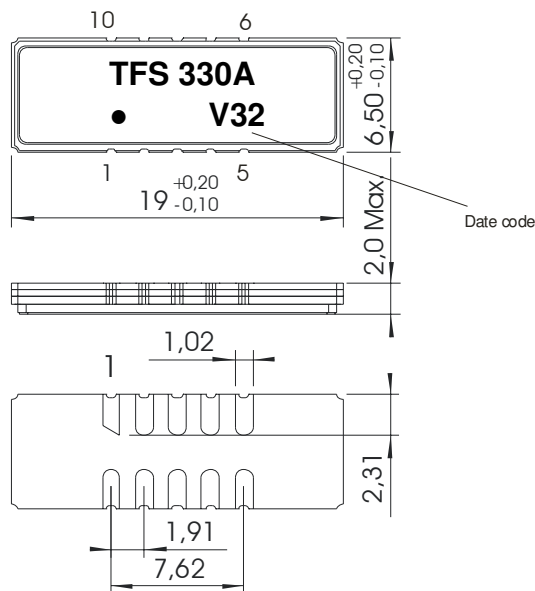
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**Filter characteristic**



**Construction and pin connection**

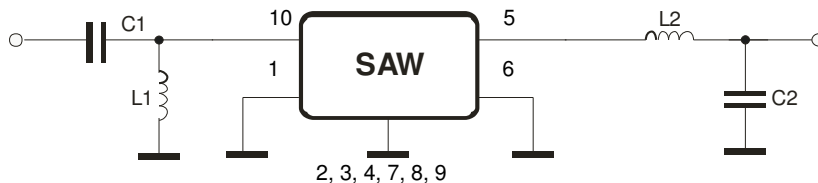
(All dimensions in mm)



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

Date code: Year + week  
 V 2007  
 W 2008  
 X 2009  
 ...

**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 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

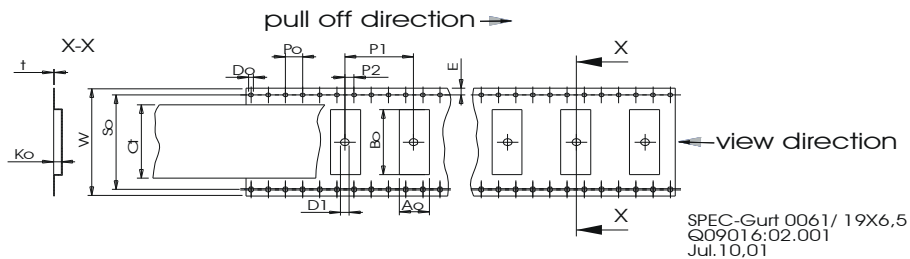
This filter is RoHS compliant (2002/95/EG, 2005/618/EG)

**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: 1700
  - reel of empty components at start: min. 300 mm
  - reel of empty components at start including leader: min. 500 mm
  - trailer: min. 300 mm

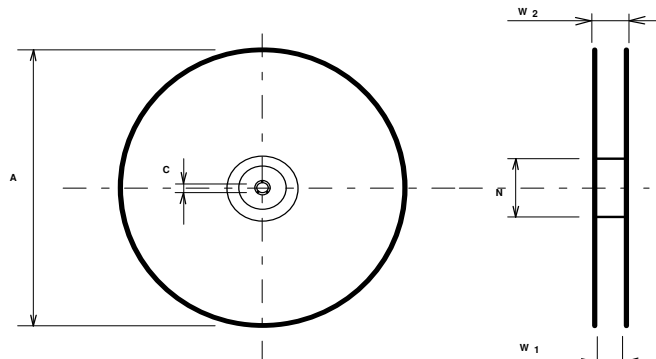
**Tape (all dimensions in mm)**

- W : 32 ± 0,3
- Po : 4 ± 0,1
- Do : 1,5 + 0,5
- E : 1,75 ± 0,1
- So : 28,4 ± 0,1
- P2 : 2 ± 0,1
- P1 : 12 ± 0,1
- D1 (min) : 1,5
- Ao : 7,1 ± 0,1
- Bo : 19,6 ± 0,1
- Ko : 2,0 ± 0,1
- t : 0,35 ± 0,05
- Ct : 25,5 ± 0,1



**Reel (all dimensions in mm):**

- A : 330
- W1 : 32,4 +2
- W2 (max) : 38,4
- N (min) : 100
- C : 13 +0,5/-0,2



The minimum bending radius is 45 mm.

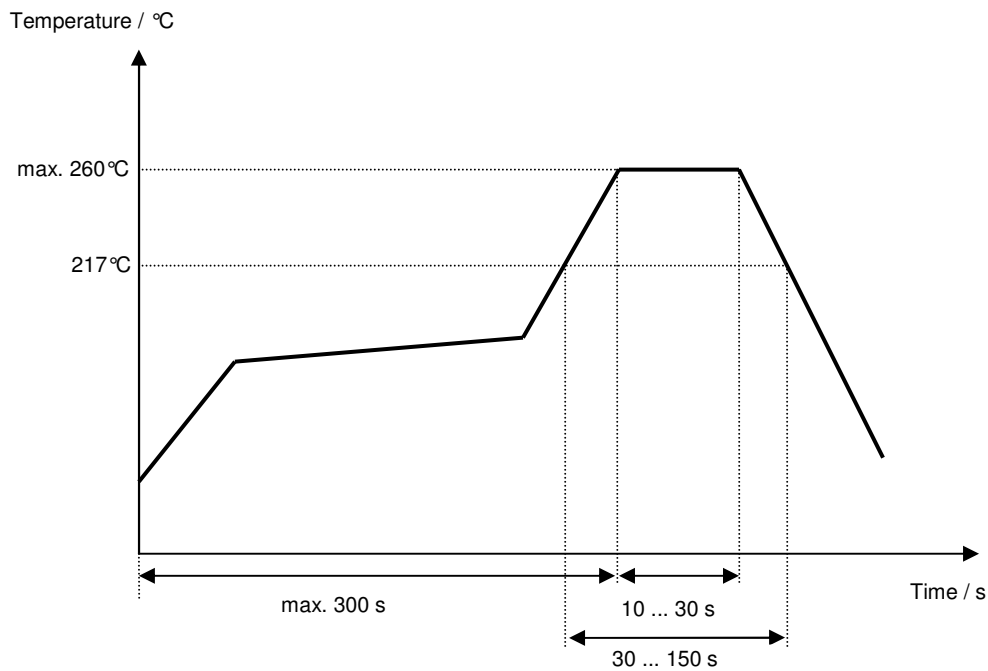
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**Air reflow temperature conditions**

<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**



**VI TELEFILTER****Filter specification****TFS 330A****5/5****History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	Generate of development specification	Alawneh	04.12.2006
1.1	Changed package to BV17.1.B3-B, update absolute delay	Martens	27.03.2007
1.2	- add of terminating impedances, typical values, filter characteristics and matching configuration - change of group delay ripple, return loss and insertion loss variation over temperature - tape and reel dimensions corrected	Pfeiffer	08.08.2007

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