

**VI TELEFILTER****Filter specification****TFS 150AH****1/5****Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	120 Ω	-22,9 pF
Output:	59 Ω	-30,3 pF

**Characteristics**

## Remark:

The reference level for the relative attenuation  $a_{rel}$  of the TFS 150AH 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 3 dB filter attenuation level relative to the insertion loss  $a_e$ . The temperature coefficient of frequency  $TC_f$  is valid for both the reference frequency  $f_c$  and the frequency response of the filter in the operating temperature range. The bandwidth change 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)	$a_e$	23,7 dB	max.	25 dB
<b>Centre frequency</b>	$f_c$	150,0 MHz	150,0	$\pm 0,1$ MHz
<b>Passband</b>	PB	-	$f_c \pm$	9,95 MHz
<b>Pass band ripple (p-p)</b>		0,8 dB	max.	1,5 dB
<b>Bandwidth</b>	BW			
1,5 dB		20,00 MHz	min.	19,9 MHz
3 dB		20,18 MHz	min.	20,0 MHz
45 dB		21,03 MHz	max.	22,0 MHz
<b>Relative attenuation</b>	$a_{rel}$			
$f_c$	$\dots f_c \pm 9,95$ MHz	1,3 dB	max.	1,5 dB
$f_c \pm 10,4$ MHz	$\dots f_c \pm 10,6$ MHz	17 dB	min.	15 dB
$f_c \pm 10,6$ MHz	$\dots f_c \pm 11$ MHz	45 dB	min.	30 dB
$f_c \pm 11$ MHz	$\dots f_c \pm 15$ MHz	55 dB	min.	45 dB
$f_c + 15$ MHz	$\dots f_c + 250$ MHz	57 dB	min.	49 dB
$f_c - 135$ MHz	$\dots f_c - 15$ MHz	57 dB	min.	49 dB
<b>Absolute group delay within PB</b>		2,8 $\mu$ s	max.	4 $\mu$ s
<b>Group delay ripple within PB (p-p)</b>		80 ns	max.	150 ns
<b>Return loss within PB</b>		12 dB	min.	9 dB
<b>Operating temperature range</b>	OTR	-	- 25 °C ... + 80°C	
<b>Storage temperature range</b>		-	- 40 °C ... + 85°C	
<b>Temperature coefficient of frequency</b>	$TC_f$ **	-88 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.

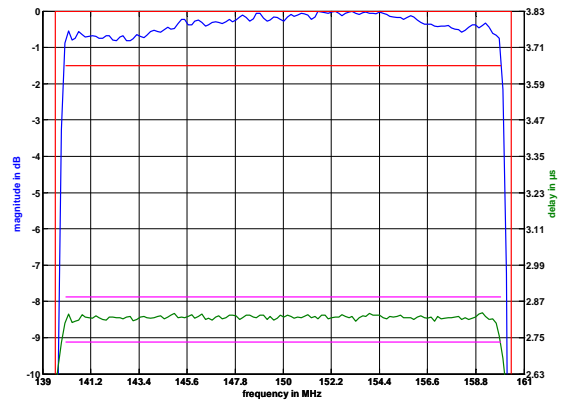
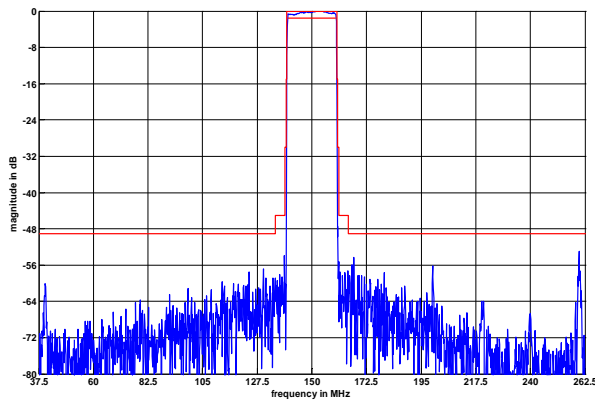
\*\* $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_A) \times f_{CAT}(\text{MHz})$

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

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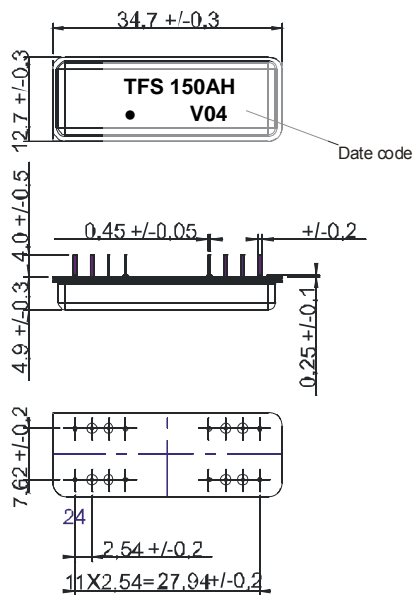
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**Filter characteristic**



**Construction and pin connection**

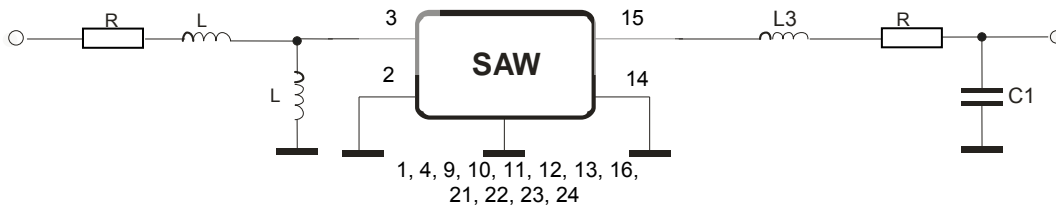
(All dimensions in mm)



1	Ground
2	Input RF Return
3	Input
4	Ground
9,10,11,12	Ground
13	Ground
14	Output RF Return
15	Output
16	Ground
21,22,23,24	Ground

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

**50 Ohm 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 5 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: twice max.;  
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

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

**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**



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**VI TELEFILTER****Filter specification****TFS 150AH****5/5****History**

<b>Version</b>	<b>Reason of changes</b>	<b>Name</b>	<b>Date</b>
1.0	- Generation of development specification	Strehl	18.08.2006
1.1	- change of pass band bandwidth - relative attenuations refer to $f_c$ - remarks modified	Pfeiffer	23.10.2006
1.2	- add of terminating impedances, typical values and filter characteristics (all preliminary values) - add of matching configuration	Pfeiffer	01.12.2006
1.3	- change of terminating impedances, typical values and filter characteristics - change of matching configuration - add of return loss - limits	Pfeiffer	26.01.2007

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