

VI TELEFILTER**Filter specification****TFS 163A****1/5****Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	33 Ω 19,6 pF	
Output:	33 Ω 19,8 pF	

Characteristics**Remark:**

The reference level for the relative attenuation a_{rel} of the TFS163A 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 reference 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 both for the reference frequency f_c and the frequency response of the filter in the operating temperature range. The bandwidth shift of the filter in the operating temperature range is included in the production tolerance scheme.

D a t a		typ. value	tolerance / limit
Insertion loss (reference level)	a_e	24,2 dB	max. 25 dB
Nominal frequency	f_N	-	163,65 MHz
Centre frequency	f_c	163,65 MHz	163,65 ± 0,1 MHz
Passband	PB	-	f_N ± 8,8 MHz
Pass band ripple (p-p)		0,7 dB	max. 1,0 dB
Bandwidth	BW		
3 dB		18,02 MHz	min. 17,92 MHz
15 dB		18,73 MHz	max. 18,78 MHz
45 dB		19,20 MHz	max. 20,0 MHz
Relative attenuation	a_{rel}		
f_c	... f_c ± 8,96 MHz	2,4 dB	max. 3 dB
f_c ± 9,39 MHz	... f_c ± 9,60 MHz	19 dB	min. 15 dB
f_c ± 9,60 MHz	... f_c ± 10,00 MHz	47 dB	min. 30 dB
f_c ± 10,00 MHz	... f_c ± 10,90 MHz	47 dB	min. 45 dB
f_c + 10,90 MHz	... f_c + 400 MHz	54 dB	min. 49 dB
f_c - 140 MHz	... f_c - 10,90 MHz	54 dB	min. 49 dB
Absolute group delay within PB		2,6 μs	max. 4 μs
Group delay ripple within PB (p-p)		85 ns	max. 150 ns
Operating temperature range	OTR	-	- 25 °C ... + 80 °C
Storage temperature range		-	- 40 °C ... + 85 °C
Temperature coefficient of frequency	TC_f **	-87 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.

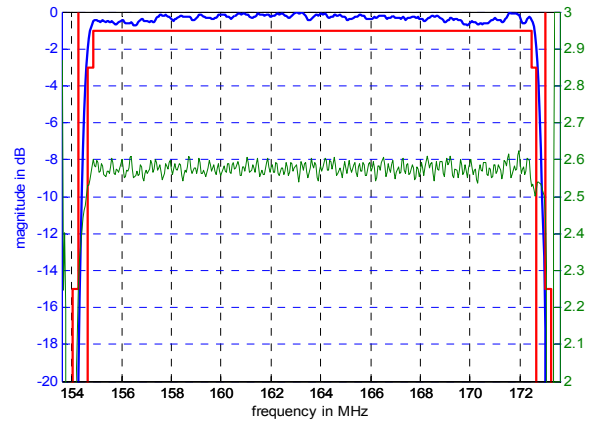
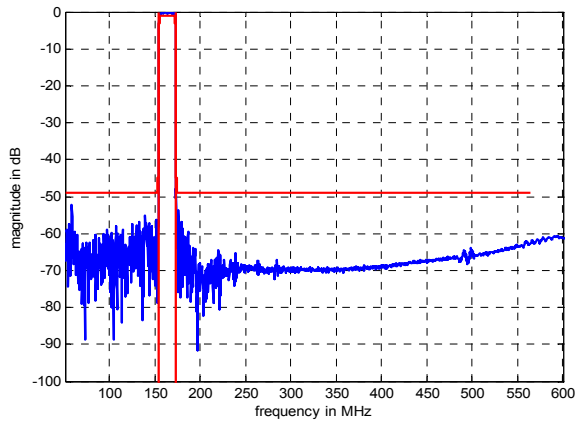
***) $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_A) \times f_{CAT}(\text{MHz})$

Generated:**Checked / Approved:**

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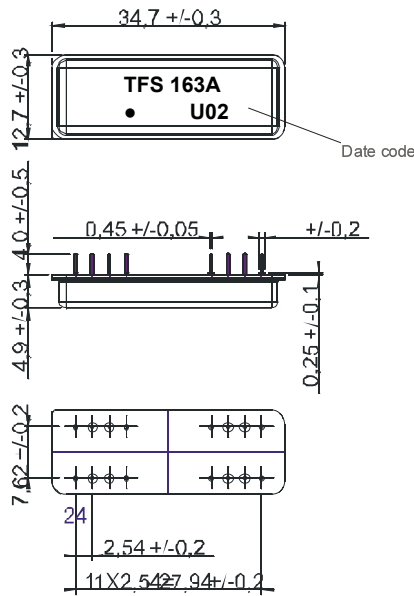
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Filter characteristic



Construction and pin connection

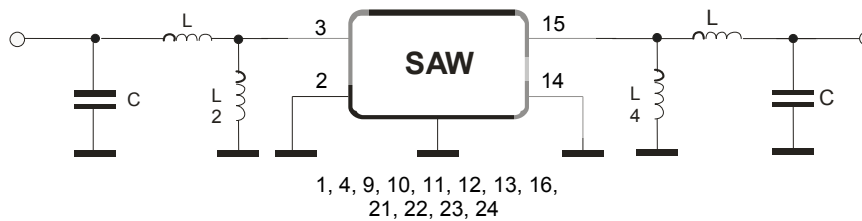
(All dimensions in mm)



- 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
 U 2006
 V 2007
 W 2008
 ...

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 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 163A****5/5****History**

Version	Reason of changes	Name	Date
1.0	- specification generated	Pfeiffer	02.12.2005
1.1	- change 3 dB bandwidth	Noack	20.12.2005
1.2	- generation of filter specification - added typical value - added filter characteristic	Noack	11.01.2006

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