

VI TELEFILTER

Filter specification

TFS 166

1/5

Measurement condition

Ambient temperature: 23 °C
 Input power level: 0 dBm
 Terminating impedance: *
 Input: 298 Ω || -15.7 pF
 Output: 126 Ω || -28.2 pF

Characteristics

Remark:

reference level for the relative attenuation a_{rel} of the TFS166 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 2 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 frequency shift of the filter in the operating temperature range is not included in the production tolerance scheme.

D a t a		typ. value		tolerance / limit	
Insertion loss (reference level)	a_e	10,6	dB	max.	12,0 dB
Nominal frequency	f_N	-			166,4 MHz
Centre frequency	f_c	166,4	MHz	±	0,25 MHz
Passband	PB	9,9	MHz	f_c ±	4,8 MHz
Pass band ripple	p-p	0,6	dB	max.	2 dB
Bandwidth	BW				
2 dB		9,9	MHz	min.	9,6 MHz
Relative attenuation	a_{rel}				
f_c	... f_c ± 4,8 MHz	1,5	dB	max.	2 dB
f_c ± 6,4 MHz	... f_c ± 8,0 MHz	28	dB	min.	24 dB
f_c ± 8,0 MHz	... f_c ± 25,6 MHz	45	dB	min.	30 dB
f_c ± 25,6 MHz	... f_c ± 35,8 MHz	53	dB	min.	43 dB
f_c ± 35,8 MHz	... f_c ± 50,0 MHz	53	dB	min.	45 dB
Input power level		-		max.	10 dBm
Operating temperature range	OTR	-			- 40 °C ... + 85 °C
Storage temperature range		-			- 40 °C ... + 85 °C
Temperature coefficient of frequency	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.

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

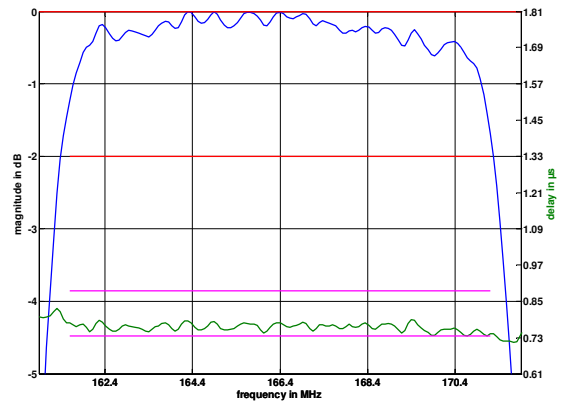
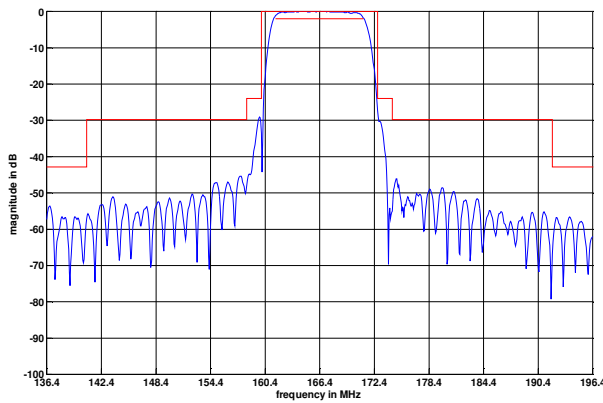
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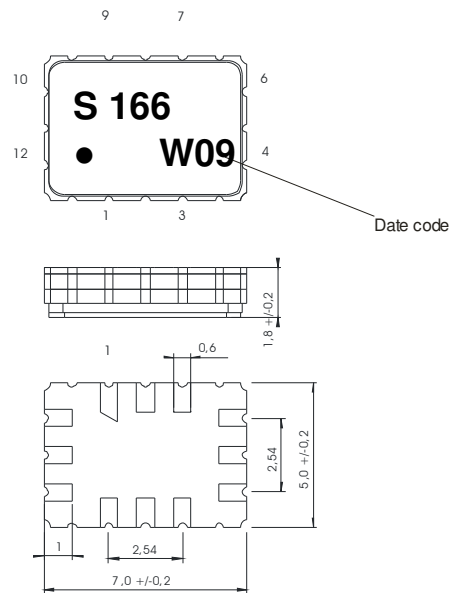
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Filter characteristic



Construction and pin connection

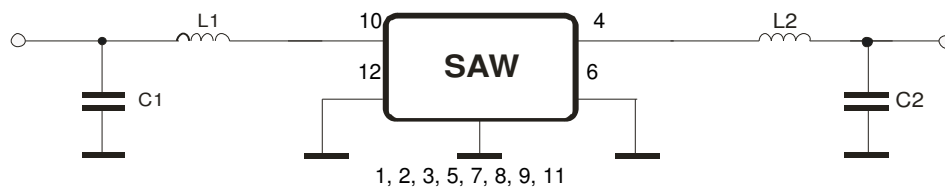
(All dimensions in mm)



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

Date code: Year + week
 W 2008
 X 2009
 A 2010
 ...

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: three times max.;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

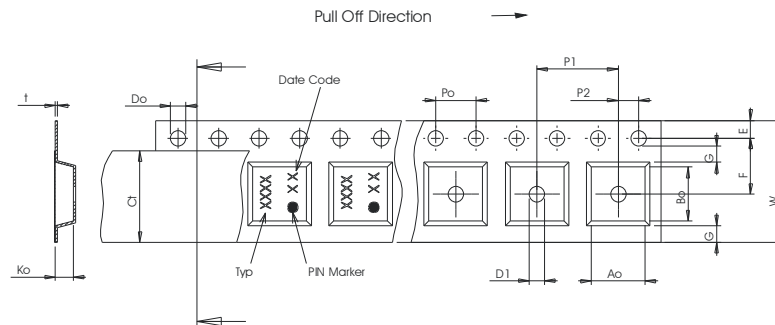
This filter is RoHS compliant (2002/95/EG, 2005/618/EG)

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 |

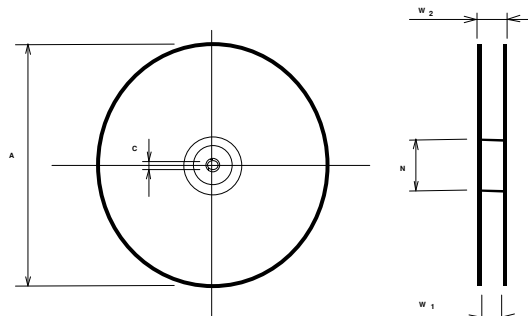
Tape (all dimensions in mm)

- 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 : 16,4 +2/-0
- W2(max) : 22,4
- N(min) : 50
- C : 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

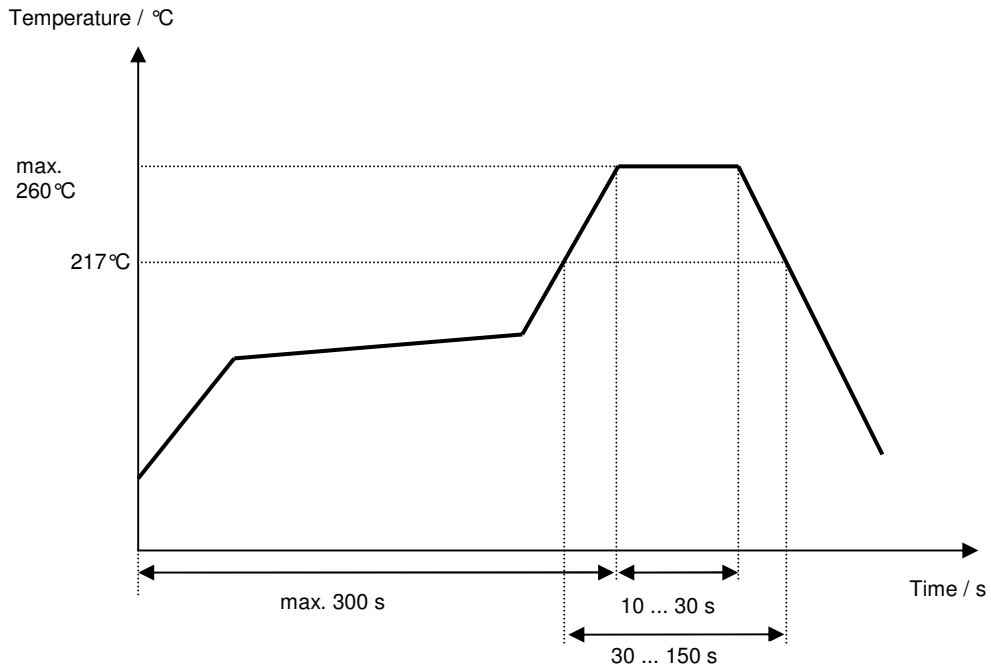
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Air reflow temperature conditions

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 166****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	Strehl	16.07.2007
1.1	- update of development specification according to new customer requirements	Strehl	20.08.2007
1.2	- created filter specification - added terminating impedances - changed remark - added typical values - added temperature coefficient of frequency - added filter characteristic - added test circuit	Chilla	28.02.2008

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