

**VI TELEFILTER**

**Filter specification**

**TFS 868**

**1/5**

**Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	132 Ω    -2,2 pF	
Output:	132 Ω    -2,2 pF	

**Characteristics**

**Remark:**

Reference level for the relative attenuation  $a_{rel}$  of the TFS 868 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 nominal frequency  $f_N$  is fixed on 868,39 MHz without tolerance. The given values for the relative attenuation  $a_{rel}$  have to be reached at the frequencies given below also if the centre frequency  $f_c$  is shifted due to the temperature coefficient of frequency  $TC_f$  in the operating temperature range and due to a production tolerance for the centre frequency  $f_c$ .

D a t a		typ. value		tolerance / limit	
<b>Insertion loss</b> (reference level)	$a_e = a_{min}$	3,4	dB	max.	4,7 dB
		3,1	dB	max.	4,2 dB **
<b>Nominal frequency</b>	$f_N$				868,39 MHz
<b>Centre frequency</b>	$f_c$	868,39	MHz		
<b>Bandwidth</b>	BW				
3	dB	1,2	MHz	min.	600 kHz
3	dB	1,2	MHz	min.	780 kHz**
6	dB	1,4	MHz	min.	800 kHz
6	dB	1,4	MHz	min.	980 kHz**
<b>Relative attenuation</b>	$a_{rel}$				
$f_N$	... $f_N$ -	390	kHz	0,8	dB
$f_N$	... $f_N$ +	210	kHz	0,8	dB
$f_N$	... $f_N$ ±	390	kHz	0,8	dB**
$f_N$ -	390 kHz ... $f_N$ +	310	kHz	0,8	dB
$f_N$ ±	390 kHz ... $f_N$ ±	490	kHz	1,6	dB**
$f_N$ -	3,37 MHz ... $f_N$ -	18,39	MHz	33	dB
$f_N$ -	3,19 MHz ... $f_N$ -	18,39	MHz	33	dB
$f_N$ -	18,39 MHz ... $f_N$ -	38,39	MHz	59	dB
$f_N$ -	38,39 MHz ... $f_N$ -	168,39	MHz	54	dB
$f_N$ -	168,39 MHz ... $f_N$ -	858,39	MHz	52	dB
$f_N$ +	2,61 MHz ... $f_N$ +	6,11	MHz	39	dB
$f_N$ +	6,11 MHz ... $f_N$ +	14,61	MHz	45	dB
$f_N$ +	14,61 MHz ... $f_N$ +	31,61	MHz	33	dB
$f_N$ +	31,61 MHz ... $f_N$ +	131,61	MHz	48	dB
<b>Input power level</b>				max.	0 dBm
<b>Operating temperature range</b>	OTR				- 45 °C ... + 90°C
<b>Storage temperature range</b>					- 45 °C ... + 90°C
<b>Frequency inversion temperature</b>		5	°C		
<b>Temperature coefficient of frequency</b>	$TC_f$ ***	-0,04	ppm/K <sup>2</sup>		

\*) 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.

\*\*) at ambient temperature

\*\*\*)  $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T_o - T_A)^2 \times f_{CAT}(\text{MHz})$

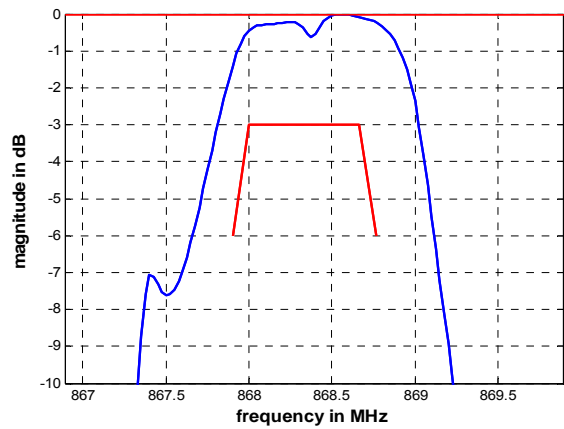
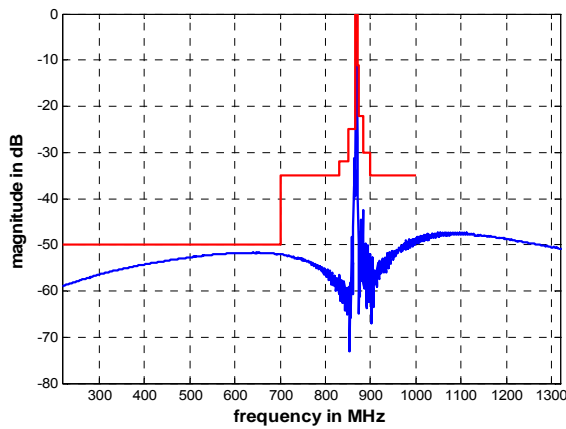
**Generated:**

**Checked / approved:**

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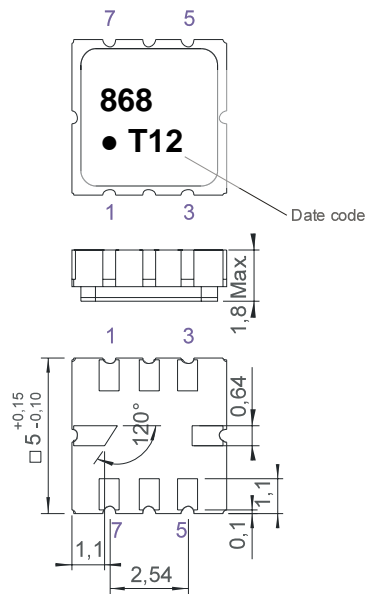
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**Filter characteristic**



**Construction and pin connection**

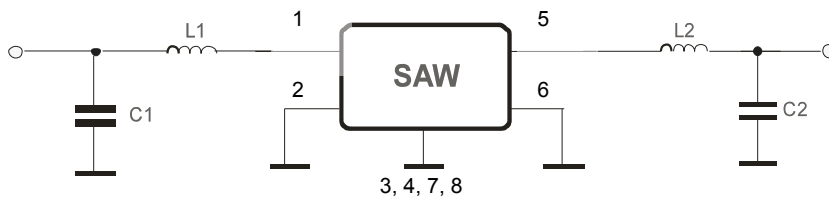
(All dimensions in mm)



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

Date code: Year + week  
 T 2005  
 U 2006  
 V 2007  
 ...

**50 Ohm Test circuit**



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**Stability characteristics**

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;

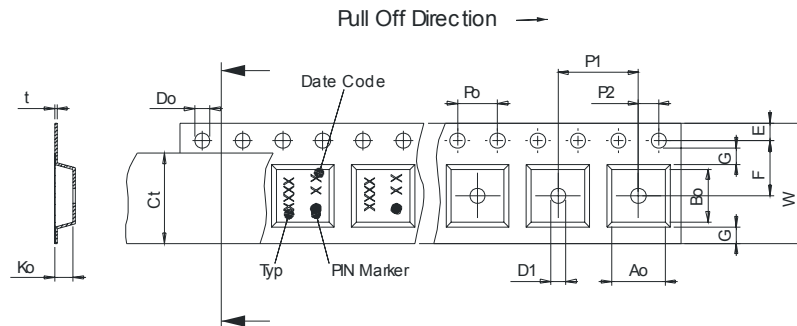
**Packing**

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 peer 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

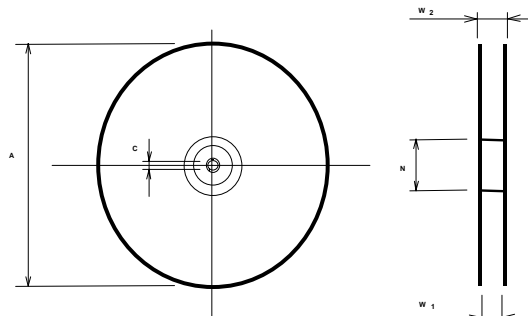
**Tape (all dimensions in mm)**

- W : 12,00 ± 0,3
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,1
- F : 5,50 ± 0,05
- G(min) : 0,75
- P2 : 2,00 ± 0,05
- P1 : 8,00 ± 0,1
- D1(min) : 1,50
- Ao : 5,30 ± 0,1
- Bo : 5,30 ± 0,1
- Ct : 9,5 ± 0,1



**Reel (all dimensions in mm)**

- A : 330
- W1 : 12,4 +2/-0
- W2(max) : 18,4
- 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 868****5/5****History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	- generated specification according to customer requirement	Dr. Sabah	25.01.2001
1.1	- correct of -3dB bandwidth	Dr. Sabah	20.12.2001
1.2	- generation of filter specification; add typical value add filter characteristic; change air reflow profile	Noack	16.03.2005

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