Measurement condition

Ambient temperature: 23 °C
Input power level: 0 dBm
Terminating impedance: *)
Input: 130 Ω || -2.3 pF
Output: 130 Ω || -2.3 pF

Characteristics

Remark:
Reference level for the relative attenuation a_{rel} of the TFS 868N 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 center 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 at 868.3 MHz without tolerance. The given values for the relative attenuation a_{rel} have to be reached at the frequencies given below even if the center 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 center frequency f_C.

D a t a		**typ. value**	**tolerance / limit**
Insertion loss (reference level)	a_e**)	3.3 dB	max. 3.8 dB
Nominal frequency	f_N	-	868.3 MHz
Center frequency	f_C	868.3 MHz	-
Passband	PB	-	min. ±300 kHz
Passband ripple	p-p	0.6 dB	max. 3 dB
Amplitude ripple f_N ± 200kHz	p-p	0.4 dB	max. 2 dB
Relative attenuation	a_{rel}		
f_N … f_N ± 200.0 kHz		0.6 dB	max. 2 dB
f_N ± 200.0 kHz … f_N ± 300.0 kHz		0.6 dB	max. 3 dB
f_N - 858.3 MHz … f_N - 12.3 MHz		42 dB	min. 38 dB
f_N - 12.3 MHz … f_N - 2.8 MHz		32 dB	min. 30 dB
f_N + 2.7 MHz … f_N + 11.7 MHz		32 dB	min. 30 dB
f_N + 11.7 MHz … f_N + 21.7 MHz		37 dB	min. 33 dB
f_N + 21.7 MHz … f_N + 131.7 MHz		40 dB	min. 36 dB
Input power level	***)	-	max. 17 dBm
Operating temperature range	OTR	-	-45 °C ... +120 °C
Storage temperature range		-	-45 °C ... +120 °C
Frequency inversion temperature		44 °C	-
Temperature coefficient of frequency	TC_f****)	-0.034 ppm/K²	-

*) 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.
**) maximum 3.8dB at 23°C, maximum 4.5dB at +120°C.
***) 17dBm for duty cycle 1:1000 @ 23°C, 8dBm for continuous power over 15yrs lifetime @23°C, 2dBm for continuous power over 15yrs lifetime @ 85°C.
****) $\Delta f(Hz) = TC_f(ppm/K) \times (T-T_0)^2 \times f_{T0}(MHz)$

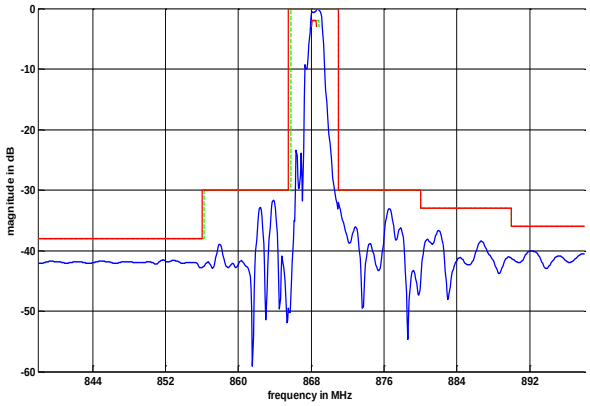
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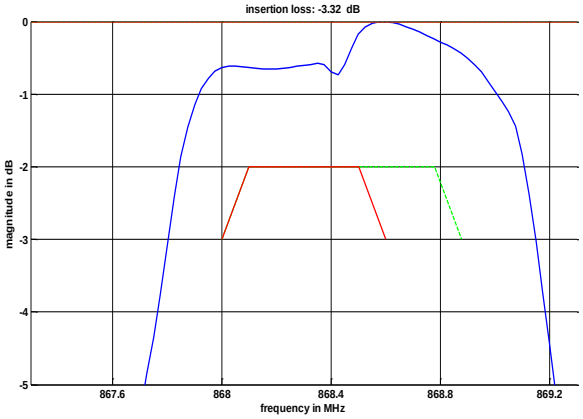
Checked / Approved:

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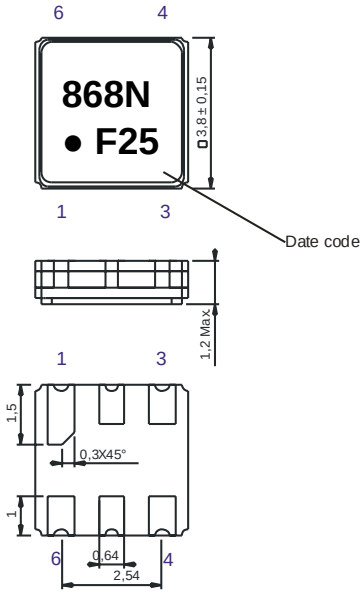
Filter characteristic





Construction and pin connection

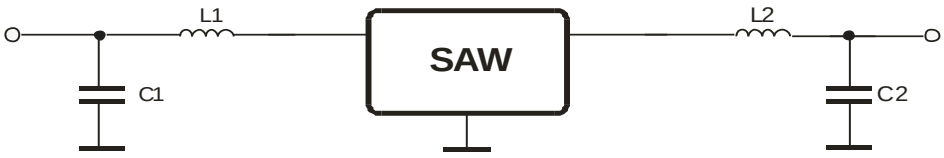
(All dimensions in mm)



1	Ground
2	Input
3	Ground
4	Ground
5	Output
6	Ground

Date code:	Year + week
F	2015
G	2016
H	2017
...	

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 plane, 3 planes; DIN IEC 68 T2 - 6

3. Change of temperature: -55 °C to 125°C / 15 min. each / 100 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 (2011/65/EU)

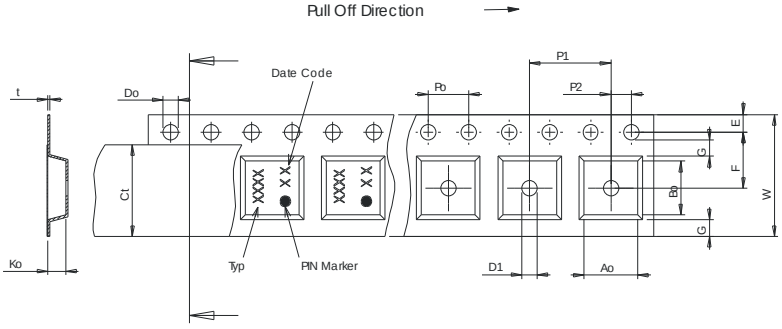
Packing

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

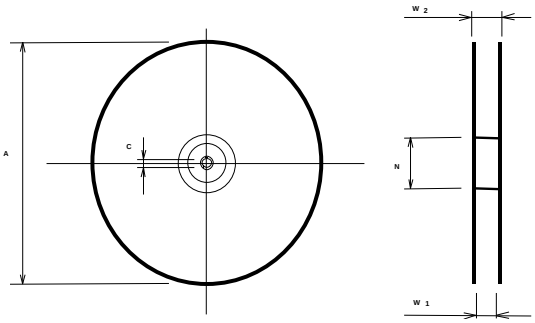
Tape (all dimensions in mm)

W	:	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	:	4,30	± 0,1
Bo	:	4,30	± 0,1
Ct	:	9,2	± 0,1



Reel (all dimensions in mm)

A	:	330	or 180
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.

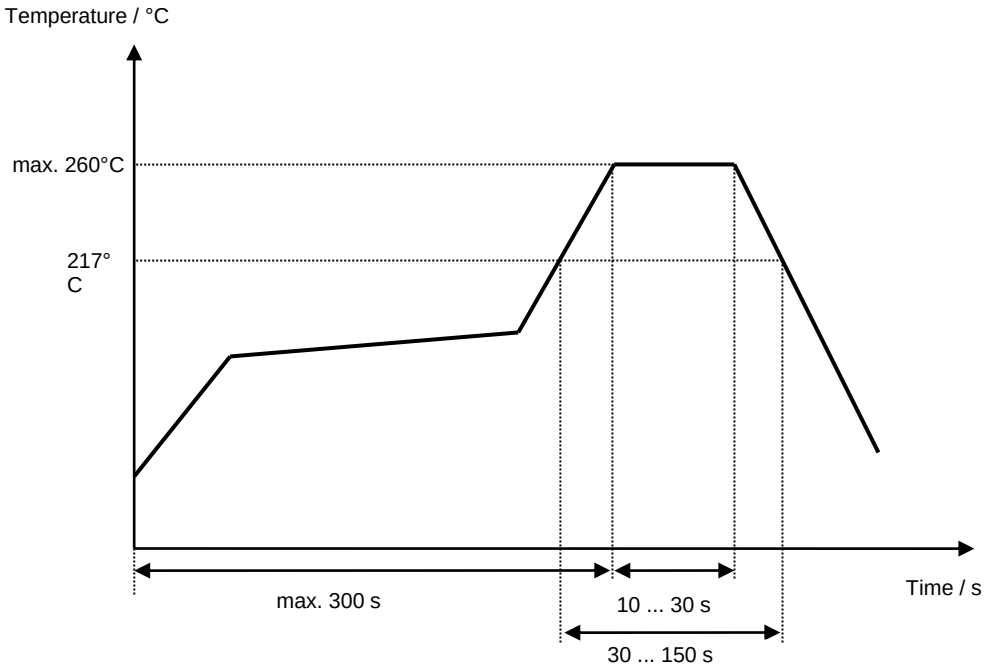
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Air reflow temperature conditions

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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History

Version	Reason of Changes	Name	Date
1.0	- generation of development specification	Strehl	06.10.2005
1.1	- change construction and pin connection to 8 pin - change stability characteristics to stability characteristics, reliability	Channaa	15.11.2005
1.2	- change of rejection in stop band and package	Sabah	12.12.2005
1.3	- Change of rejection in stop band - Add filter characteristic, add typical values - generation of filter specification - add of test circuit	Channaa	16.01.2006
1.4	- Change attenuation according to limit line in filter characteristic	Channaa	05.05.2006
2.0	- Relaxation of stop band attenuation between 871MHz and 880MHz from 36dB to 33dB introduced - Remarks in data table, typical values and filter characteristics updated	Schönbein	16.06.2015

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