

Microchip**Filter specification****TFS 902****1/5****Measurement condition**

Ambient temperature T_A :	23	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	50	Ω
Output:	50	Ω

Characteristics

Remark:

The maximum attenuation in the pass band is defined as the insertion loss a_e . The nominal frequency f_N is fixed at 902.5 MHz without any tolerance or limit. The values of absolute attenuation a_{abs} are guaranteed for the whole operating temperature range. The frequency shift of the filter in the operating temperature range is included in the production tolerance scheme.

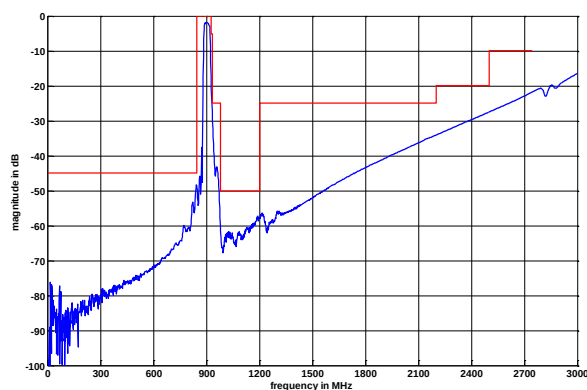
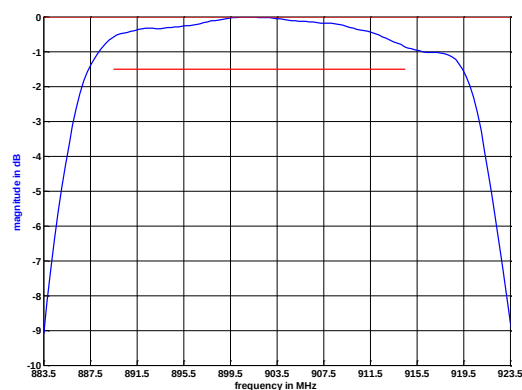
D a t a		typ. value		tolerance / limit		
Insertion loss within OTR1		a_e	2.8 dB	max.	3.75	dB
Insertion loss within OTR2			2.6 dB	max.	3.5	dB
Nominal frequency		f_N	-		902.5	MHz
Passband			-	$f_N \pm$	12.5	MHz
Pass band variation in OTR1			0.9 dB	max.	1.75	dB
Pass band variation in OTR2			0.7 dB	max.	1.5	dB
Absolute attenuation		a_{abs}				
0.3 MHz ... 845 MHz		50 dB		min.	45	dB
925 MHz ... 935 MHz		15 dB		min.	5	dB
935 MHz ... 980 MHz		32 dB		min.	25	dB
980 MHz ... 1200 MHz		59 dB		min.	50	dB
1200 MHz ... 2200 MHz		29 dB		min.	25	dB
2200 MHz ... 2500 MHz		29 dB		min.	20	dB
2500 MHz ... 2745 MHz		20 dB		min.	10	dB
VSWR		2.1 : 1		max.	2.3 : 1	
Input power level		-		max.	10	dBm
Permissible DC voltage		-		max.	0	V
Operating temperature range		OTR1	-		-35 °C ... +85 °C	
Reduced operating temperature range		OTR2	-		-25 °C ... +75 °C	
Storage temperature range			-		-55 °C ... +125 °C	
Temperature coefficient of frequency		TC_f *)	-43 ppm/K			

*) $\Delta f = TC_f(T - T_A)f_N$ **Generated:****Checked / Approved:**

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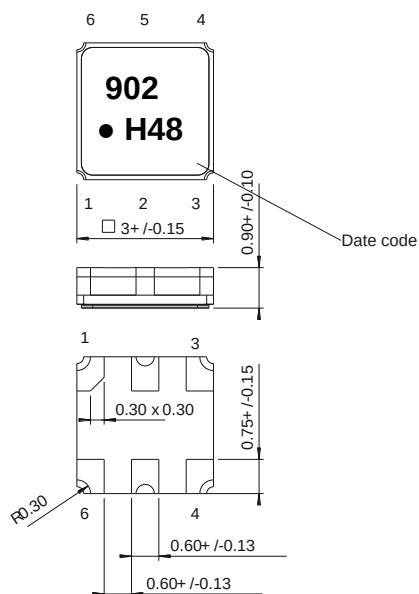
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Filter characteristic



Construction and pin connection

(All dimensions in mm)



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

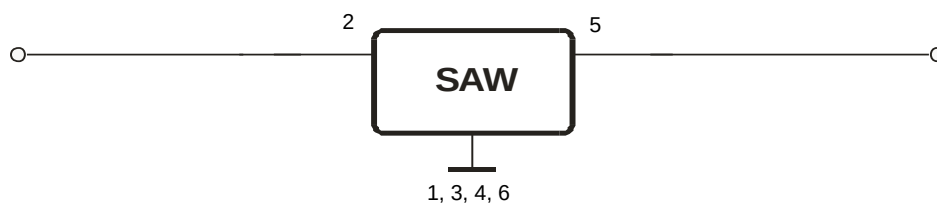
Date code: Year + week

H 2016

J 2017

K 2018

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50 Ω Test circuit

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Stability characteristics, reliability

After the following tests the filter shall meet the whole specification:

1. Shock: 500 g, 1 ms, half sine wave, 3 shocks each plane;
DIN IEC 60068 T2 - 27
2. Vibration: 10 Hz to 2000 Hz, 0.35 mm or 5 g respectively, 1 octave per min, 10 cycles per plane, 3 planes; DIN IEC 60068 T2 - 6
3. Change of temperature: -55 °C to 125 °C / 15 min. each / 100 cycles
DIN IEC 60068 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;
5. SAW devices are Electrostatic Discharge (ESD) sensitive devices.

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;

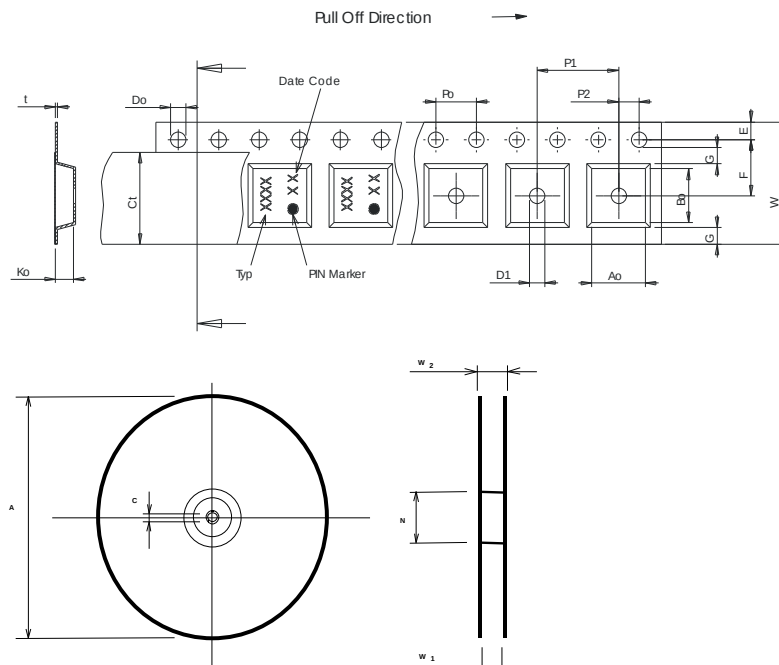
max. pieces of filters per reel:	3000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

Tape (all dimensions in mm)

W	: 8.00 ±0.3
Po	: 4.00 ±0.1
Do	: 1.50 +0.1/-0
E	: 1.75 ±0.1
F	: 3.50 ±0.05
G(min)	: 0.75
P2	: 2.00 ±0.05
P1	: 4.00 ±0.1
D1(min)	: 1.50
Ao	: 3.25 ±0.1
Bo	: 3.25 ±0.1
Ct	: 5.30 ±0.1
Ko	: 1.50 ±0.1
t	: 0.25 ±0.05

Reel (all dimensions in mm)

A	: 330 or 180
W1	: 8.40 +1.5/-0
W2(max)	: 14.40
N(min)	: 60.00
C	: 13.0 ±0.2



The minimum bending radius is 45 mm.

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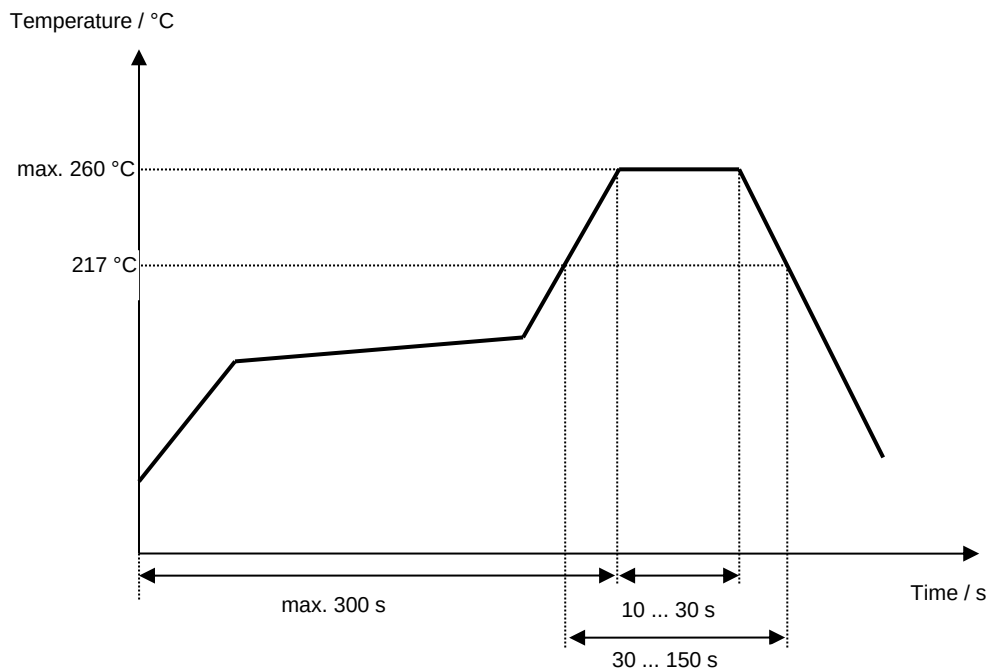
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Air reflow temperature conditions

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

Microchip**Filter specification****TFS 902****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	Springfeld	31.03.2004
1.1	- Add typical values and generate of filter specification	Dr. Sabah	17.06.2004
1.2	- Move back to dev. specification due to tightening stopband attenuation	Martens	30.11.2004
1.3	- Add typical values and generate of filter specification	Strehl	10.06.2005
1.4	- Add stop band attenuation (2500 - 2745MHz)	Noack	29.07.2005
1.5	- Change filter characteristic (correction of the limit line in screen drawing)	Noack	02.08.2005
1.6	- Change filter characteristic (correction of the limit line in screen drawing)	Noack	26.08.2005
1.7	- Adjust ultimate rejection	Steiner	23.02.2006
2.0	- Change data table (operating temperature range) - Update stability characteristics and packing	Noack	22.11.2016
3.0	- Change passband typo	Noack	24.11.2016

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