Measurement Condition

Ambient Temperature: 23 °C
Input Power Level: 0 dBm
Source impedance: 50 Ω
Load impedance: 50 Ω
Terminating impedances:
Input : 310 Ω || -14.9 pF
Output: 460 Ω || -14.4 pF

Characteristics

Remark:
Reference level for the relative attenuation a_{rel} is the pass band attenuation a_0 at nominal frequency. It is defined as the insertion loss a_e. The nominal frequency f_N is fixed to 190.0 MHz. The given values for the insertion loss, the relative attenuation a_{rel} and the group delay ripple 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**		**Limit**		
Insertion Loss (Reference level)	$a_e = a_{min}$	8.1	dB	max.	10	dB
Nominal Frequency	f_N	-			190.0	MHz
1 dB - Bandwidth	BW	5.0	MHz	min.	4.0	MHz
Relative Attenuation	a_{rel}					
f_N ... $f_N \pm$ 2.0 MHz		0.5	dB	max.	1	dB
$f_N \pm$ 5.0 MHz ... $f_N \pm$ 10.0 MHz		38	dB	min.	35	dB
$f_N \pm$ 10.0 MHz ... $f_N \pm$ 20.0 MHz		45	dB	min.	40	dB
$f_N \pm$ 20.0 MHz ... $f_N \pm$ 100.0 MHz		52	dB	min.	45	dB
Relative Attenuation over Extended Operating Temperature Range	a_{rel}					
f_N ... $f_N \pm$ 2.0 MHz		0.5	dB	max.	1	dB
$f_N \pm$ 5.0 MHz ... $f_N \pm$ 10.0 MHz		38	dB	min.	34	dB
$f_N \pm$ 10.0 MHz ... $f_N \pm$ 20.0 MHz		45	dB	min.	38	dB
$f_N \pm$ 20.0 MHz ... $f_N \pm$ 100.0 MHz		52	dB	min.	45	dB
Pass Band Ripple $f_N \pm$ 2.0 MHz		0.5	dB	max.	1	dB
Group delay ripple $f_N \pm$ 2.0 MHz		120	ns	max.	150	ns
Phase linearity $f_N \pm$ 2.00 MHz	φ	4.5	°rms	max.	6.0	°rms
Operating Temperature Range				- 10 °C ... + 85 °C		
Extended Operating Temperature Range				- 20 °C ... + 85 °C		
Storage Temperature Range				- 40 °C ... + 85 °C		
Temperature coefficient of frequency TC_f*		-18	ppm/K-		-	

*) $\Delta f_c(Hz) = Tc_f(ppm/K) \times (T - T_o) \times f_N(MHz)$.

Generated:

Checked / approved:

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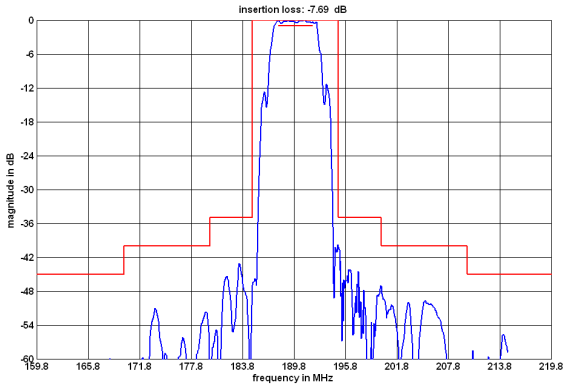
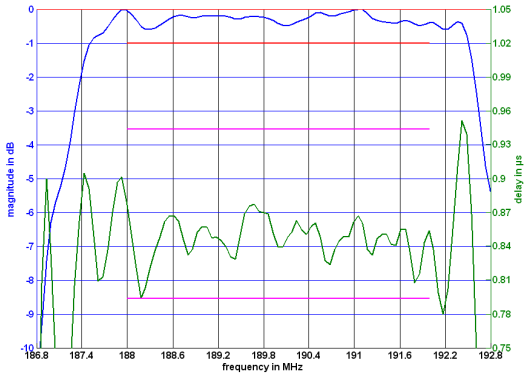
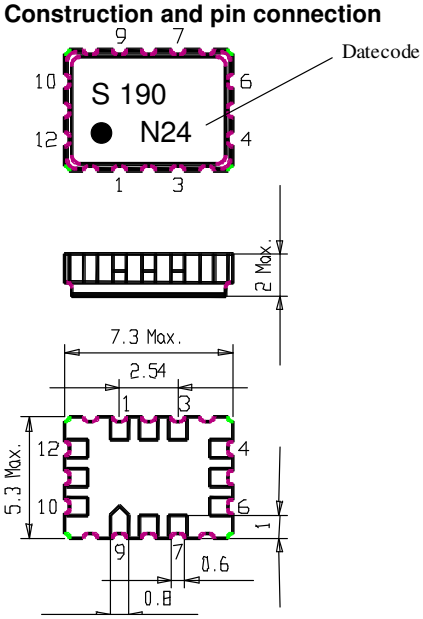
Filter characteristic





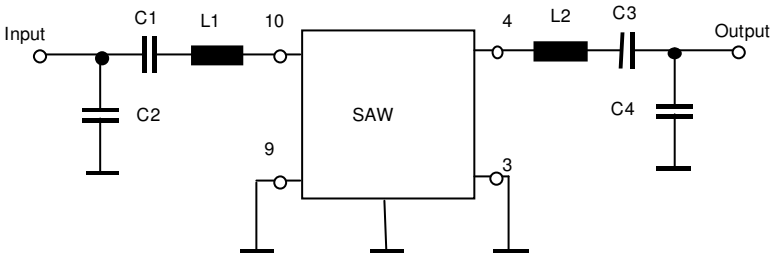
Construction and pin connection



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

Date code:	Year + week
D	2013
E	2014
F	2015

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 / 100cycles 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;
5. ESD	MIL-STD-883E using coupling network of ISO 10605 and EN 6100-4-2 HBM:250V;

This filter is RoHS compliant (2011/65/EU)

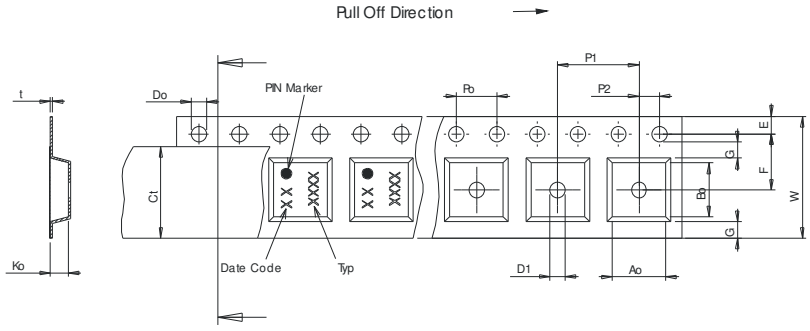
Packing

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

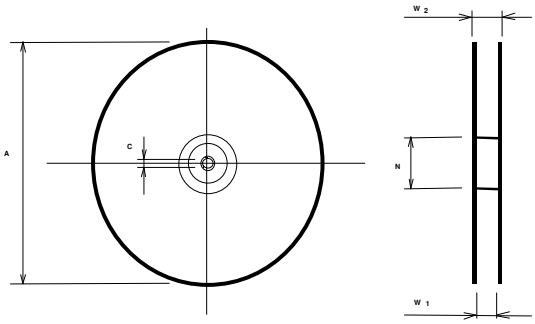
Tape (all dimensions in mm)

W	: 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	: 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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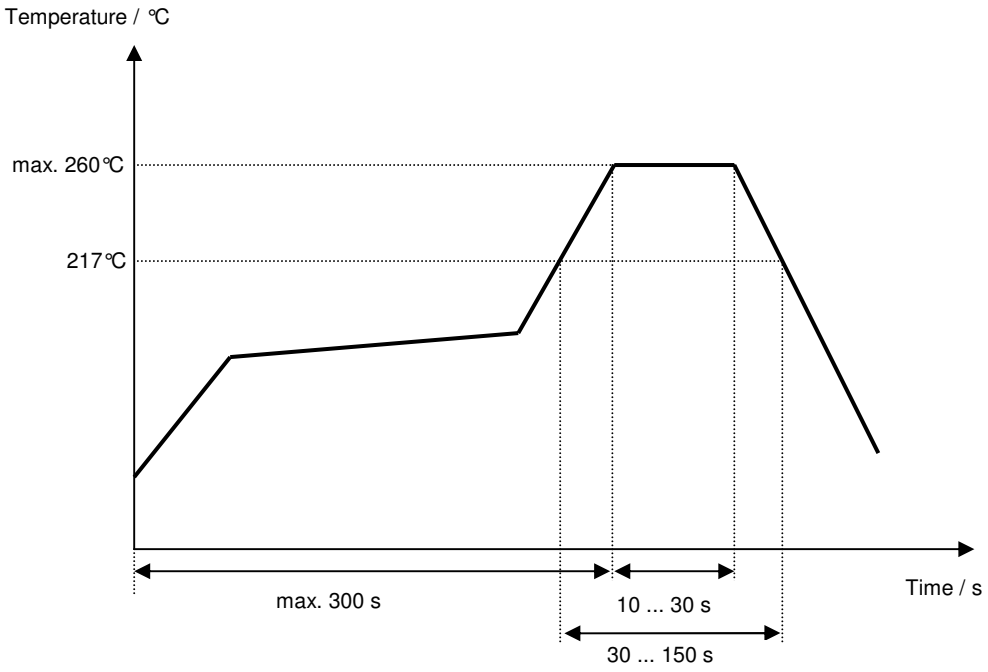
Air reflow temperature conditions

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
Development specification			
1.0	new spec	Steiner	31.05.2000
2.0	- group delay ripple, phase ripple increased - stopband attenuation decreased - package fixed to 7x5mm	Steiner	22.09.2000
filter specification			
3.0	- typical values+terminating impedances, tape and reel dimensions, air reflow profile added	Steiner	08.06.2001
4.0	-Change to new format spec : added extended temperature range with relaxed attenuation. Added filter characteristics	TCUK	13.06.2013

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