

Vectron International**Resonator specification****TFR915X****1/5****Measurement condition**

Ambient temperature T_A :	25	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	50	Ω
Output:	50	Ω

Characteristics

Remark:

The minimum of the attenuation a_{min} is defined as the insertion loss a_e . The centre frequency f_N is the measured frequency at the minimum insertion loss point. 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)	$a_e = a_{min}$	5.5	dB	max.	8.2 dB
Centre frequency at T_A	f_N	915	MHz		± 250 kHz
Phase at f_R		30	°		-
Ageing of centre frequency		-		max.	± 50 ppm
Quality factor	Unloaded Q	8300		min.	4400
	Loaded Q	3000		min.	2500
Parallel capacitance	C_0	1.76	pF		-
Motional resistance	R_1	9.5	Ω		-
Motional inductance	L_1	57	μ H		-
Motional capacitance	C_1	0.53	fF		-
Input power level				max.	0 dBm
Operating temperature range		-			-40 °C ... + 125 °C
Storage temperature range		-			-55 °C ... + 125 °C
Turnover temperature	T_0	21	°C		
Temperature coefficient of frequency	TC_f *	-0.037	ppm/K ²		-

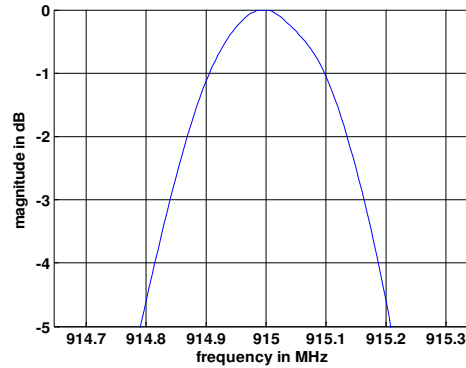
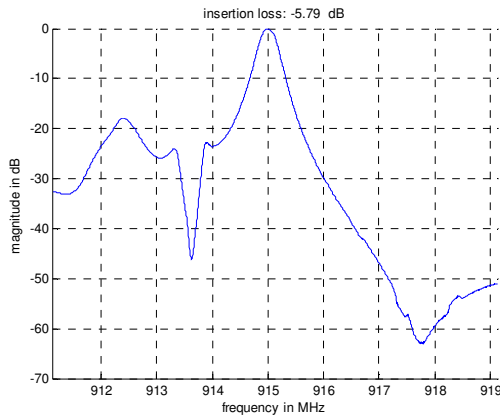
$$*) \Delta f = TC_f(T - T_0)^2 f_N$$

Generated:**Checked / Approved:**

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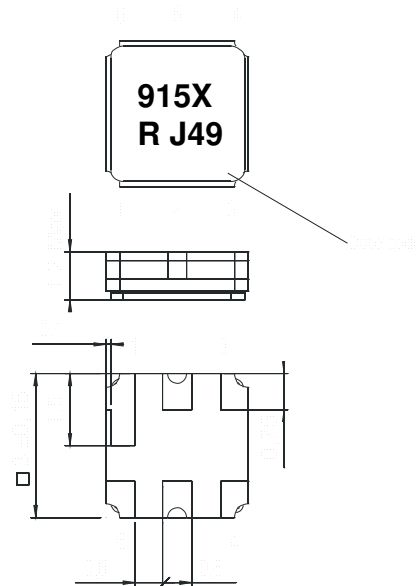
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Filter characteristic



Construction and pin connection

(All dimensions in mm)

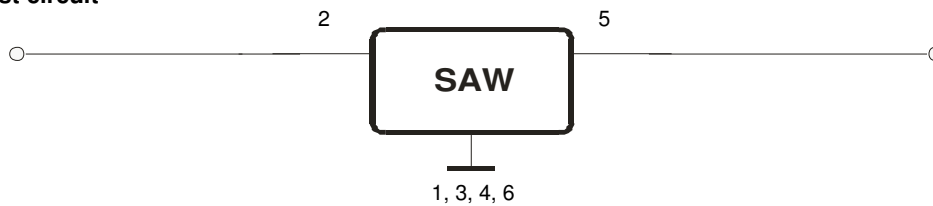


1	Ground
2	Input
3	Ground
4	Ground
5	Output
6	Ground

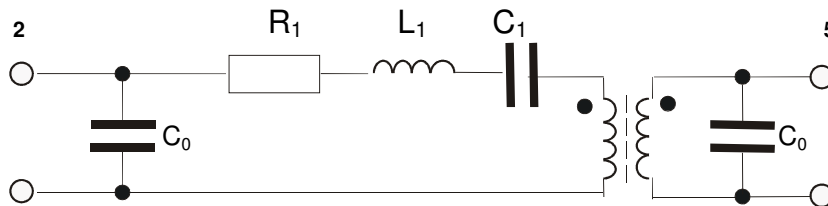
Date code: Year + week

J	2017
K	2018
L	2019
...	

50 Ω Test circuit



Equivalent 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)

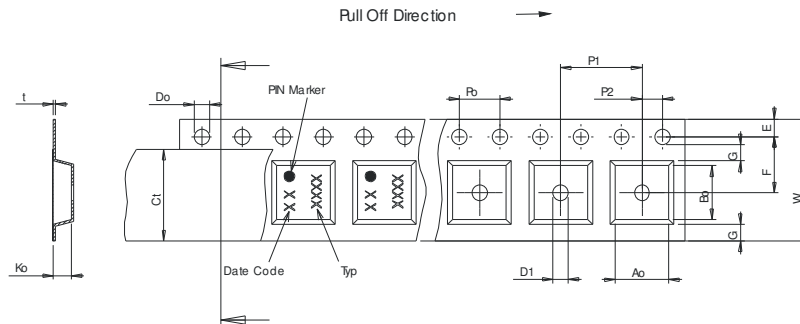
Packing

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;

reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

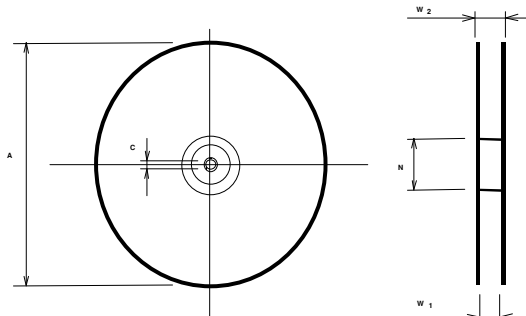
Tape (all dimensions in mm)

- 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.

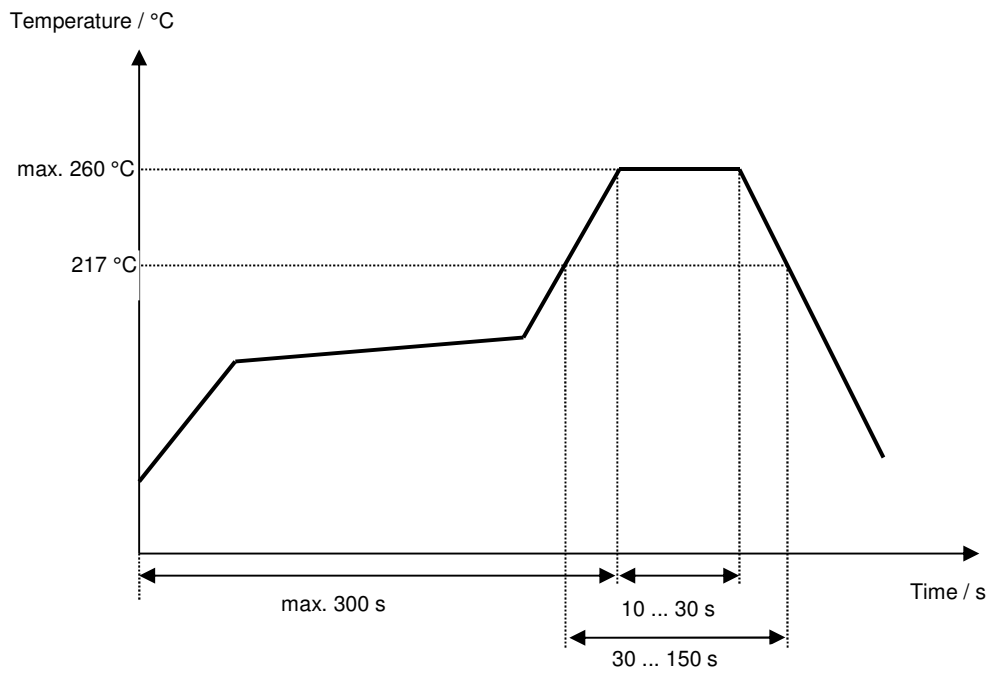
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Air reflow temperature conditions

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 resonator specification	Abutaimah	23.03.2017
1.1	Update storage temperature range Update formula for Δf Correct typos Update Tape & Reel	P. Jaster	11.08.2017
1.2	Update Δf formula below the data table Changed specification description at the header	Raura	07.12.2017

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