

**Vectron International****Filter specification****TFS 614****1/5****Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	150	Ω
Output:	150	Ω

**Characteristics**

## Remark:

The nominal frequency  $f_N$  is fixed at 614.0 MHz. The insertion loss  $a_e$  is defined as loss value determined at  $f_N$ . Reference level for the relative attenuation  $a_{rel}$  of the TFS 614 is the insertion loss  $a_e$ . All specified data are met within the operating temperature range.

<b>D a t a</b>		<b>typ. value</b>		<b>tolerance / limit</b>		
<b>Insertion Loss</b> (reference level)	$a_e$	2.2	dB	max.	4.5	dB
<b>Nominal Frequency</b>	$f_N$	-			614.4	MHz
<b>Centre Frequency</b>	$f_C$	614.4	MHz		-	
<b>Bandwidth</b> 3 dB	BW	21.68	MHz		-	
<b>Relative Attenuation</b>	$a_{rel}$					
@ 102.4 MHz		65	dB	min.	50	dB
@ 204.8 MHz		70	dB	min.	50	dB
@ 307.2 MHz		69	dB	min.	50	dB
@ 409.6 MHz		68	dB	min.	50	dB
@ 512.0 MHz		65	dB	min.	50	dB
@ 716.8 MHz		64	dB	min.	50	dB
@ 819.2 MHz		65	dB	min.	50	dB
@ 921.6 MHz		60	dB	min.	50	dB
<b>Input power level</b>				max.	0	dBm
<b>Operating Temperature Range</b>	OTR	-			-40 °C ... +90 °C	
<b>Storage Temperature Range</b>		-			-45 °C ... +95 °C	
<b>Temperature Coefficient of Frequency</b>	$TC_f^*$	-77	ppm/K		-	

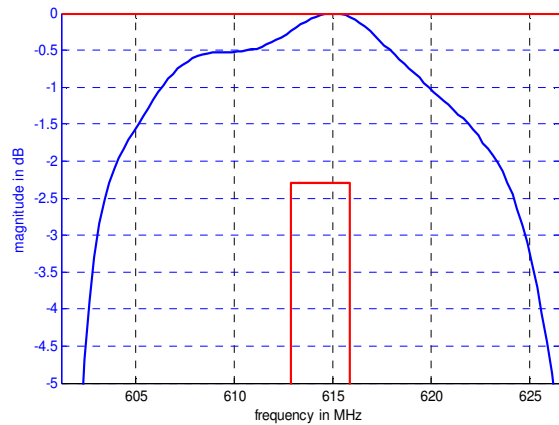
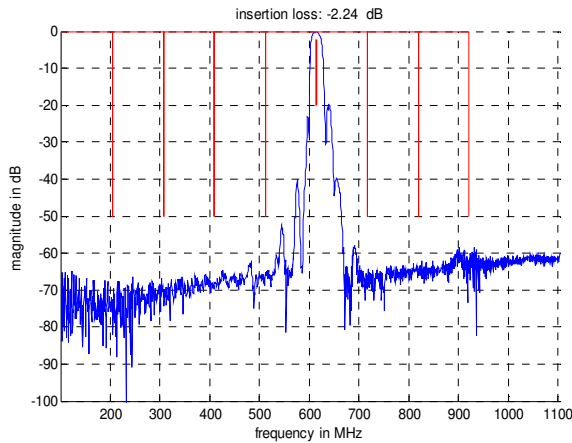
\*)  $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_0) \times f_{CAT}(\text{MHz})$ . Material: LiNbO<sub>3</sub>\_64° black, so in principle pyrofree.

**Generated:****Checked / Approved:**

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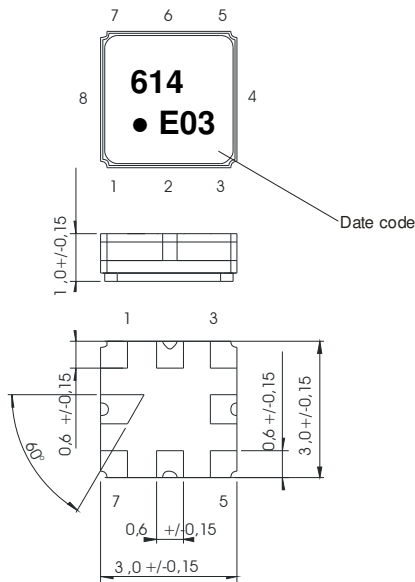
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Filter characteristic



Construction and pin connection

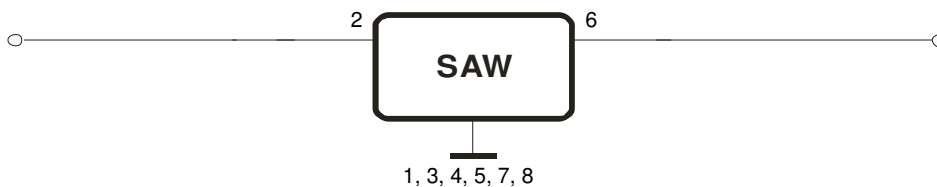
(All dimensions in mm)



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

Date code: Year + week  
 E 2014  
 F 2015  
 G 2016  
 ...

150 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 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, see page 4: "Air reflow temperature conditions"
5. ESD ANSI/ESD S20.20-1999, class 1A for HBM

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

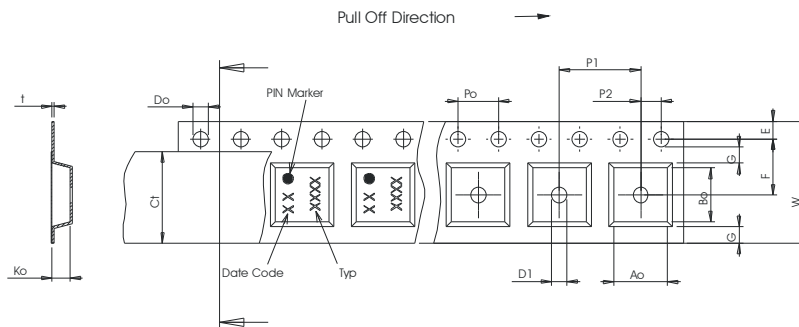
**Packing**

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:	9000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

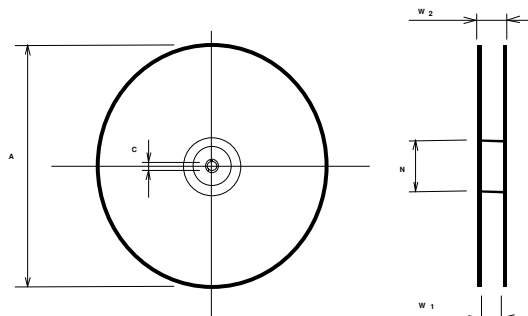
**Tape (all dimensions in mm)**

- 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 : 5,5 ± 0,1



**Reel (all dimensions in mm)**

- A : 330
- W1 : 8,4 +1,5/-0
- W2(max) : 14,4
- N(min) : 50
- C : 13,0 +0,5/-0,2



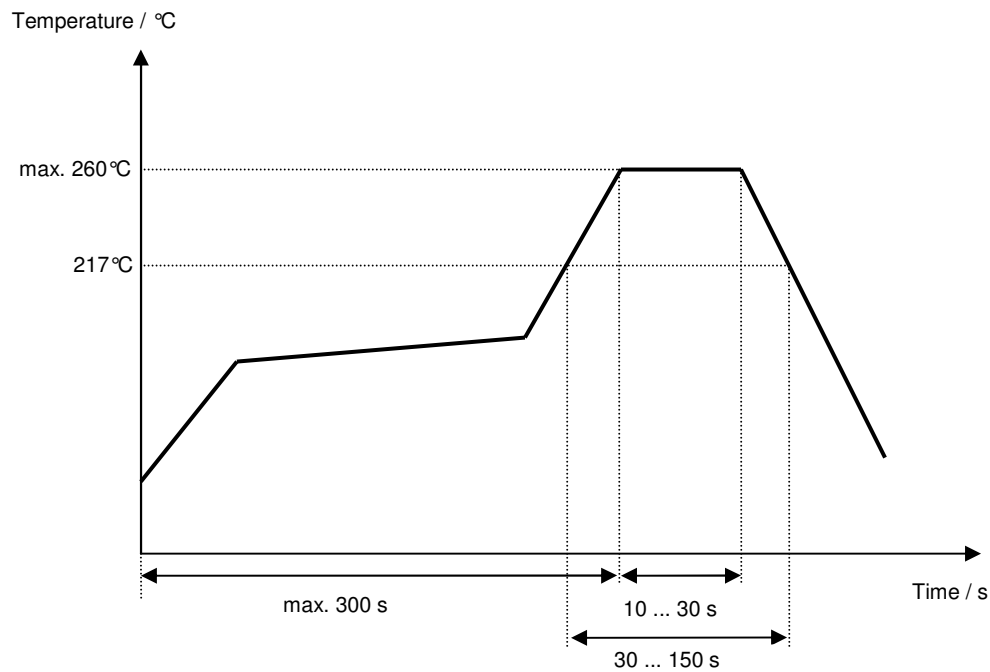
The minimum bending radius is 45 mm.

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**Air reflow temperature conditions**

<b>Conditions</b>	<b>Exposure</b>
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**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	Generation of development specification	Strehl	30.10.2008
1.1	Add typical values, add filter characteristic Generation of filter specification	S. Channaa	24.02.2009
2.0	Changed pull off direction from reel	Schönbein	29.05.2012
2.1	Remark on pyrofree material added to data table	Schönbein	25.04.2013
2.2	Maximum input power updated	Kortenbeutel	16.01.2014