

**Vectron International****Filter specification****TFS 1413****1/5****Measurement condition**

Ambient temperature:	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 1413,25 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.

<b>D a t a</b>	<b>typ. value</b>		<b>tolerance / limit</b>			
<b>Insertion loss within PB</b>	$a_e$	2,7	dB	max. 3,8	dB	
<b>Nominal frequency</b>	$f_N$	-		1413,25	MHz	
<b>Passband</b>		-		$f_N \pm$	18,25	MHz
<b>Absolute attenuation</b>	$a_{abs}$					
0,3 MHz ...	1300,0 MHz	41	dB	min.	37	dB
1300,0 MHz ...	1370,0 MHz	46	dB	min.	30	dB
1370,0 MHz ...	1385,0 MHz	11	dB	min.	7	dB
1441,5 MHz ...	1454,5 MHz	17	dB	min.	4	dB
1454,5 MHz ...	1492,5 MHz	55	dB	min.	26	dB
1492,5 MHz ...	1800,0 MHz	50	dB	min.	40	dB
1800,0 MHz ...	3000,0 MHz	34	dB	min.	20	dB
<b>Return loss within PB</b>		9	dB	max.	8	dB
<b>Input power level</b>		-		max.	14	dBm
<b>Operating temperature range</b>	OTR	-		0 °C ... + 50 °C		
<b>Storage temperature range</b>		-		- 30 °C ... + 80 °C		
<b>Temperature coefficient of frequency</b>	$TC_f$ *	- 45	ppm/K	-		

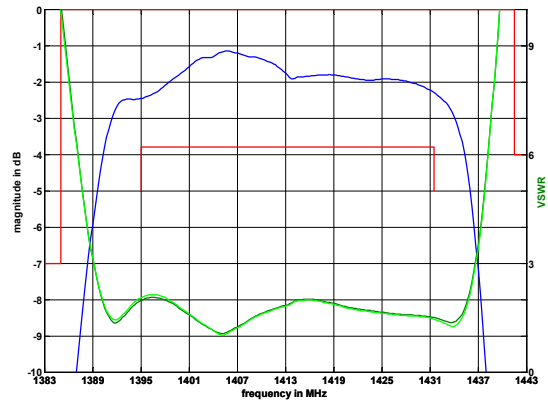
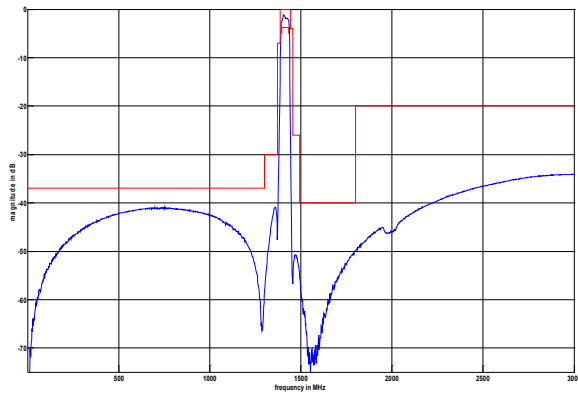
\*)  $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_0) \times f_{T0}(\text{MHz})$

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

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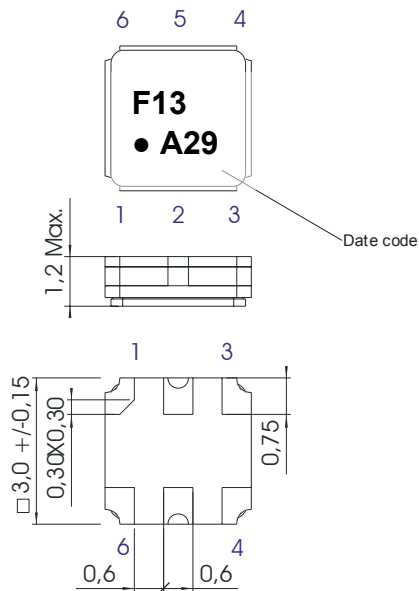
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**Filter characteristic**



**Construction and pin connection**

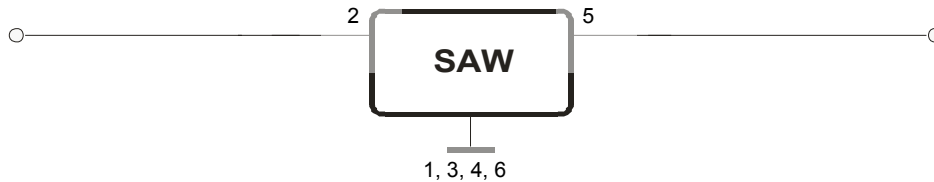
(All dimensions in mm)



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

- Date code: Year + week
- A 2010
  - B 2011
  - C 2012
  - ...

**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 plan, 3 plans;  
DIN IEC 68 T2 - 6
3. Change of temperature: -55 °C to 125°C / 30 min. each / 10 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 (2002/95/EG, 2005/618/EG)

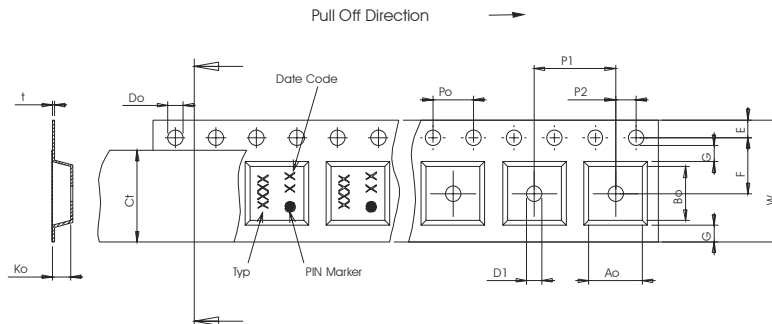
**Packing**

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

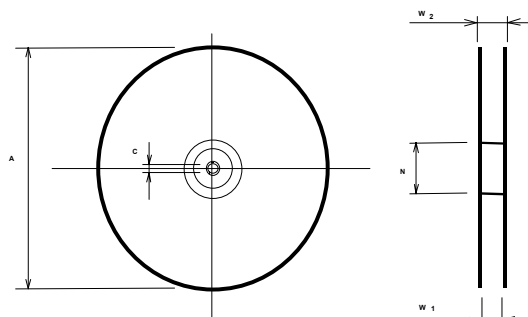
**Tape (all dimensions in mm)**

- 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



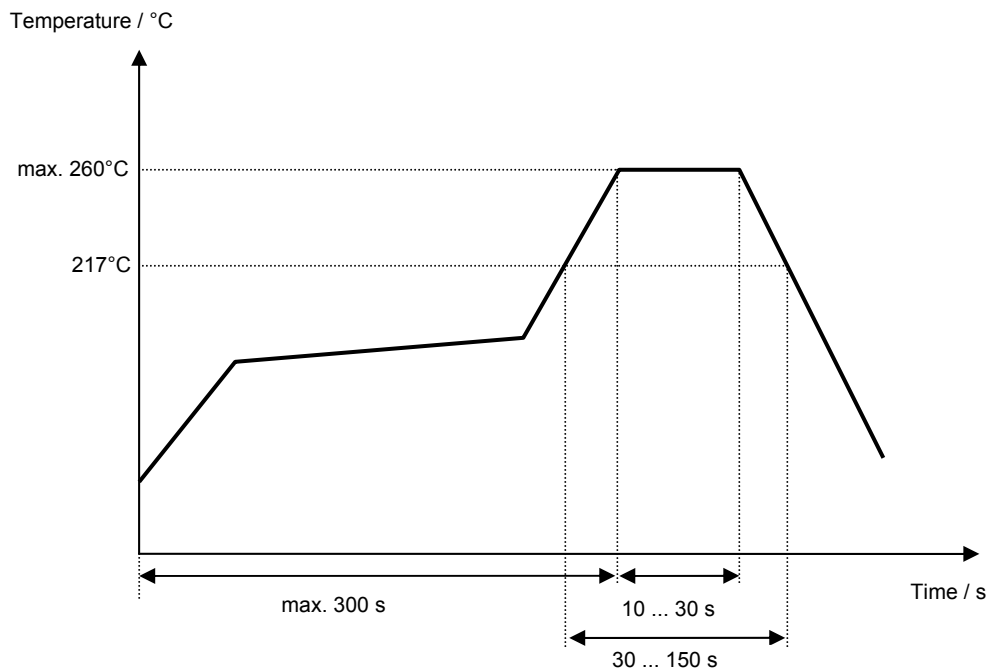
The minimum bending radius is 45 mm.

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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	26.08.2005
1.1	- Add typ. value and filter characteristic - Change stability characteristics - Generation of filter specification	Strehl	09.11.2006
1.2	- Relaxation of return loss	S.Springfeldt	30.06.2008
1.3	- Updating the typical values	S.Springfeldt	13.07.2010