

**Vectron International****Filter specification****TFS 1651****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 1651.0 MHz without any tolerance or limit. The values of absolute attenuation  $a_{abs}$  are guaranteed over the whole operating temperature range. The frequency shift of the filter within 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 in PB</b>	$a_e$	2.4	dB	max.	3.0	dB
<b>Nominal frequency</b>	$f_N$	-			1651.0	MHz
<b>Passband</b>	PB	-		$f_N \pm$	17.0	MHz
<b>Passband variation</b>	*)	1.0	dB	max.	1.75	dB
<b>Absolute attenuation</b>	$a_{abs}$					
0.3 MHz ... 1583.0 MHz		38	dB	min.	30	dB
1583.0 MHz ... 1608.5 MHz		26	dB	min.	20	dB
1693.5 MHz ... 1719.0 MHz		36	dB	min.	20	dB
1719.0 MHz ... 3500.0 MHz		32	dB	min.	30	dB
<b>Group delay ripple within PB</b>	**)	19	ns	max.	30	ns
<b>VSWR within PB</b>		2 : 1		max.	2.4 : 1	
<b>Input power level in PB</b>		-		max.	10	dBm
<b>Operating temperature range</b>	OTR	-			-30 °C ... +85 °C	
<b>Storage temperature range</b>		-			-40 °C ... +85 °C	
<b>Temperature coefficient of frequency</b>	$TC_f$ ***)	-46	ppm/K		-	

\*) 1dB in each 3MHz segment within PB

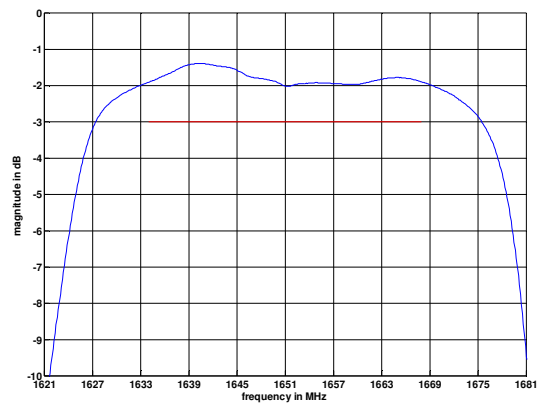
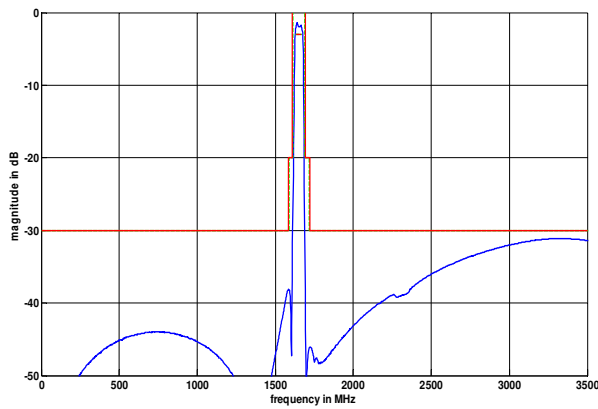
\*\*) 12ns in each 3MHz segment within PB

\*\*\*)  $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_0) \times f_{CAT}(\text{MHz})$ **Generated:****Checked / Approved:**

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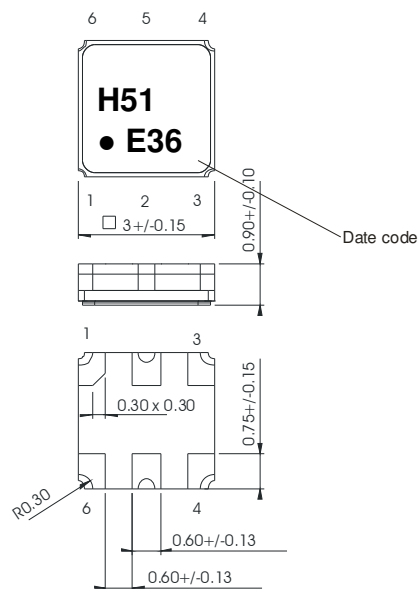
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**Filter characteristic**



**Construction and pin connection**

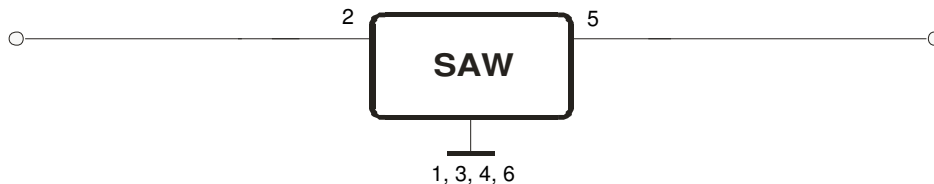
(All dimensions in mm)



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

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

**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 / 100 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;

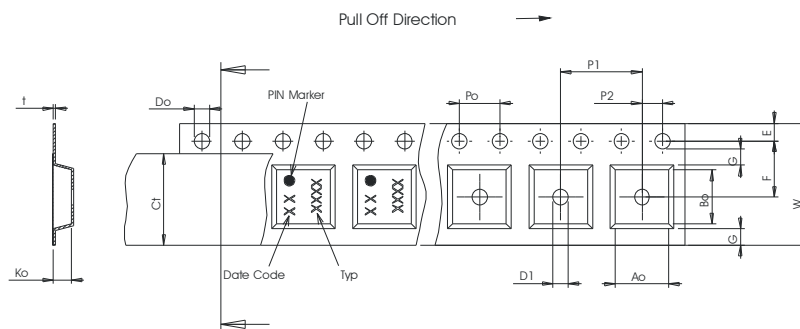
This filter is RoHS compliant (2011/65/EU)

**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

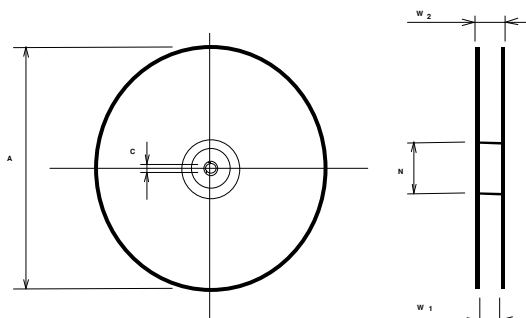
**Tape (all dimensions in mm)**

- 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 : 5,3 ± 0,1



**Reel (all dimensions in mm)**

- A : 330 or 180
- W1 : 8,4 +1,5/-0
- W2(max) : 14,4
- N(min) : 60
- C : 13,0 ± 0,2



The minimum bending radius is 45 mm.

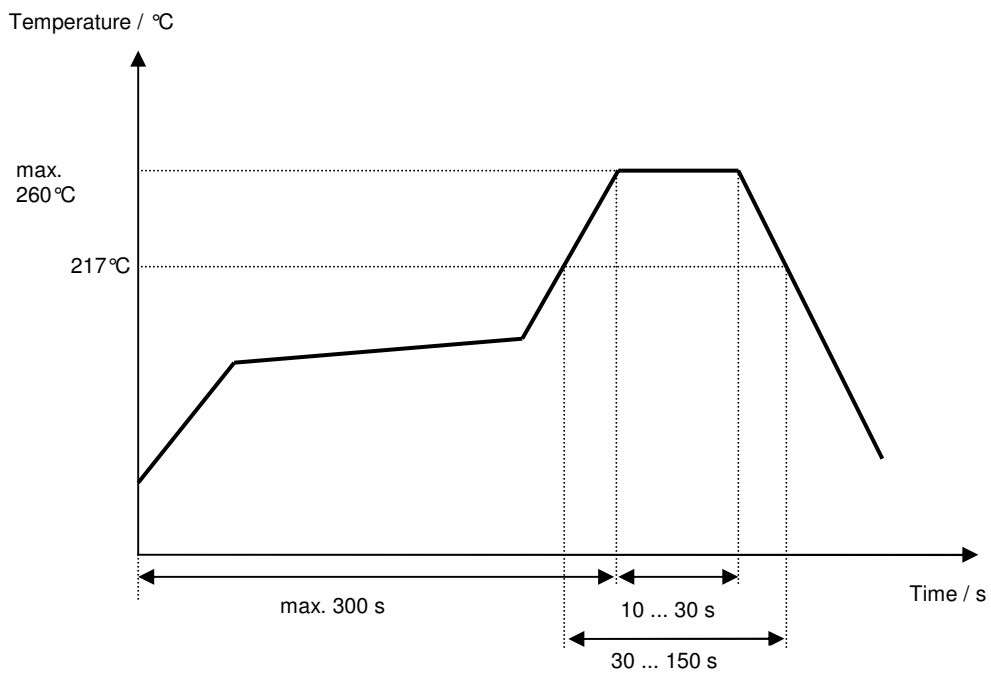
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**Air reflow temperature conditions**

<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.	Schönbein	26.06.2014
2.0	Generation of filter specification.	Schönbein	01.09.2014

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