

**Vectron International****Filter specification****TFS 1590****1/5****Measurement condition**

Ambient temperature $T_0$ :	23	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	50	$\Omega$
Output:	50	$\Omega$

**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 1590.0 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</b>	$a_e$	3.2 dB	max. 4.0 dB
<b>Nominal frequency</b>	$f_N$	-	1590.0 MHz
<b>Passband</b>	PB	-	$f_N \pm 24.0$ MHz
<b>Pass band ripple</b>	p-p	0.8 dB	max. 1.6 dB
<b>Absolute attenuation</b>	$a_{abs}$		
1 MHz ... 1515 MHz		32 dB	min. 30 dB
1658 MHz ... 1685 MHz		40 dB	min. 25 dB
1685 MHz ... 2000 MHz		33 dB	min. 30 dB
<b>Group delay ripple within PB</b>		7 ns	max. 10 ns
<b>Input power level</b>		-	max. 10 dBm
<b>Operating temperature range</b>	OTR	-	- 40 °C ... + 85 °C
<b>Storage temperature range</b>		-	- 40 °C ... + 125 °C
<b>Temperature coefficient of frequency</b>	$TC_f$ *)	- 70 ppm/K	-

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

**Generated:**

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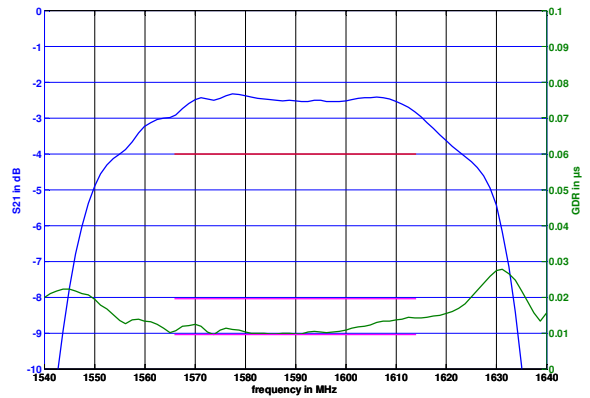
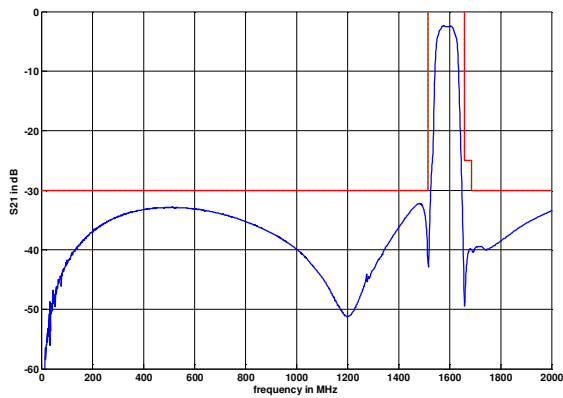
**Checked / Approved:**

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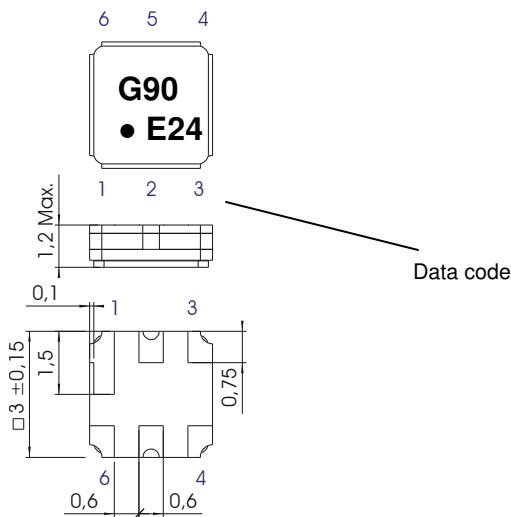
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**Filter characteristic**



**Construction and pin connection**

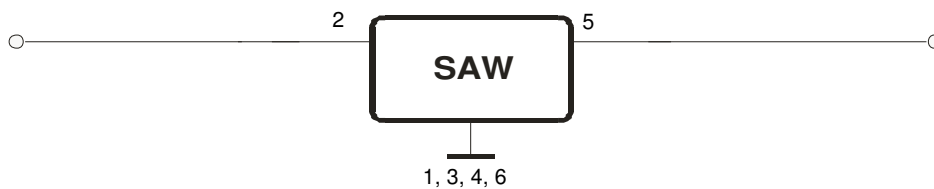
(All dimensions in mm)



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;

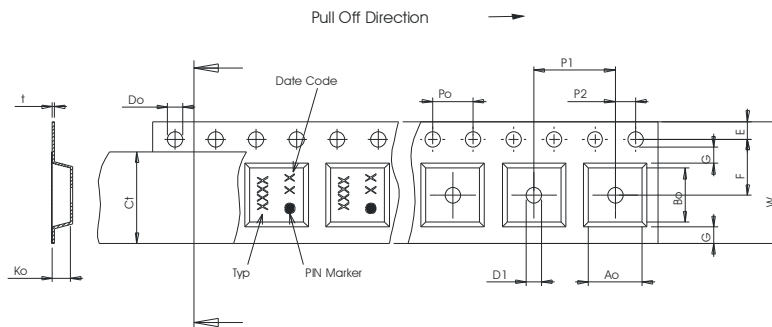
This filter is RoHS compliant (2011/65/EU)

**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

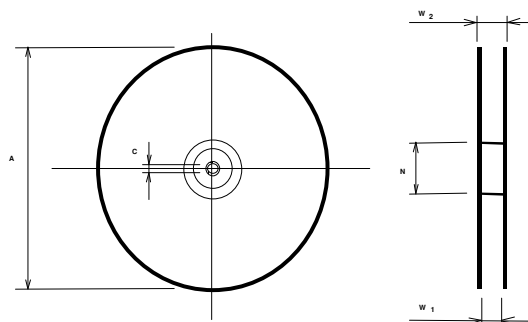
**Tape (all dimensions in mm)**

- 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.

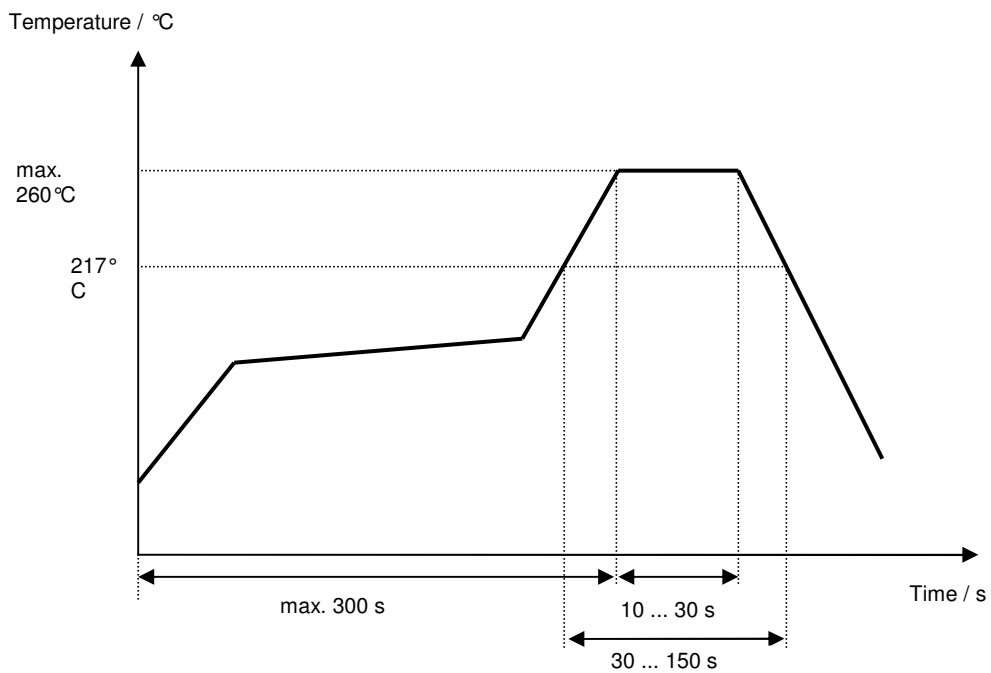
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**Air reflow temperature conditions**

<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 specification according to customer requirements.	Roizengaft	13.02.2004
1.1	- add of filter characteristics - change construction PRELIMINARY ! - add typical values	Springfeldt	02.06.2004
1.2	- add temperature coefficient of frequency - change construction and stability characteristics - generation of filter specification	Strehl	31.05.2006
1.3	- change construction back to version 1.1	Strehl	14.06.2006
1.4	- change of the max IL from 4.0 to 4.5 dB	Noack	09.10.2007
1.5	- change of the max IL from 4.5 to 4.0 dB	Noack	16.11.2007
1.6	- Change data table (storage temperature range) - Update stability characteristics, reliability, packing and filter characteristic	Noack	05.01.2015

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