

Vectron International**Filter specification****TFS2593A****1/5****Measurement condition**

Ambient temperature T_A :	23	°C
Input power level:	0	dBm
Input:	50 Ω	
Output:	50 Ω	
Source:	58 Ω -0,34 pF	
Load:	58 Ω -0,34 pF	

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 2593 MHz without any tolerance or limit. The values of absolute attenuation a_{abs} are guaranteed within the operating temperature range OTR. The frequency shift of the filter in the operating temperature range is included in the production tolerance scheme.

D a t a		typ. value		tolerance / limit	
Insertion loss OTR	a_e	4.4	dB	max.	5.2 dB
Insertion loss OTR1		4.2	dB	max.	5.0 dB
Nominal frequency	f_N				2593.0 MHz
Passband	PB			$f_N \pm$	97.0 MHz
Pass band variation OTR		1.6	dB		2.2 dB
Pass band variation OTR1		1.4	dB		2.0 dB
Absolute attenuation	a_{abs}				
0.3 MHz ... 500 MHz		37	dB	min.	25 dB
500 MHz ... 2170 MHz		31	dB	min.	26 dB
2170 MHz ... 2382.80 MHz		31	dB	min.	20 dB
2803.2 MHz ... 2987.52 MHz		28	dB	min.	20 dB
2987.52 MHz ... 3181.52 MHz		40	dB	min.	35 dB
3181.52 MHz ... 3800 MHz		36	dB	min.	30 dB
3800 MHz ... 5000 MHz		36	dB	min.	20 dB
Return loss within PB		11	dB	min.	8.5 dB
Operating temperature range	OTR	-			-40 °C ... +85 °C
Reduced operating temperature range	OTR1				-10 °C ... +70 °C
Storage temperature range					-40 °C ... +85 °C
Temperature coefficient of frequency	TC_f **	-76	ppm/K		

*) The terminating impedances depend on parasitics and q-values of matching elements and the board used, and are to be understood as reference values only. Should there be additional questions do not hesitate to ask for an application note or contact our design team.

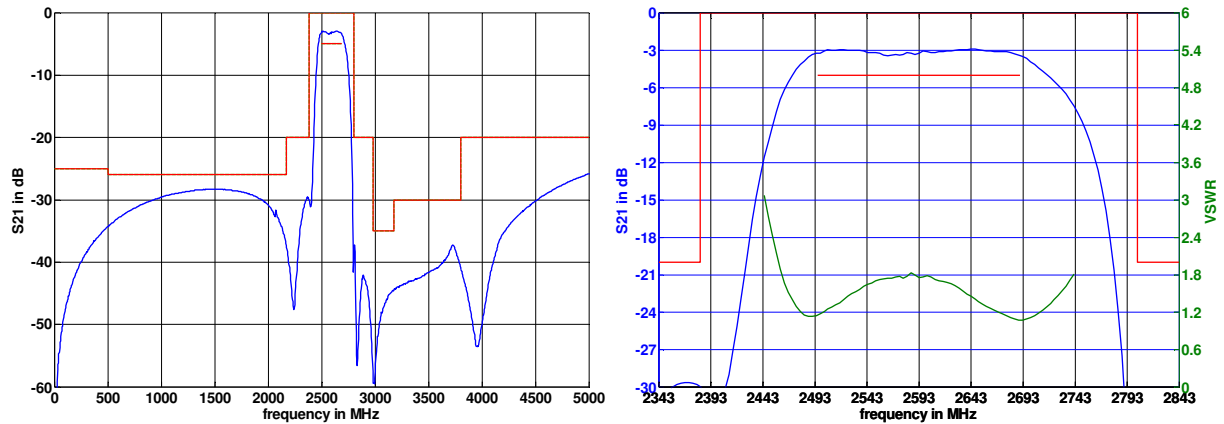
***) $\Delta f = TC_f(T - T_A)f_N$

Generated:**Checked / Approved:**

Vectron International GmbH
Potsdamer Straße 18
D 14 513 TELTOW / Germany
Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30
E-Mail: tft@vectron.com

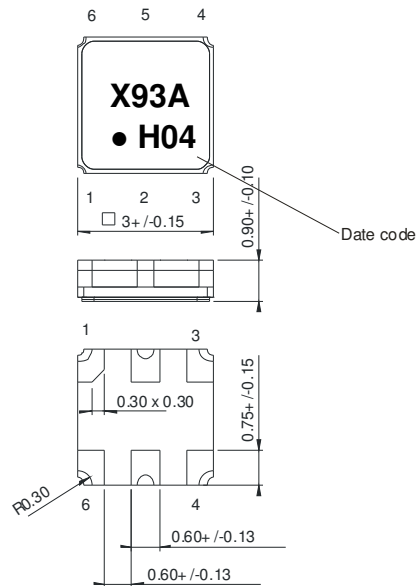
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Filter characteristic



Construction and pin connection

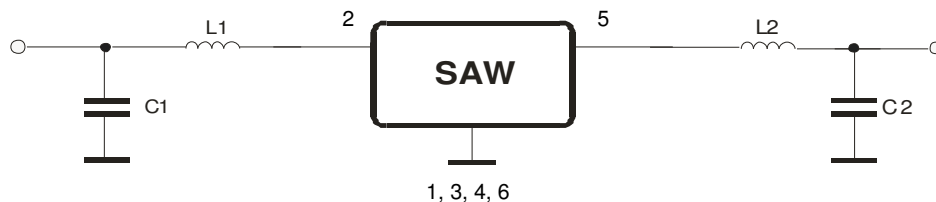
(All dimensions in mm)



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

Date code: Year + week
 H 2016
 J 2017
 K 2018
 ...

50 Ω Test 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 68 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 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;
5. SAW devices are Electrostatic Discharge (ESD) sensitive devices.

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

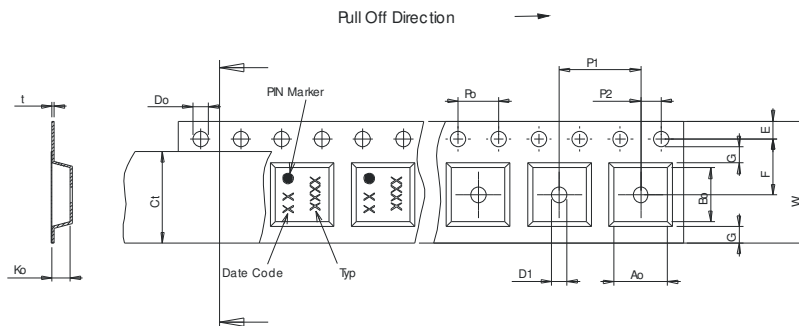
Packing

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;

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

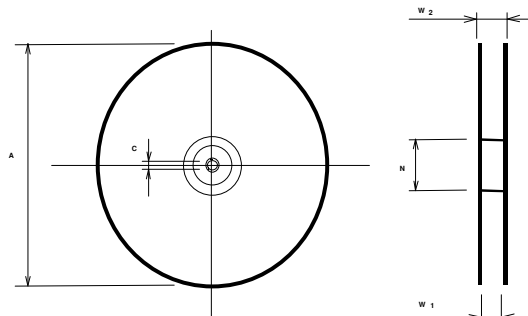
Tape (all dimensions in mm)

- 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.

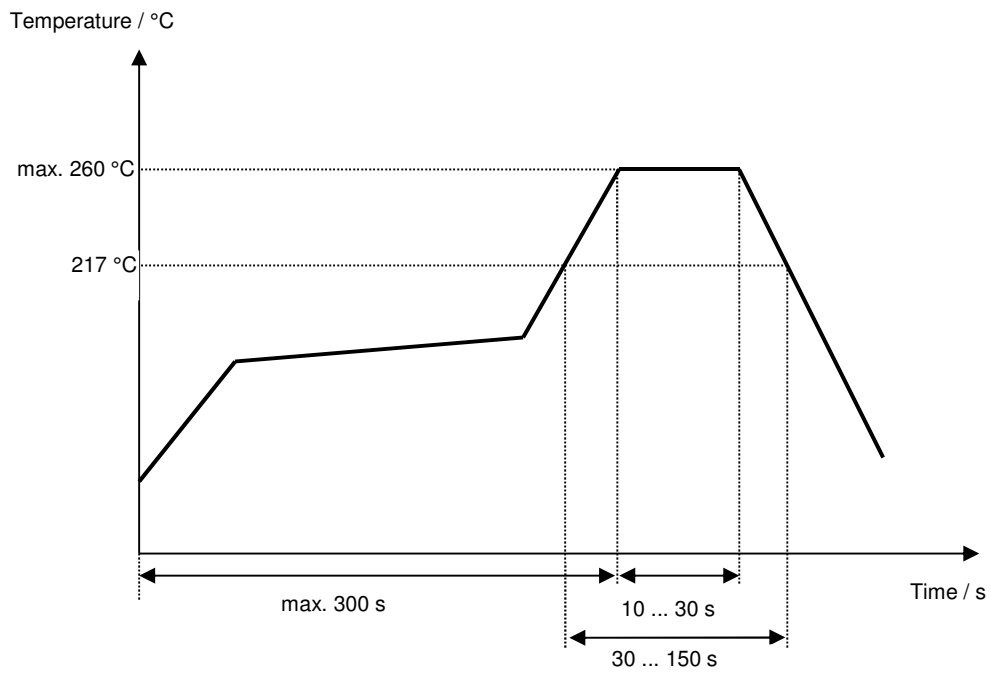
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E-Mail: tft@vectron.com

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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 development specification	S.Springfeldt	02.09.2013
1.1	Correcting laser image	S.Springfeldt	15.11.2013
2.0	Generation of filter specification (including relaxed data table)	S.Springfeldt	11.12.2013
3.0	Cutting of stop band range down to 5GHz	S.Springfeldt	21.01.2016