

Vectron International**Filter specification****TFS120U****1/5****Measurement condition**

Ambient temperature T_A :	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	585 Ω	-16.5 pF
Output:	833 Ω	-14.8 pF

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of the TFS120U is the minimum of the pass band attenuation. This value is defined as the insertion loss a_0 . The nominal frequency f_N is fixed at 120.0 MHz without any tolerance. The values of relative attenuation a_{rel} 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.

D a t a		typ. value		tolerance / limit		
Insertion loss	a_e	5	dB	max.	7	dB
Nominal frequency	f_N	-			120.0	MHz
Passband	PB	-			$f_N \pm 0.2$	MHz
Passband ripple	p-p	0.4		max.	1.0	dB
Relative attenuation	a_{rel}					
$f_N \pm 0.2$ MHz		0.4	dB	max.	1	dB
$f_N \pm 1.1$ MHz ... $f_N \pm 20$ MHz		39	dB	min.	35	dB
Average group delay within PB		0.94	μ s	max.	1.1	μ s
Group delay ripple (p-p) within PB		50	ns	max.	125	ns
Group delay ripple (p-p) within $f_N \pm 0.1$ MHz		40	ns	max.	70	ns
Return loss within PB		18	dB	min.	10	dB
Operating temperature range	OTR	-			- 40 °C ... + 85 °C	
Storage temperature range		-			- 55 °C ... + 125 °C	
Frequency inversion temperature	T_0	25	°C			
Temperature coefficient of frequency	TC_f **)	-0.036	ppm/K ²			

*) 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.

**) $\Delta f = TC_f (T - T_0)^2 f_N$

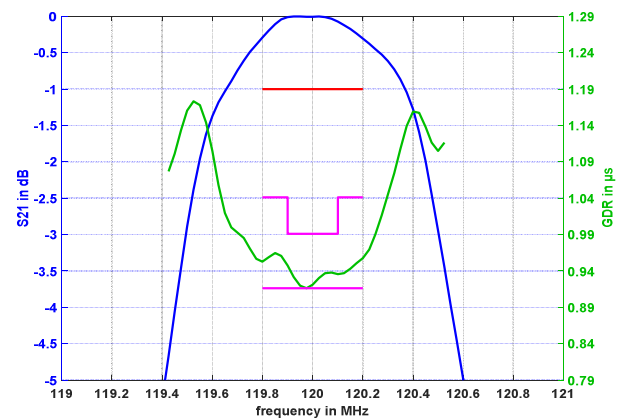
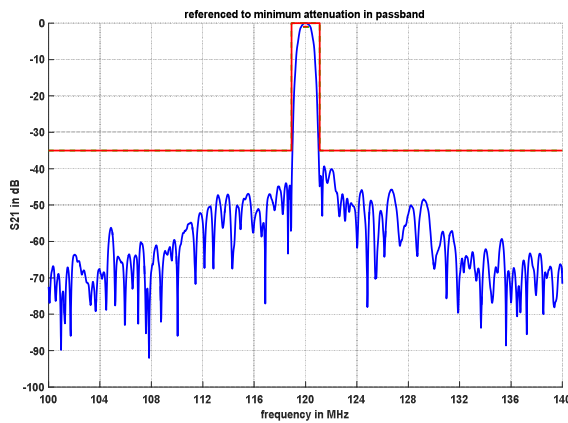
Generated:

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

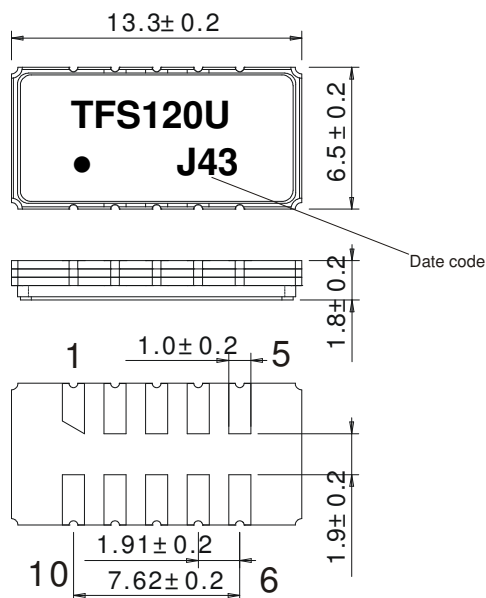
Vectron International GmbH reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

Filter characteristic



Construction and pin connection

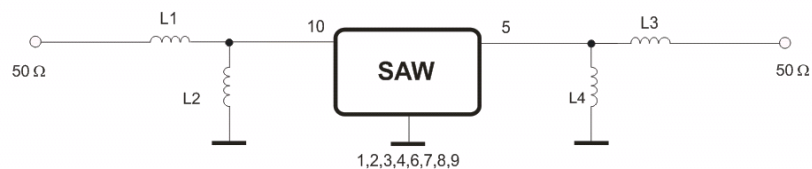
(All dimensions in mm)



1	Ground
2	Ground
3	Ground
4	Ground
5	Output
6	Ground
7	Ground
8	Ground
9	Ground
10	Input

Date code: Year + week
 J 2017
 K 2018
 L 2019
 ...

50 Ω Test circuit



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

Vectron International GmbH reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

Stability characteristics, reliability

After the following tests the filter shall meet the whole specification:

- Shock: 500 g, 1 ms, half sine wave, 3 shocks each plane;
DIN IEC 60068 T2 - 27
- 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 60068 T2 - 6
- Change of temperature: -55 °C to 125 °C / 15 min. each / 100 cycles
DIN IEC 60068 part 2 – 14 Test N
- Resistance to solder heat (reflow): reflow possible: three times max.;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;
- 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;

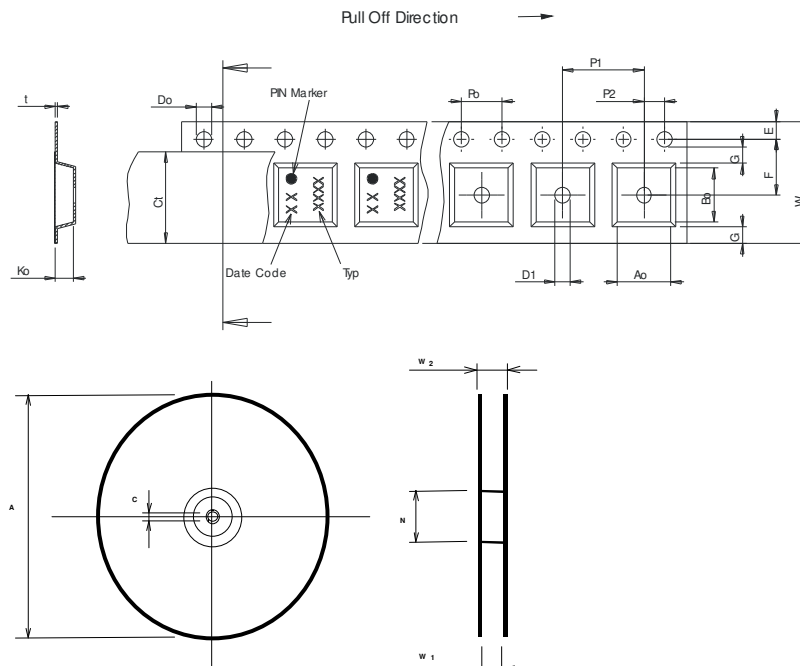
reel of empty components at start: min. 300 mm
reel of empty components at start including leader: min. 500 mm
trailer: min. 300 mm

Tape (all dimensions in mm)

W	: 24.00 +0.30/-0.10
Po	: 4.00 ±0.1
Do	: 1.50 +0.1/0
E	: 1.75 ±0.10
F	: 11.50 ±0.10
G(min)	: 0.60
P2	: 2.00 ±0.1
P1	: 12.00 ±0.1
D1(min)	: 1.50
Ao	: 7.00 ±0.10
Bo	: 13.80 ±0.10
Ct	: 21.00 ±0.1
Ko	: 2.10 ±0.10
t	: 0.30 ±0.05

Reel (all dimensions in mm)

A	: 330 or 180
W1	: 24.4 +2/-0
W2(max)	: 30.40
N(min)	: 60.00
C	: 13.0 +0.5/-0.2



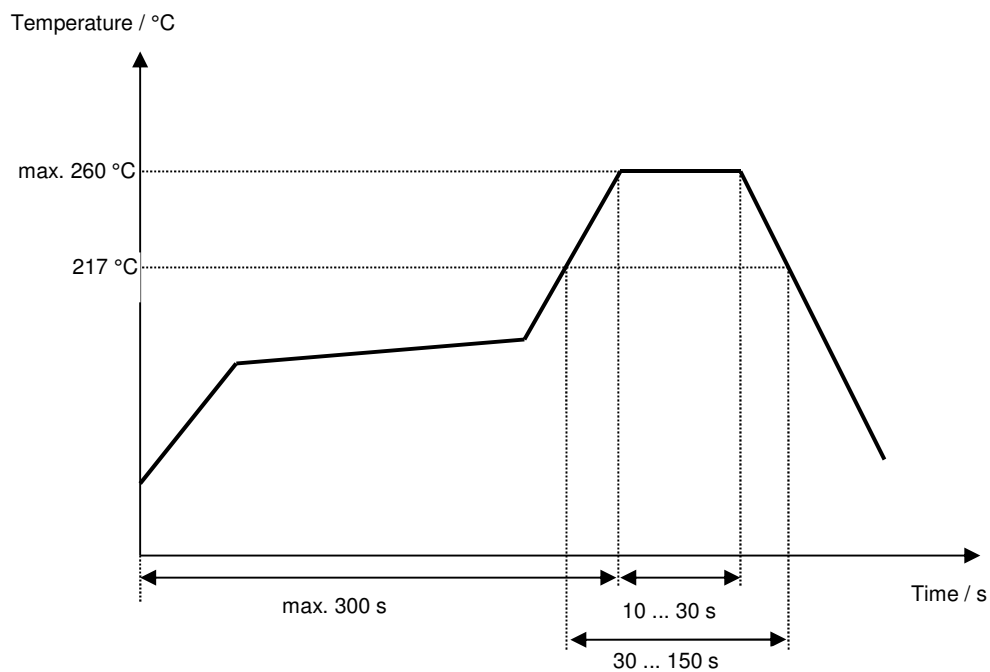
The minimum bending radius is 45 mm.

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

Vectron International GmbH reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

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

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

Vectron International GmbH reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

Vectron International**Filter specification****TFS120U****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	Bonnen	11.05.2017
1.1	- Update GDR limits as per customer request.	Jaffer	15.05.2017
1.2	- Add missing T_o symbol to data table.	Jaffer	17.05.2017
2.0	- Add typ. values and move to filter specification. - Amend default matching topology (with customer agreement, 31/5/17). - Add return loss limit, previously omitted.	Jaffer	16.06.2017
3.0	- Add average group delay limit as per customer request	Bonnen	25.07.2017

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

Vectron International GmbH reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.