

**Vectron International****Filter specification****TFS 1990B****1/5****Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	50	Ω
Output:	50	Ω

**Characteristics**

## Remark:

The reference level for the relative attenuation  $a_{rel}$  of the TFS1990B is the minimum attenuation in the passband. The maximum attenuation in the passband is defined as the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 1990 MHz without any tolerance or limit. The values of relative attenuation  $a_{rel}$  are guaranteed for 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 within PB2</b>	$a_e$	1.8 dB	max.	3.0	dB
<b>Nominal frequency</b>	$f_N$		1990.0	MHz	
<b>Passband 1</b>	PB1		$f_N \pm 3.5$	MHz	
<b>Passband 2</b>	PB2		$(f_N - 5) \text{ MHz} \dots (f_N + 9) \text{ MHz}$		
<b>Passband ripple in any 1MHz segment within PB1</b>		0.08 dB	max.	0.1	dB
<b>Passband ripple in any 1MHz segment within PB2</b>		0.1 dB	max.	0.3	dB
<b>Passband variation within PB2</b>		0.5 dB	max.	1.0	dB
<b>Relative attenuation</b>	$a_{rel}$				
300 MHz ... 1842 MHz		31 dB	min.	17	dB
1842 MHz ... 1858 MHz		41 dB	min.	33	dB
1858 MHz ... 1928 MHz		40 dB	min.	20	dB
1928 MHz ... 1955 MHz		22 dB	min.	10	dB
1955 MHz ... 1962 MHz		12 dB	min.	5	dB
2055 MHz ... 3500 MHz		28 dB	min.	20	dB
3500 MHz ... 4000 MHz		32 dB	min.	17	dB
<b>Return loss within PB2</b>		14 dB	min.	12	dB
<b>Group delay ripple within PB2</b>	p-p	3 ns	max.	15	ns
<b>Input power level</b>		-	max.	0	dBm
<b>Operating temperature range</b>	OTR	-	- 20°C ... + 80°C		
<b>Storage temperature range</b>		-	- 40°C ... + 125°C		
<b>Temperature coefficient of frequency</b>	$TC_f$ *	-42 ppm / K			

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

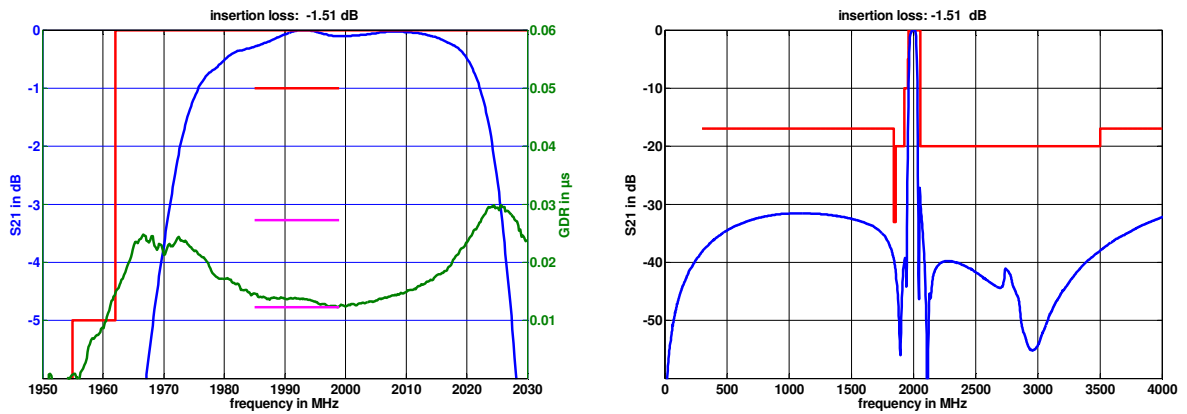
**Generated:** \_\_\_\_\_

**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](mailto:tft@vectron.com)**

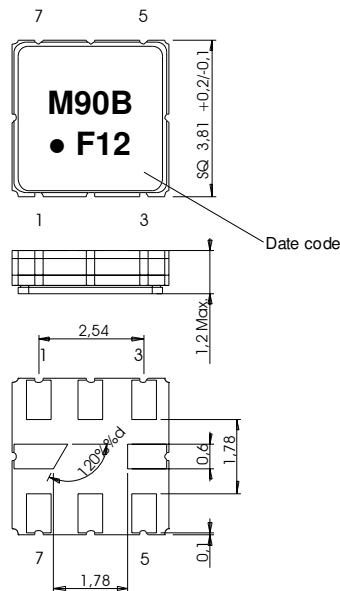
Vectron International GmbH reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

**Filter characteristic**



**Construction and pin connection**

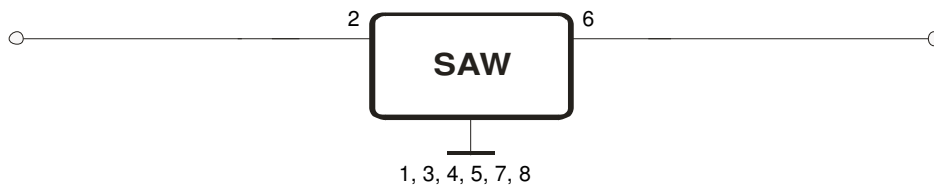
(All dimensions in mm)



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

Date code: Year + week  
 F 2015  
 G 2016  
 H 2017  
 ...

**50 Ohm 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](mailto: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:

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, see page 4: "Air reflow temperature conditions"
5. ESD ANSI/ESD S20.20-1999, class 1A for HBM

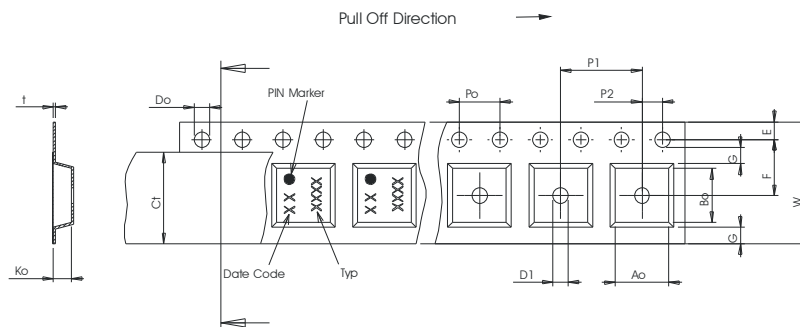
This filter is RoHS compliant (2011/65/EU)

**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 |

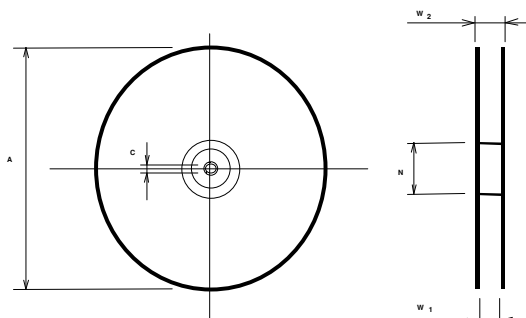
**Tape (all dimensions in mm)**

- W : 12,00 ± 0,3
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,1
- F : 5,50 ± 0,05
- G(min) : 0,75
- P2 : 2,00 ± 0,05
- P1 : 8,00 ± 0,1
- D1(min) : 1,50
- Ao : 4,30 ± 0,1
- Bo : 4,30 ± 0,1
- Ct : 9,2 ± 0,1



**Reel (all dimensions in mm)**

- A : 330 or 180
- W1 : 12,4 +2/-0
- W2(max) : 18,4
- N(min) : 50
- C : 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

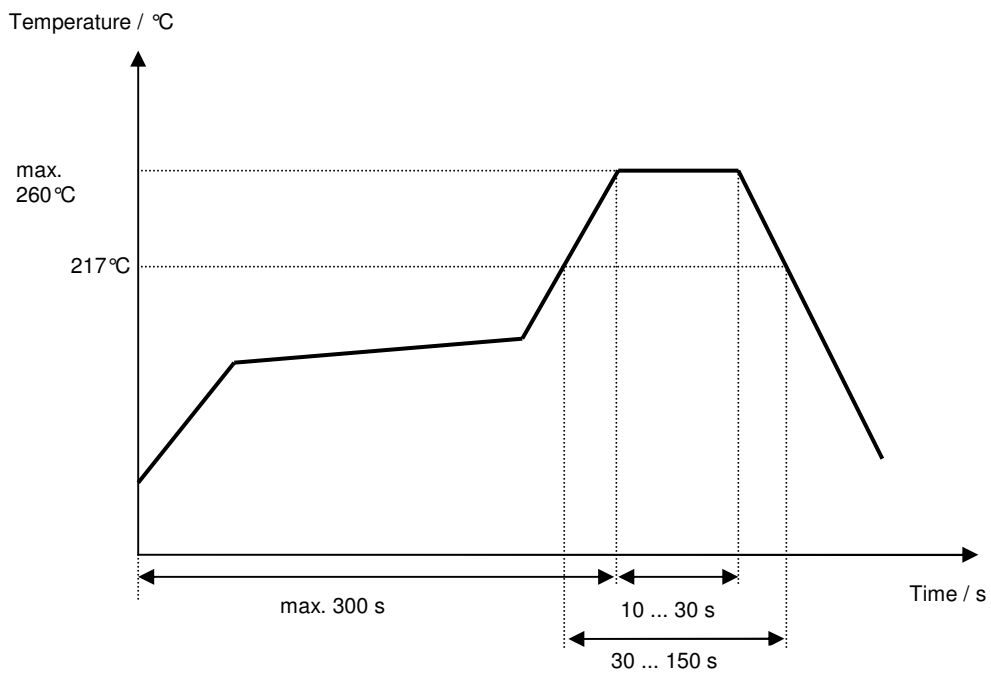
**Vectron International GmbH**  
**Potsdamer Straße 18**  
**D 14 513 TELTOW / Germany**  
**Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30**  
**E-Mail: [tft@vectron.com](mailto:tft@vectron.com)**

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**

<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**



**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](mailto: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.

**History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	Generation of development specification	A. Molke	04.03.2013
1.1	- Change from development spec to filter spec - Typical values added - Filter characteristic added	A. Molke	12.09.2013
2.0	- Change of package - Change of passband limits for PB2 - Update of typical values and filter characteristic	A. Molke	20.03.2015