

Vectron International**Filter specification****TFS 35F****1/5****T Measurement condition**

Ambient temperature:	25	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	310 Ω	-25,7 pF
Output:	690 Ω	-10,1 pF

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of the TFS 35F is the minimum of the pass band attenuation a_{min} . The minimum of the pass band attenuation a_{min} is defined as the insertion loss a_e . The centre frequency f_c is the arithmetic mean value of the upper and lower frequencies at the 3 dB filter attenuation level relative to the insertion loss a_e . The nominal frequency f_N is fixed at 35,42 MHz without any tolerance. The given values for both the relative attenuation a_{rel} and the group delay ripple have to be achieved at the frequencies given below even if the centre frequency f_c is shifted due to the temperature coefficient of frequency TC_f in the operating temperature range and due to a production tolerance for the centre frequency f_c .

D a t a		typ. value		tolerance / limit	
Insertion loss (reference level)		a_e	14,8 dB	max.	17 dB
Nominal frequency		f_N			35,42 MHz
Centre frequency		f_c	35,42 MHz		-
Passband		PB	-		$f_c \pm 0,80$ MHz
Pass band ripple			0,6 dB	max.	1,6 dB
Bandwidth		BW			
1 dB			2,01 MHz	min.	1,7 MHz
3 dB			2,44 MHz		-
21 dB			3,32 MHz	max.	3,74 MHz
Relative attenuation		a_{rel}			
34,62 MHz	...	36,22 MHz	0,8 dB	max.	1,6 dB
0,1 MHz	...	7 MHz	55...27 dB		-
7 MHz	...	28 MHz	55...50 dB	min.	35 dB
28 MHz	...	31 MHz	35 dB	min.	30 dB
31 MHz	...	33,5 MHz	40...30 dB	min.	21 dB
37,34 MHz	...	39,84 MHz	27...42 dB	min.	21 dB
39,84 MHz	...	62,42 MHz	45...60 dB	min.	35 dB
62,42 MHz	...	72,42 MHz	36 dB	min.	30 dB
72,42 MHz	...	110,42 MHz	70...80 dB	min.	40 dB
Group delay		mean value in PB	1,6 µs	max.	1,7 µs
Group delay ripple within PB			200 ns	max.	300 ns
Deviation from linear phase within PB			±2 °		-
Triple transit response suppression			35 dB		-
Crosstalk attenuation compared to main signal			50 dB		-
Operating temperature range		OTR	-		- 20 °C ... + 80 °C
Storage temperature range			-		- 40 °C ... + 85 °C
Temperature coefficient of frequency		TC_f **	-20 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.

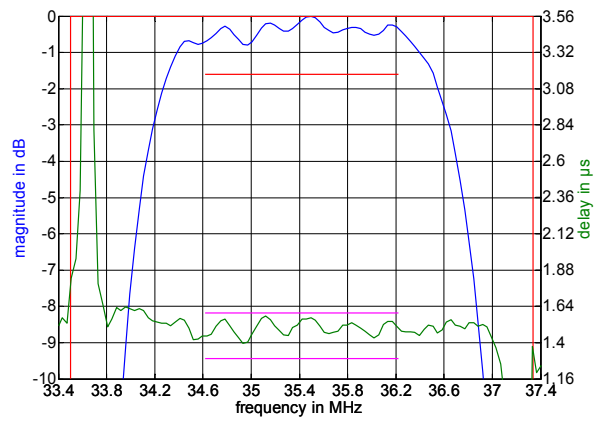
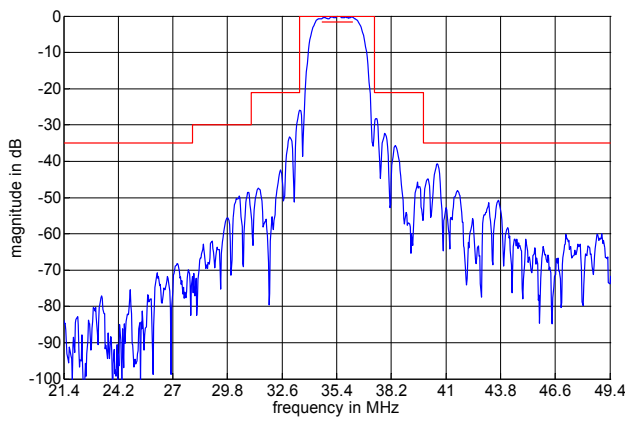
**) $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_0) \times f_{T0}(\text{MHz})$.

Generated:**Checked / Approved:**

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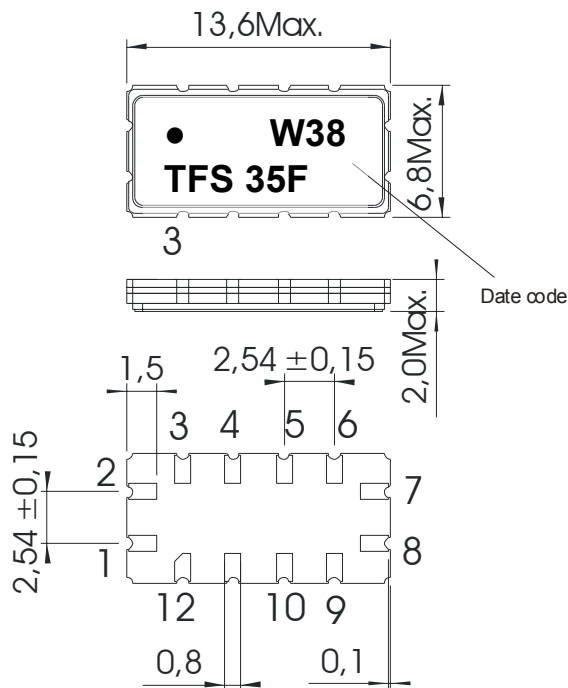
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Filter characteristic



Construction and pin connection

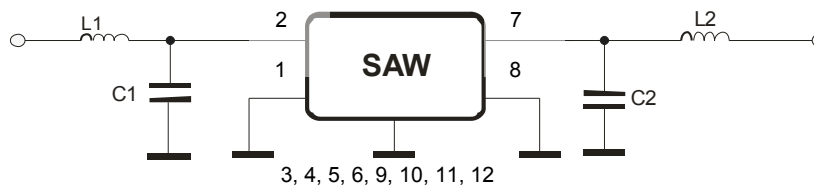
(All dimensions in mm)



- 1 Input RF Return
- 2 Input
- 3 Ground
- 4 Ground
- 5 Ground
- 6 Ground
- 7 Output
- 8 Output RF Return
- 9 Ground
- 10 Ground
- 11 Ground
- 12 Ground

Date code: Year + week
 W 2008
 X 2009
 A 2010
 ...

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 g respectively, 1 octave per min, 10 cycles per plan, 3 plans;
DIN IEC 68 T2 - 6
3. Change of temperature: -55 °C to 125°C / 30 min. each / 10 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. ESD ANSI/ESD S20.20-1999, class 1A for HBM

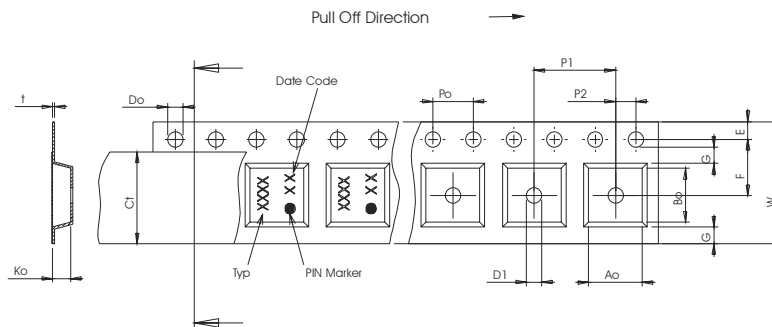
This filter is RoHS compliant (2002/95/EG, 2005/618/EG)

Packing

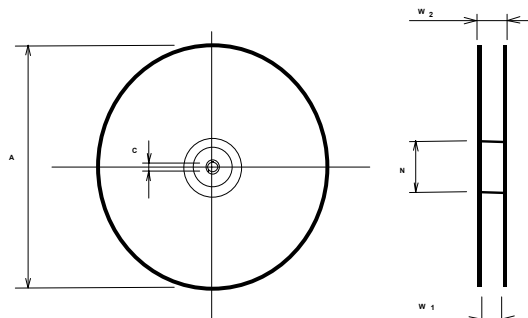
Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

max. pieces of filters per reel:	1700
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 : 7,10 ± 0,10
 - Bo : 13,90 ± 0,10
 - Ct : 21,5 ± 0,1



- Reel (all dimensions in mm)**
- A : 330
 - W1 : 24,4 +2/-0
 - W2(max) : 30,4
 - N(min) : 60
 - C : 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

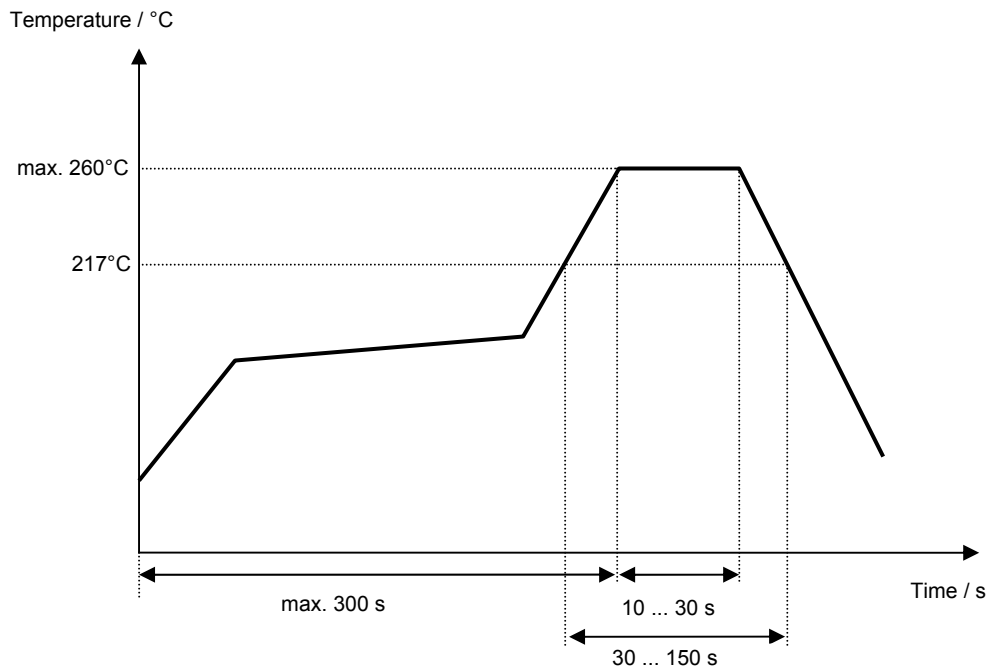
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Air reflow temperature conditions

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



History

Version	Reason of Changes	Name	Date
1.0	- Generation of filter specification	Strehl	22.02.2007
1.1	- pin connection changed - ESD class 1A	Pfeiffer	04.09.2008
1.2	- change of pin numbering and labelling	Pfeiffer	15.09.2008