Vectron International — Filter specification — TFS 224C — 1/5

Measurement condition

Ambient temperature: 23 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 1178.01 Ω || -4.84 pF
Output: 1180.00 Ω || -4.78 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of the TFS 224C is the minimum of the pass band attenuation. This value is defined as the insertion loss a_e. The nominal frequency f_N is fixed at 224.88 MHz without any tolerance. The values of relative attenuation a_{rel} 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.

D a t a		typ. value		tolerance / limit		
Insertion loss (reference level)	a_e	6.9	dB	max.	9	dB
Nominal frequency	f_N	-			224.88	MHz
Passband	PB	-		f_N ±	0.3	MHz
Pass band ripple		0.55	dB	max.	1	dB
Bandwidth	BW					
1dB		0.82	MHz		-	
3dB		1.36	MHz		-	
40dB		4.78	MHz		-	
Relative attenuation	a_{rel}					
f_N … f_N ± 0.3 MHz		0.55	dB	max.	1	dB
f_N ± 0.75 MHz … f_N ± 2.4 MHz		3.8	dB	min.	3	dB
f_N ± 2.4 MHz … f_N ± 8 MHz		39	dB	min.	33	dB
f_N ± 8 MHz … f_N ± 15 MHz		46	dB	min.	40	dB
f_N ± 15 MHz … f_N ± 50 MHz		49	dB	min.	45	dB
Group delay	mean value in PB	750	ns		-	
Group delay ripple within PB		70	ns		-	
Deviation from linear phase						
f_N ± 0.675 MHz		1.9	° rms	max.	3.5	° rms
VSWR within PB		1.25 : 1		max.	2 : 1	
Operating temperature range	OTR	-		- 30 °C ... + 80 °C		
Storage temperature range		-		- 40 °C ... + 85 °C		
Frequency inversion temperature		25	°C		-	
Temperature coefficient of frequency	TC_f **	-0.03	ppm/K²		-	

*) The terminating impedances depend on parasites 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.
**) $\Delta f(Hz) = TC_f(ppm/K^2) \times (\Delta T)^2 \times f_{To}(MHz)$

Generated:

Checked / Approved:

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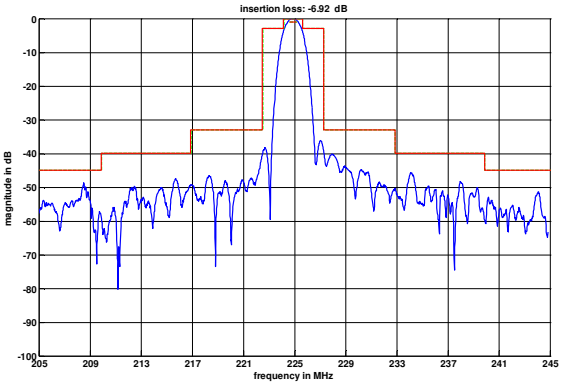
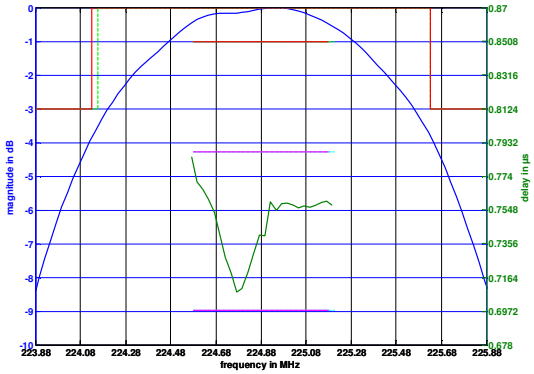
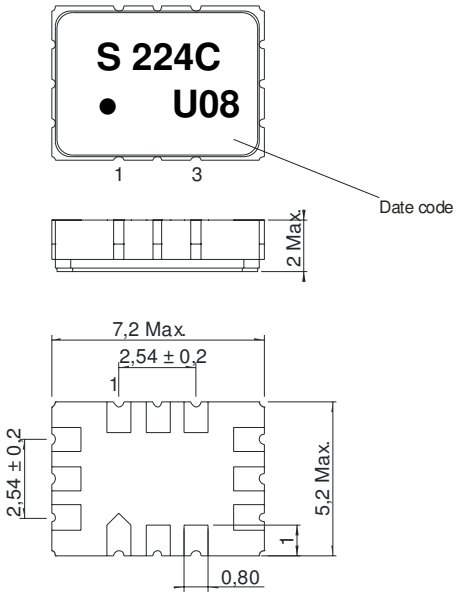
Filter characteristic





Construction and pin connection

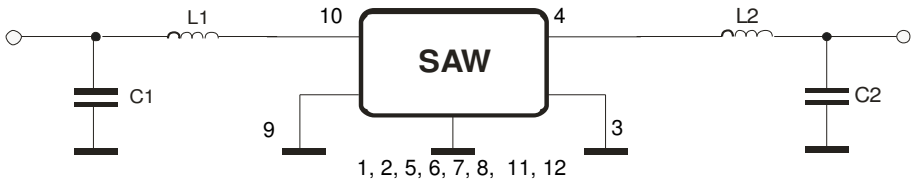
(All dimensions in mm)



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

Date code:	Year + week
U	2006
V	2007
W	2008
...	

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 / 30 min. each / 10 cycles DIN IEC 68 part 2 – 14 Test N
4. Resistance to solder heat (reflow):	reflow possible: twice max.; for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

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

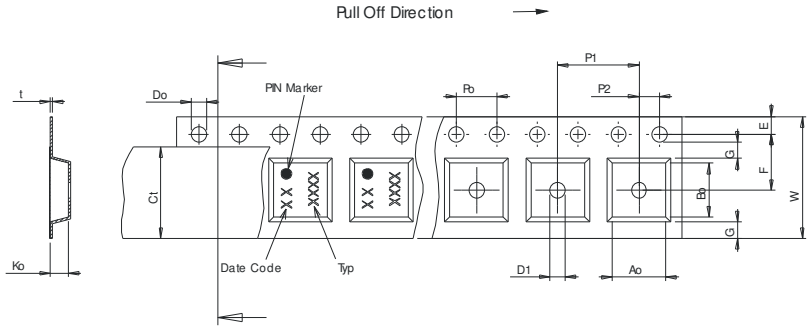
Packing

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:	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

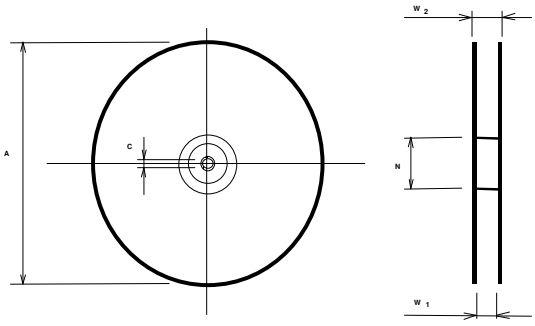
Tape (all dimensions in mm)

W	:16,00	± 0,3
Po	:4,00	± 0,1
Do	:1,50	+0,1/-0
E	:1,75	± 0,1
F	:7,50	± 0,1
G(min)	:0,60	
P2	:2,00	± 0,1
P1	:8,00	± 0,1
D1(min)	:1,50	
Ao	:5,50	± 0,1
Bo	:7,50	± 0,1
Ct	:13,5	± 0,1



Reel (all dimensions in mm)

A	:330	
W1	:16,4	+2/-0
W2(max)	:22,4	
N(min)	: 50	
C	:13,0	+0,5/-0,2



The minimum bending radius is 45 mm.

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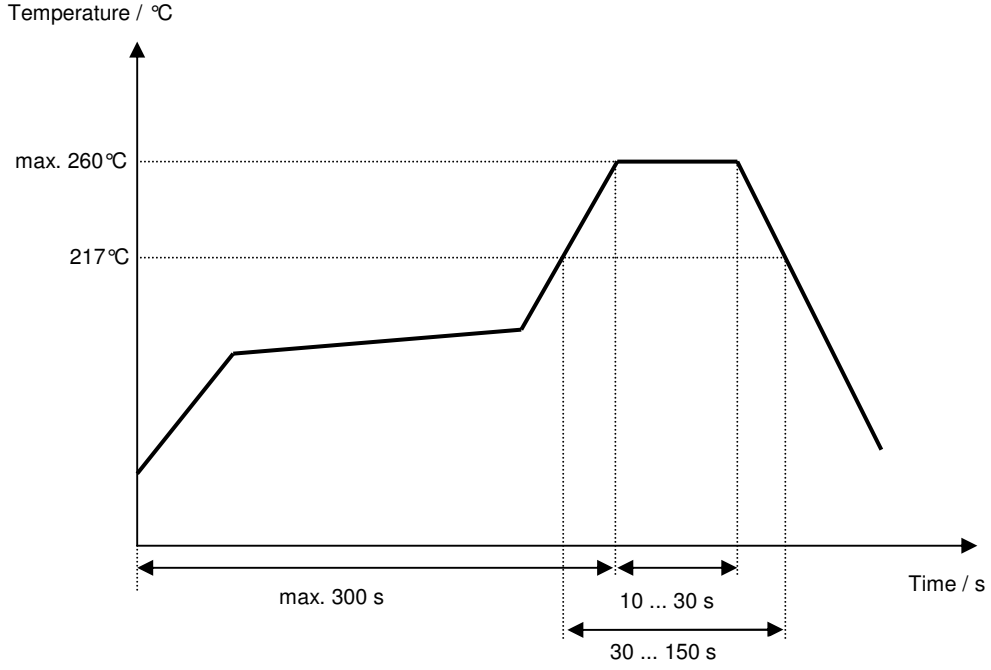
Air reflow temperature conditions

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



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History

Version	Reason of changes	Name	Date
1.0	- specification generated	Pfeiffer	21.02.2006
1.1	- add typ bw values as per customer request	TCUK	19.06.2012
2.0	- update typ values, term impedance & plots based on new manufacturing run. - remove limits for group delay mean value in PB to ease device testing. - change tape & reel orientation to present standard.	TCUK	26.09.2012

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