Vectron International — Filter specification — TFS230C — 1/5

Measurement condition

Ambient temperature: 23 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 230 Ω || -9 pF
Output: 200 Ω || -10 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of the TFS230C 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 230.4 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	10	dB	max.	12.1	dB
Nominal frequency	f_N				230.4	MHz
Passband	PB	72	MHz	f_N ±	32.5	MHz
Pass band ripple		0.6	dB	max.	1.5	dB
Relative attenuation)**	a_{rel}					
f_N … f_N ± 32.5 MHz		0.6	dB	max.	1.5	dB
10 MHz … 110 MHz		81	dB	min.	40	dB
350 MHz … 1000 MHz		73	dB	min.	35	dB
Group delay ripple		20	ns	max.	100	ns
Input power level				max.	10	dBm
Operating temperature range	OTR			- 40 °C ... + 85°C		
Storage temperature range				- 45 °C ... + 85°C		
Temperature coefficient of frequency	TC_f*	-97	ppm/K			

*) $\Delta f(Hz) = TC_f(ppm/K) \times (T-T_0) \times f_{T0}(MHz)$, f_{T0}: frequency at room temperature
**) 75dBc (min) at 100MHz…120MHz and 340MHz…360MHz

Generated:

Checked / Approved:

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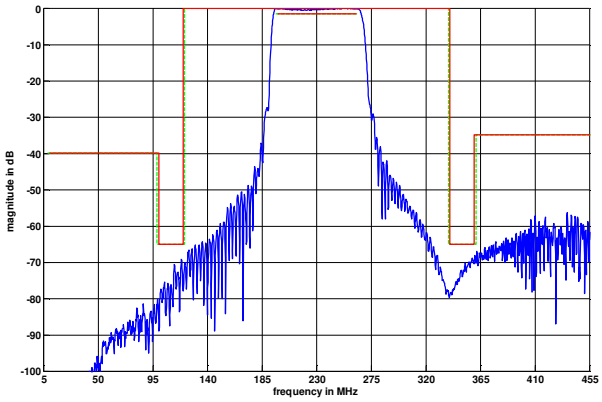
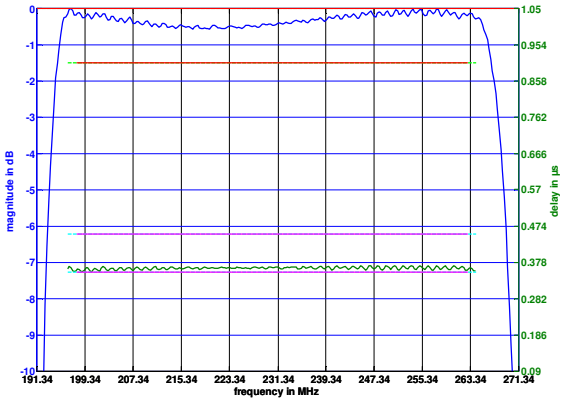
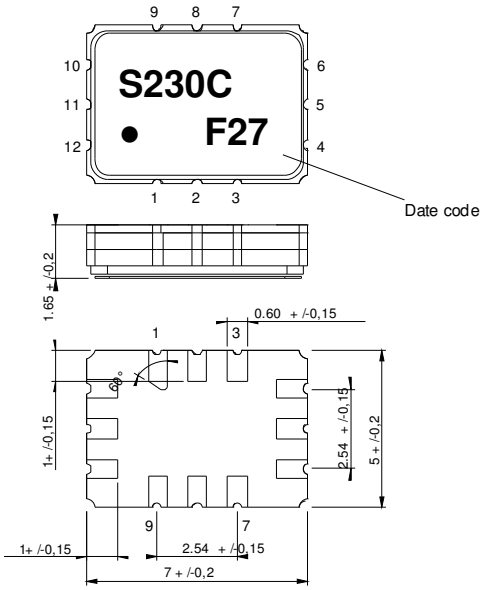
Filter characteristic





Construction and pin connection

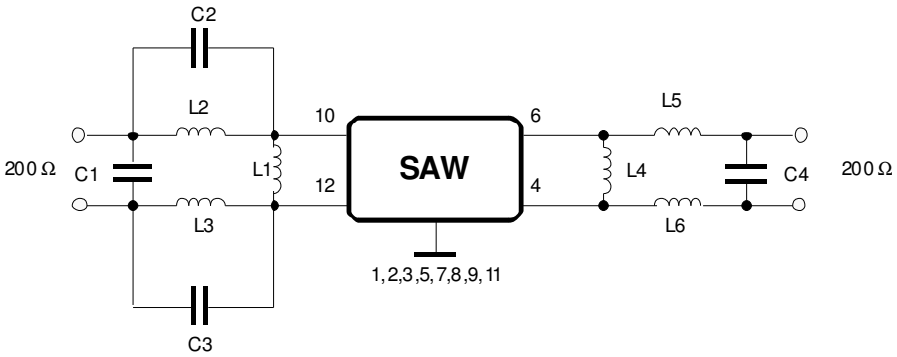
(All dimensions in mm)



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

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

Test circuit



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Stability characteristics, reliability

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

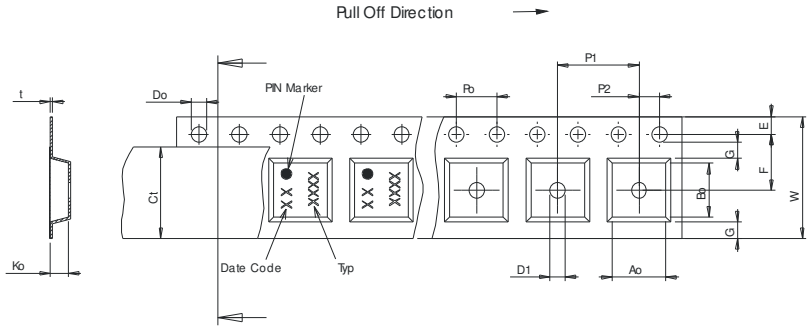
1. Shock:	500g, 1 ms, half sine wave, 3 shocks each plane; DIN IEC 68 T2 - 27
2. Vibration:	10 Hz to 500 Hz, 0.35 mm or g respectively, 1 octave per min, 10 cycles per plane, 3 planes; DIN IEC 68 T2 - 6
3. Change of temperature:	-55 °C to 125°C / 15 min. each / 100 cycles DIN IEC 68 part 2 – 14 Test 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

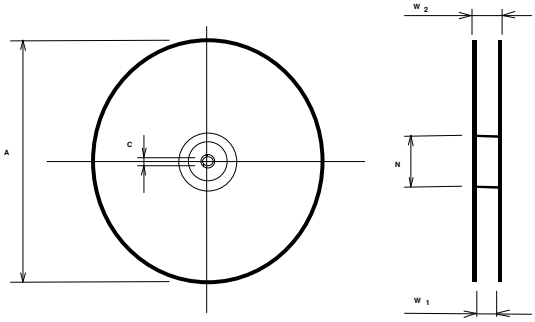
Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

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	:	16,00	+0,3/-0,1
Po	:	4,00	± 0,1
Do	:	1,50	+0,1/-0
E	:	1,75	± 0,1
F	:	7,50	± 0,1
G(min)	:	0,75	
P2	:	2,00	± 0,1
P1	:	8,00	± 0,1
D1(min)	:	1,50	
Ao	:	5,40	± 0,1
Bo	:	7,60	± 0,1
Ct	:	13,3	± 0,1



Reel (all dimensions in mm)

A	:	330	or 180
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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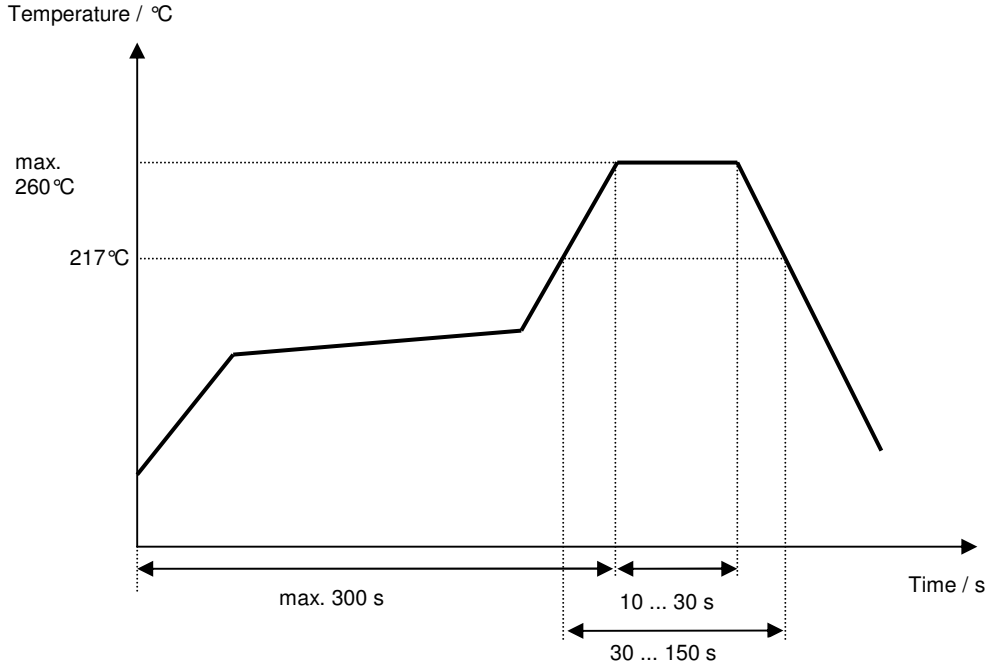
Air reflow temperature conditions

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	- Generation of development specification	Chilla	12.12.2014
1.1	- Changed passband and centre frequency - Changed relative attenuation and amplitude ripple - Added group delay ripple - Added test circuit	Chilla	22.06.2015
2.0	- Created filter specification - Added terminating impedance - Added typical values - Added filter characteristics	Chilla	03.07.2015

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