Vectron International — Filter specification — TFS 192C — 1/5

Measurement condition

Ambient temperature: 23 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 130 Ω || -20 pF
Output: 70 Ω || -30 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of the TFS 192C 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 192,0 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	10,4	dB	max.	12,0	dB
Nominal frequency	f_N				192,0	MHz
Centre frequency	f_C	192	MHz		-	
Passband	PB	24,5	MHz	f_N ±	10,25	MHz
PB ripple p-p		0,3	dB	max.	1	dB
PB ripple over any 200 kHz p-p		0,1	dB	max.	0,3	dB
Relative attenuation	a_{rel}					
f_N … f_N ± 10,25 MHz		0,3	dB	max.	1	dB
f_N ± 15 … f_N ± 21 MHz		4,5	dB	min.	3	dB
f_N - 92 MHz … f_N - 62 MHz		55	dB	min.	45	dB
f_N - 62 MHz … f_N - 21 MHz		48	dB	min.	40	dB
f_N + 21 MHz … f_N + 58 MHz		41,5	dB	min.	40	dB
f_N + 58 MHz … f_N + 98 MHz		60	dB	min.	45	dB
Absolute group delay in PB		0,47	µs	max.	1	µs
Group delay ripple in PB GDR		25	ns	max.	100	ns
GDR over any 200 kHz		10	ns	max.	20	ns
Return loss		13	dB	min.	12	dB
Input power level				max.	18	dBm
Operating temperature range	OTR			- 40 °C ... + 85 °C		
Storage temperature range				- 40 °C ... + 85 °C		
Temperature coefficient of frequency	TC_f **	-90	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.
**) $\Delta f(Hz) = TC_f(ppm/K) \times (T-T_0) \times f_{cat}(MHz)$.

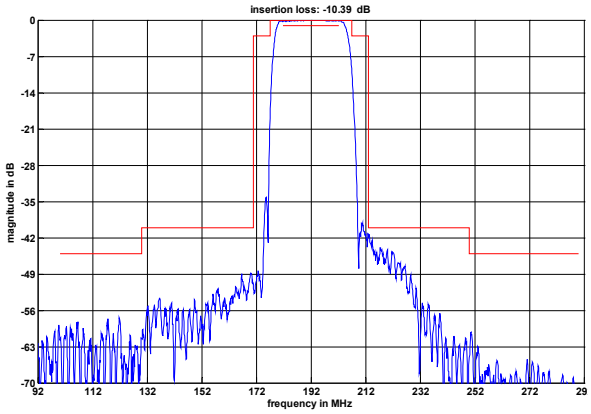
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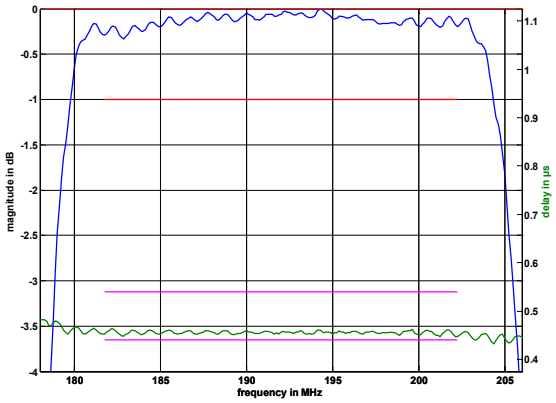
Checked / Approved:

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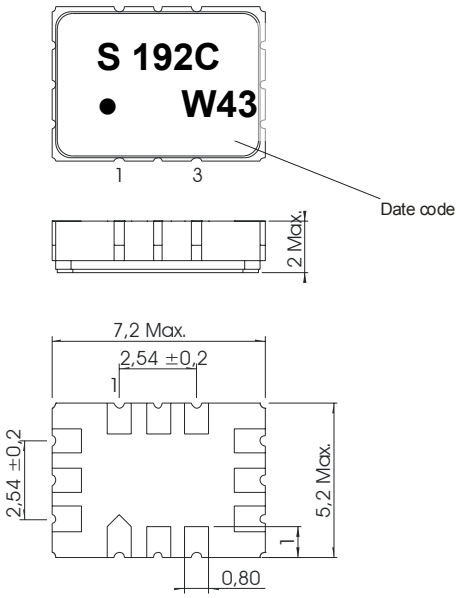
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Filter characteristic





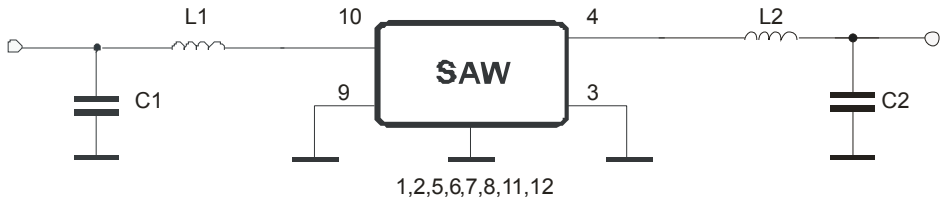
(All dimensions in mm)



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
V	2007
W	2008
X	2009
...	

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 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

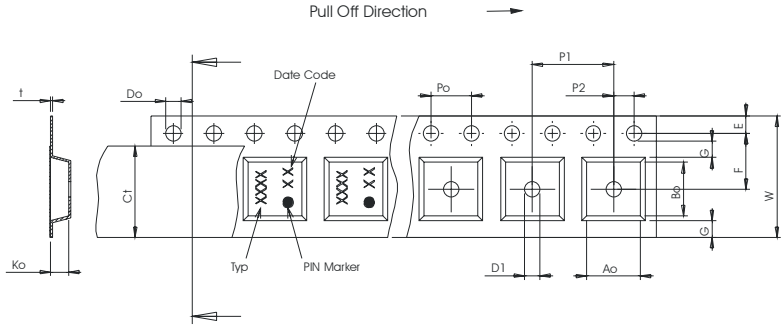
4. Resistance to solder heat (reflow): reflow possible: three times max.;
   for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

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

Packing

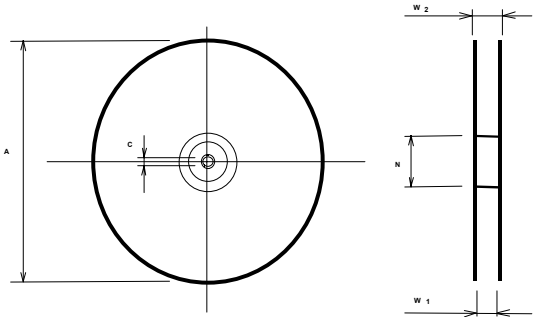
Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

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.

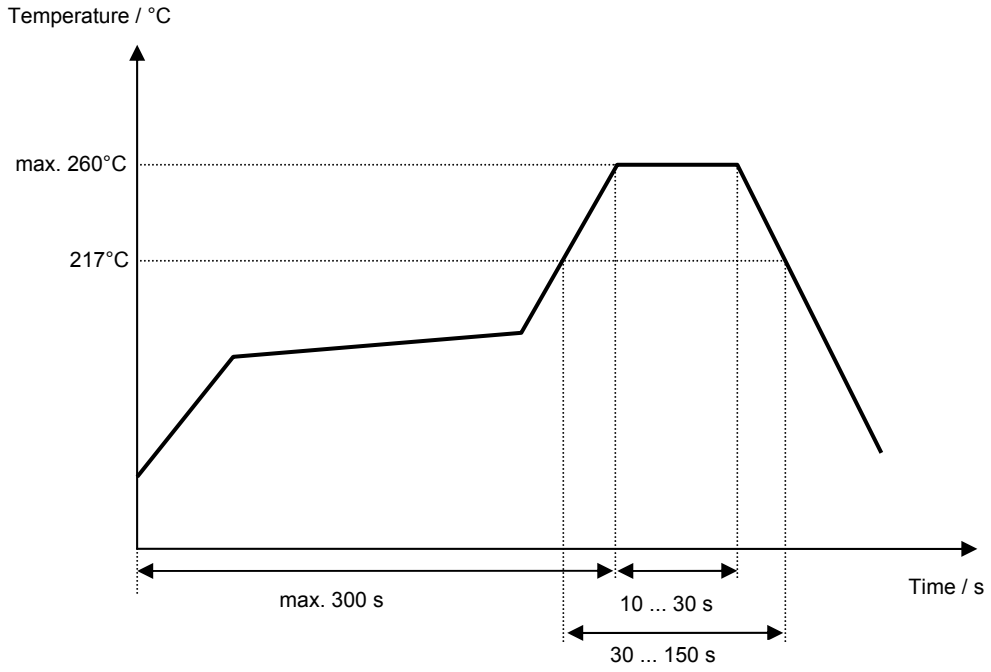
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Air reflow temperature conditions

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	- Generation of development specification	Strehl	17.10.2007
1.1	- added PB ripple over any 200 kHz - added Absolute group delay in PB - added Group delay ripple in PB - added GDR over any 200 kHz	Chilla	25.10.2007
1.2	- change of package drawing and pin connections	Pfeiffer	02.11.2007
1.3	- created filter specification - added terminating impedances - changed remark - added typical values - added temperature coefficient of frequency - added filter characteristic - added test circuit	Chilla	23.10.2008

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