VI TELEFILTER — Filter specification — TFS 140AG — 1/5

Measurement condition

Ambient temperature: 23 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 333 Ω || -9.9 pF
Output: 326 Ω || -10.9 pF

Characteristics

Remark:
Reference level for the relative attenuation a_{rel} of the TFS 140AG 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 1dB filter attenuation level relative to the insertion loss a_e. The nominal frequency f_N is fixed at 140,0 MHz without tolerance. The given values for the relative attenuation a_{rel} and for the group delay ripple have to be reached 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	9.1	dB	max.	11.5	dB
Nominal frequency	f_N	140	MHz		140	MHz
Passband	PB	-		f_N ±	7,5	MHz
Pass band ripple	p-p	0.2	dB	max.	0.8	dB
Relative attenuation	a_{rel}					
f_N ... f_N ± 9,5 MHz		0.3	dB	max.	1	dB
f_N - 139 MHz ... f_N - 18 MHz		45	dB	min.	37	dB
f_N - 18 MHz ... f_N - 14 MHz		23	dB	min.	10	dB
f_N + 14 MHz ... f_N + 18 MHz		14	dB	min.	10	dB
f_N + 18 MHz ... f_N + 360 MHz		43	dB	min.	37	dB
Absolute group delay in PB**		524	ns			
Group delay ripple in PB**	p-p	30	ns	max.	50	ns
Phase linearity in PB**	p-p	2.5	deg	max.	6	deg
Input power level ***		-		max.	21	dBm
Operating temperature range	OTR	-		-25 °C.....	+70 °C	
Storage temperature range		-		-40 °C.....	+85 °C	
Temperature coefficient of frequency	TC_f ****	-94	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.
**) Maximum variation of the mean value measured in PB within operating temperature range.
***) Maximum value for 10 years operation.
****) $\Delta f_C(Hz) = TC_f(ppm/K) \times (T - T_o) \times f_{To}$ (MHz).

Generated:

Checked / Approved:

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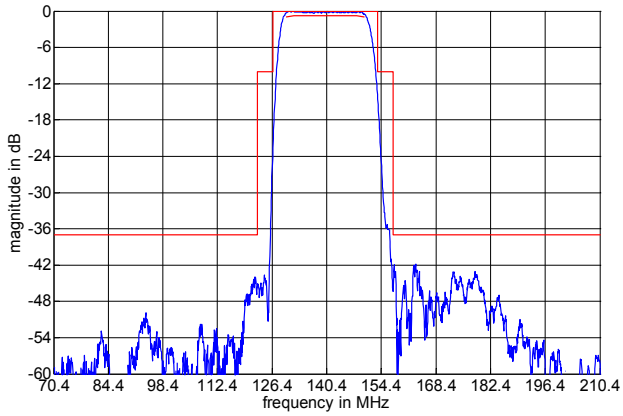
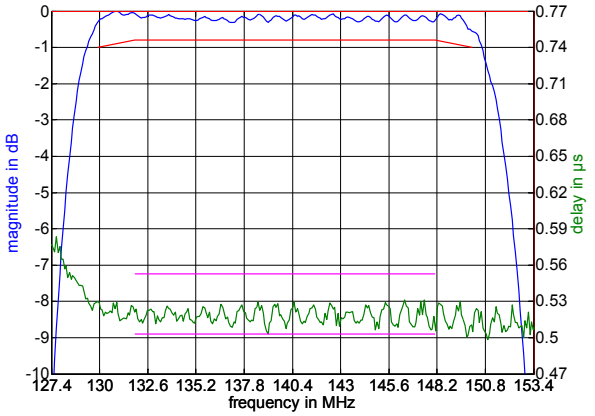
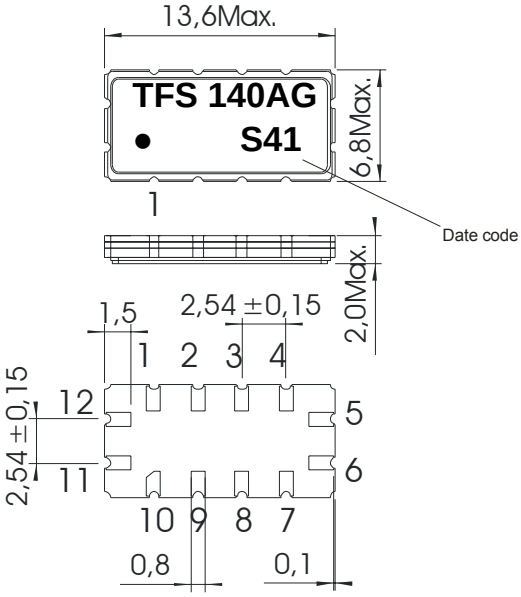
Filter characteristic





Construction and pin connection

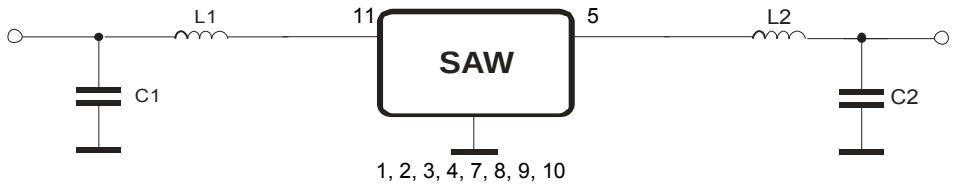
(All dimensions in mm)



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

Date code:	Year + week
S	2004
T	2005
U	2006
...	

50 Ohm Test circuit



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Stability characteristics

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

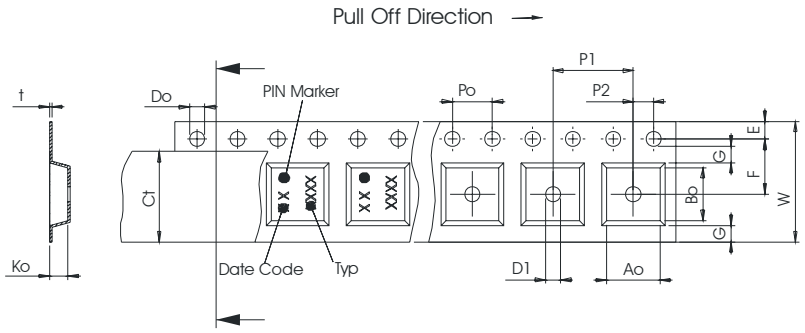
1. Shock:	500g, 18 ms, half sine wave, 3 shocks each plane; DIN IEC 68 T2 - 27
2. Vibration:	10 Hz to 500 Hz, 0,35 mm or 5 g respectively, 1 octave per min, 10 cycles per plan, 3 plans; DIN IEC 68 T2 - 6
3. Change of temperature:	-55 °C to 125°C / 30 min. each / 10 cycles DIN IEC 68 part 2 – 14 Test N
4. Resistance to solder heat (reflow):	reflow possible: 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

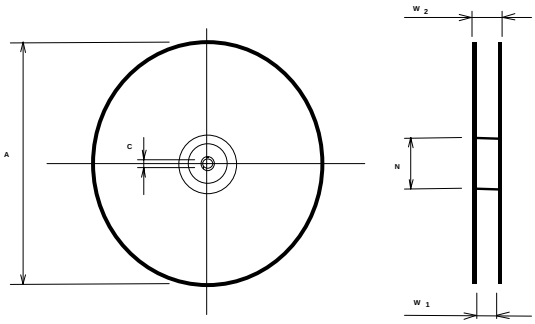
Tape & Reel: IEC 286 – 3, with exeption of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

max. pieces of filters peer 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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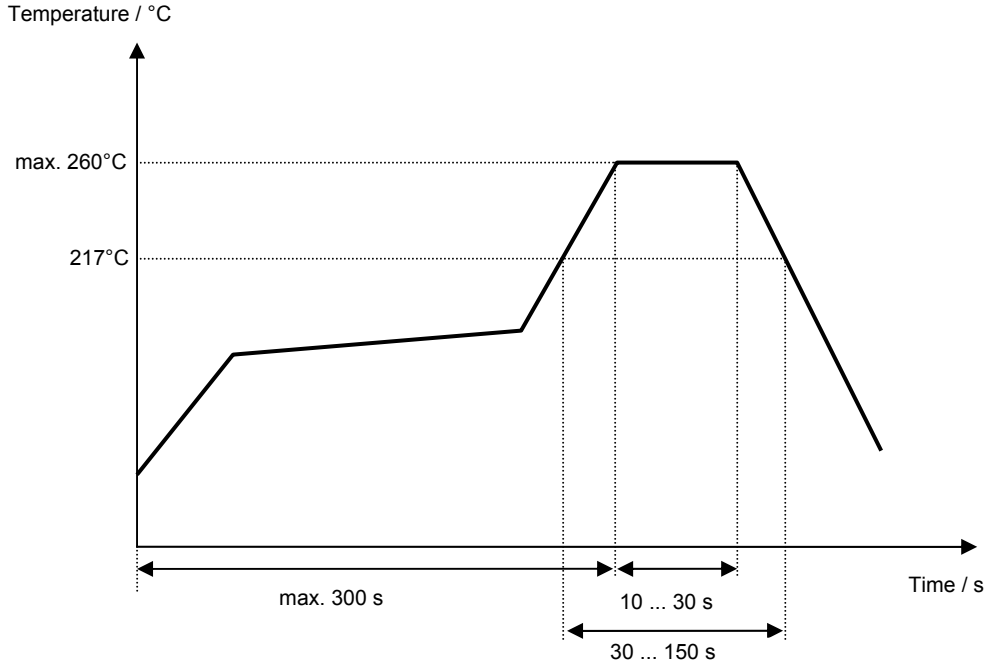
Air reflow temperature conditions

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



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History :

Version	Reason of Changes	Name	Date
1.0	Generate development specification	Chilla	18.06.2004
1.1	decreased passband added relative attenuation at fn+/-14MHz	Chilla	08.09.2004
1.2	created filter specification added termination impedances added typical values changed insertion loss changed passband changed ripple in passband changed frequency limit at 10 dB and 37 dB relative attenuation changed group delay ripple changed phase linearity added filter characteristic added test circuit	Chilla	08.10.2004
1.3	added typical values for absolute group delay Added comments for RoHS compliance Update of reflow profile	Chilla	02.02.2006

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