Measurement condition

Ambient temperature: 23 °C
Input power level: 0 dBm
source impedance (balanced): 200 Ω
load impedance (balanced): 200 Ω
Terminating impedance: *
Input: 258 Ω || -7.2 pF
Output: 258 Ω || -7.2 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of the TFS134D 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 134,0 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	14,2	dB	max.	15,5	dB
Nominal frequency	f_N				134,0	MHz
Passband	PB			f_N ±	10	MHz
Pass band ripple		0,1	dB	max.	2,0	dB
Bandwidth						
3 dB		22,5	MHz	min.	20	MHz
Relative attenuation	a_{rel}					
f_N - 8,5 MHz … f_N + 8,5 MHz		2,4	dB	max.	3	dB
f_N - 50 MHz … f_N - 35 MHz		45	dB	min.	40	dB
f_N - 35 MHz … f_N - 25 MHz		41	dB	min.	30	dB
f_N - 25 MHz … f_N - 15 MHz		12	dB	min.	10	dB
f_N + 15 MHz … f_N + 25 MHz		12	dB	min.	9	dB
f_N + 25 MHz … f_N + 35 MHz		41	dB	min.	30	dB
f_N + 35 MHz … f_N + 50 MHz		45	dB	min.	37	dB
Group delay ripple in f_N ± 4 MHz *)	GDR	8	ns	max.	±8	ns
Group delay ripple in PB *)	GDR	8	ns	max.	±9	ns
Group delay variation (unit to unit)*) **)				max.	±5	ns
Return loss within PB		8	dB	min.	6	dB
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 ***)	-94	ppm/K			

*) time gating window 0 … 0.5µs
**) Measured at centre frequency, and averaged value to account for unit to unit variation and different bandwidth variants
***) $\Delta f_C(Hz) = Tc_f(ppm/K) \times (T - T_o) \times f_{CAT}$ (MHz).

Generated:

Checked / Approved:

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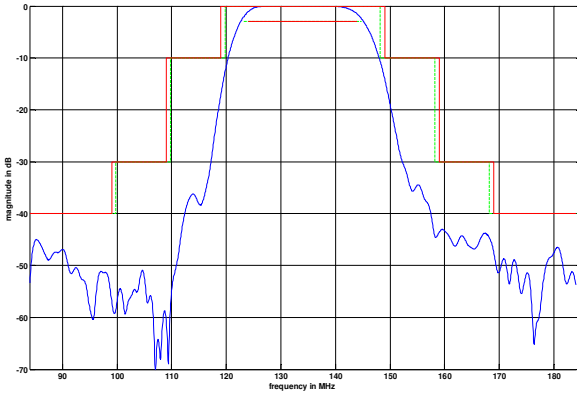
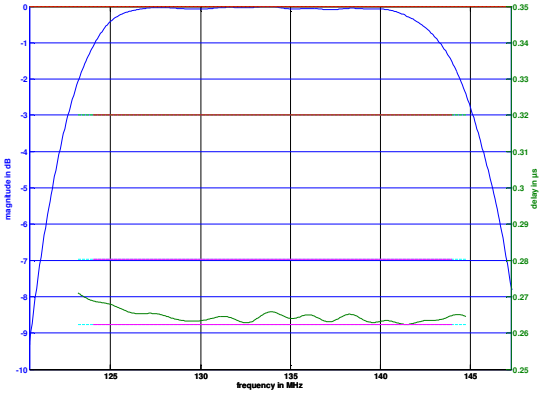
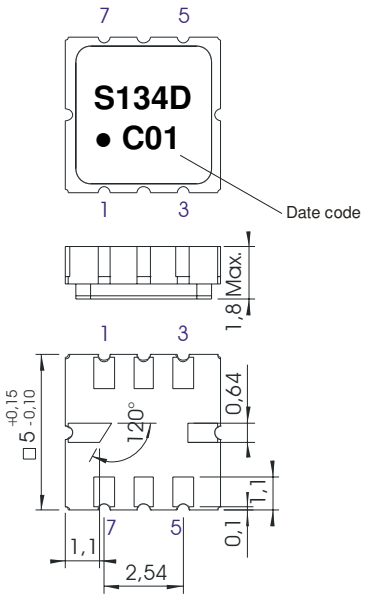
Filter characteristic





Construction and pin connection

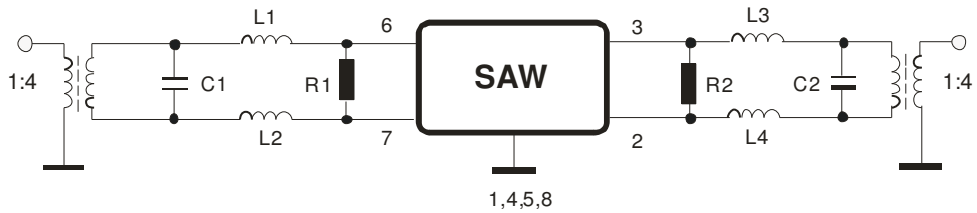
(All dimensions in mm)



1	Ground
2	Output 2
3	Output 1
4	Ground
5	Ground
6	Input 2
7	Input 1
8	Ground

Date code:	Year + week
C	2012
D	2013
E	2014
...	

50 Ω Test circuit



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Stability characteristics, reliability

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

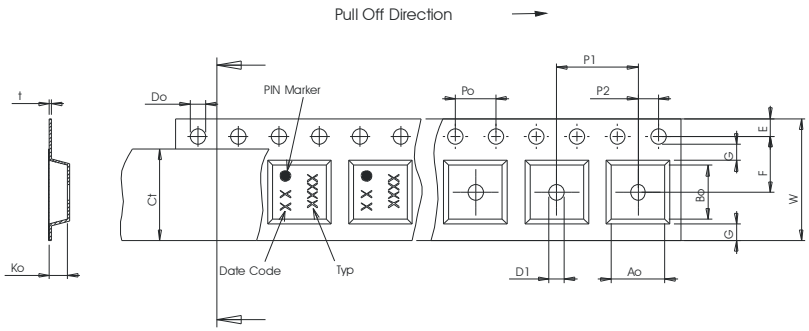
1. Shock:	500g, 1 ms, half sine wave, 3 shocks each plane; DIN IEC 68 T2 - 27
2. Vibration:	10 Hz to 500 Hz, 0,35 mm or 5 g respectively, 1 octave per min, 10 cycles per plane, 3 planes; DIN IEC 68 T2 - 6
3. Change of temperature:	-55 °C to 125°C / 30 min. each / 10 cycles DIN IEC 68 part 2 – 14 Test N
4. Resistance to solder heat (reflow):	reflow possible: three times max.; for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;
5. ESD	MIL-STD-883E using coupling network of ISO 10605 and EN 6100-4-2 HBM:250V;

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

Packing

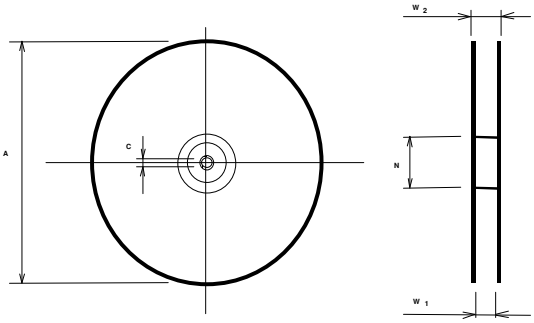
Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

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	: 12,00	
Po	: 4,00	
Do	: 1,50	
E	: 1,75	
F	: 5,50	
G(min)	: 0,75	
P2	: 2,00	
P1	: 8,00	
D1(min)	: 1,50	
Ao	: 5,30	
Bo	: 5,30	
Ct	: 9,2	± 0,1



Reel (all dimensions in mm)

A	:330	
W1	: 12,4	+2/-0
W2(max)	: 18,4	
N(min)	: 50	
C	: 13,0	

The minimum bending radius is 45 mm.

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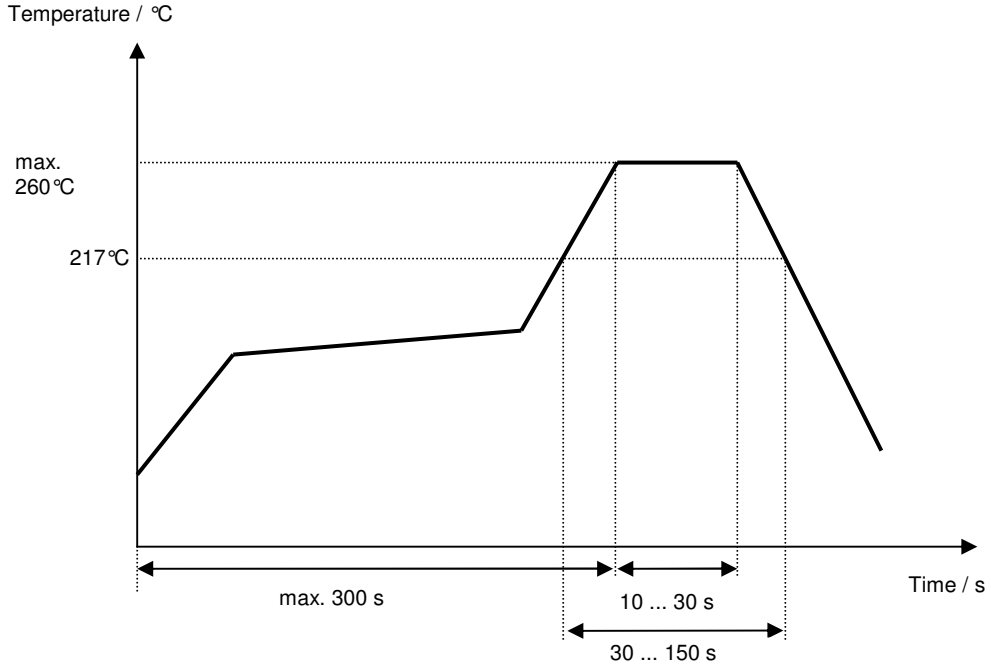
Air reflow temperature conditions

Conditions	**Exposure**
Average ramp-up rate (30℃ to 217℃)	less than 3℃/second
> 100℃	between 300 and 600 seconds
> 150℃	between 240 and 500 seconds
> 217℃	between 30 and 150 seconds
Peak temperature	max. 260℃
Time within 5℃ of actual peak temperature	between 10 and 30 seconds
Cool-down rate (Peak to 50℃)	less than 6℃/second
Time from 30℃ 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	14.02.2011
1.1	- Changed pin connection	Chilla	21.06.2011
1.2	- Created filter specification - Added terminating impedance - Added typical values - Changed triple transit delay - Added filter characteristic - Added test circuit - Changed packing	Chilla	03.01.2012
1.3	- Changed input power level	Chilla	27.03.2012
1.4	- Changed relative attenuation	Chilla	01.06.2012
2.0	- Added time gating window - Removed triple transit level and triple transit delay	Chilla	02.11.2012

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