Measurement condition

Ambient temperature: 23 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 183 Ω || -12.5 pF
Output: 172 Ω || -12.6 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of the TFS281 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 281,6 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	9	dB	max. 12,0	dB
Nominal frequency	f_N			281,6	MHz
Passband	PB	47,2	MHz	f_N ± 20,0	MHz
Pass band ripple p-p		0,4		max. 1	dB
Relative attenuation	a_{rel}				
f_N ... f_N ± 20 MHz		0,4	dB	max. 1	dB
10 MHz ... f_N - 40 MHz		47	dB	min. 40	dB
f_N - 40 MHz ... f_N - 31,2 MHz		41	dB	min. 37	dB
f_N + 40 MHz ... f_N + 31,2 MHz		43	dB	min. 37	dB
f_N + 40 MHz ... f_N + 220 MHz		43	dB	min. 40	dB
Group delay ripple within PB		35	ns	max. 75	ns
Return loss within PB		14	dB	min. 10	dB
Input power level		-		max. 15	dBm
Operating temperature range	OTR	-		- 40 °C ... + 85 °C	
Storage temperature range		-		- 40 °C ... + 85 °C	
Temperature coefficient of frequency	TC_f ***	-95	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.
**) Δf_C(Hz) = Tc_f(ppm/K) x (T - T_o) x f_N (MHz).

Generated:

Checked / Approved:

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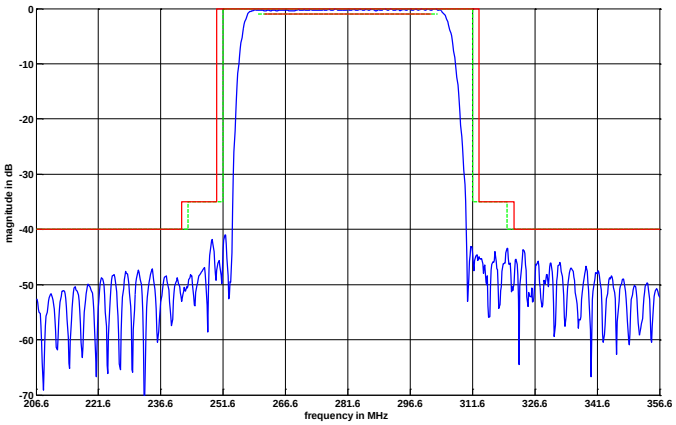
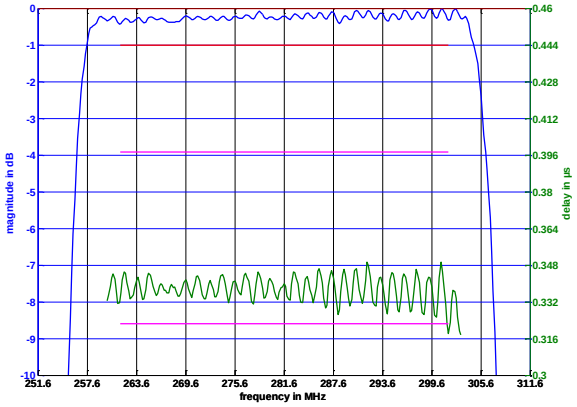
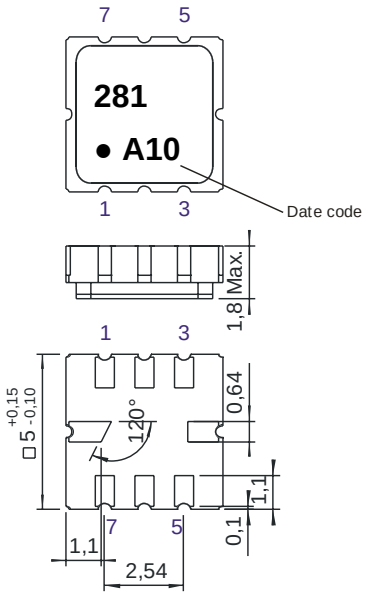
Filter characteristic





Construction and pin connection

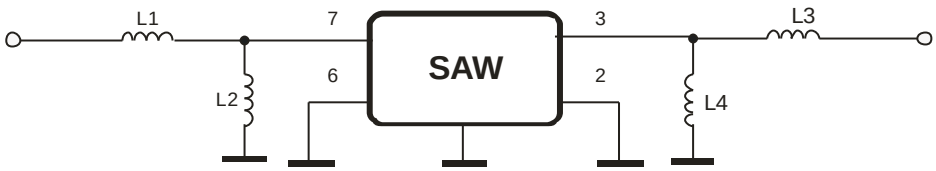
(All dimensions in mm)



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

Date code:	Year + week
X	2009
A	2010
B	2011
...	

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)

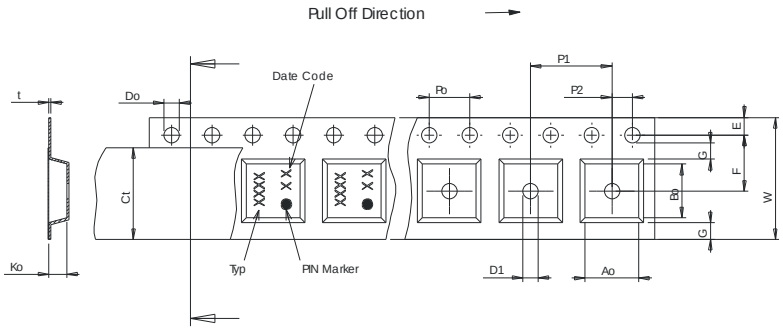
Packing

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

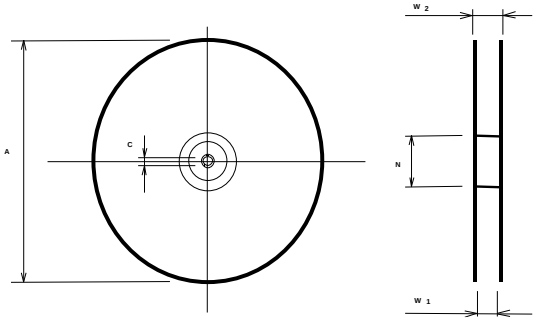
Tape (all dimensions in mm)

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	:	9,5



Reel (all dimensions in mm)

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



The minimum bending radius is 45 mm.

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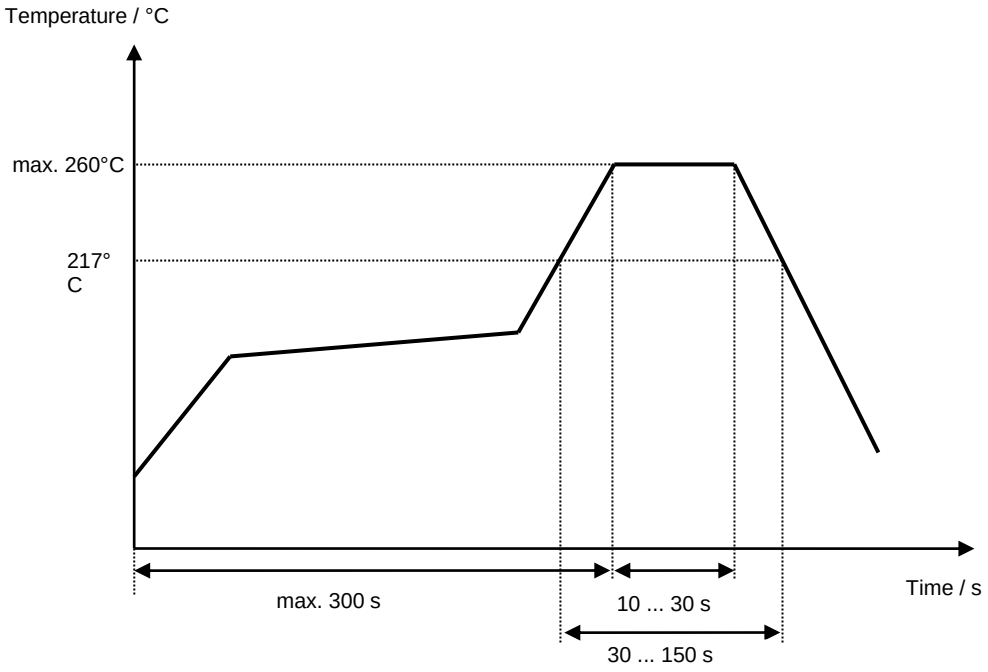
Air reflow temperature conditions

Conditions	**Exposure**
Average ramp-up rate (30°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	03.06.2009
1.1	- Changed relative attenuation	Chilla	03.07.2009
1.2	- Created filter specification - Added terminating impedance - Added typical values - Changed pin connection - Added filter characteristics - Added test circuit	Chilla	15.12.2009
2.0	- Update of stopband attenuation on customer request	Chilla	12.03.2010
2.1	- Customer request improve rej f_N ±31,2 MHz ...f_N ±40 MHz, was 35dB	Jaffer	30.03.2010
2.2	- Added temperature coefficient of frequency - Changed remark	Chilla	24.06.2010

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