

Microchip**Filter specification****TFS280H****1/5****Measurement condition**

Ambient temperature T_A :	23	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	130 Ω	-14 pF
Output:	200 Ω	-9 pF

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of the TFS280H 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 280.0 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.

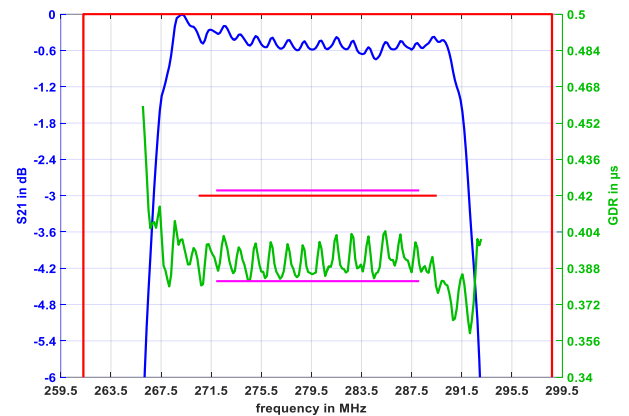
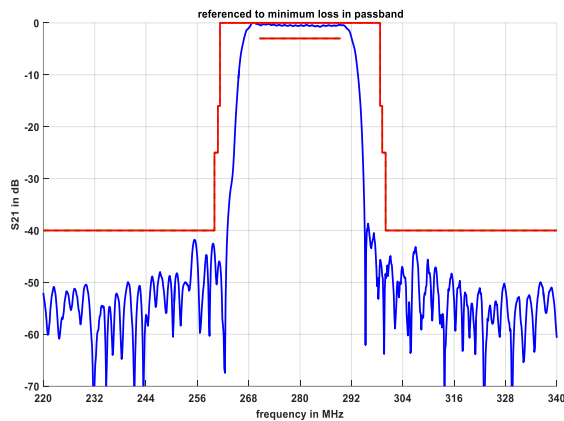
D a t a		typ. value		tolerance / limit		
Insertion loss (reference level)		a_e	7.2	dB	max.	10 dB
Nominal frequency		f_N			280	MHz
Passband		PB			$f_N \pm$	9.5 MHz
Pass band ripple			0.7	dB	max.	3 dB
Relative attenuation		a_{rel}				
f_N	... $f_N \pm$	9.5 MHz	0.8	dB	max.	3 dB
$f_N \pm$	18.7 MHz ... $f_N \pm$	19.2 MHz	35	dB	min.	16 dB
$f_N \pm$	19.2 MHz ... $f_N \pm$	20 MHz	30	dB	min.	25 dB
$f_N \pm$	20 MHz ... $f_N \pm$	100 MHz	43	dB	min.	40 dB
Group delay ripple		GDR				
$f_N -$	8.1 MHz ... $f_N +$	8.1 MHz	29	ns	max.	40 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 *)	-87	ppm/K		

*) $\Delta f = TC_f(T - T_A)f_N$ **Generated:****Checked / Approved:**

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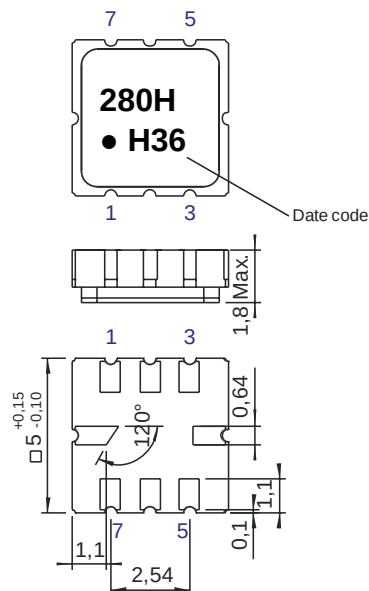
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Filter characteristic



Construction and pin connection

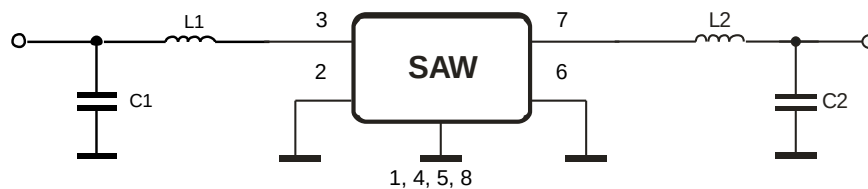
(All dimensions in mm)



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

Date code: Year + week
 H 2016
 J 2017
 K 2018
 ...

Test circuit



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Stability characteristics, reliability

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

1. Shock: 500 g, 1 ms, half sine wave, 3 shocks each plane;
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 2000 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 / 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 refer to the attached "Air reflow temperature conditions" on page 4;
5. SAW devices are Electrostatic Discharge (ESD) sensitive devices.

This filter is RoHS compliant (2011/65/EU)

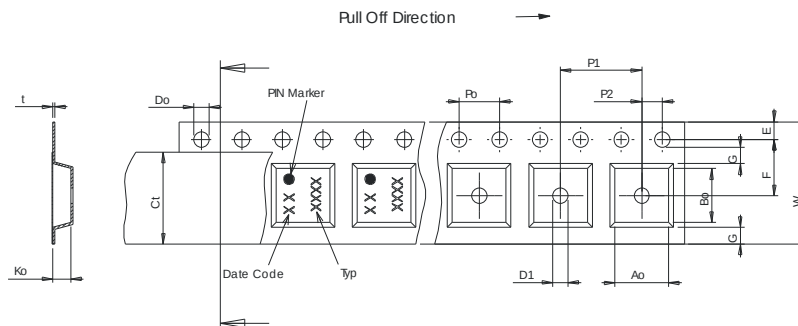
Packing

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;

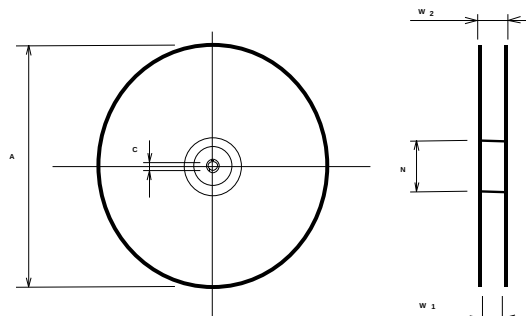
max. pieces of filters per reel:	3000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

Tape (all dimensions in mm)

W	: 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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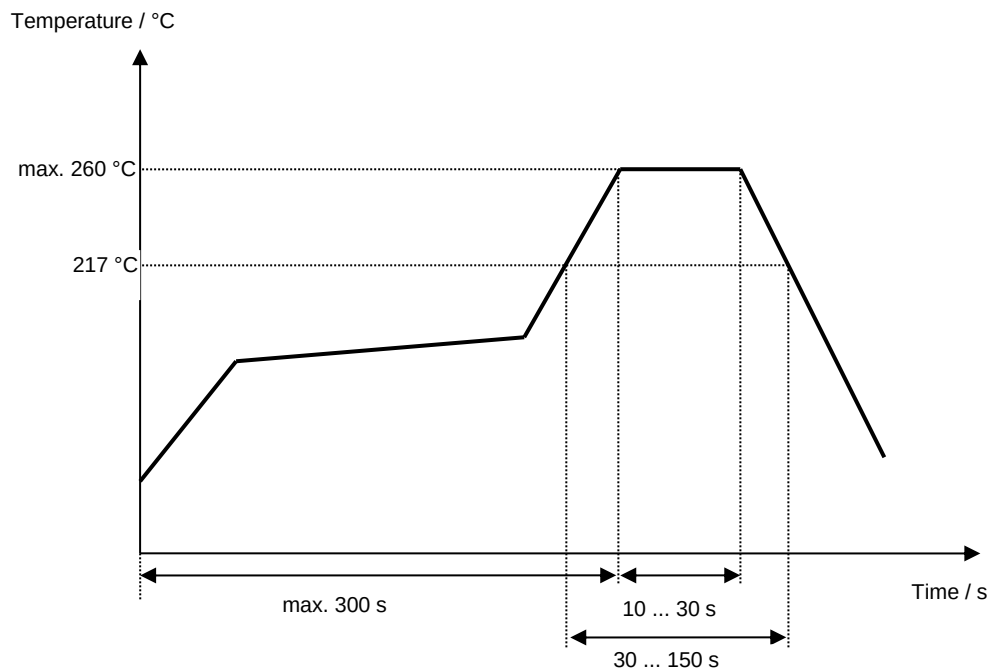
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Air reflow temperature conditions

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

Microchip**Filter specification****TFS280H****5/5****History**

Version	Reason of Changes		Name	Date
1.0	generate specification	Pfeiffer	17.03.2003	
1.1	frequency range for group delay ripple (GDR) changed pin 6 set to output rf return	Chilla	02.06.2003	
1.2	Reel information corrected. Preliminary values for termination impedances added. 50 Ω matching network added. Relative attenuation of 16 dB and 25 dB added.	Dr. Wall	19.06.2003	
1.3	insertion loss changed. temperature coefficient of frequency added. 50 Ω matching network modified. termination impedance changed	Chilla	14.08.2003	
1.4	typical values added.	Chilla	13.01.2004	
1.5	filter characteristics added test circuit updated stability characteristics updated air reflow temperature conditions updated	Chilla	03.03.2006	
2.0	remark changed GDR changed	Chilla	06.09.2016	

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