

Microchip**Filter specification****TFS 180D****1/5****Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	300 Ω	-14,7 pF
Output:	315 Ω	-14,2 pF

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of the TFS 180D 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 180 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	5,1 dB	max.	8	dB
Nominal frequency		f_N	-		180	MHz
Passband		PB	-	$f_N \pm$	1	MHz
Pass band ripple		p-p	0,4 dB	max.	1	dB
Bandwidth		BW				
1	dB		2,44 MHz	min.	2	MHz
30	dB		4,8 MHz	max.	5,5	MHz
Relative attenuation		a_{rel}				
$f_N \dots$	$f_N \pm$	1 MHz	0,7 dB	max.	1	dB
$f_N - 178$	$f_N -$	2,75 MHz	35 dB	min.	30	dB
$f_N + 2,75$	$f_N +$	3,3 MHz	35 dB	min.	30	dB
$f_N + 3,3$	$f_N +$	7,5 MHz	29 dB	min.	27	dB
$f_N + 7,5$	$f_N +$	820 MHz	34 dB	min.	30	dB
Group delay		mean value in PB	0,36 µs	max.	0,6	µs
Group delay ripple within PB		p-p	245 ns	max.	300	ns
Return loss within PB			18 dB	min.	10	dB
Input power level			-	max.	10	dBm
Intermodulation IIP3***			-	min.	30	dBm
Operating temperature range		OTR	-	- 20 °C ... + 80 °C		
Storage temperature range			-	- 40 °C ... + 85 °C		
Temperature coefficient of frequency		TC_f **	-18 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.

**) $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_0) \times f_N(\text{MHz})$.

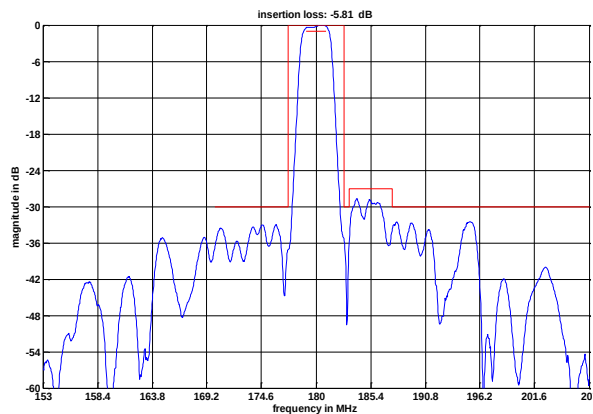
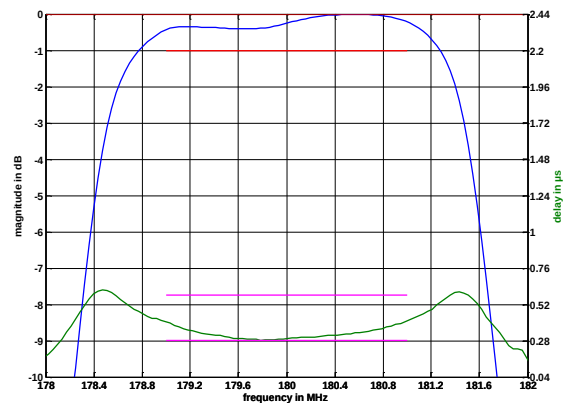
***) $f_{in1} = 180,1 \text{ MHz}$; $f_{in2} = 180,2 \text{ MHz}$; $P_{in} = 0 \text{ dBm}$ $f_{\text{measurement}} = 180,0 \text{ MHz}$

Generated:**Checked / Approved:**

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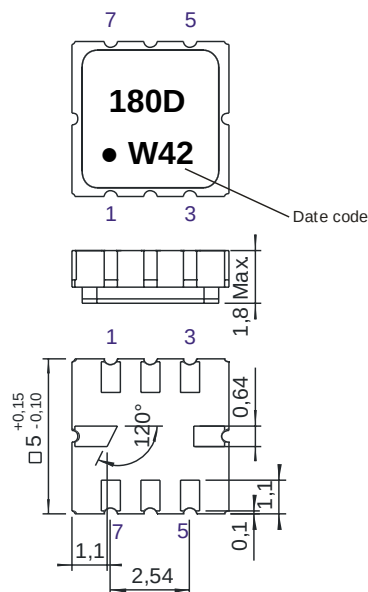
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Filter characteristic



Construction and pin connection

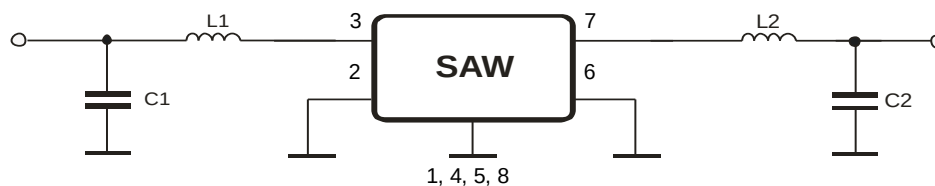
(All dimensions in mm)



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

Date code: Year + week
W 2008
X 2009
A 2010
...

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;
5. ESD ANSI/ESD S20.20-1999, class 1A for HBM

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

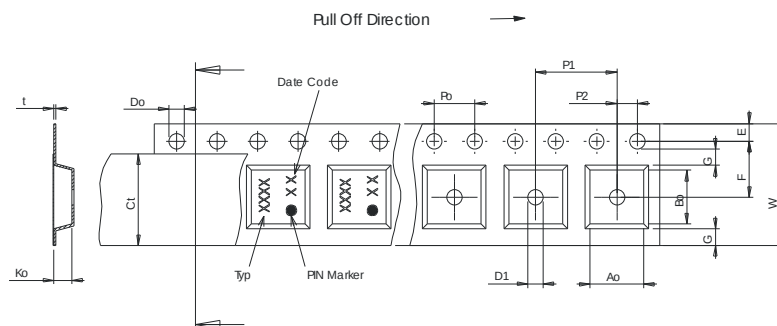
Packing

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;

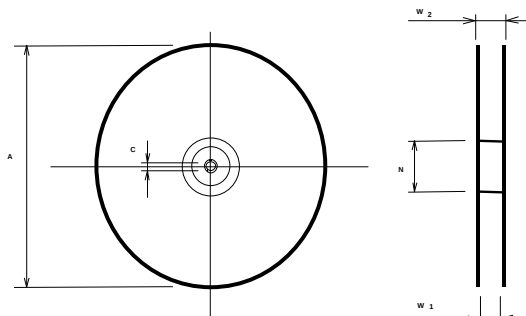
max. pieces of filters per reel:	3000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

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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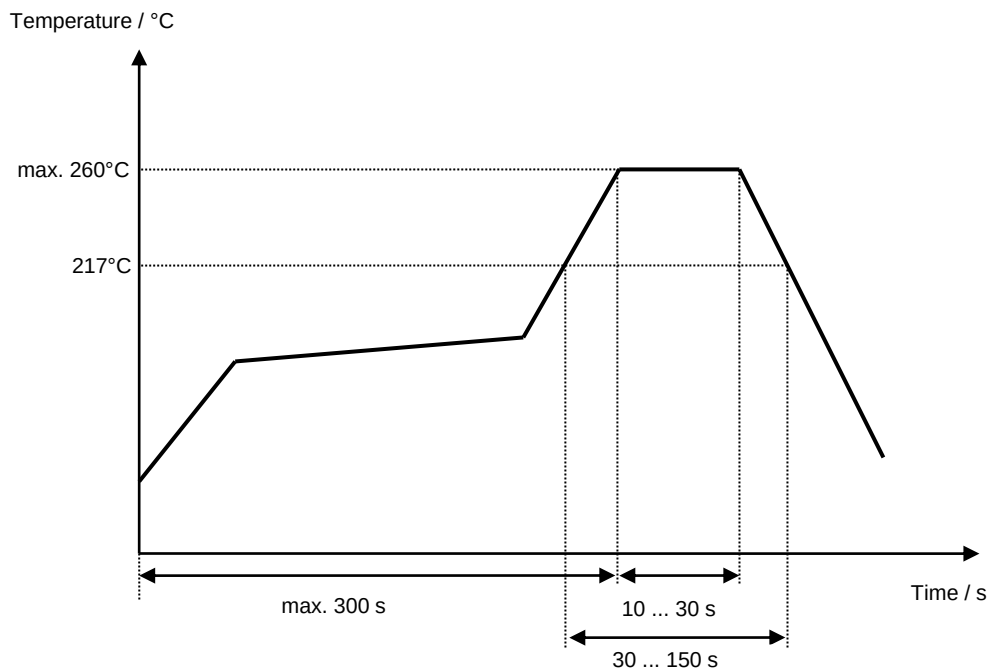
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Air reflow temperature conditions

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 Frequency Technology GmbH****Potsdamer Straße 18****D 14 513 TELTOW / Germany****Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30**

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Microchip**Filter specification****TFS 180D****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	Strehl	26.03.2008
1.1	- change of relative attenuation - add of max. input power level, intermodulation and mean value of group delay	Pfeiffer	08.04.2008
1.2	- add of typical values, filter characteristics, matching configuration and terminating impedances - change of relative attenuation	Pfeiffer	05.09.2008
1.3	- change pin connection	Strehl	17.10.2008

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