

Measurement condition

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	205.51 Ω	-23.24 pF
Output:	141.63 Ω	- 31.49 pF

Characteristics**Remark:**

The reference level for the relative attenuation a_{rel} of the TFS180L 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 180,0 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	8	dB	max. ± 2 dB
Nominal frequency	f_N	-		180 MHz
Passband	PB	-		$f_N \pm 4.0$ MHz
Pass band ripple $f_N \dots f_N \pm 4.0$ MHz (p-p)		-	dB	max. 1 dB
Relative attenuation	a_{rel}			
f_N ... $f_N \pm 4.0$ MHz		0.4	dB	max. 1 dB
$f_N \pm 4.0$ MHz ... $f_N \pm 5.0$ MHz		2	dB	max. 3 dB
$f_N \pm 9.25$ MHz ... $f_N \pm 25.6$ MHz		38	dB	min. 30 dB
$f_N \pm 25.6$ MHz ... $f_N \pm 35.8$ MHz		47	dB	min. 43 dB
$f_N \pm 35.8$ MHz ... $f_N \pm 50$ MHz		49	dB	min. 45 dB
Absolute group delay within PB ***		444	ns	max. ± 30 ns
Return loss within PB		17	dB	min. 9 dB
Input Power		-		max. 10 dBm
Operating temperature range	OTR	-		-40°C ... + 85 °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.

**) $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_A) \times f_{CAT}(\text{MHz})$

***) Both delay and ripple variations are to be included, (temperature and manufacturing variations are also included).

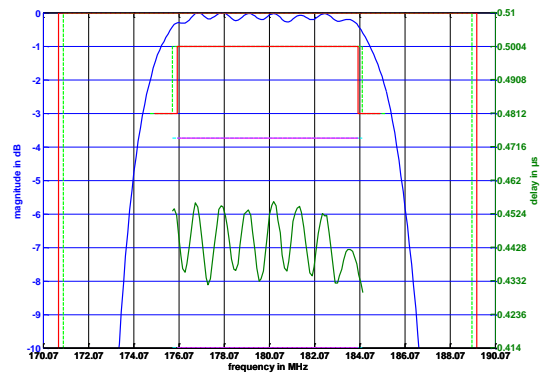
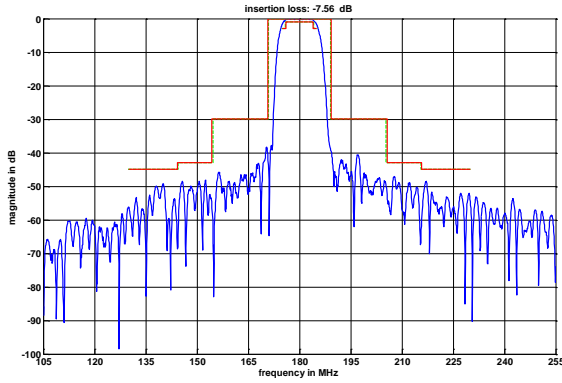
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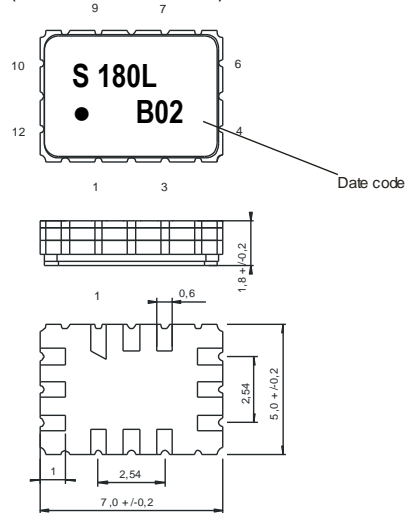
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Filter characteristic



Construction and pin connection

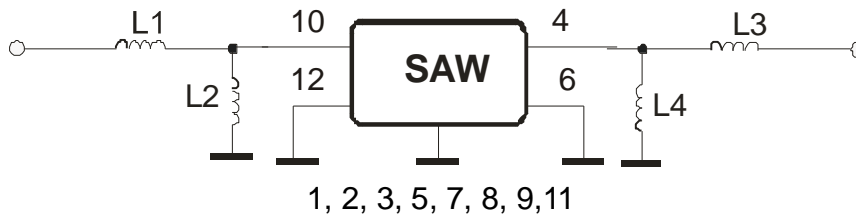
(All dimensions in mm)



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

Date code: Year + week
 B 2011
 C 2012
 D 2013
 ...

50 Ohm 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)

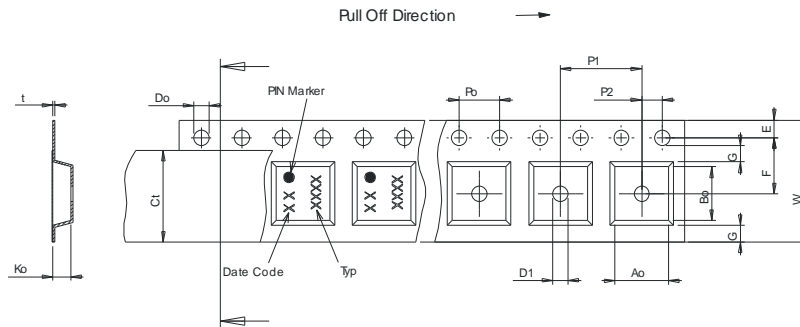
Packing

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

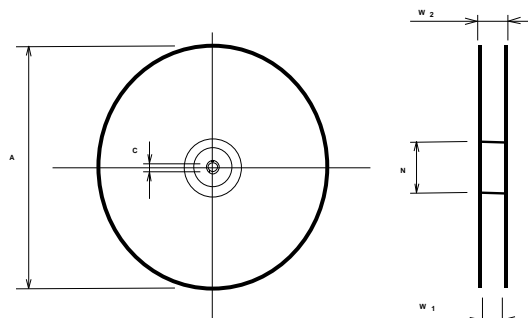
Tape (all dimensions in mm)

- W : 16,00 ± 0,3
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,1
- F : 7,50 ± 0,1
- G(min) : 0,60
- P2 : 2,00 ± 0,1
- P1 : 8,00 ± 0,1
- D1(min) : 1,50
- Ao : 5,50 ± 0,1
- Bo : 7,50 ± 0,1
- Ct : 13,5 ± 0,1



Reel (all dimensions in mm)

- A : 330
- W1 : 16,4 +2/-0
- W2(max) : 22,4
- N(min) : 50
- C : 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

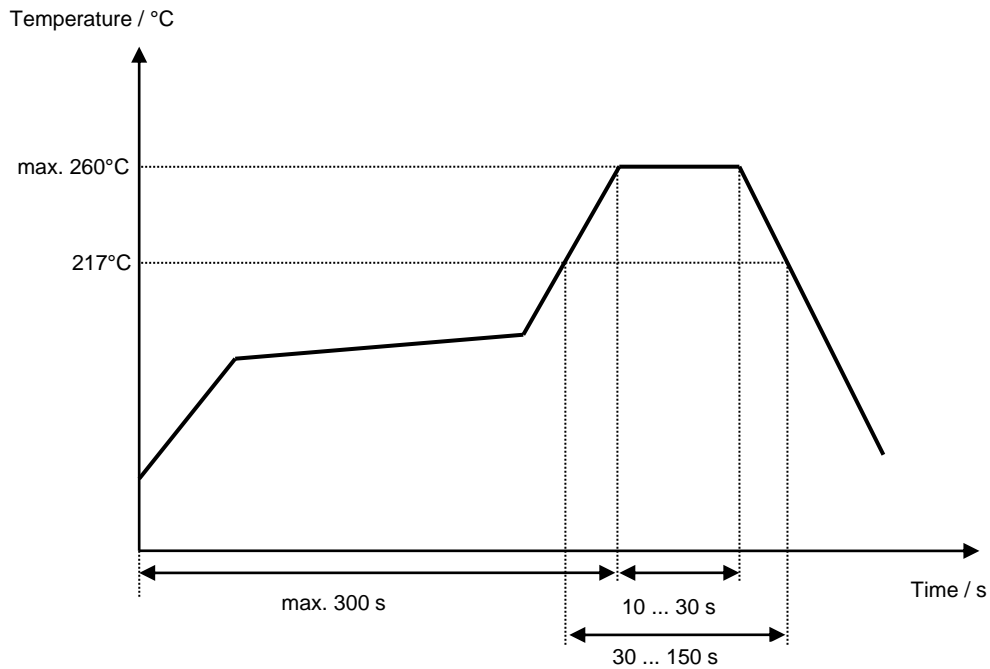
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Air reflow temperature conditions

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



History

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Version	Reason of changes	Name	Date
1.0	- Development specification	TCUK	08.12.2011
2.0	- Add typical values, plots etc... and change development to filter specification. - As agreed with the customer, amend limits for loss, return loss & group delay ripple.	TCUK	24.04.2012
2.1	- Removed RoHS compliance statement.	TCUK	01.05.2012
2.2	- Now the TFS180L is standard part i.e. Pads NOT coated with SN60/Pb40 - Remove statement 'Pads coated with SN60/Pb40' - Include RoHS compliance statement.	TCUK	28.02.2013