

<b>Microchip</b>	<b>Filter specification</b>	<b>TFS 1581</b>	<b>1/5</b>
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**Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	200	Ω
Output:	200	Ω

**Characteristics**

**Remark:**

The maximum attenuation in the passband is defined as the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 1581.5 MHz without any tolerance or limit. The values of absolute attenuation  $a_{abs}$  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		
<b>Insertion loss in PB</b>	$a_e$	4.0	dB	max.	5.0	dB
<b>Nominal frequency</b>	$f_N$	-			1581.5	MHz
<b>Passband</b>	PB	-			$f_N \pm 28.5$	MHz
<b>Passband variation</b>		0.6	dB	max.	3.0	dB
<b>Absolute attenuation</b>	$a_{abs}$					
0.3 MHz ... 1485 MHz		34	dB	min.	30	dB
1485 MHz ... 1510 MHz		14	dB	min.	7	dB
1665 MHz ... 1685 MHz		19	dB	min.	10	dB
1685 MHz ... 3000 MHz		38	dB	min.	30	dB
<b>Group delay ripple</b>						
1553 MHz ... 1585 MHz		4	ns	max.	10	ns
1593 MHz ... 1610 MHz		4	ns	max.	10	ns
<b>Group delay variation (unit to unit)</b>	*					
1553 MHz ... 1585 MHz		+/-2	ns	max.	+/-6	ns
1593 MHz ... 1610 MHz		+/-2	ns	max.	+/-6	ns
<b>Return loss within PB</b>		9	dB	min.	7	dB
<b>Input power level in PB</b>		-		max.	10	dBm
<b>Operating temperature range</b>	OTR	-			- 40 °C ... + 85°C	
<b>Storage temperature range</b>		-			- 40 °C ... + 85°C	
<b>Temperature coefficient of frequency</b>	$TC_f$ **	-76	ppm/K			

\*) measured at:  $f_N$ ,  $f_N + 28.5$  MHz,  $f_N - 28.5$  MHz

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

**Generated:**

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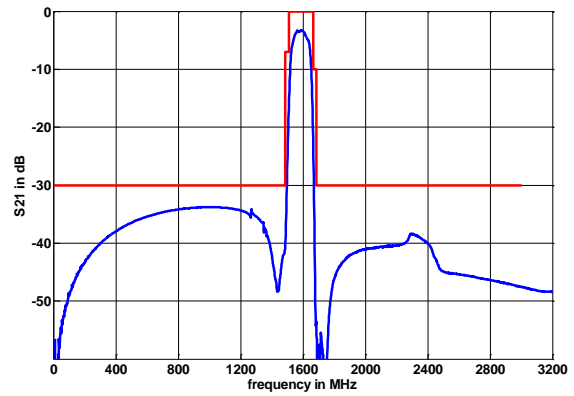
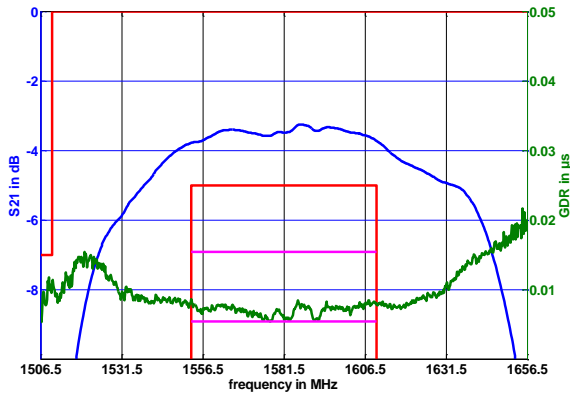
**Checked / Approved:**

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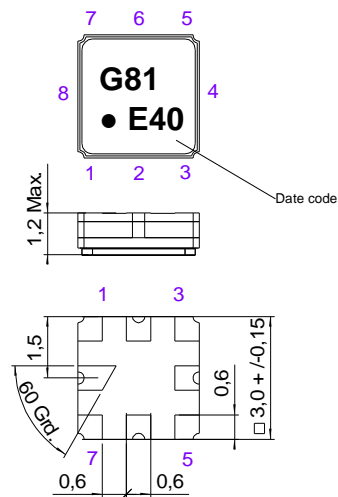
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**Filter characteristic**



**Construction and pin connection**

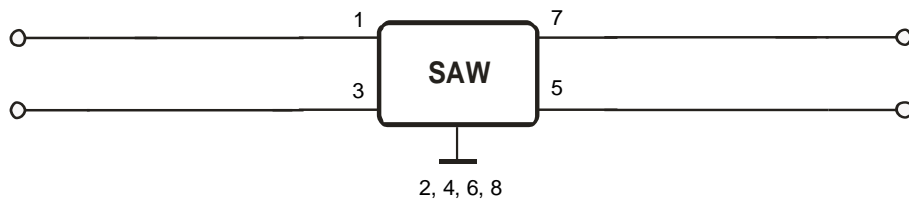
(All dimensions in mm)



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

Date code: Year + week  
 E 2014  
 F 2015  
 G 2016  
 ...

**200 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 / 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, see page 4: "Air reflow temperature conditions"
5. ESD ANSI/ESD S20.20-1999, class 1A for HBM

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

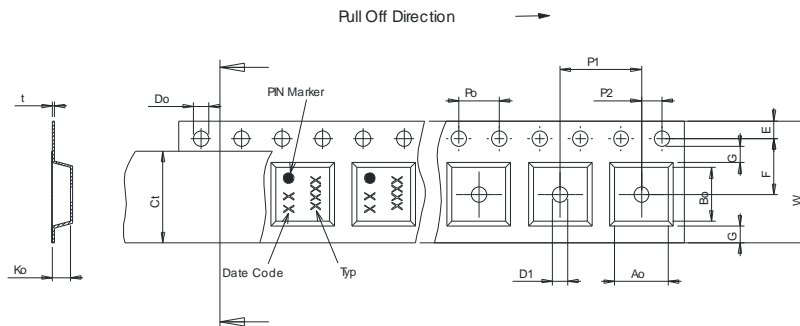
**Packing**

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

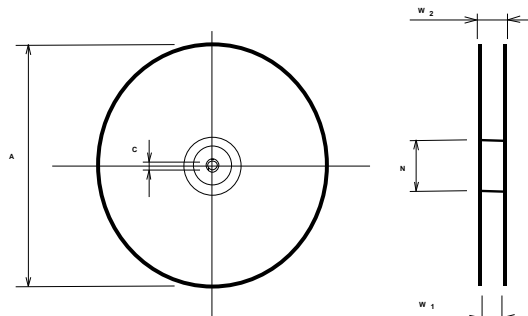
**Tape (all dimensions in mm)**

- W : 8,00 ± 0,3
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,1
- F : 3,50 ± 0,05
- G(min) : 0,75
- P2 : 2,00 ± 0,05
- P1 : 4,00 ± 0,1
- D1(min) : 1,50
- Ao : 3,25 ± 0,1
- Bo : 3,25 ± 0,1
- Ct : 5,3 ± 0,1



**Reel (all dimensions in mm)**

- A : 330 or 180
- W1 : 8,4 +1,5/-0
- W2(max) : 14,4
- N(min) : 60
- C : 13,0 ± 0,2



The minimum bending radius is 45 mm.

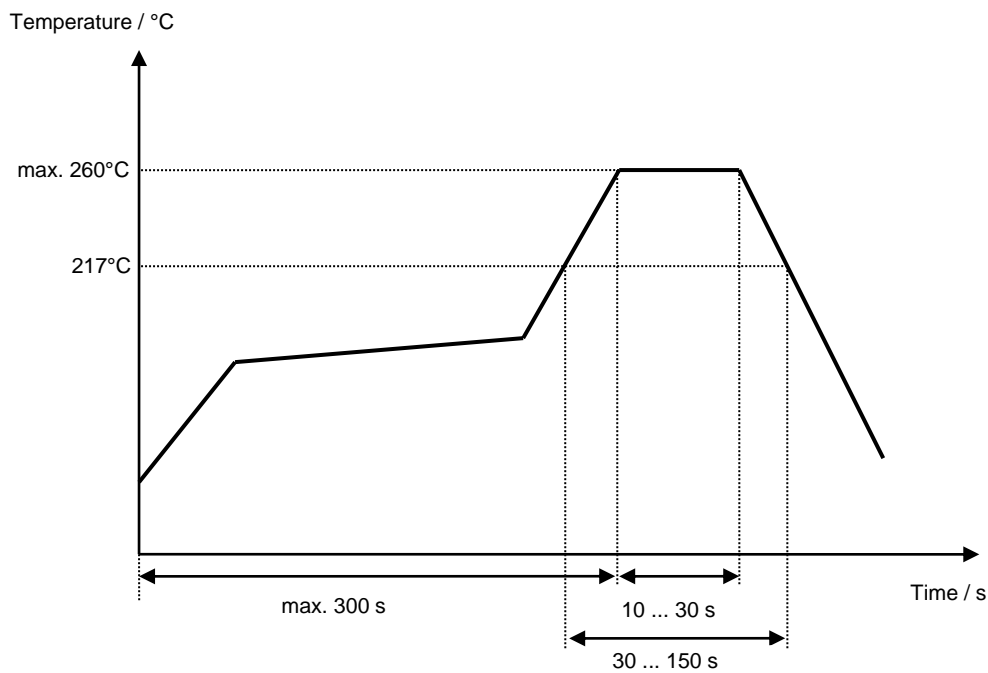
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**Air reflow temperature conditions**

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**



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**Microchip****Filter specification****TFS 1581****5/5**

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**History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	- Generation of development specification	A. Molke	12.08.2013
1.1	- Change from development spec to filter spec - Typical values added - Filter characteristic added	A. Molke	29.09.2014

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