

**Microchip****Filter specification****TFS 682****1/5****Measurement condition**

|                        |    |     |
|------------------------|----|-----|
| Ambient temperature:   | 23 | °C  |
| Input power level:     | 0  | dBm |
| Terminating impedance: |    |     |
| Input:                 | 50 | Ω   |
| Output:                | 50 | Ω   |

**Characteristics**

## Remark:

The maximum attenuation in the pass band is defined as the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 682 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.

| <b>D a t a</b>                              | <b>typ. Value</b> |     | <b>tolerance / limit</b> |                     |     |
|---------------------------------------------|-------------------|-----|--------------------------|---------------------|-----|
| <b>Insertion loss within PB</b>             | $a_e$             | 2,1 | dB                       | max. 3              | dB  |
| <b>Nominal frequency</b>                    | $f_N$             | -   |                          | 682                 | MHz |
| <b>Passband</b>                             | PB                | -   |                          | $f_N \pm 12$        | MHz |
| <b>Absolute attenuation</b>                 | $a_{abs}$         |     |                          |                     |     |
| $f_N \pm 80$ MHz ... $f_N \pm 149$ MHz      |                   | 45  | dB                       | min. 33,5           | dB  |
| $f_N + 149$ MHz ... $f_N + 300$ MHz         |                   | 49  | dB                       | min. 45             | dB  |
| 1 MHz ... 200 MHz                           |                   | 57  | dB                       | min. 50             | dB  |
| 200 MHz ... $f_N - 149$ MHz                 |                   | 62  | dB                       | min. 55             | dB  |
| <b>Group delay ripple within PB</b>         | p-p               | 20  | ns                       | max. 0,2            | μs  |
| <b>IIP3</b>                                 | *                 | -   |                          | min. 36             | dBm |
| <b>Input power level</b>                    |                   | -   |                          | max. 10             | dBm |
| <b>Operating temperature range</b>          | OTR               | -   |                          | - 10 °C ... + 75 °C |     |
| <b>Storage temperature range</b>            |                   | -   |                          | - 40 °C ... + 85 °C |     |
| <b>Temperature coefficient of frequency</b> | $TC_f$ **         | -76 | ppm/K                    | -                   |     |

\*)  $f_{in1} = f_C - 14$  MHz;  $f_{in2} = f_C - 14,4$  MHz;  $P_{in} = 0$  dBm;  $f_{measurement1} = f_C - 13,6$  MHz;  $f_{measurement2} = f_C - 14,8$  MHz. The centre frequency  $f_C$  is the arithmetic mean value of the upper and lower frequencies at the 3 dB filter attenuation level relative to the insertion loss  $a_e$ .

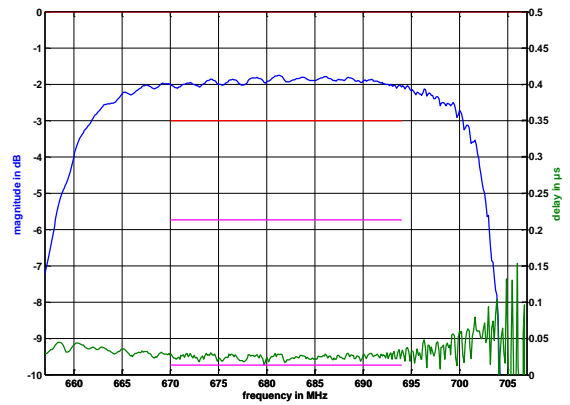
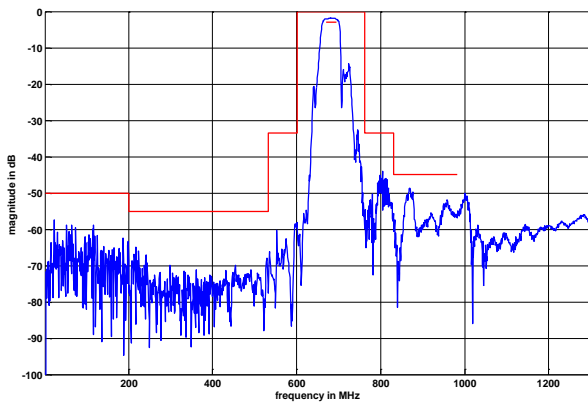
\*\*\*)  $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_0) \times f_{T_0}(\text{MHz})$

**Generated:****Checked / Approved:**

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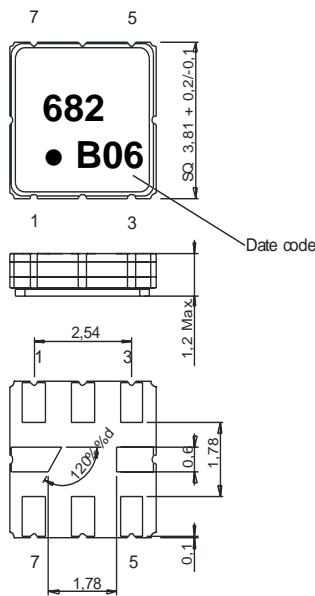
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**Filter characteristic**



**Construction and pin connection**

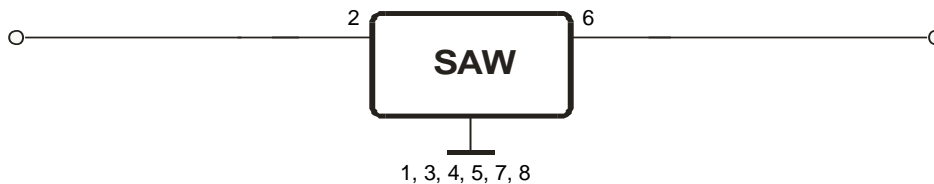
(All dimensions in mm)



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

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

**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;

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

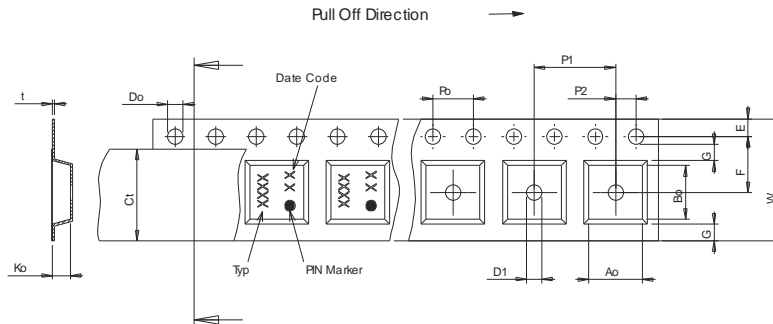
**Packing**

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 |

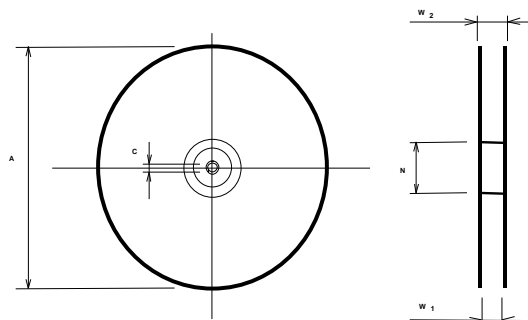
**Tape (all dimensions in mm)**

- W : 12,00 ± 0,3
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,1
- F : 5,50 ± 0,05
- G(min) : 0,75
- P2 : 2,00 ± 0,05
- P1 : 8,00 ± 0,1
- D1(min) : 1,50
- Ao : 4,30 ± 0,1
- Bo : 4,30 ± 0,1
- Ct : 9,5 ± 0,1



**Reel (all dimensions in mm)**

- A : 330
- W1 : 12,4 +2/-0
- W2(max) : 18,4
- N(min) : 50
- C : 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

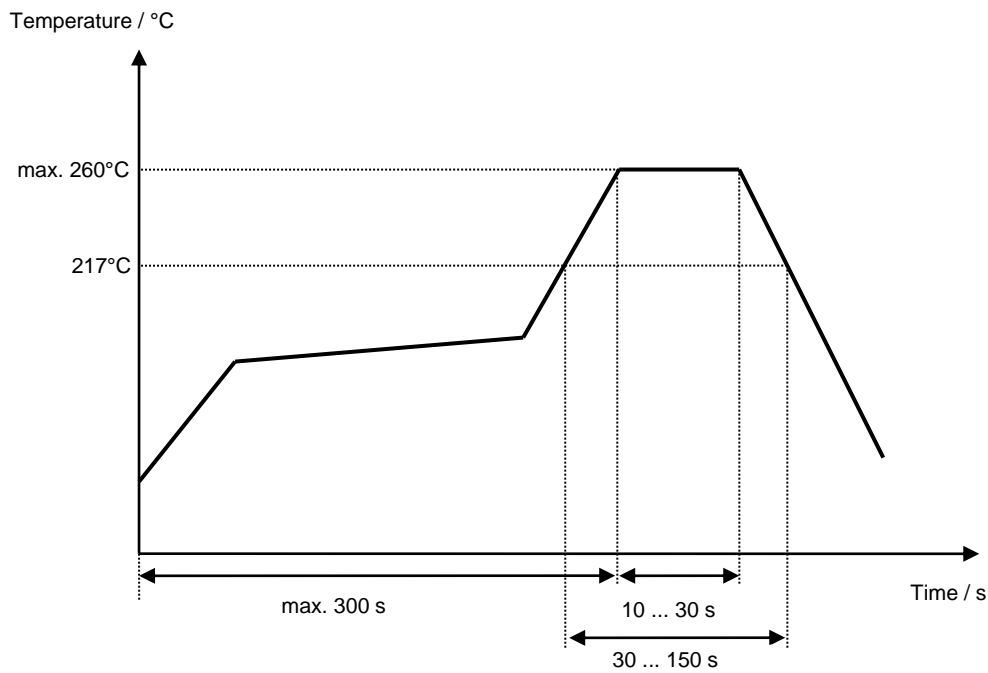
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**Air reflow temperature conditions**

| <b>Conditions</b>                          | <b>Exposure</b>             |
|--------------------------------------------|-----------------------------|
| 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 682****5/5****History**

| <b>Version</b> | <b>Reason of Changes</b>                                                                                               | <b>Name</b> | <b>Date</b> |
|----------------|------------------------------------------------------------------------------------------------------------------------|-------------|-------------|
| 1.0            | Generation of development specification                                                                                | Springfeldt | 14.04.2004  |
| 1.1            | Change of absolute attenuation $f_N + 149 \dots 300$ MHz<br>change insertion loss                                      | Strehl      | 20.01.2005  |
| 1.2            | Change stability characteristics<br>add typical values and filter characteristic<br>generation of filter specification | Strehl      | 09.05.2005  |
| 1.3            | Correct sign in limit line from 200 MHz to $f_N - 149$ MHz                                                             | Martens     | 01.06.2006  |
| 1.4            | Add IIP3 and change stability characteristics                                                                          | Strehl      | 19.07.2006  |
| 1.5            | typo correction in absolute attenuation                                                                                | Chanaa      | 10.02.2011  |

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