

Microchip**Filter specification****TFS 1651****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 1651.0 MHz without any tolerance or limit. The values of absolute attenuation a_{abs} are guaranteed over the whole operating temperature range. The frequency shift of the filter within the operating temperature range is included in the production tolerance scheme.

| D a t a | | typ. value | | tolerance / limit | | |
|---------------------------------------------|-------------|-------------------|-------|--------------------------|------------------|----------|
| Insertion loss in PB | a_e | 2.4 | dB | max. | 3.0 | dB |
| Nominal frequency | f_N | - | | | 1651.0 | MHz |
| Passband | PB | - | | f_N | ± | 17.0 MHz |
| Passband variation | *) | 1.0 | dB | max. | 1.75 | dB |
| Absolute attenuation | a_{abs} | | | | | |
| 0.3 MHz ... 1583.0 MHz | | 38 | dB | min. | 30 | dB |
| 1583.0 MHz ... 1608.5 MHz | | 26 | dB | min. | 20 | dB |
| 1693.5 MHz ... 1719.0 MHz | | 36 | dB | min. | 20 | dB |
| 1719.0 MHz ... 3500.0 MHz | | 32 | dB | min. | 30 | dB |
| Group delay ripple within PB | **) | 19 | ns | max. | 30 | ns |
| VSWR within PB | | 2 : 1 | | max. | 2.4 : 1 | |
| Input power level in PB | | - | | max. | 10 | dBm |
| Operating temperature range | OTR | - | | | -30 °C ... +85°C | |
| Storage temperature range | | - | | | -40 °C ... +85°C | |
| Temperature coefficient of frequency | TC_f ***) | -46 | ppm/K | | - | |

*) 1dB in each 3MHz segment within PB

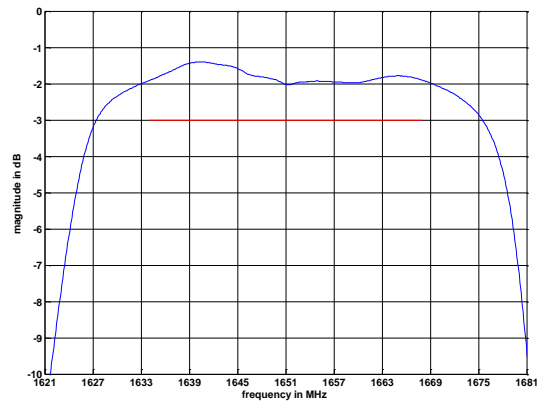
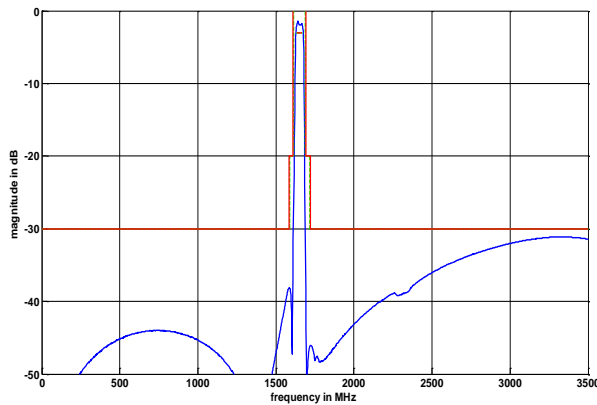
**) 12ns in each 3MHz segment within PB

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

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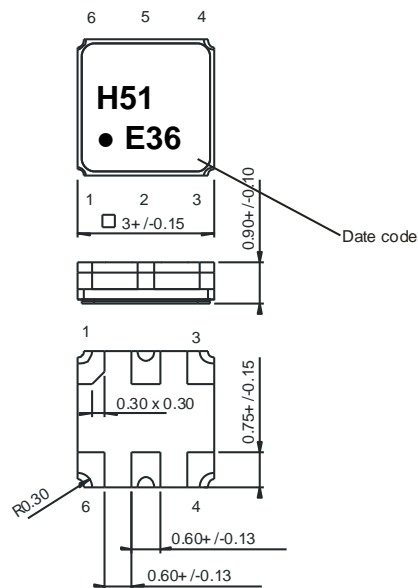
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Filter characteristic



Construction and pin connection

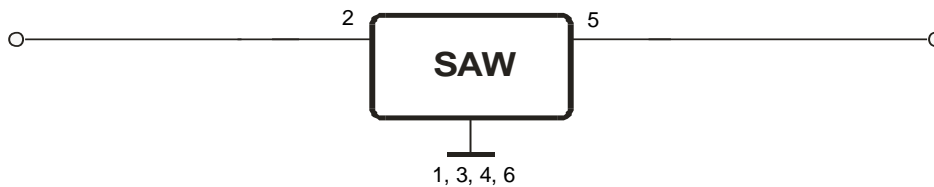
(All dimensions in mm)



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

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

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 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;

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

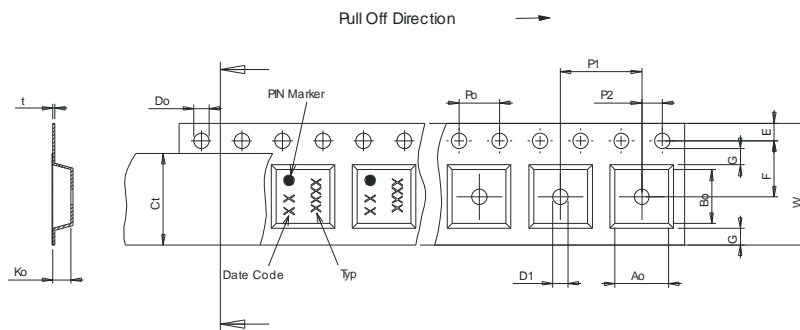
Packing

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 |

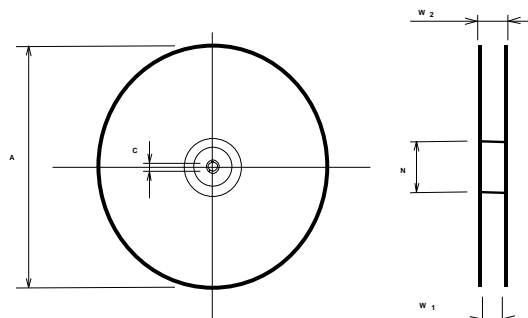
Tape (all dimensions in mm)

- 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.

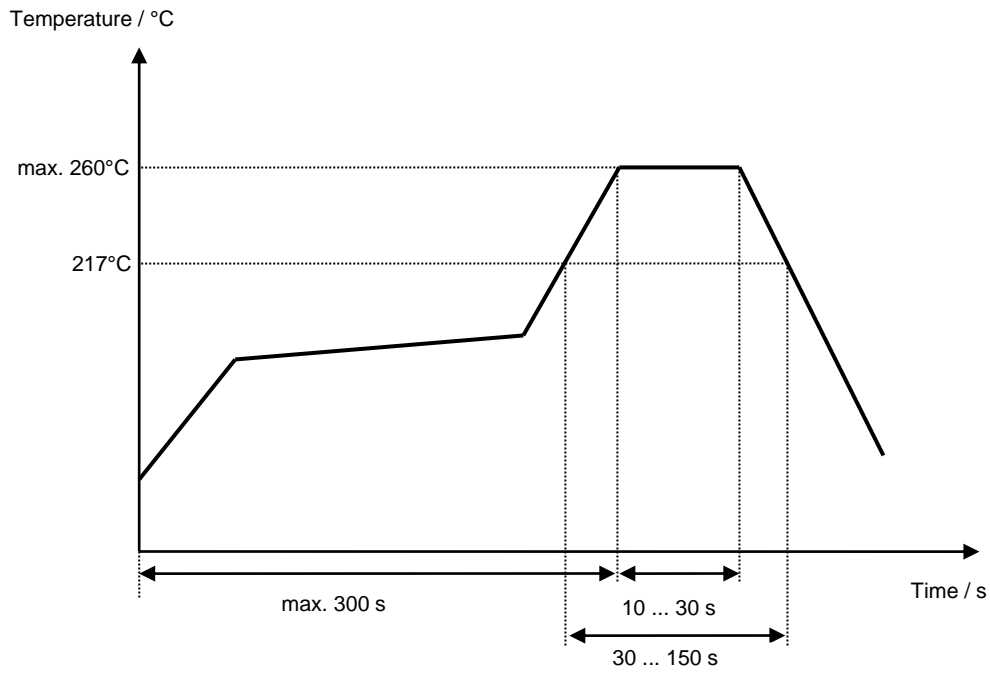
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Air reflow temperature conditions

| 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 1651****5/5**

History

| Version | Reason of Changes | Name | Date |
|----------------|------------------------------------------|-------------|-------------|
| 1.0 | Generation of development specification. | Schönbein | 26.06.2014 |
| 2.0 | Generation of filter specification. | Schönbein | 01.09.2014 |

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