

| | | | |
|----------------------|-----------------------------|-----------------|------------|
| VI TELEFILTER | Filter specification | TFS 111B | 1/5 |
|----------------------|-----------------------------|-----------------|------------|

Measurement condition

Ambient temperature: 23°C
 Input power level: 0dBm
 Terminating impedances *)
 for input: 3,2 kΩ ||- 5,6pF
 for output: 3,1 kΩ || -6.2pF

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of TFS 111B is the minimum of the pass band attenuation a_{min} . This value is defined as the insertion loss a_e . The centre frequency f_c is the arithmetic mean value of the upper and lower frequencies at the 20,0 dB filter attenuation level relative to the insertion loss a_e .

| D a t a | typ. value | tolerance / limit |
|--|----------------------------|---------------------|
| Insertion loss (reference level) $a_e = a_{min}$ | 7 dB | 11 dB |
| Centre frequency f_c (30 dB-BW) | 111 MHz | ± 60 kHz |
| Relative attenuation a_{rel} $f_c - 500$ kHz ... $f_c + 500$ kHz | 1 dB | max. 2 dB |
| $f_c \pm 1$ MHz ... $f_c \pm 2$ MHz | 22 dB | min. 20 dB |
| $f_c \pm 2$ MHz ... $f_c \pm 3$ MHz | 33 dB | min. 30 dB |
| $f_c \pm 3$ MHz ... $f_c \pm 10$ MHz | 45 dB | min. 40 dB |
| **) | | |
| Group delay GD Ripple $f_c \pm 500$ kHz | 300 ns | max 500 ns |
| Temperature coefficient TC 2nd order **) | - 0,032 ppm/K ² | - |
| Frequency inversion temperature T_o | 25 °C | |
| Operating temperature range | | - 10 °C ... + 60 °C |
| Storage temperature range | | - 40 °C ... + 85 °C |
| Input power level | - | max. + 10 dBm |

*) 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.

***) - Δf (Hz) = TC (ppm/K²) x (T - T_o)² x F_{T_o} (MHz)

Generated: _____

Checked / approved: _____

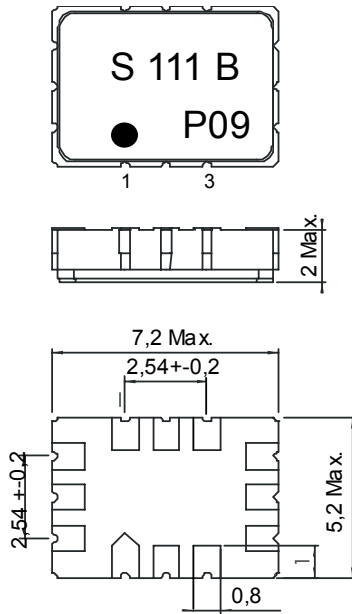
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Construction and pin connection

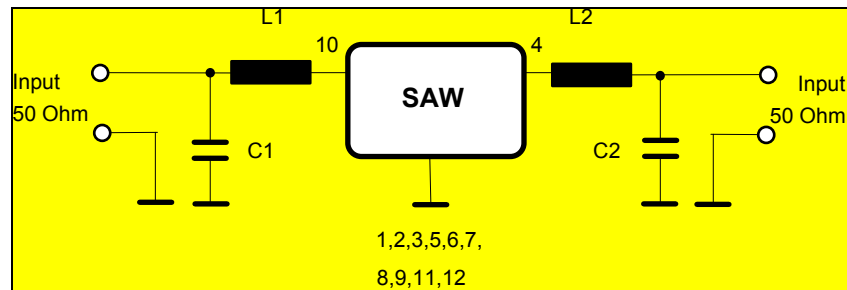
(All dimensions in mm)



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

| | |
|-----------|-----------|
| Datecode: | Year+week |
| M | 2000 |
| N | 2001 |
| P | 2002 |
| ... | |

50 Ω test circuit



Stability Characteristics:

After the following tests the filter shall meet the whole specification:

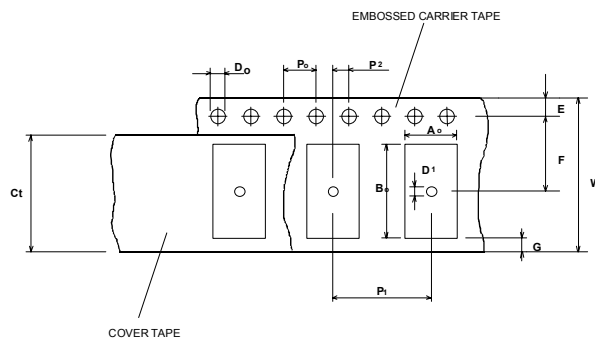
- 1. Shock: 500g, 18 ms, half sine wave, 3 shocks each plane;
DIN IEC 68 T2 - 27
- 2. Vibration: 10 Hz to 500 Hz, 0,35 mm or 5g respectively, 1 octave per min, 10 cycles per plan, 3 plans;
DIN IEC 68 T2 - 6
- temperature: -55 °C to 125°C / 30 min each. / 10 cycles
DIN IEC 68 part 2 – 14 Test N
- 4. Resistance to solder heat (reflow): max. 2 times reflow process;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

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

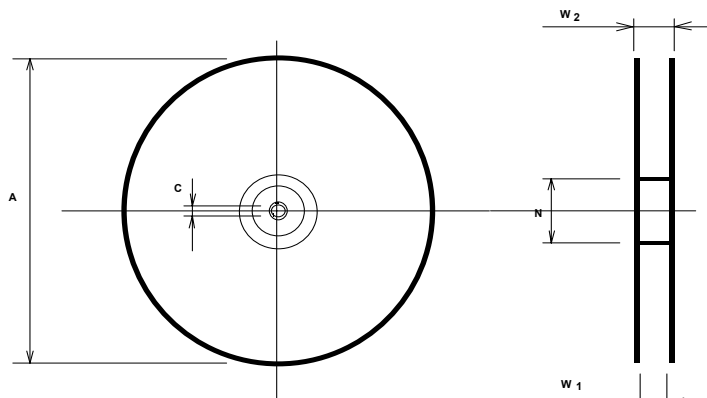
Tape (all dimensions in mm)

- W : 16 ± 0,3
- Po : 4 ± 0,1
- Do : 1,5 + 0,1
- E : 1,75 ± 0,1
- F : 7,5 ± 0,1
- G (min): 0,6
- P2 : 2 ± 0,1
- P1 : 8 ± 0,1
- D1(min): 1,5
- Ao : 5,5 ± 0,1
- Bo : 7,5 ± 0,1
- Ct : 13,5+/-0,1



Reel (all dimensions in mm):

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



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. Markings on the filters can be read if the upper side of the carrier tape is regarded with the sprocket holes on its right.

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Air reflow temperature conditions

1st and 2nd air reflow profile

| Name: | pre-heating periods | main-heating periods | peak temperature |
|--------------|---------------------|----------------------|------------------|
| Temperature: | 150 °C - 170 °C | over 200 °C | 255 °C ± 5 °C |
| Time: | 60 sec. - 90 sec. | 20 sec. - 25 sec. | |

Air reflow profile

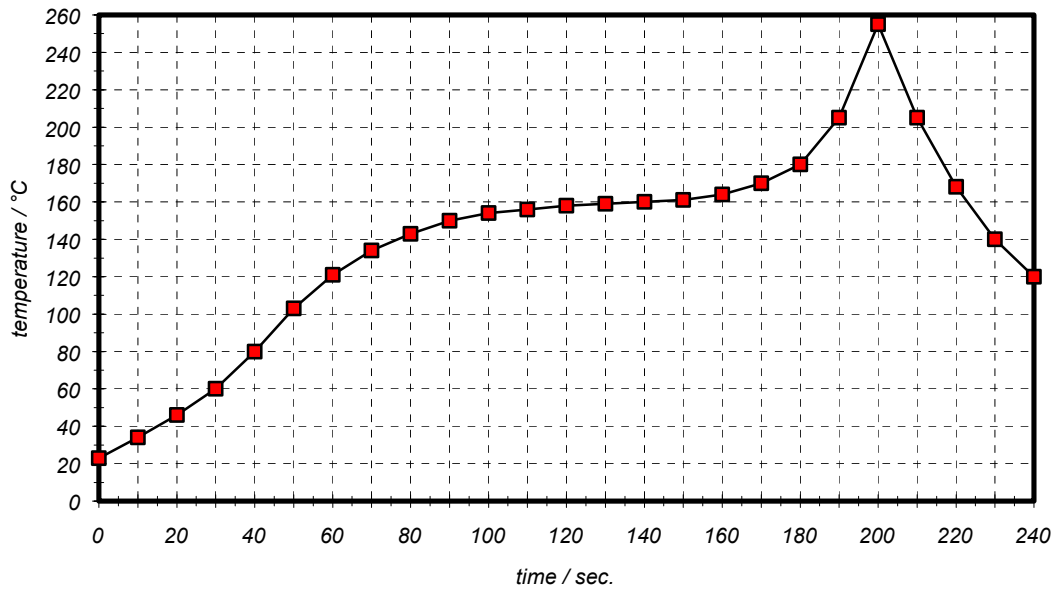


Table for temperature vs. time during the air reflow process

Tolerance of temperatures: ± 5 °C

| time / sec. | temperature / °C | time / sec. | temperature / °C |
|-------------|------------------|-------------|------------------|
| 0 | 23 | 140 | 160 |
| 10 | 34 | 150 | 161 |
| 20 | 46 | 160 | 164 |
| 30 | 60 | 170 | 170 |
| 40 | 80 | 180 | 180 |
| 50 | 103 | 190 | 205 |
| 60 | 121 | 195 | 230 |
| 70 | 134 | 200 | 255 |
| 80 | 143 | 205 | 230 |
| 90 | 150 | 210 | 205 |
| 100 | 154 | 215 | 180 |
| 110 | 156 | 220 | 165 |
| 120 | 158 | 230 | 140 |
| 130 | 159 | 240 | 120 |

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History

| Version | Reason of Changes | Name | Date |
|----------------------------------|--|-------------|-------------|
| Development specification | | | |
| 1.1. | - passband ripple: 3dB → 1.5 dB - new datecode introduced and explained | Steiner | 08.05.2000 |
| 1.2. | - complete specification - passband ripple, group delay ripple, attenuation at $f_c \pm 1\text{MHz}$ changed according to agreements with customer | Steiner | 28.07.2000 |
| Filter specification | | | |
| 2.0 | - typical values and terminating impedance added | Steiner | 26.02.2002 |

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