**Measurement condition**

Ambient temperature: 23 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 1180 Ω || -7,1 pF
Output: 1110 Ω || -7,9 pF

## 2. Characteristics

Remark:
Reference level for the relative attenuation $a_{rel}$ of the TFS 120A is the insertion loss. The insertion loss $a_e$ is defined as the insertion loss at the nominal frequency $f_N$ . 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 $a_e$. The temperature coefficient of frequency $TC_f$ is valid for both the reference frequency $f_c$ and the frequency response of the filter on the operating temperature.

| D a t a | | typ. value | | tolerance / limit | |
|---|---|---|---|---|---|
| **Insertion loss** | $a_e$ | 5,6 | dB | max. 10,5 | dB |
| (reference level) | | - | | - | |
| **Nominal frequency** | $f_N$ | - | | 120 | MHz |
| **Centre frequency** | $f_C$ | 120 | MHz | - | |
| **Passband** | | - | | $f_N$ ± 100 | kHz |
| **Pass band ripple** | | 0,6 | dB | 1 | dB |
| **Relative attenuation** | $a_{rel}$ | | | | |
| $f_N$ ... $f_N$ ± 100 kHz | | 0,6 | dB | max. 1 | dB |
| $f_N$ ± 0,6 MHz ... $f_N$ ± 1,0 MHz | | 35 | dB | min. 32,5 | dB |
| $f_N$ ± 1,0 MHz ... $f_N$ ± 25,0 MHz | | 50 | dB | min. 37,5 | dB |
| **Group delay** | at $f_N$ | 1,8 | µs | max. 3,5 | µs |
| **Group delay ripple within PB** | | 60 | ns | max. 300 | ns |
| **Operating temperature range** | OTR | - | | - 20 °C ... + 85 °C | |
| **Storage temperature range** | | - | | - 20 °C ... + 85 °C | |
| **Frequency inversion temperature** | | 35 | °C | - | |
| **Temperature coefficient of frequency** | $TC_f$ ** | -0,04 | ppm/K² | - | |

*) 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.
**) $\Delta f(Hz) = TC_f(ppm/K) \times (T-T_0)^2 \times f_{To}(MHz)$.

**Generated:**

**Checked / Approved:**

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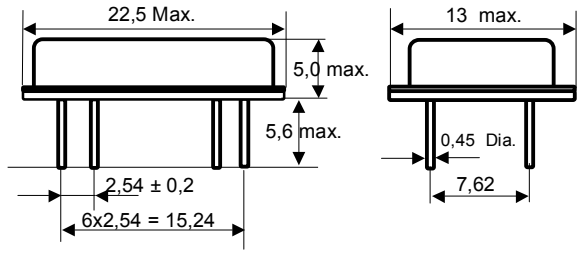
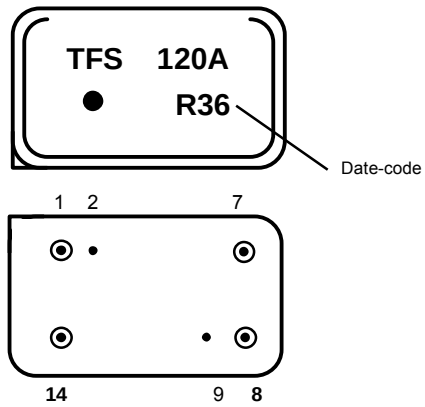
### 3. Construction and pin connection :

(all dimensions in mm)



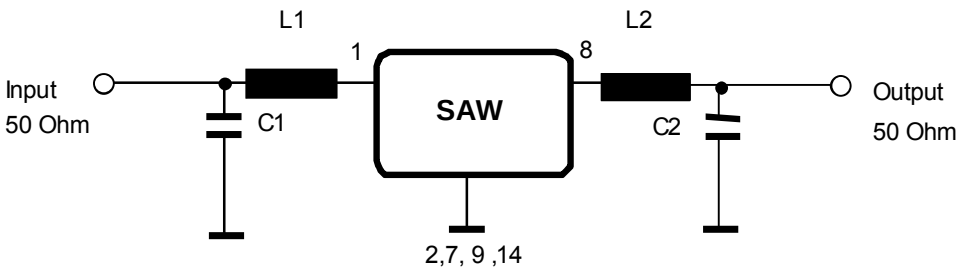




| Date-code: | Year+week |
|---|---|
| N | 2001 |
| P | 2002 |
| R | 2003 |
| ... | |




| | |
|---|---|
| Pin **1** | **Input** |
| Pin 14 | Input RF Return |
| Pin **8** | **Output** |
| Pin 7 | Output RF Return |
| Pin 2, 9 | Pakage Ground |

### 4. 50 Ω matching network :

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### 5. 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;<br>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;<br>DIN IEC 68 T2 - 6 |
| 3. Change of temperature: | 25 °C to 55°C / 95% r.H. / 10 cycles<br>DIN IEC 68 - 2 – 30 Db |
| 4. Resistance to solder heat (reflow): | max. 2 times reflow process;<br>for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4; |

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## 6. 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**

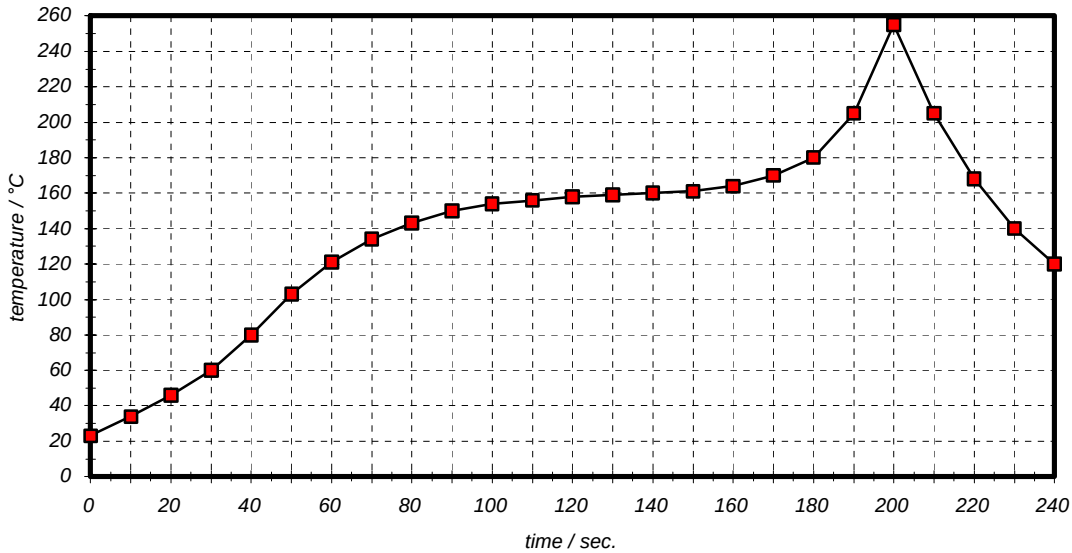


Table for temperature vs. time during the air reflow process

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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## 7. History

| Version | Reason of Changes | Name | Date |
|---|---|---|---|
| 1.0 | generate specification according to customer requirements | Pfeiffer | 08.06.2001 |
| 1.1 | change specification to actual format<br>change package dimension | Braun | 24.04.2003 |
| 1.2 | typical values and terminating impedance added<br>auto format correction of first page | Pfeiffer | 04.09.2003 |

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