

TELE FILTER tft GmbH SAW filter specification TFS 241 A 1/4

Measurement condition

Ambient temperature: 23 °C
 Input power level: -10 dBm
 Source impedance: 580 Ω || -1,4 pF
 Load impedance: 580 Ω || -1,4 pF
 Ext coil: 140 nH

Construction

see page 2

Characteristics

Remark:
 Reference level for the relative attenuation a_{rel} of the TFS 241 is the minimum of the pass band attenuation a_{min} . The minimum of the pass band attenuation a_{min} is defined as the insertion loss a_e . The centre frequency f_0 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 nominal frequency f_N is fixed on 241 MHz without tolerance. The given values for the relative attenuation a_{rel} and for the group delay ripple have to be reached at the frequencies given below also if the centre frequency f_0 is shifted due to the temperature coefficient of frequency TC_f in the operating temperature range and due to a production tolerance for the centre frequency f_0 .

| D a t a | | typ. value | | tolerance / limit | |
|--------------------------------------------------------------|-----------------|---------------------|--------------------|-------------------|-----|
| Insertion loss (Reference level) | $a_e = a_{min}$ | 3,9 | dB | max 5 | dB |
| Nominal frequency | f_N | - | | 241,000 | MHz |
| Pass band ripple $f_N - 80$ kHz ... $f_N + 90$ kHz | | 0,5 | dB | max 1,5 | dB |
| Relative attenuation | a_{rel} | | | | |
| $f_N - 80$ kHz ... $f_N + 90$ kHz | | 0,5 | dB | max 1,5 | dB |
| $f_N \pm 330$ kHz ... $f_N \pm 400$ kHz | | 28 | dB | min 18 | dB |
| $f_N \pm 400$ kHz ... $f_N \pm 600$ kHz | | 40 | dB | min 28 | dB |
| $f_N \pm 600$ kHz ... $f_N \pm 1,6$ MHz | | 52 | dB | min 40 | dB |
| $f_N \pm 1,6$ MHz ... $f_N \pm 3$ MHz | | 55 | dB | min 48 | dB |
| $f_N \pm 3$ MHz ... $f_N \pm 10$ MHz | | 60 | dB | min 50 | dB |
| $f_N \pm 10$ MHz ... $f_N \pm 25$ MHz | | 55 | dB | min 45 | dB |
| Group delay distortion | GDD | | | | |
| $f_N \pm 70$ kHz | | 0,5 | µs | max 1,5 | µs |
| Operating temperature range | | - 20 °C ... + 70 °C | | | |
| Storage temperature range | | - 40 °C ... + 85 °C | | | |
| Temperature coefficient of frequency | TC_f | - 0,036 | ppm/K ² | - | |
| Frequency inversion temperature | | + 25 | °C | | |

Generated:

Checked / approved:

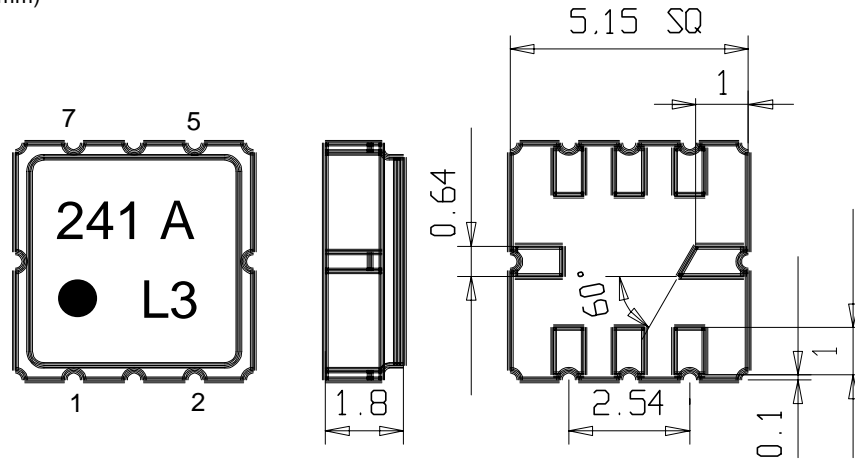
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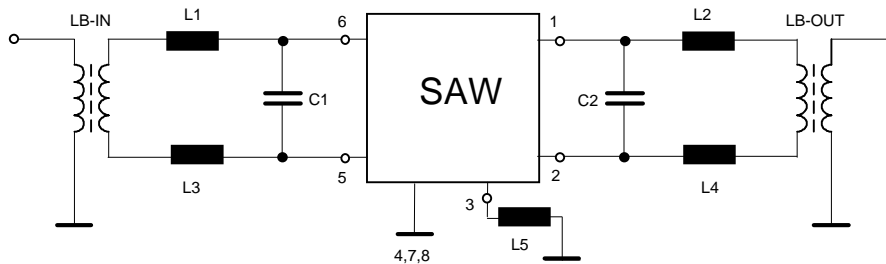
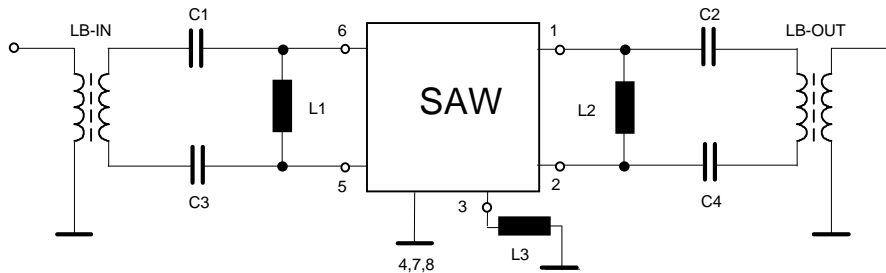
Construction and pin configuration

(All dimensions in mm)



Pin 1 Sym. Output
 Pin 2 Sym. Output
 Pin 3 External Coil
 Pin 4 Package Ground

Pin 5 Sym. Input
 Pin 6 Sym. Input
 Pin 7 Ground
 Pin 8 Package ground

50 Ohm Test circuit 1**50 Ohm Test circuit 2**

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
3. Damp heat: 25 °C to 55°C / 95% r.H. / 10 cycles
(cycle) DIN IEC 68 - 2 – 30 Db
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;

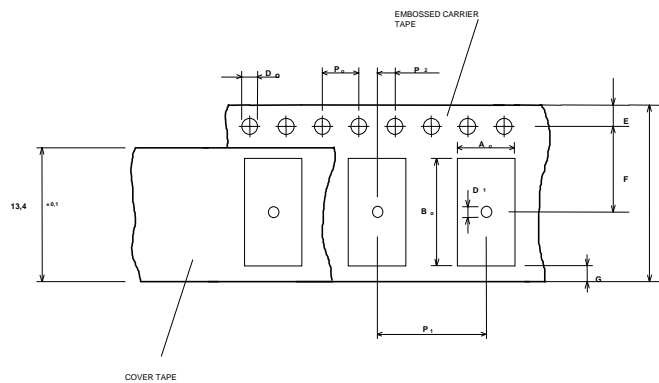
Packing

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

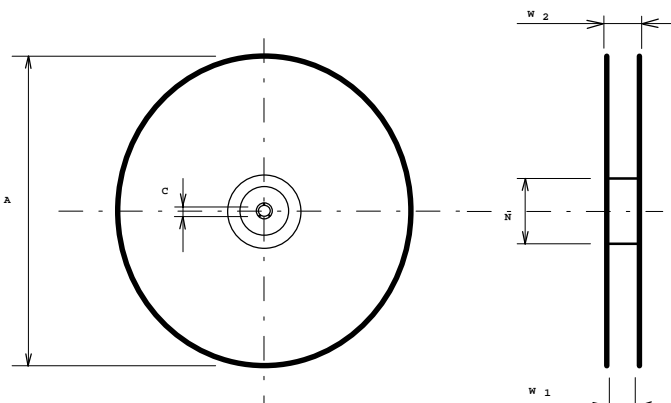
Tape (all dimensions in mm)

| | |
|---------|--------------|
| W | : 12 ± 0,3 |
| Po | : 4 ± 0,1 |
| Do | : 1,5 + 0,5 |
| D1 | : 1,5 + 0,5 |
| E | : 1,75 ± 0,1 |
| F | : 7,5 ± 0,1 |
| G (min) | : 0,75 |
| P2 | : 2 ± 0,05 |
| P1 | : 8 ± 0,1 |
| D1(min) | : 1,5 |
| Ao | : 5,4 ± 0,1 |
| Bo | : 5,4 ± 0,1 |



Reel (all dimensions in mm):

| | | |
|----------|---|-----------|
| A | : | 330 |
| W1 | : | 16,4 +2 |
| W2 (max) | : | 22,4 |
| N (min) | : | >= 90 |
| C | : | 13 ± 0,25 |



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. The marking of the filters is able to read if the view is directed on the upper side of the carrier tape with the sprocket holes on the right side of the tape.

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. | |

Chip-mount air reflow profile

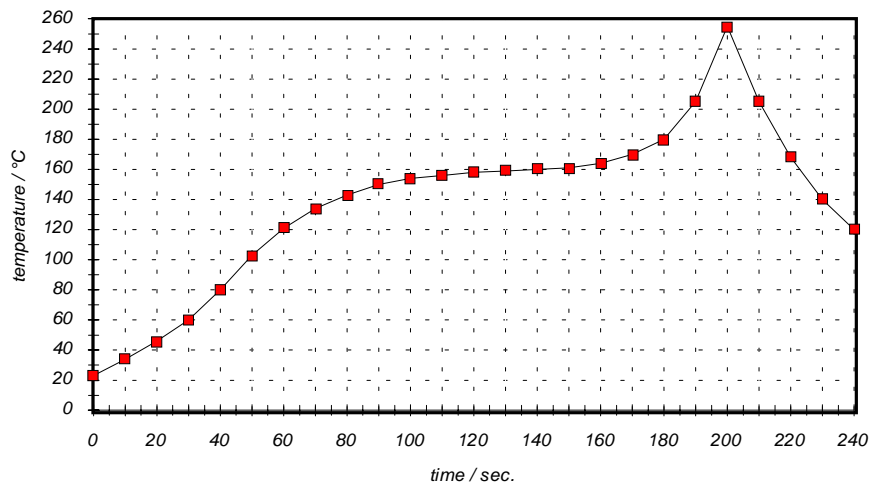


Table for temperature vs. time during the air reflow process

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 |