

1. General

The filter is balanced driven. It is matched to $50\ \Omega$

The matching element values given below are valid on the test PCB. If the parasitics on the customer PCB and on this PCB are different, the matching elements have to be optimised regarding the circuit and PCB design.

There are ground pin thru's under the filter and in the other area of the PCB but additional pin thru's to decrease cross talk.

The matching elements have been chosen from the E12- series (European standard series with fixed tolerances) to get the best agreement between the PCB measurement and the measurement in a reference test fixture.

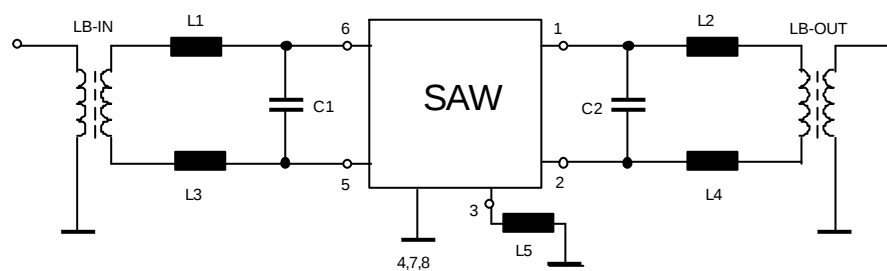
2. Theoretical matching

The balanced driven source and load impedances of the filter are:

source impedance: $580\ \Omega \parallel -1.4\ \text{pF}$

load impedance: $580\ \Omega \parallel -1.4\ \text{pF}$

The values of the matching elements which are given below are calculated from the source and load impedance. If the values of the matching elements are not equal to standard values the best standard values are given in brackets.



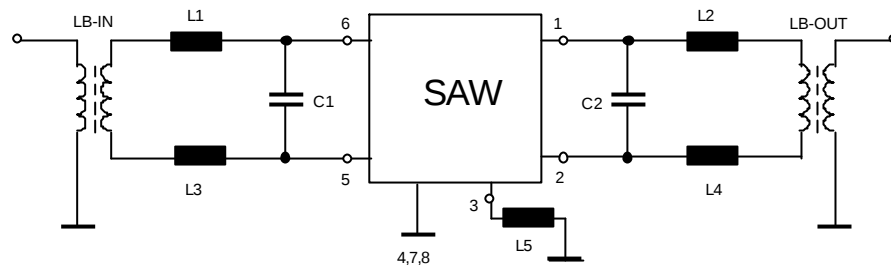
$L1 = L2 = L3 = L4 = 53\ \text{nH}$ (56nH)
 $C1 = C2 = 2,3\ \text{pF}$ (2,2pF)
 $L5 = 140\ \text{nH}$

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3. Matching on the PCB



$$L1 = L2 = L3 = L4 = 68 \text{ nH}$$

$$C1 = C2 = 0,8 \text{ pF}$$

$$L5 = 120 \text{ nH}$$

The matching on the PCB does slightly differ from the theoretical matching. The reason for that are parasitics of the PCB and of the transformers.

But if the parasitics on the customer board (mentioned parasitics, additional parasitics of active parts) are different to this PCB the matching elements have to be slightly adjusted. Both in line and shunt elements change both passband tilt and passband ripple. But

- the in line coils mainly influences the pass band ripple
a decrease of the inductivity of the in line coils will decrease passband ripple or change a round pass band shape towards a flat one
- the shunt capacitors mainly influences the pass band tilt
an increase of the capacity value will change the tilt to lower attenuation on the high frequency side of the passband

The coupling coil mainly influences the bandwidth in passband of the filter