

Section D Filters**3-Resonator Capacitively Coupled LC Band-Pass Filters****K 24 D 05****K 24 D 06****Design**

This filter structure avoids the parallel resonant coupling circuits which result from the standard low-pass to band-pass transformation procedure as described in most texts. A step by step design procedure will be found in "Microwave Filters, Impedance Matching Circuits and Coupling Structures" by Matthiae, Young and Jones. (Artech House)

The order of this filter is equal to the number of shunt resonators. In general, filter orders greater than 3 are difficult to tune and best avoided.

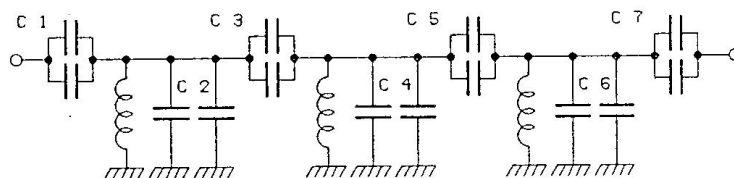
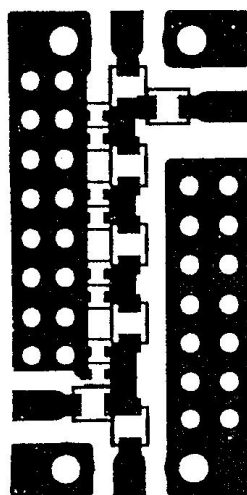
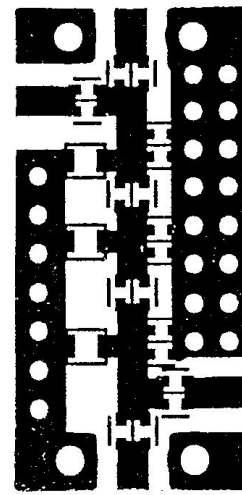
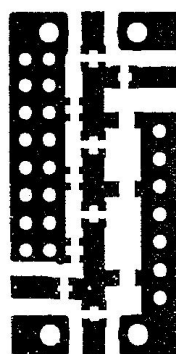
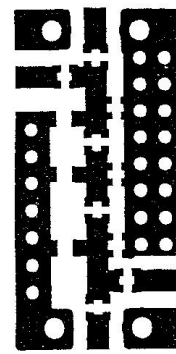
For the special case of 50 Ohm terminations, 10 % bandwidth and a few particular response types, the element values for a given cut-off frequency are tabulated in Appendix 2. Element values for frequencies not listed in the tables may be found by simply scaling listed values with frequency.

Successful performance requires inductors of suitably low loss, giving individual resonator unloaded Q values at least an order of magnitude greater than the Q required of the overall filter. Usually this demands the use of air-cored inductors for frequencies above 100 MHz or so. Physically deforming these inductors enables the filter to be tuned.

This type of filter is practical up to frequencies approaching 1 GHz. At such frequencies it is desirable to use high quality ceramic capacitors rather than the usual chip types.

PCB Versions

The two PCB versions together with the various input and output port locations provide a high degree of versatility in the application of this filter.

Circuit Diagram**K 24 D 05****K 24 D 06****Component Placement (1.4 x Full-Size)****K 24 D 05****K 24 D 06****Track Patterns (Full-Size)****K 24 D 05****K 24 D 06**