

Abstract

In this thesis, a novel miniaturized microstrip parallel coupled-line bandpass filter with wide stopband realization beyond $3f_0$ is demonstrated. This new structure is based on the capacitive terminations for the classical parallel coupled-line sections to achieve size minimization, whilst the spurious responses are eliminated by the over-coupling approach. These features offer the classical microstrip parallel coupled-line bandpass filter with simultaneous compactness and wide stopband performance. The mathematical model is also derived, so as to provide a design methodology for this new structure instead of a trial-and-error approach. The simulations and measurements of a 900 MHz prototype bandpass filter are presented. The measured results agree well with the simulation. Compared with the classical parallel coupled-line bandpass filter, the measured 2nd and 3rd spurious responses are suppressed to -64 dB and -55 dB respectively. In addition, the circuitry size of the prototype filter can be reduced by 25%.