

**MULTILAYER COUPLED RING RESONATOR FILTER FOR
DIGITAL BROADCASTING APPLICATIONS**

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ABSTRACT

The purpose of this project is to present the design and simulation of multilayer microstrip bandpass filter based on coupled rectangular ring resonator. The bandpass filter is designed for digital satellite broadcasting applications.

Centered at around 2.6 GHz with bandwidth of 4.2 % from 2.54 GHz to 2.65 GHz the filter is designed on a 0.75-mm-thick Rogers RO3003 substrate ($\epsilon_r = 3$, $\tan \delta = 0.0013$). The multilayer environment favors the flexibility in coupling level realization needed in the ring filter designs. The Computer Simulation Technology (CST) simulator is used to design and simulate the response of the microstrip coupled ring resonator.

Results from electromagnetic simulation of the filter involving return loss, S_{11} and insertion loss, S_{21} are presented through this paper. The value of S_{11} of the implemented filter using RO3003 is about 0.0724 dB and the S_{21} is 44.289 dB at 2.6 GHz.

The proposed filter has the advantage of compact structure, high return loss, tiny insertion loss, adequate bandwidth and almost accurate operating frequencies (right shifted).

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