

## Complementary Split Ring Resonator-Loaded Microstrip Patch Antenna Useful for Microwave Communication

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**Abstract :** Complementary split-ring resonator (CSRR) loaded microstrip square patch antenna has been optimally designed with the help of high frequency structure simulator (HFSS). The antenna has been fabricated on the basis of the simulation design data and experimentally tested in anechoic chamber to evaluate its gain, bandwidth, efficiency and polarization characteristics. The CSRR loaded microstrip patch antenna has been found to realize significant size miniaturization (to the extent of 24%) compared to the conventional-type microstrip patch antenna both operating at the same frequency (5.2 GHz). The fabricated antenna could realize a maximum gain of 4.17 dB, 10 dB impedance bandwidth of 34 MHz, efficiency 50.73% and with maximum cross-pol of 10.56 dB down at the operating frequency. This practically designed antenna with its miniaturized size is expected to be useful for airborne and space borne applications at microwave frequency.

**Keywords :** split ring resonator, metamaterial, CSRR loaded patch antenna, microstrip patch antenna, LC resonator

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