Abstract

Today’s world of miniaturization needs more optimizations for effective utilization of patch antenna. The paper proposed technique for optimization of microstrip antenna using Complementary Split Ring Resonator Metamaterials (CSRR). The CSRR exhibits negative refractive index since it had negative permittivity at its plasma frequency. The frequency of optimization for microstrip antenna is same as that of plasma frequency of Metamaterial structure. Simulation of Unit Cell for Metamaterial gives S-parameters for the same.
Parameter extraction from those S-parameters gives operating range of frequency. When patch antenna is loaded with Metamaterial structure negative permeability and negative permittivity enhances antenna parameters. This results in optimized patch dimension and similar antenna performance. The same patch simulated at 3.17 GHz with Unit Cell which results in approximately 44% reduction in patch dimensions. In both case antenna gain is 5.6 dB over an impedance band of 200 MHz. Limitation of the suggested technique is that it operates over a limited band of frequencies.

References

- Impedance Bandwidth and Gain Improvement for Microstrip Antenna Using Metamaterials, Han XIONG &apos;Jing –Song HONG&apos;apos;;, Yue-Hong PENG Radio Engineering, vol. 21, No 4, December 2012.

Index Terms

Computer Science Wireless

Keywords

Complementary Split Ring Resonator antenna Optimization