Metamaterial Based Patch Antenna with Broad Bandwidth
Designed by COMSOL
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Introduction: A patch antenna based on metamaterials of composite split-ring-resonators (CSRRs) and strip gaps is designed by COMSOL Multiphysics®. The antenna is constructed by using CSRR structures in forms of circular rings on the patch and employing strip gaps on the ground plane.

Structure: To achieve broadband and simple-structure properties, the configuration of the two antennas is based on an original one-layer patch antenna. It was constructed by employing CSRRs on the patch and etching strip gaps on the ground.

Results: The S11 band is from 1.70GHz to 2.98GHz and from 3.99GHz to 5.34GHz. The relative bandwidths of the antenna are 75% at 1.70GHz and 34% at 3.99GHz, respectively. The radiation gain is favorable over the operating bands with a simulated peak gain of 6.04dB at 3.58GHz.

Conclusion: The antenna keeps the radiation performance favorable with such simple structures and compact sizes. The newly designed antenna is applicable for a wide spectrum of applications like WCDMA, WiMAX, Bluetooth and Wibro.

Reference: