

Microstrip Dual J-Shape Monopole for Material Characterization

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**ZAINAL ABIDIN ALI BIN ZAHARI
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA (UiTM)
SHAH ALAM, SELANGOR DARUL EHSAN**

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ABSTRACT

Throughout this thesis, it will briefly describe the design of dual J-shape bend monopoles in microstrip circuit. The purpose of this work is to investigate the best J-shaped monopole design to be used in microstrip circuit with the intention to create a non-destructive method by implementing free space technique with a different method of measurement. The microstrip dual monopole was design and analyzes using computer simulation technology (CST) software. The frequency used is 0.5 GHz, substrate permittivity 4.1, thickness of substrate (mm) 1.6, and copper thickness (mm) 0.035 respectively. The material type used for substrate is FR-4. Different type of monopole shape was analyzed to find the best directivity of monopole. From the simulation result, it can be proved that the higher the radius of bend in J-shape monopole the higher the directivity of the monopole antenna. The best shape was used for the measurement of material under test (MUT) with different dielectric constant. The MUT has same cylinder shape with radius 15 mm and length 100 mm, is inserted in the middle of substrate between monopole. The S12 value, which is the power transfer from port 2 to port 1, is analyzed to see it variation in each different material. It can be conclude if the dielectric constant of the material is high more power is transferred from port 2 to port 1.

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