

FABRIKASI ANTENA MIKROSTRIP PADA FREKUENSI 2,4 GHZ UNTUK WIRELESS FIDELITY (WI – FI)

ABSTRAK

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Penelitian ini dilakukan bertujuan untuk membuat desain, memfabrikasi, serta mengukur Antena Mikrostrip yang bekerja pada frekuensi 2,4 GHz untuk Wireless Fidelity (Wi – Fi). Bahan Substrate atau bahan utama antena yang digunakan yakni FR-4 yang memiliki nilai permitivitas relatif sebesar 4,6. Dalam perancangan desain antena, penelitian menggunakan perangkat lunak CST Studio. Didapatkan ukuran desain lebar patch 37,35 mm, panjang patch 29,292 mm, lebar groundplane/substrate 46,35 mm, panjang groundplane/substrate 38,292 mm, dan panjang stripline 4,274 mm, yang kemudian nilai tersebut dibulatkan demi mendapatkan hasil simulasi yang lebih optimal. Hasil yang didapatkan dari simulasi antena melalui CST Studio, didapatkan nilai frekuensi kerja pada 2,4 GHz, nilai return loss = -36,0629 dB, dan nilai VSWR = 1,0319. Setelah pemfabrikasian antena dilakukan uji laboratorium dengan alat VNA (Vector Network Analyzer) yang didapatkan hasil nilai frekuensi kerja pada 2,456 GHz, nilai return loss = -33,3153 dB, dan nilai VSWR = 1,04. Dapat disimpulkan bahwa antena yang telah dibuat berdasarkan desain yang dibikin bekerja sesuai dengan spesifikasi yang diinginkan yakni bekerja pada frekuensi 2,4 GHz dengan nilai return loss ≤ -10 dB dan nilai VSWR ≤ 2 .

Kata Kunci: Antena Mikrostrip, Wi – Fi, VSWR, *Return Loss*

MICROSTRIP ANTENNA FABRICATION AT 2.4 GHZ FREQUENCY FOR WIRELESS FIDELITY (WI – FI)

ABSTRACT

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This research was conducted with the aim of designing, fabricating, and measuring a Microstrip Antenna that operates at a frequency of 2.4 GHz for Wireless Fidelity (Wi-Fi). The substrate material or the main material of the antenna used is FR-4, which has a relative permittivity value of 4.6. In the design process of the antenna, the research used CST Studio software. The design dimensions obtained were a patch width of 37.35 mm, patch length of 29.292 mm, groundplane/substrate width of 46.35 mm, groundplane/substrate length of 38.292 mm, and stripline length of 4.274 mm, which were then rounded to achieve more optimal simulation results. The results from antenna simulations using CST Studio showed an operating frequency of 2.4 GHz, return loss value of -36.0629 dB, and a VSWR value of 1.0319. After fabrication, laboratory tests were carried out using a VNA (Vector Network Analyzer), which obtained an operating frequency of 2.456 GHz, return loss value of -33.3153 dB, and a VSWR value of 1.04. It can be concluded that the antenna made based on the designed specifications works according to the desired criteria, specifically operating at 2.4 GHz with a return loss value of ≤ -10 dB and a VSWR value of ≤ 2 .

Keywords: *Microstrip Antenna, Wi – Fi, VSWR, Return Loss*