

ABSTRAK

Saat ini, kebutuhan akan layanan jaringan internet sangat tinggi, masyarakat sudah banyak yang menggunakan paket data yang ditawarkan oleh *provider* maupun menggunakan layanan *Wi-Fi*. *Wi-Fi* membutuhkan karakteristik antenna yang mempunyai bentuk relatif kecil dan massa yang ringan seperti antenna mikrostrip. Sistem MIMO (*Multiple Input Multiple Output*) pada antenna digunakan untuk mengurangi efek *multipath fading*. Pada tugas akhir ini akan dilakukan penelitian “Perancangan Antena Mikrostrip MIMO 2x1 *Patch Triangular* Pada Frekuensi 2,4 GHz Untuk Aplikasi *Wi-Fi*”. Dengan target pencapaian *return loss* $\leq -10\text{dB}$, *VSWR* ≤ 2 , *gain* $\geq 4\text{dB}$, dan memiliki pola radiasi *unidirectional*. Dengan adanya penambahan teknik MIMO, antenna diharapkan mampu mencapai nilai koefisien isolasi $\leq -20\text{dB}$, nilai koefisien korelasi $\leq 0,2$, *diversity gain* $> 7,4\text{dB}$ serta memperlebar *bandwidth* mencapai $\geq 150\text{MHz}$. Setelah dilakukan perancangan antenna dan simulasi dengan menggunakan *software AWR Design Environment 2009*, didapatkan nilai *return loss* = $-35,9\text{dB}$, *VSWR* = 1,032, *gain* = $9,536\text{dB}$, *diversity gain* = $9,999\text{dB}$, nilai koefisien isolasi = $-84,11\text{dB}$, nilai koefisien korelasi = 0,00014, *bandwidth* mencapai 171MHz atau 7,02% dan memiliki pola radiasi *unidirectional*. Sehingga dalam hal ini hasil rancangan antenna sudah mencapai target dan antenna sudah dalam keadaan *matching*.

Kata Kunci : Antena Mikrostrip, *Patch Triangular*, MIMO, *Wi-Fi*, *Bandwidth*

ABSTRACT

Currently, the need for internet network services is very high, many people have used data packages offered by providers or used Wi-Fi services. Wi-Fi requires antenna characteristics that have a relatively small shape and light mass such as microstrip antennas. The MIMO (Multiple Input Multiple Output) system on the antenna is used to reduce the effect of multipath fading. In this final project will be conducted research "Design of MIMO Microstrip Antenna 2x1 Triangular Patch on 2.4 GHz Frequency For Wi-Fi Application". With the target of achieving return loss $\leq -10\text{dB}$, VSWR ≤ 2 , gain $\geq 4\text{dB}$ and has an unidirectional radiation pattern. With the addition of the MIMO technique, the antenna is expected to be able to achieve an isolation coefficient value of $\leq -20\text{dB}$, correlation coefficient ≤ 0.2 , diversity gain $>7,4\text{dB}$ and widen the bandwidth to reach 150MHz. After doing antenna design and simulation using AWR Design Environment 2009 software, obtained return loss value = $-35,9\text{dB}$, VSWR = 1,032, gain = $9,536\text{dB}$, diversity gain = $9,999\text{dB}$, isolation coefficient value = $-84,11\text{dB}$, correlation coefficient = 0,00014, the bandwidth reaches 171MHz or 7,02% and has an unidirectional radiation pattern. So in this case the antenna design results have reached the target and the antenna is in a matching state.

Keywords : Microstrip Antenna, Triangular Patch, MIMO, Wi-Fi, Bandwidth