

**RANCANG BANGUN ANTENA MIKROSTRIP *TRIANGULAR PATCH*
DUAL BAND DENGAN METODE *PARASITIC* DAN MODIFIKASI
GROUNDPLANE UNTUK SISTEM KOMUNIKASI 5G**

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ABSTRAK

Teknologi 5G di Indonesia mulai diterapkan meski masih terbatas di kota besar seperti Surabaya dengan layanan dari Telkomsel, Indosat Ooredoo Hutchison, dan XL Axiata. Antena mikrostrip dipilih karena bentuknya kecil, tipis, dan mampu bekerja pada frekuensi tinggi, meskipun memiliki kelemahan berupa *bandwidth* sempit dan *gain* rendah sehingga digunakan metode *parasitic* dan modifikasi *groundplane* untuk meningkatkannya. Desain *triangular patch* dinilai efektif karena dapat mengurangi efek bayangan di perkotaan serta mendukung kinerja 5G. Penelitian ini mengusulkan antena mikrostrip *triangular patch* dengan *parasitic* sebagai inovasi, di mana hasil simulasi menunjukkan *return loss* -34,85 dB, VSWR 1,03, *gain* 3,73, *bandwidth* 777,3 MHz, dan pola radiasi *omnidirectional*, sedangkan hasil pengukuran memperoleh *return loss* -36,34 dB, SWR 1,03, dan *bandwidth* 666 MHz. Secara keseluruhan, desain ini sudah memenuhi spesifikasi 5G dengan performa *dual band*.

Kata kunci: Antena, Mikrostrip, *Parasitic*, *Triangular Patch*, 5G

**DESIGN OF DUAL BAND TRIANGULAR PATCH MICROSTRIP ANTENNA
WITH PARASITIC METHOD AND GROUNDPLANE MODIFICATION
FOR 5G COMMUNICATION SYSTEM**

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ABSTRACT

5G technology in Indonesia has begun to be implemented although it is still limited to big cities such as Surabaya with services from Telkomsel, Indosat Ooredoo Hutchison, and XL Axiata. Microstrip antennas were chosen because they are small, thin, and capable of working at high frequencies, although they have weaknesses in the form of narrow bandwidth and low gain so that parasitic methods and groundplane modifications are used to improve them. The triangular patch design is considered effective because it can reduce the shadow effect in urban areas and support 5G performance. This study proposes a triangular patch microstrip antenna with parasitic as an innovation, where simulation results show a return loss of -34.85 dB, VSWR 1.03, gain 3.73, bandwidth 777.3 MHz, and omnidirectional radiation pattern, while measurement results obtained a return loss of -36.34 dB, SWR 1.03, and bandwidth 666 MHz. Overall, this design has met 5G specifications with dual-band performance.

Keywords: Antenna, Microstrip, Parasitic, Triangular Patch, 5G