

UNIVERSITI TEKNOLOGI MARA

**A Miniature Stub-Loaded Antenna Optimized at VHF
Band for FSR Sensor Application**

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ABSTRACT

The concept of forward scattering radar briefly introduced in this paper is the suggested application for monopole antenna design proposed. The concept of antenna monopole design, miniature technique and optimization method proposed with problem statement, objectives and research methodology are explained in earlier chapter of this article. This is supported with a review of previous experimental results from several researches as references. This article demonstrated a miniature monopole antenna optimization at VHF band (30-300MHz) for FSR sensor application. Stub-loaded technique is applied in this design by placing the stub at strategic positions along the antenna. 200MHz is targeted as the operating frequency and antenna characteristics such as return loss, radiation pattern, VSWR etc are targeted to be comparable to Commercial Off-The-Shelf (COTS) products. Antenna design in this paper is simulated using Computer Simulation Technique (CST) and introduced Parameter Sweep and Genetic Algorithm (GA) techniques to determine the optimal lengths of antenna and stubs. This paper reveals that stubs attached to one side of a monopole antenna are more suitable for single frequency at VHF band and proved that 26.7% of antenna size reduction can be achieved compared to conventional quarter-wave monopole antennas.

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