

DESIGN OF COMPACT U- AND MODIFIED U-SHAPED PLANAR MONOPOLE ANTENNAS FOR WIDE BAND APPLICATIONS

RUSHINGABIGWI GERARD¹, SUN LIGUO², HE YUXING³ & NTAGWIRUMUGARA ETIENNE⁴

¹Research Scholar, Department of Electronic Engineering and Information Science,
University of Rwanda, College of Science and Technology, Nyarugenge, Rwanda

²Professor, Department of Electronic Engineering and Information Science,
University of Science and Technology of China, Hefei, Anhui, China

³Research Scholar, Department of Electronic Engineering and Information Science,
University of Science and Technology of China, Hefei, Anhui, China

⁴Professor and Head of Department, Department of Electrical and Electronic Engineering,
University of Rwanda, College of Science and Technology, Nyarugenge, Rwanda

ABSTRACT

This is a comparative design for two planar monopole antennas with small sizes, omnidirectional radiation patterns as well as wide-band performance. For purpose of selecting the best design, two slightly different structures were analyzed for size, bandwidths as well as radiation gain. Regardless of feed lines, the antenna structures are respectively referred to as U-shaped and modified U-shaped planar monopole antenna. They were analyzed at a common frequency of 4.6 GHz and individual central and resonance frequencies were finally set separately. The results show that both the antennas qualify for wideband standards. As we compare them, the U-shaped planar monopole presents the best impedance matching while the modified U-shaped is the smallest with much stable radiation fields. Both the models were manufactured and prototypes test results prove simulation results. Compared against some other antennas in similar area of research, our contribution are found in the improved antenna radiation fields throughout the whole wide-band (WB) together with very good WB bandwidth impedance matching. Upon requests, either model would be packaged for applications mentioned in the section of results and discussion.

KEYWORDS: Planar Monopole Antennas, Radiation Patterns, (Ultra-) Wideband Antennas