

Accepted Manuscript



Short communication

A short broadband monopole antenna

Omid Manoochehri, Mohammad Ali Salari, Amin Darvazehban

PII: S1434-8411(17)31212-8
DOI: <http://dx.doi.org/10.1016/j.aeue.2017.09.007>
Reference: AEUE 52060

To appear in: *International Journal of Electronics and Communications*

Received Date: 18 May 2017
Revised Date: 6 September 2017
Accepted Date: 9 September 2017

Please cite this article as: O. Manoochehri, M. Ali Salari, A. Darvazehban, A short broadband monopole antenna, *International Journal of Electronics and Communications* (2017), doi: <http://dx.doi.org/10.1016/j.aeue.2017.09.007>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

A short broadband monopole antenna

Omid Manoochehri¹, Mohammad Ali Salari², and Amin Darvazehban³

1. Department of Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL 60607 USA, MScEE
(e-mail: omanoo2@uic.edu)

2. Department of Physics, RWTH-Aachen University, 52074 Aachen, Germany, MScEE
(e-mail: salari.mohammadali@gmail.com) Corresponding author

3. Electrical Engineering Department, Amirkabir University of Technology, Tehran 15914, Iran, MScEE
(e-mail: amin.darvazehban@gmail.com)

Abstract: A novel design procedure is proposed to overcome the narrow bandwidth characteristic of the monopole antenna. Having sections with different lengths and radii as well as adding loads at two points along the antenna makes it permissible to optimize the radiation efficiency and bandwidth of the monopole antenna. Particle swarm optimization (PSO) technique is used to determine the load values, their respective locations and the elements of the matching network. A bandwidth ratio of 5:1 within the frequency range of 100-500 MHz is achieved. The total length of the antenna is 35 cm and the matching network is capable of handling RF power up to 100 W. The whole system is simulated with CST and ADS software. Measurement results of the fabricated antenna are in good agreement with simulations.

Key words: Monopole antenna, Matching circuits, Wideband antenna, Omni directional

1. Introduction: Mobile systems take advantage of antennas with an omnidirectional radiation pattern for full azimuth coverage. Throughout the frequency band of operation, the antenna gain should be maximized in the horizontal plane and the VSWR value should be minimized. For the ground-wave transmission at medium and low frequencies, the vertical polarization has considerably less attenuation compared to the horizontal polarization. Therefore, vertical polarization is preferred in many mobile systems, particularly for vehicular applications. We should mention that the monopole antennas are used as the feed for cavities [1] and come also in microstrip form [2-3]. Non-resonant antennas, such as helical and biconical antennas, have a length of two or more wavelengths and therefore they are not suitable for mobile applications at

Download English Version:

<https://daneshyari.com/en/article/4953763>

Download Persian Version:

<https://daneshyari.com/article/4953763>

[Daneshyari.com](https://daneshyari.com)