

# Accepted Manuscript



Regular paper

A compact resistively-loaded dipole antenna fed by a triangular tapered transmission line for imaging applications

Doojin Lee

PII: S1434-8411(17)32951-5

DOI: <https://doi.org/10.1016/j.aeue.2018.03.014>

Reference: AEUE 52267

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

Received Date: 15 January 2018

Accepted Date: 7 March 2018

Please cite this article as: D. Lee, A compact resistively-loaded dipole antenna fed by a triangular tapered transmission line for imaging applications, *International Journal of Electronics and Communications* (2018), doi: <https://doi.org/10.1016/j.aeue.2018.03.014>

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 compact resistively-loaded dipole antenna fed by a triangular tapered transmission line for  
imaging applications

Doojin Lee

Mechanical and Mechatronics Engineering, University of Waterloo (UW), Waterloo, ON,  
Canada.

Corresponding author: Dr. Doojin Lee (doojin.lee@uwaterloo.ca)

Abstract

This study realized a compact resistively loaded dipole antenna (CRDA) for imaging applications. The triangular tapered transmission line was designed to feed the balanced structure of the CRDA and 78.5% of energy was successfully delivered to the end of the transmission line. We analyzed the fabricated CRDA, which was fed by the triangular tapered transmission line, in terms of the characteristics of its reflected pulse and current distribution for image quality aspects by comparing it with a conventional dipole antenna (CDA). Using the CRDA, we performed an imaging experiment for a perfect electric conductor (PEC) target and fabricated a multi-layered head phantom. With this experiment, the target image was successfully reconstructed by the delay and sum technique.

Keywords

resistive antennas, reconstructed image, transmission line, wide band antennas

1. Introduction

Ultra-wide band (UWB) radar has attracted much interest for imaging applications in industrial and medical fields over the past decades [1, 2, 3, 4, 5]. Its main contribution is the advantages of microwaves: It is a nondestructive approach and a non-ionizing method, and it enjoys low cost fabrication.

The applications of a nondestructive approach to the target are ground penetrating radar (GPR) [6, 7, 8, 9, 10, 11, 12, 13] and wall penetrating radar [14, 15, 16]. In such applications,

Download English Version:

<https://daneshyari.com/en/article/6879368>

Download Persian Version:

<https://daneshyari.com/article/6879368>

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