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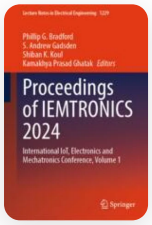
| Conference paper | First Online: 30 January 2025

| pp 343–352 | Cite this conference paper



Proceedings of IEMTRONICS 2024

(IEMTRONICS 2024)

Srijita Chakraborty, Wrishav Das, Deeptapol Datta, Dipta Chaudhuri, Aditi Raj & Mrinmoy Chakraborty

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Abstract

The reported research proposition presents designs for cavity-backed SIW, i.e., substrate integrated waveguide antennas and analyzes their frequency band responses. For the satellite application band, one Circular split ring slot is implemented. The developed

Institute of Technology, Agartala from 2012 -2014 and from January 2015 he has joined in the IEM / UEM group, Kolkata as Senior Professor and research Director. He was at the top of the merit lists in all the said cases.

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Bibliographic Information

Book Title
Proceedings of IEMTRONICS 2024

Book Subtitle
International IoT, Electronics and Mechatronics Conference, Volume 1

Editors
Phillip G. Bradford, S. Andrew Gadsden, Shiban K. Koul, Kamakhya Prasad Ghatak

Series Title
Lecture Notes in Electrical Engineering

DOI
https://doi.org/10.1007/978-981-97-4780-1

Publisher
Springer Singapore

eBook Packages
Engineering, Engineering (R0), Springer Nature Proceedings excluding Computer Science

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Hardcover ISBN
978-981-97-4779-5
Published: 30 January 2025

Softcover ISBN
978-981-97-4782-5
Due: 13 February 2026

eBook ISBN
978-981-97-4780-1
Published: 29 January 2025

Series ISSN
1876-1100

Series E-ISSN

Edition Number

Number of Pages

Circular Split Ring Integrated Cavity-Backed SIW Antenna for Satellite Application Band

Srijita Chakraborty, Wrishav Das, Deeptapol Datta, Dipta Chaudhuri, Aditi Raj, and Mrinmoy Chakraborty

Abstract The reported research proposition presents designs for cavity-backed SIW, i.e., substrate integrated waveguide antennas and analyzes their frequency band responses. For the satellite application band, one Circular split ring slot is implemented. The developed antenna has a gain of 4.4 dBi and resonates at the satellite application band at 11.2 GHz. The research integrates Circular Split Ring technology with Cavity-Backed Substrate Integrated Waveguide (SIW), presenting a comprehensive exploration of the antenna's characteristics and performance within satellite application bands. The Circular Split Ring element enhances the antenna's adaptability and resonance properties, contributing to broader bandwidth coverage. The integration of Cavity-Backed SIW ensures improved radiation efficiency, reduced back radiation, and controlled radiation patterns, aligning with the stringent requirements of satellite communication. This study not only advances the understanding of advanced antenna configurations but also holds promise for the development of highly efficient and adaptable satellite communication systems to meet the evolving demands of modern satellite applications.

Keywords Cavity-backed antenna · Substrate integrated waveguide · Slot antenna · Circular split ring slot

1 Introduction

Cavity-Backed Substrate Integrated Waveguide (SIW) Antenna represents the integration of two cutting-edge technologies in the realm of electromagnetic wave propagation and communication systems. At its core, the SIW technology combines the advantages of conventional waveguides and microstrip transmission lines, offering

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P. G. Bradford et al. (eds.), *Proceedings of IEMTRONICS 2024*, Lecture Notes in Electrical Engineering 1229, https://doi.org/10.1007/978-981-97-4780-1_26