



(<http://ipindia.nic.in/index.htm>)



(<http://ipindia.nic.in>)

Patent Search

Invention Title	Investigation of a RF p-i-n Diode Circuit Network Employing Electromagnetic-Based Modelling
Publication Number	18/2023
Publication Date	05/05/2023
Publication Type	INA
Application Number	202341028901
Application Filing Date	20/04/2023
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	ELECTRONICS
Classification (IPC)	G06F 151730, G06F 162800, H01L 292000, H01L 298680, H01L 311050

Inventor

Name	Address	Country
Dr.Ch.Kanchana Latha, Associate Professor in Physics / Department of Physics, Government Degree College for Women (A).	Government Degree College for Women (A), Begumpet, Hyderabad, Telangana-500016.	India
Dr. K. Parvathalu, Assistant Professor / Department of Physics, Government City College (A).	Government City College (A), Nayapul, Hyderabad, Telangana-500002.	India
Dr.Y.Vasudeva Reddy, Assistant Professor / Department of Physics, Government City College (A).	Government City College (A), Nayapul, Hyderabad, Telangana-500002.	India
Dr.S.E. Naina Vinodini, Assistant Professor / Department of Physics, Government City College (A).	Government City College (A), Nayapul, Hyderabad, Telangana-500002.	India
Sridhar Rao M, Assistant Professor / Department of Physics, Vaagdevi College of Engineering.	Vaagdevi College of Engineering, Bollikunta, Warangal, Telangana-506005.	India
R Radhika, Assistant Professor / Department of Physics, Vaagdevi Engineering College.	Vaagdevi Engineering College, Bollikunta, Warangal, Telangana-506005.	India
A Chandra Prakash, Assistant Professor / Department of Physics, Institute of Aeronautical Engineering.	Institute of Aeronautical Engineering, Dundigal Road, Hyderabad, Telangana-500043.	India

Applicant

Name	Address	Country
Dr.Ch.Kanchana Latha, Associate Professor in Physics / Department of Physics, Government Degree College for Women (A).	Government Degree College for Women (A), Begumpet, Hyderabad, Telangana-500016.	India
Dr. K. Parvathalu, Assistant Professor / Department of Physics, Government City College (A).	Government City College (A), Nayapul, Hyderabad, Telangana-500002.	India
Dr.Y.Vasudeva Reddy, Assistant Professor / Department of Physics, Government City College (A).	Government City College (A), Nayapul, Hyderabad, Telangana-500002.	India
Dr.S.E. Naina Vinodini, Assistant Professor / Department of Physics, Government City College (A).	Government City College (A), Nayapul, Hyderabad, Telangana-500002.	India
Sridhar Rao M, Assistant Professor / Department of Physics, Vaagdevi College of Engineering.	Vaagdevi College of Engineering, Bollikunta, Warangal, Telangana-506005.	India
R Radhika, Assistant Professor / Department of Physics, Vaagdevi Engineering College.	Vaagdevi Engineering College, Bollikunta, Warangal, Telangana-506005.	India
A Chandra Prakash, Assistant Professor / Department of Physics, Institute of Aeronautical Engineering.	Institute of Aeronautical Engineering, Dundigal Road, Hyderabad, Telangana-500043.	India

Abstract:

Abstract As we move into an era of higher functioning frequencies and expanded functionality, alongside a grander integration scale, the ability to accurately foresee electromagnetic (EM) impacts generated by unwanted radiation and the reciprocal coupling of digital electronic devices are becoming increasingly important in contemporary circuit design. This research proposes a simulation method centred around electromagnetic physics to simulate electronic components and circuits. To model a circuit at higher frequencies, it uses electromagnetic simulation FDTD combined with physics-based simulations of the semiconductor components in the circuit. The suggested approach is verified by comparing sample numerical outcomes on circuits with an authorized P-I-N diode against the model by the side of RF frequencies with data from measurements. Both data sets were in good agreement, proving the feasibility and reliability of the suggested approach. As a bonus, the projected process can be able to provide a physical apparatus for comprehending the impacts on semiconductor components and paths.

Complete Specification

Description: Investigation of a RF p-i-n Diode Circuit Network Employing Electromagnetic-Based Modelling

Field and Background of the Invention

High-frequency electrical gadgets, including RF, which operates between 300 kHz and 30 GHz, are becoming increasingly commonplace as modern communication and industrial processes continue to flourish. Designers of RF circuits face new challenges when working frequencies rise, functionality grows, and integration density rises. It is especially the case when planning a PCB layout containing semiconductor components. For instance, any semiconductor device's charging carriers, as can their interaction with propagating waves, can be modelled, provided that the device's size is proportional to the signal wavelengths at the frequency it operates. To reliably forecast the EM reactions of the incorporated and packed elements and classifications, full-wave equations must be used as the number of elements on the circuit increases. Understanding the fundamental features of sophisticated devices, predicting their efficacy, and optimizing their structure to decrease fabricating effort also necessitate good simulation. Researchers have developed numerous methodologies, each with their own unique basis, level of accuracy, and complication. The structure of the equations with Maxwell's equations is determined as a coordination reflecting an intensely interconnected, extremely nonlinear array of DEs using the same grid as the global modelling method the most stringent methodology. However, unlike circuit simulation, the processing time for global modelling is relatively lengthy. So far, it has only been used to model semiconductors or, at most, a minimal circuit with just one or two extra components. A corresponding circuit has defined each component in a physical device throughout the context of standard circuit-analysis methods; consequently, the simulation depends on a library of configurations and technological variables that must be characterised in light of the accurate fabrication method. However, there may be cases where the analogous circuit's accuracy suffers.

[View Application Status](#)



Terms & conditions (<http://ipindia.gov.in/terms-conditions.htm>) Privacy Policy (<http://ipindia.gov.in/privacy-policy.htm>)

Copyright (<http://ipindia.gov.in/copyright.htm>) Hyperlinking Policy (<http://ipindia.gov.in/hyperlinking-policy.htm>)

Accessibility (<http://ipindia.gov.in/accessibility.htm>) Archive (<http://ipindia.gov.in/archive.htm>) Contact Us (<http://ipindia.gov.in/contact-us.htm>)

Help (<http://ipindia.gov.in/help.htm>)

Content Owned, updated and maintained by Intellectual Property India, All Rights Reserved.

Page last updated on: 26/06/2019