

Scopus

## Document details

[< Back to results](#) | 1 of 1[Export](#) [Download](#) [Print](#) [E-mail](#) [Save to PDF](#) [Add to List](#) [More... >](#)[Full Text](#)[View at Publisher](#)

Proceedings - 5th International Conference on Computer and Communication Engineering: Emerging Technologies via Comp-Unication Convergence, ICCCE 2014

4 February 2015, Article number 7031652, Pages 262-264

5th International Conference on Computer and Communication Engineering, ICCCE 2014; Sunway Putra HotelKuala Lumpur; Malaysia; 23 September 2014 through 24 September 2014; Category numberE5413; Code 110844

## CNTFET SPICE model: Design of a carbon nanotube field effect transistor

(Conference Paper)

Farhana, S., [✉](#) Alam, A.H.M.Z., Khan, S., Motakabber, S.M.A.

Department of Electrical and Computer Engineering, Faculty of Engineering, International Islamic University Malaysia, Kuala Lumpur, Malaysia

### Abstract

[View references \(10\)](#)

In this paper, we elucidate the development of SPICE model of Carbon Nanotube Field Effect Transistor (CNTFET) and analyze the performance of the proposed model. A set of key parameter can be obtained from this model analysis such as drain current variation as a function of the conductance and drain-source voltage. Furthermore, a SPICE small signal model nanotube transistor is developed. It is used for studying the performance of current gain as well as design of nanotube transistor circuits and phase angle with cut-off frequency. CNT diameter is responsible for the better performance of CNTFET. Therefore an optimum diameter of CNT is imposed here to develop CNTFET. © 2014 IEEE.

### Author keywords

CNTFET gain small signal SPICE

### Indexed keywords

Engineering controlled terms: Amplification Carbon Carbon nanotubes Damage detection Drain current Field effect transistors Heterojunction bipolar transistors Nanosensors SPICE Transistors Yarn

Better performance

Carbon nano-tube field effect transistor (CNTFET)

CNTFET

Drain-source voltage

gain

Nanotube transistors

Optimum diameters

Small signal model

Engineering main heading: Carbon nanotube field effect transistors

### Metrics

0 Citations in Scopus

0 Field-Weighted Citation Impact



PlumX Metrics 

Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

### Cited by 0 documents

Inform me when this document is cited in Scopus:

[Set citation alert >](#)

[Set citation feed >](#)

### Related documents

Spice model design for carbon nanotube field effect transistor (CNTFET)

Farhana, S., Alam, A.H.M.Z., Khan, S. (2014) *IEEE International Conference on Semiconductor Electronics, Proceedings, ICSE*

Long-term effect of transportation on particle concentrations in various process chemicals

Misat, S.I., De Vos, G., Huysmans, G. (2003) *Solid State Phenomena*

Phonon-limited transport in carbon nanotubes using the monte carlo method

Pennington, G., Akturk, A., Goldsman, N. (2004) *2004 10th International Workshop on Computational Electronics, IEEE IWCE-10 2004, Abstracts*

**ISBN:** 978-147997635-5  
**Source Type:** Conference Proceeding  
**Original language:** English

**DOI:** 10.1109/ICCCE.2014.81  
**Document Type:** Conference Paper  
**Volume Editors:** Gunawan T.S.  
**Sponsors:** Felda Wellness Corporation, Malaysia Convention and Exhibition Bureau (MyCEB), Malaysian Industry-Government Group for High Technology, University Putra Malaysia, Yayasan Kesejahteraan Bandar  
**Publisher:** Institute of Electrical and Electronics Engineers Inc.

View all related documents based on references

Find more related documents in Scopus based on:

Authors > Keywords >

## References (10)

[View in search results format >](#)

All  Export  Print  E-mail  Save to PDF  Create bibliography

- 
- 1 *International Technology Roadmap for Semiconductors (ITRS) Reports*. Cited 803 times.  
<http://www.itrs.net/reports.html>
- 
- 2 Li, H., Xu, C., Srivastava, N., Banerjee, K.  
**Carbon Nanomaterials for Next-Generation Interconnects and Passives: Physics, Status, and Prospects**  
 (2009) *IEEE Transactions on Electron Devices*, 56 (9), pp. 1799-1821. Cited 245 times.  
 doi: 10.1109/TED.2009.2026524  
[View at Publisher](#)
- 
- 3 Saito, R., Dresselhaus, G., Dresselhaus, M.S.  
 (1998) *Physical Properties of Carbon Nanotubes*. Cited 6335 times.  
 London: Imperial College Press
- 
- 4 Javey, A., Tu, R., Farmer, D.B., Guo, J., Gordon, R.G., Dai, H.  
**High performance n-type carbon nanotube field-effect transistors with chemically doped contacts**  
 (2005) *Nano Letters*, 5 (2), pp. 345-348. Cited 333 times.  
 doi: 10.1021/nl047931j  
[View at Publisher](#)
- 
- 5 Javey, A., Guo, J., Farmer, D.B., Wang, Q., Wang, D., Gordon, R.G., Lundstrom, M., (...), Dai, H.  
**Carbon nanotube field-effect transistors with integrated ohmic contacts and high-k gate dielectrics**  
 (2004) *Nano Letters*, 4 (3), pp. 447-450. Cited 412 times.  
 doi: 10.1021/nl035185x  
[View at Publisher](#)
- 
- 6 Mann, D., Javey, A., Kong, J., Wang, Q., Dai, H.  
**Ballistic Transport in Metallic Nanotubes with Reliable Pd Ohmic Contacts**  
 (2003) *Nano Letters*, 3 (11), pp. 1541-1544. Cited 316 times.  
 doi: 10.1021/nl034700o  
[View at Publisher](#)
-

- 7 Charlier, A., Setton, R., Charlier, M.-F.  
Energy components in a lattice of ions and dipoles: Application to the  $K(\text{THF})_x\text{C}_{24}$  compounds ( $x=1,2$ )  
(1997) *Physical Review B - Condensed Matter and Materials Physics*, 55 (23), pp. 15537-15543. Cited 4 times.  
[View at Publisher](#)
- 
- 8 Pennington, G., Goldsman, N.  
Semiclassical transport and phonon scattering of electrons in semiconducting carbon nanotubes  
(2003) *Physical Review B - Condensed Matter and Materials Physics*, 68 (4), art. no. 045426, pp. 454261-4542611. Cited 176 times.  
[View at Publisher](#)
- 
- 9 Farhana, S., Alam, A.Z., Motakabber, S., Khan, S.  
Design and analysis of CNT electronics structure to design CNTFET  
(2013) *5th IEEE International Nanoelectronics Conference, IEEE INEC 2013*. Cited 3 times.
- 
- 10 Kocabas, C., Dunham, S., Cao, Q., Cimino, K., Ho, X., Kim, H.-S., Dawson, D., (...), Rogers, J.A.  
High-Frequency performance of submicrometer transistors that use aligned arrays of single-walled carbon nanotubes  
(2009) *Nano Letters*, 9 (5), pp. 1937-1943. Cited 103 times.  
<http://pubs.acs.org/doi/pdfplus/10.1021/nl9001074>  
doi: 10.1021/nl9001074  
[View at Publisher](#)

© Copyright 2015 Elsevier B.V., All rights reserved.

[< Back to results](#) | 1 of 1

[^ Top of page](#)

## About Scopus

[What is Scopus](#)  
[Content coverage](#)  
[Scopus blog](#)  
[Scopus API](#)  
[Privacy matters](#)

## Language

[日本語に切り替える](#)  
[切换到简体中文](#)  
[切换到繁體中文](#)  
[Русский язык](#)

## Customer Service

[Help](#)  
[Contact us](#)

**ELSEVIER**

[Terms and conditions](#) [Privacy policy](#)

Copyright © 2017 Elsevier B.V. All rights reserved. Scopus® is a registered trademark of Elsevier B.V.

Cookies are set by this site. To decline them or learn more, visit our [Cookies page](#).

 RELXGr