

2017 IEEE Regional Symposium on Micro and Nanoelectronics (RSM 2017)

**Batu Ferringhi, Penang, Malaysia
23-25 August 2017**



**IEEE Catalog Number: CFP1768N-POD
ISBN: 978-1-5090-4030-8**

**Copyright © 2017 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP1768N-POD
ISBN (Print-On-Demand):	978-1-5090-4030-8
ISBN (Online):	978-1-5090-4029-2

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Table of Contents

Estimation of Thin Film Stress in Buckled MEMS Bridge from Pull-in Voltage <i>Rhonira Latif, Muhtade Aqil, Muhammad Fahmi Jaafar, Burhanuddin Yeop Majlis</i>	1
MetalMUMPs Resonator for Acetone Vapor sensing <i>Almur Abdelkreem Saeed Rabih, John Ojur Dennis, Mohd Haris Md Khir, Abdelaziz Yousif Ahmed, Mawahib Gafare Ahmed, Muhammad U Mian, Alamin Idris</i>	5
Size-based Particles Separation Utilizing Dielectrophoresis Technique <i>Nurul Nadya Yahya, Muhamad Ramdzan Buyong, Norazreen Abd Aziz, Burhanuddin Yeop Majlis</i>	10
A K-Band Switched-Line Phase Shifter Using Novel Low-Voltage Low-Loss RF-MEMS Switches <i>Ma Li Ya, Norhayati Soin, Anis Nurashikin Nordin</i>	14
Application of BOE and KOH+IPA for Fabrication of Smooth Nanopore Membrane Surface for Artificial Kidney <i>Kamarul 'Asyikin Mustafa, Jumril Yunas, Azlan Hamzah, Burhanuddin Yeop Majlis</i>	18
Mechanical Analysis of MEMS Diaphragm for Bladder Pressure Monitoring <i>Norliana Yusof, Badariah Bais, Burhanuddin Yeop Majlis, Norhayati Soin</i>	22
Simulation on Mechanical Properties of Porous Nanocrystalline Silicon Membrane for Artificial Kidney <i>Muhammad Fahmi Jaafar, Rhonira Latif, Burhanuddin Yeop Majlis</i>	26
Synthesis and enhanced photocatalytic property of CuO nanostructure via dip coating method <i>Ahmad Sabirin Zoolfakar, Nur Munirah Megat Abu Bazar, Rozina Abdul Rani, Nur Samihah Khairir, Mahzatun Aqma Abu Talip, Mohamad Hafiz Mamat, Mohamad Rusop</i>	30
Electrochemical Deposition of Zinc Oxide Thin Film using Two-terminal Setup <i>Amer Safri Hamidi, Mastura Shafinaz Zainal Abidin</i>	34
Modified Electrical Characteristics of Filtered Cathodic Vacuum Arc Amorphous Carbon Film on n-Si (100) by Heat Treatment <i>Hung Pham, Anthony S Holland, James Partridge, Hiep Tran, Nguyen L Huy</i>	38
Analytical Study of the Electronic Properties of Boron Nitride Nanosheet <i>Lim Wei Hong, Afiq Hamzah, Mohammad Taghi Taghi Ahmadi, Razali Ismail</i>	42
DC Magnetron sputtered TiO₂ thin film as efficient hole blocking layer for perovskite solar cell <i>Mohamed Salleh, Norani Muti Mohamed, Balbir Singh Mahinder Singh, Veeradasan Perumal, Mohamed Shuaib Mohamed Saheed</i>	46
Template-Assisted Growth of Highly Oriented 3D Graphene pH sensor towards New Avenues for Biosensor <i>Veeradasan Perumal, Norani Muti Mohamed, Mohamed Salleh, Mohamed Shuaib Mohamed Saheed</i>	50
All-solution process flexible nanocomposite generator made of BaTiO₃ nanoparticles and graphene quantum dots <i>Mohd Ambri Mohamed, Elyani Abu Bakar, Burhanuddin Yeop Majlis, Oskar Hasdinor Hassan, Firdaus Omar, Tunku Ishak Tunku Kudin</i>	54
Grounded and Floating Impedance Simulators Employing a New Active Element <i>Jahariah Sampe, Mohammad Faseehuiddin, Sawal Hamid Md Ali, Zubaida Yusoff, Burhanuddin Yeop Majlis</i>	58
Theoretical modeling and FEA simulation of a CMOS-MEMS resonator <i>Abdelaziz Yousif Ahmed, Almur Abdelkreem Saeed Rabih, John Ojur Dennis, Mohd Haris Md Khir, Ala Basuwaqi</i>	62
Impact of strain on electrical performance of Silicon Nanowire MOSFET <i>Fatimah K.A Hamid, Razali Ismail, Muhammad Anas Razali</i>	67

Numerical study of laminar flow in pillared-microchannel	71
<i>Wan Ammar Fikri Wan Ali, Jumril Yunas, Azlan Hamzah, Burhanuddin Yeop Majlis</i>	
Design and Simulation of a Low Noise PWM Based Phase Synchronous Inverter for microgrid	75
<i>Tawfikur Rahman, S M A Motakabber, Muhammad I Ibrahimy</i>	
Development of ECG Home Monitoring System	80
<i>Sarah Rafiq, AHM Zahirul Alam, Md Rafiqul Islam</i>	
Negative Charge Dielectrophoresis by using Different Radius of Electrodes for Biological Particles	84
<i>Farahdiana Yunus, Azlan Hamzah, Muhamad Ramdzan Buyong, Jumril Yunas, Burhanuddin Yeop Majlis</i>	
Transfer Characteristics of Graphene based Field Effect Transistor (GFET) for Biosensing Application	88
<i>Reena Sri Selvarajan, Azlan Hamzah, Burhanuddin Yeop Majlis</i>	
Parameter Design of Microstrip Patch Antenna Operating at Dual Microwave-Band for RF Energy Harvester Application	92
<i>Noor Hidayah Mohd Yunus, Jahariah Sampe, Jumril Yunas, Alipah Pawi</i>	
New CFOA-Based Low Frequency Filters for Biomedical and Seismic Applications	96
<i>Muhammad Taher Abuelma'atti</i>	
Straightforward fabrication of low Schottky barrier single-walled carbon nanotube transistors by direct growth method	100
<i>Mohd Ambri Mohamed, Burhanuddin Yeop Majlis</i>	
Electrical Characterization of Gold Contact on Porous Silicon Layer	104
<i>Muhammad Hazwan Aizat Hussin, Mastura Shafinaz Zainal Abidin</i>	
Growth Time Dependent of High Quality Graphene on Interdigital Electrodes for MEMS Supercapacitor	108
<i>Hafzaliza Erny Zainal Abidin, Azlan Hamzah, Mohd Ambri Mohamed, Burhanuddin Yeop Majlis, Reena Sri Selvarajan</i>	
Graphene-based Surface Plasmon Resonance Urea Biosensor using Kretschmann configuration	112
<i>Nur Akmar Jamil, P. Susthitha Menon, Fairus Atida Said, Kalaivani Tarumaraja, Siew Mei Gan, Sahbudin Shaari, Burhanuddin Yeop Majlis</i>	
Sensitivity Increment of One Dimensional Photonic Crystal Biosensor	116
<i>Mohamad Hazwan Haron, Ahmad Rifqi Md Zain, Burhanuddin Yeop Majlis</i>	
A Study of Different Extraction Techniques of Nanocrystalline Graphite (NCG)/p-type silicon Schottky diode Parameters	119
<i>Azfar Abid Nawawi, Suhana Mohamed Sultan, Shaharin Fadzli Bin Abd Rahman, Hing Wah Lee, Suan Hui Pu, John McBride</i>	
Effects of Annealing Temperature on P3HT:Graphene Thin Film Characterization	123
<i>Nur Shakina Mohd Shariff, Puteri Sarah Mohamad Saad</i>	
DNA/AuNP-Graphene Back-gated Field Effect Transistor as a Biosensor for Lead (II) Ion Detection	127
<i>Hoe Chee Ling, Pradeep Kumar, Chun Hong Kang, Zainal Arif Burhanudin</i>	
Yttrium Iron Garnet Thick Film Inclusion for Enhanced Microstrip Patch Antenna Performance	131
<i>Intan Helina Hasan, Mohd Nizar Hamidon, Alyani Ismail, Ismayadi Ismail, Rosiah Osman</i>	
Experimental Investigation and Physical Explanation of Shallow Trench Isolation Stress Effect in MOSFETs	135
<i>Chiew Ching Tan, Philip Beow Yew Tan</i>	
Solar Battery Charger using a Multi-Stage Converter	139
<i>Thanyanut Lueangamornsiri, Warit Wichakool, Kusumal Chalermyanont</i>	

Numerical Simulation of Thick Metal Passivation Stress, Part I: Identification of Stress Source	143
<i>Raj Sekar Sethu, David Kho, Salil Kulkarni, How Ung Ha, Kok Heng Soon</i>	
Numerical Simulation of Thick Metal Passivation Stress, Part II: Minimizing Stress using Response Surface Methodology	147
<i>Raj Sekar Sethu, David Kho, Salil Kulkarni, How Ung Ha, Kok Heng Soon</i>	
Simulation Study of 25 nm PMOS FinFET Fabrication with Silicon Co-Implant	151
<i>Muhammad Anas Razali, Fatimah K.A Hamid</i>	
Temperature Compensation of ISFET Based pH Sensor Using Artificial Neural Networks	155
<i>Rishabh Bhardwaj, Soumendu Sinha, Sagnik Majumder, Pratik Narang, Pawan K Ajmera, Rishi Sharma, Ravindra Mukhiya</i>	
Enhancing efficiency of Organic Solar Cells by Interfacial Materials Modification	159
<i>Mohd Zuhir Hamzah, Ismail Saad, Roystone Anthony, Khairul Anuar Mohamad, Bablu K. Ghosh, Nurmin Bolong</i>	
Design and Simulation Single stage CMOS TIA for 1.4 GHz,-27 dB MEMS SAW Resonator	163
<i>Norlizawati Kamarudin, Jamilah Karim</i>	
Null Convention Logic Primitive Element Architecture for Ultralow Power High Performance Portable Digital Systems	167
<i>Nguyen L Huy, Paul Beckett</i>	
Sequential Experimental Strategies of Longitudinal Unzipping of SWNTs: Selective Width of Single Layer Graphene Nanoribbon	171
<i>Hideaki Furuki, Amin TernehYousefi, Hirofumi Tanaka</i>	
Deposition Temperature Dependence of ZnO Nanostructures Growth using TCVD for EGFET pH Sensor	175
<i>Aimi bazilah Rosli, Zaiki Awang, Shafinaz Sobihana Shariffudin, Sukreen Hana Herman</i>	
Characterization of Difference Carbon Nanotubes (CNTs) as a Sensing Mechanism for Development of Formaldehyde Gas Detection Sensor	179
<i>Mohd Zaki Mohamed Kamarudin, Uda Hashim, Mohd Khairuddin Md Arshad, Mohamad Nasir Mat Arif</i>	
An Amplitude Independent Muscle Activity Detection Algorithm Based on Adaptive Zero crossing Technique and Mean Instantaneous Frequency of the sEMG signal	183
<i>Husamuldeen Hameed, Wan Zuha Wan Hasan, Suhaidi Shafie, Siti Anom Ahmad, Haslina Jaafar</i>	
One Step Precipitation of CaCO₃ Nanoparticles assisted by Drying and Hydrothermal Method	187
<i>Nurul Hidah Sulimai, Salifairus Mohammad Jafar, Zuraida Khusaimi, Saifollah Abdullah, Rozina Abdul Rani, Abdul Haseeb, Salman Alrokayan, Mohamad Rusop</i>	
Gold Nano-particle Based Al Interdigitated Electrode Electrical Biosensor for Specific ssDNA Target Detection	191
<i>Asanka Rajapaksha, Uda Hashim, A. z. Natasha, Afnan Uda, Thivina Vijayakumaran, Nandana Fernando</i>	
Structural and Optical Properties of Anatase TiO₂ Thin Films Deposited by Dip Coating Method	195
<i>Siti Farhaniza Abd Samat, Puteri Sarah Mohamad Saad, Mohd Faizul Idros</i>	
Surface Morphological and Electrical Characterization of Silicon Nanowires (SiNWs) by Conventional Photolithography Method	199
<i>Nur Khairun Syahirah Nordin, Uda Hashim, Adilah Ayoib, Thivina Vijayakumaran</i>	
Fabrication and Characterization of Carbon-Based Flexible Strain Sensor	203
<i>Haslina Jaafar, Mohd Nizar Hamidon, Roslina Mohd Sidek, Mohd Faris Fadzil</i>	
Dielectrophoresis based Focusing in Microfluidic Devices	207
<i>Anas Alazzam, Fadi Al Naimat, Ali Hilal-Alnaqbi, Waqas Waheed, Bobby Mathew</i>	

Effect of 3D microstructure geometry on wetting properties of PDMS surfaces by micro 3-dimensional (3D) grayscale fabrication technique	212
<i>Intan Sue Liana Abdul Hamid, Asrulnizam Abd Manaf</i>	
Quadcopter Sensing System for Risky Area	216
<i>Omar Ibrahim Dallal Bashi, Wan Zuha Wan Hasan, Suhaidi Shafie, Norhafiz Azis, Hiroaki Wagatsuma</i>	
Fabrication and Characterization of Titanium Dioxide through Different Depositions Method for Detection of Formaldehyde Gas	220
<i>Mohd Zaki Mohamed Kamarudin, Mohamad Nasir Mat Arif, Mohd Khairuddin Md Arshad, Uda Hashim</i>	
Dielectric Properties of Ceramic Materials obtained from Rice Husk for Electronic Applications	224
<i>Rosiah Osman, Hapishah Abdullah, Alaa Husain, Mohd Nizar Hamidon, Khamirul Amin Matori, Intan Helina Hasan</i>	
Low Cost Design and Fabrication of PDMS Microfluidics Micromixers for DNA Extraction	227
<i>Adilah Ayoib, Uda Hashim, Subash C. B. Gopinath, Mohd Khairuddin Md Arshad, Thivina Vijayakumaran, Nur Khairun Syahirah Nordin, Noor Amalina Aini Abdul Karim, Reanddy Yopop</i>	
Temperature Effect on ON/OFF Current ratio of FinFET Transistor	231
<i>Yasir Hashim</i>	
SDSoC Based Development of Vehicle Counting System Using Adaptive Background Method	235
<i>Katawut Srijongkon, Nattha Jindapetch, Rakkrit Duangsoithong, Masami Ikura, Surachate Chumpol</i>	
Assessing the NSOP (non stick on pad) bond pad by EDX, XPS and ToFSIMS analysis	239
<i>Lai Chin Yung, Ho Hong, Choke Fei Cheong</i>	
Correlation of Wafer Level Wire Bond and Package Level Wire Bond for Bond Pad Quality Evaluation	244
<i>Kuan Fang Lee</i>	
The influence of shallow trench isolation angle on hot carrier effect of STI-based LDMOS transistors	248
<i>Ainul Fatin Muhammad Alimin, Sharifah Fatmadiana Wan Muhamad Hatta, Norhayati Soin</i>	
Temperature Cycle Test Study on Thick Metal Passivation Cracks	252
<i>Handie Bin Ahmataku, Raj Sekar Sethu</i>	
Impacts of fin width scaling on the electrical characteristics of 10-nm FinFET at different metal gate work function	256
<i>Nurul Aida Farhana Othman, Sharifah Fatmadiana Wan Muhamad Hatta, Norhayati Soin</i>	
Development of Wearable Patch Antenna for Medical Application	260
<i>Ain Syafiqah Zaaba, Siti Noorjannah Ibrahim, Norun Abdul Malek, Athirah Mohd Ramly</i>	
Micro IDEs versus Nano IDEs: morphological and electrical characterizations	264
<i>Thivina Vijayakumaran, Uda Hashim, Mohd Khairuddin Md Arshad, Adilah Ayoib, Nur Khairun Syahirah Nordin, Asanka Rajapaksha</i>	