

# **2024 6th Iranian International Conference on Microelectronics (IICM 2024)**

**Tabriz, Iran  
29-31 October 2024**



**IEEE Catalog Number: CFP24BX3-POD  
ISBN: 979-8-3315-1138-8**

**Copyright © 2024 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:	CFP24BX3-POD
ISBN (Print-On-Demand):	979-8-3315-1138-8
ISBN (Online):	979-8-3315-1137-1

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## Table of Contents

A 2x1 Bit Multiplier Based on Vibrating Microelectromechanical Resonators.....	1
A differential ring VCO with a new structure for the pre-charger and pre-discharger method.....	5
A Low-Power Fully Differential LC Oscillator with Phase Noise Reduction for LTE Applications.....	10
A Review for Graphene, Graphene-based Materials, and Their Applications in Photonics and Optoelectronic Devices .....	15
A runtime reconfigurable exact-approximate full-adder design.....	20
An Ultra-Low-Voltage, High-Voltage Gain, Bulk Driven CMOS Operational Amplifier.....	25
Broadband All-Dielectric Metasurface Absorber For VLC Applications.....	30
Characteristics of Electrophoretic Graphene-oxide (GO) Film on Permalloy (Ni-Fe) Thin Film Sputtered on Copper Substrate.....	35
Clusters of Cubic Plasmonic Nanoparticles for Improved Efficiency in Bifacial Perovskite Solar Cells.....	39
Comparison between Hardware/Software Co-design of RiscV Vector and Scalar Implementation of Deep Neural Networks.....	45
Design and Implementation of 2kw Grid connected Inverter.....	50
Design and Numerical Assessment of a Novel Dielectrophoretic Microfluidic Chip to Separate CTCs.....	55
Design and Simulation of a 2.4 GHz Class E Power Amplifier With High PAE and Linearity Improvement in 0.13 $\mu$ m CMOS Technology.....	60
Design of a High Voltage Common Mode Resilient FlexRay Receiver in 180nm/5V CMOS Process.....	65
Design of All-Passive Harmonic-Rejection N-Path Filter.....	70
Design of Floating-Point Multiplier Architecture with Adaptive Data Timing Channels.....	76
Design of long signal path Ternary computational blocks using Dynamic and Pass Transistor Logic based on Carbon Nanotube Field Effect Transistors.....	82
Dynamic Power Control in a Hardware Neural Network with Error-Configurable MAC Units....	87
Efficiency enhancement of tin-based perovskite solar cell with carbon back-contact using cubic and pyramid metallic nano-particles: numerical investigation.....	93

Enhanced sensitivity of ISFET pH-sensor utilizing reduced Graphene Oxide.....	99
Evaluation of Run-Time Energy Efficiency using Controlled Approximation in a RISC-V Core.....	106
Frequency Response and Design Based on gm/ID of Amplifier in CNFET Technology.....	113
High Figure of Merit Metasurface Biosensor at Optical Telecommunication Band.....	119
Human Presence Detection and Energy Harvesting Using SWIPT.....	123
Influence of piezoelectric actuator on the stability of micromechanical device via Casimir force.....	129
OptiCore: A Novel Approach for Designing a Low Power Multi-Core Processor.....	134
Optimized design of Lower Complexity Reversible Toffoli Gate in QCA Technology.....	139
Optimum Design of GaAs/AlGaAs Surface-Relief VCSELs with Single-Mode Operation at 808 nm.....	144
Plasmonic CH <sub>4</sub> Sensor Using an MIM Waveguide with a Hexagonal Cavity and Silver Square Island.....	149
Quantum Machine Learning Acceleration with Quantum Control Techniques.....	154
Six-Band Frequency Full Absorber Based on The Heterogeneous Structure of Graphene Metamaterial.....	159
Study Nanoscale Material NEMS Resonant Pressure Sensors: Simulation and Comparion.....	165
Temperature Sensor Based on a Plasmonic MIM Waveguide with a Grill-Shaped Cavity.....	170
Third Harmonic Generation Improvement with BIC-based Perovskite Metasurface.....	174
Three-Phase Bidirectional Integrated Meter Using Hall Effect Sensor in 0.5um CMOS Process.....	180
Tunable High-Q N-Path Filters; Review and Redesign.....	185
Unified Modeling Framework for Dynamic Analysis of a MEMS Resonant Biosensor.....	190
Using GDI Structure in Hardware Implementation of Convolution Operation in Deep Neural Networks.....	195