State Key Laboratory of Analog and Mixed-Signal VLSI (AMSV) Institute of Microelectronics (IME)

University of Macau

Newsletter

(2023 Milestones)

Year 13
No. 13

ORGANIZATIONAL CHART

Academic Team 學術團隊

Management 管理

Prof. Rui MARTINS
馬許願教授
IEEE Life Fellow IEEE終身會士
Director of IME
微電子研究院院長
Founding Director of SKL-AMSV (2011-2022)
國家重點實驗室原主任 (2011-2022)

Prof. Pui In MAK
麥沛然教授
IEEE Fellow IEEE會士
Director of SKL-AMSV
國家重點實驗室主任
Deputy Director (Research) of IME
微電子研究院副院長 (研究)

Prof. Sai Weng SIN
冼世榮副教授
Deputy Director of SKL-AMSV
國家重點實驗室副主任
Deputy Director (Academic) of IME
微電子研究院副院長 (學術)

Prof. Ming LIU
劉明教授
Chair of SKL Academic Committee (Scientific Advisory Board)
實驗室學術委員會主席

Prof. Man Kay LAW
羅文基教授
Laboratory Infrastructure Coordinator
實驗室基礎設施協調主任

Prof. Yan ZHU
諸嫣副教授
Industrial Collaboration Coordinator
產業合作協調主任

Prof. Yan LU
路延副教授
Microelectronics Center / ZUMRI Coordinator
珠海澳大科技微電子研發中心主任

Wireless and Multidisciplinary Research Group (WMRG) 無線和多學科研究組

Pui In MAK
麥沛然
Full Professor
教授

Man Kay LAW
羅文基
Full Professor
教授

Sio Hang PUN
潘少恆
Associate Professor
副教授

Jun YIN
殷俊
Associate Professor
副教授

Yong CHEN
陳勇
Associate Professor
副教授

Yanwei JIA
賈艷偉
Associate Professor
副教授

Ka Fai UN
阮家煇
Assistant Professor
助理教授

Ka Meng LEI
李家明
Assistant Professor
助理教授

Yang JIANG
江洋
Assistant Professor
助理教授

Wei Han YU
于維翰
Assistant Professor
助理教授

Yatao PENG
彭亞濤
Assistant Professor
助理教授

Yuan WANG
王苑
Assistant Professor
助理教授

Data and Power Conversion Research Group (DPRG) 數據和電源轉換研究組

Sai Weng SIN
冼世榮
Associate Professor
副教授

Yan ZHU
諸嫣
Associate Professor
副教授

Chi Seng LAM
林智聲
Associate Professor
副教授

Yan LU
路延
Associate Professor
副教授

Chi Hang CHAN
陳知行
Associate Professor
副教授

Mo HUANG
黃沫
Assistant Professor
助理教授

Minglei ZHANG
張明磊
Assistant Professor
助理教授

Mingqiang GUO
郭銘強
Assistant Professor
助理教授

Wenliang ZENG
曾文良
UM Macau Fellow
澳大濠江學者

Chi Wa U
余志樺
UM Macau Fellow
澳大濠江學者

Cheng GONG
宮成
Research Assistant Professor
研究助理教授

Administrative and Technical Team 行政技術團隊

Fan NG, Leo
吳凡
Functional Head (Operation)
事務主管 (運行)

Un Pang LEI, Lewis
李遠鵬
Functional Head (Technical)
事務主管 (技術)

Bin ZHOU, Jet
周斌
Technology Transfer Officer
技術轉移主任

Chi Wai TANG, Kevin
鄧志偉
Laboratory Technician - Safety Officer
實驗室技術員 — 安全主任

Yuen Ki CHAN, Elizabeth
陳婉琪
Administrative Officer
行政主任

Jie GAO, Jennie
高潔
Laboratory Technician - Safety Officer
實驗室技術員 — 安全主任

Jianyu ZHONG, Jankey
鍾健瑜
Laboratory Technician
實驗室技術員

Pui Wan SOU, Jenny
蘇佩雲
Senior Administrative Assistant
高級行政助理

Sut Wai IEONG, Hedy
楊雪慧
Senior Administrative Assistant
高級行政助理

ACADEMIC COMMITTEE

The Third SKL Academic Committee
第三屆國家重點實驗室學術委員會

2023-2028

Prof. Ming LIU
IEEE Fellow
Fudan University *1

Prof. Franco MALOBERTI
IEEE Life Fellow
University of Pavia

Prof. Zhihua WANG
IEEE Fellow
Tsinghua University

Prof. Howard Cam LUONG
IEEE Fellow
Hong Kong University of Science and Technology

Prof. Rui MARTINS
IEEE Life Fellow
University of Macau / University of Lisbon *2

Dr. Seng-Pan U
IEEE Fellow
Silergy Corp. | Silergy Micro Tech (Nanjing, Guangdong & Macau)

Prof. Massimo ALIOTO
IEEE Fellow
National University of Singapore

Prof. Chi-Hou CHAN
IEEE Fellow
City University of Hong Kong

Prof. Michael KRAFT
Katholieke Universiteit Leuven

Prof. Qiang LI
University of Electronic Science and Technology of China

Prof. Yu WANG
IEEE Fellow
Tsinghua University

Prof. Nanjian WU
Chinese Academy of Sciences

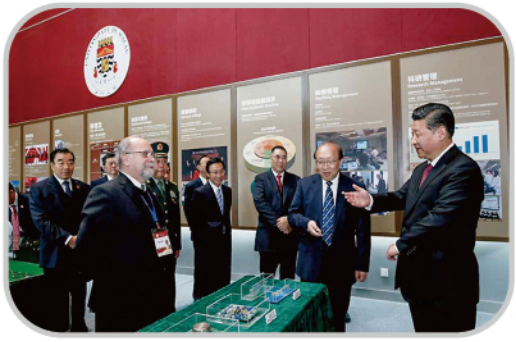
Prof. Shouyi YIN
Tsinghua University

13 eminent IC experts (9 IEEE Fellows)　13名杰出的IC專家 (9名IEEE會士)
2 Academicians (1 China, 1 Portugal)　2名院士 (中國 1, 葡萄牙 1)

* 1: Academician of Chinese Academy of Sciences 中國科學院院士
* 2: Academician of the Academy of Sciences of Lisbon, Portugal 葡萄牙科學院院士

INTRODUCTION

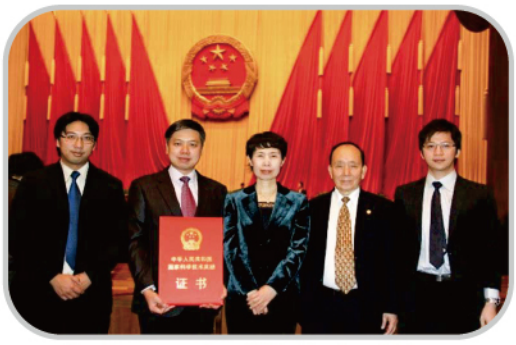
The laboratory was established by the University of Macau to conduct cutting-edge research on state-of-the-art electronics and other related emerging fields with research emphasis in analog and mixed-signal circuits specially focusing in wireless/wireline RF transceivers and data converters for high-speed and low-power applications. The laboratory also actively develops research in power management circuits and microfluidic chips, developing solutions for Lab-on-Chip and eventually Lab-on-CMOS applications.



President Xi Jinping visits the University of Macau and knows about the research development of SKL-AMSV, 2014

The core research team of the laboratory (SKL-AMSV) is mainly composed (50%) by Macau talents born and trained at all levels up to the PhD in the University of Macau. In 2023, it has attracted 1 chair professor, 1 adjunct chair professor (visiting), 2 full professors, 9 associate professors, 9 assistant professors, 2 UM Macau fellow and 1 Research Assistant Professor, among them 3 are IEEE Fellows (USA) and 1 is RSC & IET Fellow.

Macao S&T Awards - 1st Class Technological Invention Award, 2020



The first awardee of the National Science and Technology Progress Award from Macau, 2011

There are also around 30 post-docs and over 300 doctoral and master students. The dominant expertise of the lab in state-of-the-art electronics reached world-top standards in the field. The testing equipment is also advanced and quite unique in the Greater Bay Area. As of 2023, the laboratory published 14 books and chapters, 573 international refereed journal articles and 313 international conference papers, 60 of which were published in the most prestigious electronics conference in the world - the International Solid-State Circuits Conference (ISSCC), that takes place every year in San Francisco, USA. The research team presented 15 papers at ISSCC 2023 with chip measurements, ranking first in the world in terms of number of publications. They also presented 14 papers at ISSCC 2024, ranked first in the world together with Samsung and the Korea Advanced Institute of Science and Technology (KAIST). Furthermore, during the same period the lab had 51 patents, 11 Chinese patents, 3 Taiwan Region patents and 37 US patents. Several works from the lab are already in practical use in a wide range of electronic equipment, achieving technology transfer. In addition, the lab's research team won the second prize of the 2011 National Science and Technology Progress Award, for the first time attributed to a team from Macau, and numerous FDCT awards in particular the 1st prize in Technological Invention also attributed for the first time in Macau in 2020.

A group photo of the research team at ISSCC 2024

Prof. Rui Martins, Founding Director (2011-2022) of the SKL-AMSV, received Medal of Merit from Macao SAR Government in 2022, in recognition of his outstanding contribution to education. Moreover, Prof. Mak Pui-In Interim Director of the SKL-AMSV, being the first and only scholar from Macau to recieve the Xplorer Prize in 2022. Besides, the lab's research team won the 2010 Ho Leung Ho Lee Science and Technology Innovation Award, 6 medals from the Central and Macau SAR governments, and 1 of its members was recently elevated to the Chinese Academy of Sciences as a Foreign Expert.

✓ **Benchmark** with top national academic institutions in terms of ***state-of-the-art chips*** in **IEEE ISSCC**, San Francisco, USA

按**前沿芯片成果**於**國際固態電路會議**與我國頂級學術機構的比較

國內學術機構	2011-2015	2016-2020	2021	2022	2023	2024	論文總數
University of Macau 澳門大學 ★	9	30	2	4	15	14	74
Tsinghua University 清華大學	3	8	6	8	14	13	52
HKUST 香港科技大學	11	11		1			23
Peking University 北京大學		2	4	5	6	5	22
Fudan University 復旦大學	5	6		3	3	3	20
Chengdu UESTC 電子科技大學		4	3	1	5	4	17
Southeast University 東南大學		2	1		3	6	12
Chinese Acad. Sci. 中國科學院	3		1		4	3	11
Zhejiang University 浙江大學			2	3	3	2	10
Univ. of S&T of China 中國科學技術大學			1	2	1	5	9
Southern Univ. of S&T 南方科技大學						5	5
Shanghai Jiaotong U. 上海交通大學		2			1	1	4
Tianjin University 天津大學		1		1			2
Xi'an Jiaotong U. 西安交通大學		1				1	2
CUHK(Shenzhen) 香港中文大學(深圳)						2	2

***Awards*獎項**

- 1 x Far-East Best Paper Award 遠東傑出論文獎 (1st in China 中國首獲)
- 9 x SSCS Pre-Doctoral Achievement Award 博士生成就獎
- 2 x ISSCC Silkroad Award 絲綢之路獎
- 1 x ISSCC Student Research Preview Award 學生研究海報獎
- 20 x ISSCC Student Research Preview 學生研究海報

Fourteen consecutive years (2011-2024) in ISSCC with 74 papers! 連續14年於國際固態電路會議發表了74篇論文!

Rank排名	2024		Paper論文數量
1	University of Macau ★	澳門大學	14
1	SAMSUNG *	三星電子	14
2	KAIST(South Korea)	南韓科學技術院	13
2	Tsinghua University	清華大學	13
3	Delft University of Tech.	荷蘭台夫特理工	9

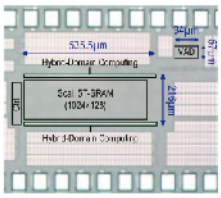
Rank排名	2023		Paper論文數量
1	University of Macau ★	澳門大學	15
2	Tsinghua University	清華大學	14
3	Delft University of Tech.	荷蘭台夫特理工	9
4	KAIST(South Korea)	南韓科學技術院	8
4	SAMSUNG *	三星電子	8

** Multi-countries in Worldwide 包括世界多個國家*

***World Organization Ranking* 世界機構排名 ▪ 2024 & 2023 : 1st**

Benchmark with top national academic institutions in terms of state-of-the-art chips in ISSCC

Chips presented in ISSCC 2024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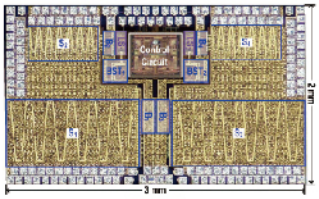
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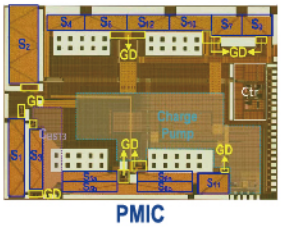
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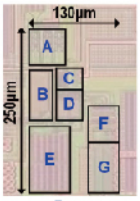
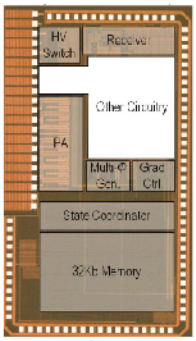
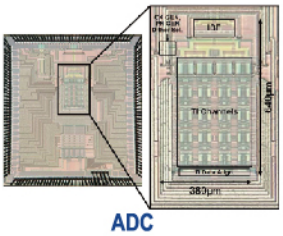


PLL



MRI Sensor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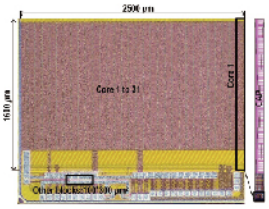
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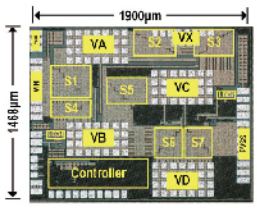

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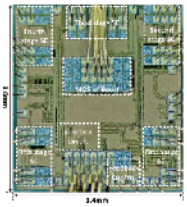
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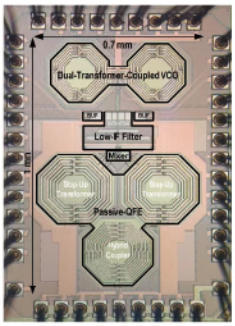

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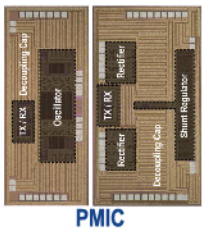
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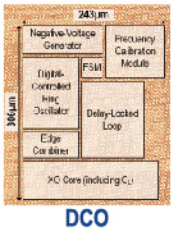
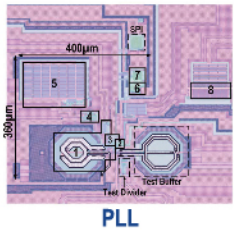


DCO



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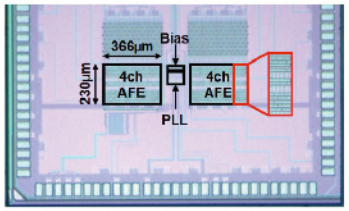
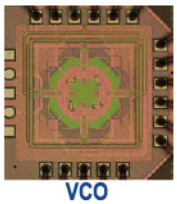


ToF System

Chips presented in ISSCC 2023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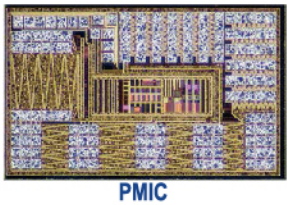
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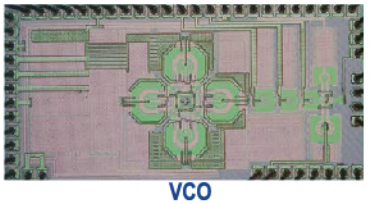
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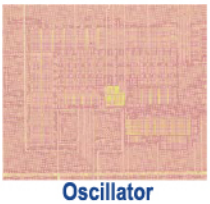
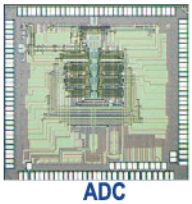

Oscillator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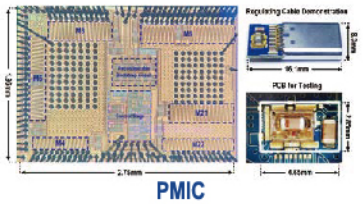
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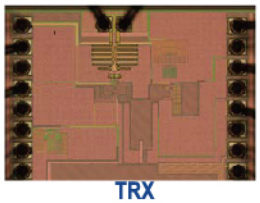
TRX


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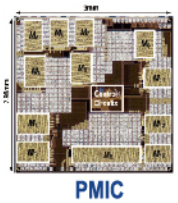
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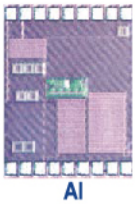
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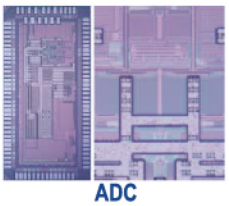
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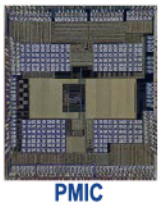
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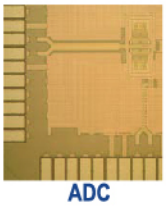
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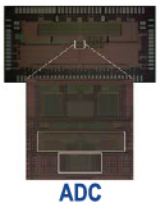
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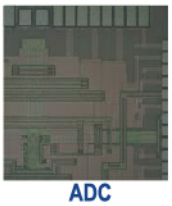
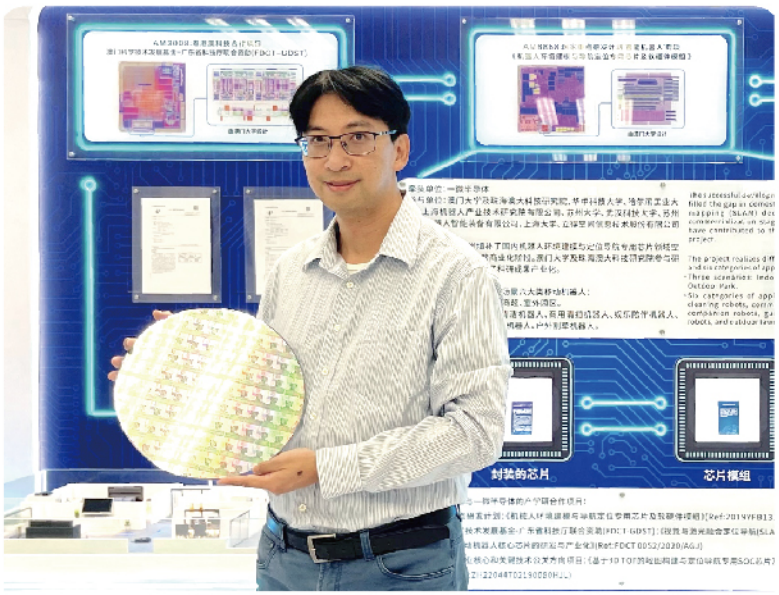

ADC

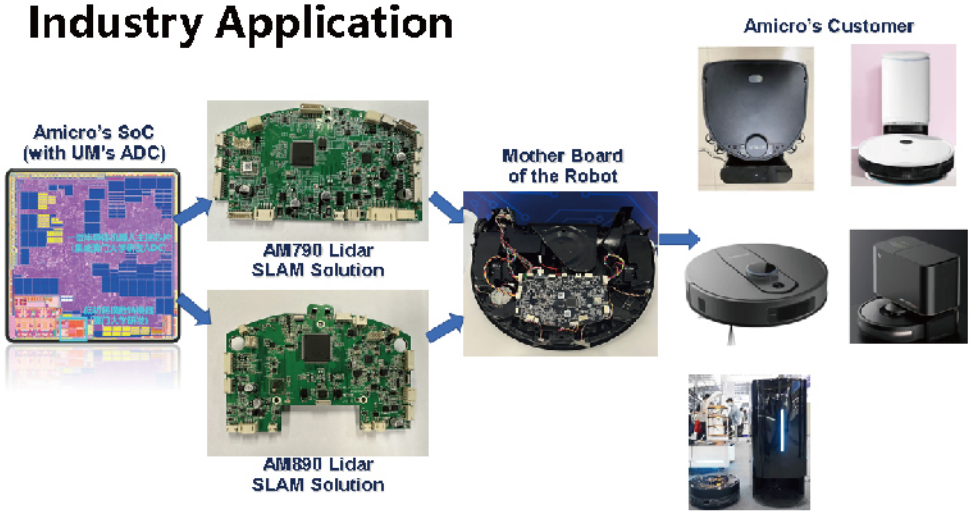
R&D of Robotic Simultaneous Localization and Mapping – MaNSoC



The successful development of the National Key R&D project and also the joint Science and Technology Development Fund (FDCT) and the Department of Science and Technology of Guangdong Province (GDST) projects have filled the gap in domestic robot simultaneous localization and mapping (SLAM) dedicated chips. In cooperation with the company The Amicro Semiconductor Co. Ltd. in Hengqin, it has entered the commercialization stage of trial production. UM and ZUMRI have contributed to the R&D of the low-power ADC in the projects. Both of the projects were concluded in 2023 with successful assessment results. Two joint-laboratories with Amicro are launched in 2023 – ZUMRI-Amicro Joint Laboratory and Guangdong Mobile Robot Integrated Circuits Engineering Research Technology Center.

The project realizes different mobile robots in three scenarios and six categories of application demonstrations. Two joint-patents with the cooperated industry are applied, with two UM commercial IP authorized to the company for IP usage in their product lines.

Industry Application



Wireless Charging System

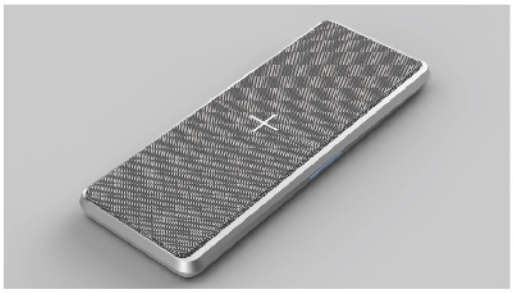
Smarmac Technology Ltd., of which the goal is to promote and gradually realize the industrialization of wireless charging technology, power quality compensation devices and other self-developed power electronic technologies.

Dedicated to the advanced power electronics technology solutions developed in Macau, our main business currently focuses on applications for low-power mobile devices and medium-power electric devices wireless charging products and solutions. The technology was independently developed by the company's founder at the SKL-AMSV, UM and has obtained relevant patents authorized by UM. The potential application scenarios mainly cover offices, hotels, parking lots, and other public places, bringing a brand-new and convenient charging experience to travelers and citizens, and assisting in the creation of a smart tourism city.

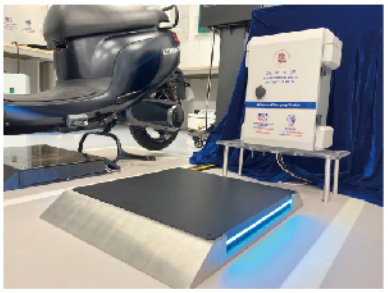
On the other hand, as different devices are connected to the power system in the future, a series of power quality issues such as harmonic pollution and reactive power will become more severe, jeopardizing the efficiency of the power grid and even affecting safety. Our power quality compensation devices can reduce customers' huge reactive power costs and eliminate problems such as overheating, vibration, and noise caused by harmonic currents, thus expanding the lifespan of electrical equipment. This achieves a win-win effect for both power supply companies and their customers. Currently, the company has collaborated with the UM to install a prototype of a power quality compensation device in a research building, successfully alleviating harmonic problems caused by the load and heating problems at the contact points of electrical cabinet. Third-party testing and certification for this device are underway to ensure compliance with national standards. In the next phase, the team will iterate on the power quality compensation device and add data on carbon emission savings after installation to the software interface, providing users and different departments with reference data to actively assist in promoting and implementing the dual-carbon policy in Macau.

Smarmac Technology Ltd. was registered in Macau in 2021, with a team composed of local postgraduate students from the State Key Laboratory of Analog and Mixed-Signal VLSI (AMSV) and the Institute of Microelectronics (IME) at the University of Macau. With great support from the SKL-AMSV & IME, the team has been working to commercialize research results and has participated in several national and regional entrepreneurship competitions, winning a total of 10 awards, including the silver award in the 13th “Challenge Cup” National College Student Business Plan Competition and the silver award in the 6th China International “Internet+” College Students’ Innovation Competition. In 2023, the team participated in the 48th Geneva International Exhibition of Inventions with projects titled “Low-Cost Advanced Controlled Hybrid Active Power Filtering Devices” and “An Efficient and Easy-Adaptation Wireless Charging Solution,” winning a gold award and a bronze award, respectively.

The team hopes to promote green and sustainable development in Macau by providing different power electronics solutions, enhancing the research and development capabilities of local young scientists and technologists, and contributing to the moderate diversification of Macau’s economy.



Wireless charger for low-power mobile devices



Wireless charging system for medium-power electric devices

Power quality devices installed in UM

Awards from the 48th Geneva International Exhibition of Inventions

Digifluidic Biotech Ltd. http://digifluidic.com

Digifluidic Biotech Ltd. is a young and dynamic biotechnology company founded in 2018.

With digital microfluidics as the core technology and automatic nucleic acid analysis system as the main product, Digifluidic is committed to developing precise automatic in vitro diagnostic equipment, whose application fields include medical disease diagnosis, animal and plant disease detection, health index detection, import and export inspection and quarantine, food safety detection, etc., which shows infinite possibilities in the future.

The nucleic acid detection equipment developed by Digifluidic at this stage has the characteristics of small size, easy to carry, simple operation and low cost. It solves the problems that traditional nucleic acid detection requires complex personnel operation and special detection sites. In the future, Digifluidic plans to cooperate with government agencies and scientific research institutions in different fields to develop various detection applications with different detection methods. In the medical field, Digifluidic aims to improve patient care, reduce costs and improve laboratory efficiency; in the non-medical field, Digifluidic aims to develop a variety of applications, improve people's quality of life and efficiency, and provide greater driving force for the future development of precision, automation and miniaturization of detection equipment.

INTERNATIONAL COLLABORATION

Stanford University

HARVARD UNIVERSITY

Georgia Institute of Technology

University of Colorado

imec

INL

TÉCNICO LISBOA

Companies in Greater Bay Area

芯耀辉 AkroStar

ANYKA 安凯微电子

达安基因 DA AN GENE

上海贝岭 SHANGHAI BELLING

Sytrons 思信电子

Allwinner Technology

珠海市杰理科技股份有限公司 ZhuHai JieLi Technology Co.,Ltd

Geehy SEMICONDUCTOR 极海半导体

國際合作

and beyond 大灣區工業界

微毫 MICROTERA

澳門自來水 MACAO WATER

CDC

GIANTECH

AMICRO 一微半导体

SILERGY

WISEWAVE 芯潮流(珠海)科技有限公司

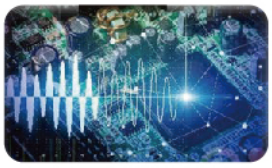
纽瑞芯科技 NEWRADIOTECH

Master of Science in Microelectronics
理學碩士學位（微電子學）課程
Master of Philosophy in Microelectronics
哲學碩士學位（微電子學）課程

- 澳門大學提供兩個微電子學碩士課程
  理學碩士學位（微電子學）課程：適用於培養業界工程師人才
  哲學碩士學位（微電子學）課程：研究型人才
- 華南地區唯一的微電子國家重點實驗室，在IEEE國際固態電路會議（ISSCC）上發表了大量論文（2023 & 2024年連續兩年在全球學術/產業機構中排名第1位）

- UM offers two Master Programmes in Microelectronics:
  - Master of Science in Microelectronics: to train the talents and advanced engineers
  - Master of Philosophy in Microelectronics: for research talents
- The only State Key Laboratory of Microelectronics in South China, published a high number of publications in the world - renowned flagship conference - the International Solid - State Circuits Conference (ISSCC) 1st in the World in both 2024 & 2023

所提供的課程 Courses Offered



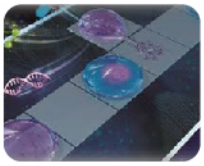
模擬集成電路
Analog IC Design

數字集成電路
Digital IC Design

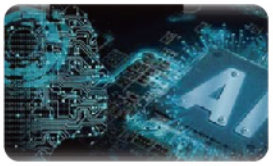
無線/有線
Wireless/Wireline

模數/數模轉換
Data Converters

電源管理
Power Management



生物科技
Biomedical



人工智能
Machine Learning

傳感器/物聯網
Sensors/IoT Interfaces

https://ime.um.edu.mo/zh-hant/programme-educational-objectives/

Appraisal meeting of the Third State Key Laboratory Academic Committee.

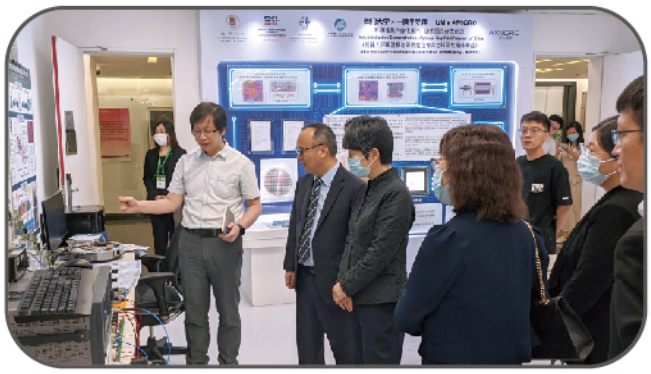
The Third SKL Academic Committee and staff of the State Key Laboratory.

Doctor honoris causa Lecture ' A Long Journey with the Fascinating (Micro)electronics' by Prof. Franco Maloberti.

Master programme orientation of Institute of Microelectronics (IME).

EVENTS AND VISITS

Liuquan Huang, Vice Director of Liaison Office of the Central People's Government in the Macao S.A.R. visited Univerisity of Macau (UM) and recognized the fruitful research outcomes of the State Key laboratories.



Tingting Guo, Vice Minister of Ministry of Commerce of the People's Republic of China visited the State Key laboratory of the University Macau.

Dr. Xiankang Dou, the Director of National Natural Science Foundation of China visited University of Macau (UM) and recognized the academic achievements of the State Key laboratories.

Visit of deputy secretary-general of Ministry of Science and Technology of the People's Republic of China and a delegation with his leadership.

Visit and appraisal of Ministry of Science and Technology of the People's Republic of China.

Visit of a delegation of Ministry of Science and Technology of the People's Republic of China.

Visit of a delegation of members of the Science and Technology Committee of Macao S.A.R..

Visit of Prof. Bo Zhang, Member of the Chinese Academy of Sciences and the Honorary Dean of Institute of Artificial Intelligence of Tsinghua University to visit the State Key laboratory.

Visit of Prof. Saifur Rahman, the life fellow and former president of IEEE to the State Key laboratory.

Visit of former president of IST to the State Key laboratory.

Visit of Mr. Pedro Matias, executive president of ISQ group to the State Key laboratory.

Visit of Mr. Ricardo Serrão Santos, Former Minister of Maritime Affairs of Portugal to the State Key laboratory.

Visit of Prof. Nuno Ferrand de Almeida, comes from University of Porto, Portugal to the State Key laboratory.

Visit of delegation of scientific and technological enterprises from Portuguese-speaking countries to the Guangdong-Hong Kong-Macao Greater Bay Area.

Visit of Prof. José F. Rodrigues, from University of Lisbon, Portugal to the State Key laboratory.

Visit of Prof. Yu Wang, department head of the Electronic Engineering, Tsinghua University to the State Key laboratory.

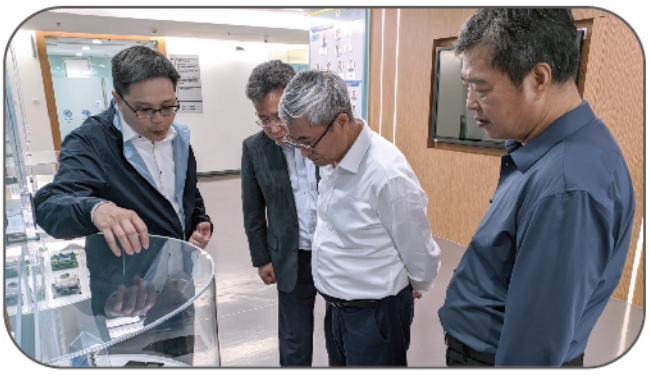
EVENTS AND VISITS

Visit of Dr. Yongli Wang, member of the Standing Committee of Fujian Provincial Committee to the State Key laboratory.

Visit of Economic and Technological Development Bureau (DSEDT) of Macau S.A.R. and WI Harper Group to the State Key laboratory.

Visit of the delegation of Xidian University to the State State Key laboratory.

Visit of the delegation of the National Natural Resources Foundation Committee to the State Key laboratory.



Visit of vice director of Beijing University of Chemical Technology and the members of the Chinese Academy of Sciences to the State Key laboratory.

Visit of delegation of Beijing Municipal Committee of the Chinese People's Political Consultative Conference.

Visit of delegation of Academician of Chinese Academy of Engineering and Northwestern Polytechnical University.

Visit of the delegation of the Science and Technology Development Fund (FDCT) to the State Key laboratory.

STATE KEY LAB OF AMSV PUBLICATIONS IN 2023

Selected SCI Journal Publications in 2023 (100+)

IEEE Journal of Solid-State Circuits

- "A 6.78-MHz Wireless Power Transfer System With Inherent Wireless Phase Shift Control Without Feedback Data Sensing Coil",**IEEE Journal of Solid-State Circuits**, Vol. 58, No. 6, pp. 1746-1757, **Jun 2023**.
- "An SC-Parallel-Inductor Hybrid Buck Converter With Reduced Inductor Voltage and Current", **IEEE Journal of Solid-State Circuits**, Vol. 58, No. 6, pp.1758-1768, **Jun 2023**.
- "A Portable CMOS-Based Spin Resonance System for High-Resolution Spectroscopy and Imaging",**IEEE Journal of Solid-State Circuits**, Vol. 58, no.7, pp.1838-1849, **Jul 2023**.
- "A Miniaturized 3-D-MRI Scanner Featuring an HV-SOI ASIC and Achieving a 10 × 8 × 8 mm3Field of View",**IEEE Journal of Solid-State Circuits**, Vol. 58, No. 7, pp. 2028-2039, **Jul 2023**.
- "Fully Integrated Frequency-Tuning Switched-Capacitor Rectifier for Piezoelectric Energy Harvesting", **IEEE Journal of Solid-State Circuits**, Vol.58, No. 8, pp. 2337-2348, **Aug 2023**.
- "A 0.4-V 0.0294-mm2Resistor-Based Temperature Sensor Achieving ±0.24 °C p2p Inaccuracy From40 °C to 125 °C and 385 fJ · K2Resolution FoM in 65-nm CMOS",**IEEE Journal of Solid-State Circuits**, Vol. 58, No. 9, pp. 2543-2553, **Sep 2023**.
- "A 14b 500 MS/s Single-Channel Pipelined-SAR ADC With Reference Ripple Mitigation Techniques and Adaptively Biased Floating Inverter Amplifier", **IEEE Journal of Solid-State Circuits**, Vol.58, No. 10, pp. 2709- 2721, **Oct 2023**.
- "A 3.07 mW 30 MHz-BW 73.2 dB-SNDR Time- Interleaved Noise-Shaping SAR ADC With Self-Coupling Second-Order Error-Feedforward",**IEEE Journal of Solid-State Circuits**, Vol. 58, No. 10, pp. 2722-2732, **Oct 2023**.
- "A 47-nW Voice Activity Detector (VAD) Featuring a Short-Time CNN Feature Extractor and an RNN-Based Classifier with a Non-Volatile CAP-ROM", **IEEE Journal of Solid-State Circuits**, Vol. 57, No. 11, pp. 3020-3029, **Nov 2023**.
- "All Rivers Flow to the Sea: A High-Density Wireless Power Receiver With Split-Dual-Path and Hybrid-Quad-Path Step-Down Rectifying Conversion,"**IEEE Journal of Solid-State Circuits**, Vol. 57, No. 11, pp. 3127-3137, **Nov 2023.**
- "A 0.004-mm2 3.65-mW 7-Bit 2-GS/s Single-Channel GRO-Based Time-Domain ADC Incorporating Dead-Zone Elimination and On-Chip Folding-Offset Calibration in 28-nm CMOS",**IEEE Journal of Solid-State Circuits**, Vol. 58, No. 11, pp. 3179-3193, **Nov 2023.**
- "A 12-to-1 Flying Capacitor Cross-Connected Buck Converter with Inserted D > 0.5 Control for Fast Transient Response",**IEEE Journal of Solid-State Circuits**, vol. 58, no. 11, pp. 3207-3218, **Nov 2023**.
- "A 95% Peak Efficiency Modified KY Converter with Improved Flying Capacitor Charging in DCM for IoT Applications", **IEEE Journal of Solid-State Circuits**, Vol. 58, no.11, pp. 3219-3230, **Nov 2023**.
- "A 12-to-1 v Quad-Output Switched-Capacitor Buck Converter with Shared DC Capacitors",**IEEE Journal of Solid-State Circuits**, Vol. 58, No. 12, pp.3492-3502, **Dec 2023**.
- "A Second-Order NS Pipelined SAR ADC with Quantization-Prediction-Unrolled Gain Error Shaping and Fully Passive Integrator",**IEEE Journal of Solid-State Circuits**, Vol. 58, No. 12, pp. 3565-3575, **Dec 2023**.
- "A 52.5-dB 2× Time-Interleaved 2.8-GS/s SAR ADC With 5-bit/Cycle Time-Domain Quantization and a Compact Signal DAC",**IEEE Journal of Solid-State Circuits**, Vol. 58, No. 12, pp. 3586-3597, **Dec 2023.**

IEEE Transactions on Circuits and Systems (I & II)

- "A Hybrid Single-Inductor Bipolar Triple-Output DC–DC Converter With High-Quality Positive Outputs for AMOLED Displays,"**IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 1, pp. 506-517, **Jan. 2023.**
- "A 3.78-GHz Type-I Sampling PLL With a Fully Passive KPD-Doubled Primary–Secondary S-PD Measuring 39.6-fsRMS Jitter, −260.2-dB FOM, and −70.96–dBc Reference Spur," **IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 4, pp. 1463-1475, **April 2023.**
- "A 10.8-to-37.4 Gb/s Reference-Less FD-Less Single-Loop Quarter-Rate Bang-Bang Clock and Data Recovery Employing Deliberate-Current- Mismatch Wide-Frequency-Acquisition Technique", **IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 7, pp. 2637-2650, **July 2023**.
- "Floating-Domain Integrated GaN Driver Techniques for DC–DC Converters: A Review",**IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 9, pp. 3790-3805, **Sept. 2023**.
- "A High-Current Scalable Parallel LDO Scheme With Analog-Digital Merged Control for Small Current-Sharing Mismatch,"**IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 10, pp. 3857-3866, **Oct. 2023**.
- "A 50Gb/s CMOS Optical Receiver With Si-Photonics PD for High-Speed Low-Latency Chiplet I/O",**IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 11, pp. 4271-4282, **Nov. 2023**.
- "A Level Shifter With Almost Full Immunity to Positive dv/dt for Buck Converters,"**IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 11, pp. 4595-4604, **Nov. 2023**.
- "A 12-bit 1GS/s ADC With Background Distortion and Split-ADC-Like Gain Calibration,"**IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 12, pp. 4679-4691, **Dec. 2023.**
- "A Fully Integrated CMOS Tri-Band Ambient RF Energy Harvesting System for IoT Devices,"**IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 12, pp. 4705-4718, **Dec. 2023.**
- "A Continuous-Output-Current Buck-Boost Converter Without Right-Half-Plane-Zero (RHPZ),**IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 12, pp. 4719-4728, **Dec. 2023.**
- "A Two-Channel Time-Interleaved Continuous-Time Third-Order CIFF-Based Delta-Sigma Modulator,"**IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 12, pp. 4729-4741, **Dec. 2023.**
- "An 1 V Supply, 740 nW, 8.7 ppm/°C Bandgap Voltage Reference With Segmented Curvature Compensation,"**IEEE Transactions on Circuits and Systems I:Regular Papers**, vol. 70, no. 12, pp. 4755-4766, **Dec. 2023.**
- "A 10b 700 MS/s Single-Channel 1b/Cycle SAR ADC Using a Monotonic-Specific Feedback SAR Logic With Power-Delay-Optimized Unbalanced N/P-MOS Sizing", **IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 12, pp. 4767-4780, **Dec. 2023.**
- "A 10MHz-BW 85dB-DR CT 0-4 Mash Delta-Sigma Modulator Achieving +5dBFS MSA,"**IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 12, pp. 4781-4792, **Dec. 2023.**
- "P3 ViT: A CIM-Based High-Utilization Architecture With Dynamic Pruning and Two-Way Ping-Pong Macro for Vision Transformer," **IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 12, pp. 4938-4948, **Dec. 2023.**
- "Analysis and Design of a 15.2-to-18.2-GHz Inverse-Class-F VCO With a Balanced Dual-Core Topology Suppressing the Flicker Noise Upconversion,"**IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 12, pp. 5110-5123, **Dec. 2023.**
- "A 10.5 W, 93% Efficient Dual-Path Hybrid (DPH)-Based DC–DC Converter Incorporating a Continuous-Current-Input Switched-Capacitor Stage and Enhanced IL Reduction for 12 V/24 V Inputs," **IEEE Transactions on Circuits and Systems I: Regular Papers**, vol. 70, no. 12, pp. 5482-5495, **Dec. 2023**.

- "On the DC-Settling Process of the Pierce Crystal Oscillator in Start-Up,"**IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 1, pp. 26-30, **Jan. 2023.**
- "A 27-dBm, 0.92-GHz CMOS Power Amplifier With Mode Switching and a High-Q Compact Inductor (HQCI) Achieving a 30% Back-Off PAE," **IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 1, pp. 121-125, **Jan. 2023.**
- "An FPGA-Based Transformer Accelerator Using Output Block Stationary Dataflow for Object Recognition Applications," **IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 1, pp. 281-285, **Jan. 2023.**
- "On the Synthesis of Continuous-Time Sturdy MASH Delta-Sigma Modulators,"**IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 2, pp. 356-360, **Feb. 2023.**
- "A 3.57-mW 2.88-GHz Multi-Phase Injection-Locked Ring-VCO With a 200-kHz $1/f^3$ Phase Noise Corner,"**IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 3, pp. 865-869, **Mar. 2023**.

STATE KEY LAB OF AMSV PUBLICATIONS IN 2023

- "Universal Stability Criterion for Type-I Sampling Phase-Locked Loops," **IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 4, pp. 1351-1355, **Apr. 2023**.
- "A Two-Phase Multi-Bit Incremental ADC With Variable Loop Order,"**IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 8, pp. 2724-2728, **Aug. 2023**.
- "A 1-A Switching LDO With 40-mV Dropout Voltage and Fast DVS," **IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 9, pp. 3454-3458, **Sep. 2023.**
- "A High-PCE Range-Extension CMOS Rectifier Employing Advanced Topology Amalgamation Technique for Ambient RF Energy Harvesting," **IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 10, pp. 3747-3751, **Oct. 2023.**
- "A 0.016mm2 Active Area 4GHz Fully Ring-Oscillator-Based Cascaded Fractional-N PLL With Burst-Mode Sampling," **IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 10, pp. 3792-3796, **Oct. 2023.**
- "A 0.4-V 8400-μm2 Voltage Reference in 65-nm CMOS Exploiting Well-Proximity Effect," **IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 10, pp. 3822-3826, **Oct. 2023.**
- "A Battery to 70-V Hybrid Boost Converter Achieving 14-to-20 VCR for Piezoelectric Actuators," **IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 10, pp. 3857-3861, **Oct. 2023.**
- "A 0.5V 22.5ppm/°C Bandgap Voltage Reference With Leakage Current Injection for Curvature Correction," **IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 10, pp. 3897-3901, **Oct. 2023.**
- "A 28-nm 368-fJ/Cycle, 0.43%/V Supply-Sensitivity, FLL-Based RC Oscillator Featuring Positive-TC-Only Resistors and ΔΣM-Based Trimming," **IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 11, pp. 3950-3954, **Nov. 2023.**
- "Relative Stability Analysis of Multi-Loop Low Dropout Regulators Using a Sub-Loop Superposition Method," **IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 11, pp. 3968-3972, **Nov. 2023**.
- "Highway Connection for Low-Latency and High-Accuracy Spiking Neural Networks," **IEEE Transactions on Circuits and Systems II: Express Briefs**, vol. 70, no. 12, pp. 4579-4583, **Dec. 2023**.

IEEE Transactions on Very Large Scale Integration (VLSI) Systems

- "A 3.6-GHz Type-II Sampling PLL With a Differential Parallel-Series Double-Edge S-PD Scoring 43.1-fsRMSJitter, −258.7-dB FOM, and −75.17-dBc Reference Spur," **IEEE Transactions on Very Large Scale Integration (VLSI) Systems**, vol. 31, no. 2, pp. 188-198, **Feb. 2023**.
- "A 4.5-W, 18.5–24.5-GHz GaN Power Amplifier Employing Chebyshev Matching Technique," **IEEE Transactions on Very Large Scale Integration (VLSI) Systems**, vol. 31, no. 2, pp. 233-242, **Feb. 2023.**
- "A Security-Enhanced, Charge-Pump-Free, ISO14443-A-/ISO10373-6-Compliant RFID Tag With 16.2-μW Embedded RRAM and Reconfigurable Strong PUF," **IEEE Transactions on Very Large Scale Integration (VLSI) Systems**, vol. 31, no. 2, pp. 243-252, **Feb. 2023.**
- "A 0.0043-mm2 0.085-μW/MHz Relaxation Oscillator Using Charge-Prestored Asymmetric Swings R-RC Network," **IEEE Transactions on Very Large Scale Integration (VLSI) Systems**, vol. 31, no. 8, pp. 1248-1252, **Aug. 2023**.
- "A High-Performance Dual-Topology CMOS Rectifier With 19.5-dB Power Dynamic Range for RF-Based Hybrid Energy Harvesting," **IEEE Transactions on Very Large Scale Integration (VLSI) Systems**, vol. 31, no. 8, pp. 1253-1257, **Aug. 2023**.

IEEE Transactions on Power Electronics

- "A 200 MHz Passive Rectifier With Active-Static Hybrid VTH Compensation Obtaining 8% PCE Improvement," **IEEE Transactions on Power Electronics**, vol. 38, no. 5, pp. 5655-5658, **May 2023.**
- "Reinforcement Learning Based Sliding Mode Control for a Hybrid-STATCOM," **IEEE Transactions on Power Electronics**, vol. 38, no. 6, pp. 6795-6800, **June 2023.**
- "A 12/24 V-Input HV-LV-Separated Hybrid SC PoL Converter With 355 mW/mm3 Power Density at 3 A Load Current and 15.2 mm3 Power Passives," **IEEE Transactions on Power Electronics**, vol. 38, no. 12, pp. 15109-15114, **Dec. 2023**.

IEEE Transactions on Industrial Electronics

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- "A Capacitive-Coupling Winding Tap Injection DSTATCOM Integrated With Distribution Transformer for Balance and Unbalance Operations," **IEEE Transactions on Industrial Electronics**, vol. 70, no. 2, pp. 1081-1093, **Feb. 2023**.
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