
FOREWORD

Special Section on Analog Circuits and Their Application Technologies

It is my great honor and pleasure to announce the publication of this special section on analog circuits and their application technologies.

The rapid progress of IoT, AI, 5G, quantum computing demands the evolution of integrated circuits in the fields such as wireless/wireline communication, sensing systems, health/biomedicine, signal processing, power management, edge computing, and cryo-CMOS, where analog circuits have been playing a crucial role. In addition to pure analog techniques, the scope of this special section includes fundamental issues such as co-design of analog/digital circuits, analog circuits in SoCs, analog circuit design for manufacturability (DFM) and testability (DFT), device modeling techniques, and hardware security. Analog circuits with high performance and enhanced functionality as well as low power and low cost are challenging to design but strongly demanded for next-generation applications. Thus, this special section aims to advance the state of the art in analog circuits and their application technologies.

This special section has 8 excellent papers including 2 invited papers, 5 regular papers, and 1 brief paper covering an ultra-low-power bandgap reference, a low voltage charge pump for thermoelectric energy harvesting, a computing in memory, a millimeter-wave/terahertz wireless transceiver, and chaos circuits. The first invited paper by Prof. Minoru Fujishima from Hiroshima University presents “Advancements in Terahertz Communication: Harnessing the 300GHz Band for High-Efficiency, High-Capacity Wireless Networks”. The second invited paper by Prof. Ludovico Minati from University of Electronic Science and Technology of China (UESTC) presents “Chaos and Synchronization - Potential Ingredients of Innovation in Analog Circuit Design?”.

On behalf of the editorial committee, I would like to express our sincere appreciation to all the authors who submitted their manuscripts for this special section. I would also like to take this opportunity to thank all the reviewers and all of the editorial committee members, as listed below, for their enthusiastic support. Finally, I would like to thank Prof. Atsushi Shirane, Prof. Masaya Miyahara and Prof. Takuji Miki for their extensive contribution as guest editors.

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Hiroyuki Ito (*Member*) received the B.E. degree in Department of Electronics and Mechanical Engineering from Chiba University, Chiba, Japan, in 2002, and M.E. and Ph.D. degrees in Department of Advanced Applied Electronics, Tokyo Institute of Technology, Yokohama, Japan, in 2004 and 2006, respectively. From 2004 to 2007, he was a research fellow of the Japan Society for the Promotion of Science. He was a temporary visiting researcher and a visiting professor in the Communications Technology Laboratory, Intel Corporation, Hillsboro, OR, USA, in 2006 and 2007, respectively. He was an assistant professor at the Precision and Intelligence Laboratory, Tokyo Institute of Technology, Yokohama, Japan, from 2007 to 2013. From 2008 to 2010, he was with Fujitsu Laboratories Ltd., Yokohama, Japan. He was an associate professor at the Precision and Intelligence Laboratory from 2013 to 2015, and at the Institute of Innovative Research from 2016 to 2024, Tokyo Institute of Technology, Yokohama, Japan. Since 2024, he has been a professor at the Institute of Innovative Research, Tokyo Institute of Technology, Yokohama, Japan. He has been the co-founder/CEO of EVRIM Co., Ltd, Yokohama, Japan since 2020. From 2020 to 2023, he was the International Technical Program Committee Member of Wireless Subcommittee at IEEE International Solid-State Circuits Conference (ISSCC). He was a Guest Editor of IEEE Journal of Solid-State Circuits (JSSC) Special Issue on the 2022 IEEE ISSCC in 2022.

