
FOREWORD

Special Section on Analog Circuit Techniques and Related Topics

With the recent COVID-19 disaster, the importance of the spread and progress of Digital Transformation, which realizes improvement of business competitiveness through streamlining and speeding up operations, has come to be strongly recognized. Analog circuit technology is indispensable for connecting the real world and digital, and therefore although it is named “analog” rather than “digital”, it is one of the most important basic technologies for realizing DX. For example, knowledge of analog circuit technology is indispensable for sensor technology that handles minute signals, high-frequency technology for realizing high-speed, large-capacity communication, and high-efficiency power conversion technology for realizing high-efficiency operation.

It is my pleasure to publish this special section, “Analog Circuit Techniques and Related Topics” this time. This special section consists of one invited paper and one regular paper. The invited paper entitled “An evaluation of a new type of high-efficiency Hybrid Gate Driver circuit for SiC MOS-FETs suitable for Automotive Power Electronics System Applications”, presents the proposal of a hybrid gate drive circuit realizing fast and low-loss switching of SiC MOS-FETs for 3-phase invertors, battery chargers and isolated DC-DC converters for automotive applications, that is very helpful to achieve high-efficiency operation.

One regular paper deeply analyzes the bandwidth of the transformer matching circuit of a differential power amplifier, and proposes how to improve it. This contributes to the progress of the development of the merging 5th-generation mobile phone and will be great help for the readers.

On behalf of the editorial committee of this special section, I would like to express our sincere appreciation to all the authors of the submitted manuscripts and all the reviewers for their great contribution and helpful effort. I also would like to thank all of the committee members for their valuable efforts in this editorial work. Finally, I would like to express my special thanks to Mr. Yohei Nakamura, Dr. Yoshiaki Yoshihara and Dr. Junya Matsuno for their hard works as secretaries and liaison.

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Taizo Yamawaki (*Member*) received the B.S. and M.S. degrees in electronic engineering from Kyoto University, Kyoto, Japan, in 1992 and 1994, respectively. After graduating, he joined the Central Research Laboratory, Hitachi Ltd., Tokyo, where he developed a series of commercial cellular-phone RFICs for several standards, including GSM, EDGE, WCDMA, and LTE using BiCMOS or CMOS technologies. Since 2013, he has participated in a variety of projects including analog front-end circuits for ultrasound probes, dc-dc converter circuits and transformers for automotive applications. Mr. Yamawaki is a member of the Institute of Electronics, Information and Communication Engineering (IEICE). He has been serving as a TPC member for the IEEE Asian Solid-State Circuits Conference (A-SSCC) since 2016. He received the IEICE Young Scientist Award in 1999.

