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## FOREWORD

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### Special Section on Microwave and Millimeter-Wave Technologies

The long-term COVID-19 pandemic around the world has increasingly been driving the demand for high-data-rate, large-capacity wireless communications, because on-line meeting, telework, wireless sensing, and so on have already been indispensable to our daily activities.

Under the circumstances, I am pleased to present the Special Section of the IEICE Transactions on Electronics focusing on recent studies, achievements, and reviews on microwave and millimeter-wave technologies. The topics of the Section cover various wireless electronic design ranging from RF active/passive devices and circuits to wireless power transfer, which are expected to contribute to great advances in wireless communications.

On behalf of the Editorial Committee, I would like to thank all authors for submitting their latest studies to this Special Section. After carefully reviewed by the Committee, eight invited papers and three regular ones have been accepted for publication. The authors and titles of the invited papers are as follows: 1) Dr. Satoshi Tanaka, Mr. Kenji Mukai, and Mr. Hiroshi Okabe, "Evolution of power amplifiers for mobile phone terminals from the 2nd generation to the 5th generation," 2) Mr. Keigo Nakatani, Mr. Yutaro Yamaguchi, Mr. Takuma Torii, and Dr. Masaomi Tsuru, "A review of GaN MMIC power amplifier technologies for millimeter-wave applications," 3) Prof. Shinichi Tanaka, Mr. Hirotaka Asami, and Mr. Takahiro Suzuki, "Class-E power amplifier with improved PAE bandwidth using double CRLH TL stub for harmonic tuning," 4) Dr. Hiroshi Yamamoto, Mr. Ken Kikuchi, Dr. Valeria Vadalà, Dr. Gianni Bosi, Prof. Antonio Raffo, and Prof. Giorgio Vannini, "Analysis of efficiency-limiting factors resulting from transistor current source on class-F and inverse class-F power amplifiers," 5) Prof. Akio Wakejima, Mr. Arijit Bose, Dr. Debaleen Biswas, Dr. Shigeomi Hishiki, and Mr. Sumito Ouchi, Mr. Koichi Kitahara, and Dr. Keisuke Kawamura, "AlGaIn/GaN HEMT on 3C-SiC/low-resistivity Si substrate for microwave applications," 6) Prof. Masataka Ohira and Prof. Zhewang Ma, "Surrogate-based EM optimization using neural networks for microwave filter design," 7) Dr. Naoki Hasegawa, "Link design and techniques of microwave power transfer for latest power utilization systems on Beyond-5G/6G," and 8) Prof. Kenji Itoh, Dr. Naoki Sakai, and Prof. Keisuke Noguchi, "Highly efficient high-power rectenna with the diode on antenna (DoA) topology."

Finally, special thanks go to the Editorial Committee members, the IEICE office members, and all relevant reviewers for their devoted supports and efforts.

The editorial committee members of this Special Section are as follows:

Guest Editor: Kenjiro Nishikawa (Kagoshima Univ.), Hiroshi Okazaki (NTT DOCOMO)

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Kazuya Yamamoto (Mitsubishi Electric), Guest Editor-in-Chief

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**Kazuya Yamamoto** (*Senior Member*) received the B.E., M.E., and Ph.D. degrees in electrical engineering from Osaka Prefecture University, Sakai, Japan, in 1988, 1990, and 1998, respectively. Since joining the Optoelectronic and Microwave Devices Laboratory, Mitsubishi Electric Corporation, Itami, Japan, in 1990, he has been engaged in the research and development of GaAs-based analog and digital ICs—power amplifiers, antenna switches, prescalers, and quadrature modulators—for mobile communications. He has also been engaged in the research on circuit design techniques of high-speed analog and digital ICs—preamplifiers, electro-absorption (EA) drivers, and decision circuits—for optical fiber links. He is currently the Chief Engineer of the High Frequency Device Department, High Frequency and Optical Device Works, Mitsubishi Electric Corporation, and he is leading the development of GaN power amplifiers for mobile and satellite communications. He was a Visiting Lecturer with Osaka Prefecture University between 2008 and 2015, where he held the Chair of microwave device and circuit engineering for microwave applications. He was an Associate Editor of the IEICE Transaction on Electronics (English version) between 2008 and 2014. He also served on the 2014 Asia-Pacific Microwave Conference (APMC) Technical Program Committee. His current research interests include GaN-based power amplifiers, millimeter-wave RFICs, and chip/chip-less RFIDs. Dr. Yamamoto is a senior member of the IEEE, and serves on the IEEE MTT-S Technical Committee (MTT-9), the International Microwave Symposium (IMS) Technical Paper Review Committee, the 2022 Asia-Pacific Microwave Conference (APMC) Technical Program Committee, and the IEEE BiCMOS and Compound Semiconductor Integrated Circuits and Technology Symposium (BCICTS) Technical Program Committee.

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