
FOREWORD

Special Section on Fundamentals and Applications of Advanced Semiconductor Devices

For large-scale applications such as big data analysis and artificial intelligence, higher performance LSIs are required for servers and high-function terminals, and demand for advanced CMOS transistors based on miniaturization continues to be high. On the other hand, ultra-low power consumption is the most important for green electronics and Internet-of-Things (IoT) devices that play the role of edge devices in cyber physical system (CPS). In the CPS, the IoT devices acquire a large amount of sensing data in real space, uploads it to the cloud server in the virtual space, the data is accumulated and analyzed in the cloud, and new social services are provided. It is predicted that the number of IoT devices will exceed 1 trillion in the future, and low power consumption is the most important requirement specification.

This special section on fundamentals and Applications of Advanced Semiconductor Devices is arranged to discuss fundamentals and applications of semiconductor devices for future advanced electronics. This section contains 12 papers, which cover the fields of ultra-high frequency devices, power devices, memories, organic devices, and process technology.

I would like to express my sincere gratitude to all authors for their contributions to the special section. I also thank all reviewers and editorial committee members for their devoted contribution to reviewing and editing the papers. This special section could not be achieved without their efforts.

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Tatsuya Kunikiyo (*Nonmember*) received the B.S. degree in electronics engineering from the University of Tokyo, Tokyo, Japan, in 1988. He received the M.S. degree in electrical engineering from Stanford University, CA, in 1997, and the Dr. Eng. degree from Osaka University, Osaka, Japan, in 2004. He joined LSI Laboratory, Mitsubishi Electric Corporation, Itami, Hyogo, Japan, in April 1988, where he was engaged in the research and development on semiconductor process and device simulation. Since April 2003, he has been with the advanced device development department in Renesas Technology Corporation (currently Renesas Electronics Corporation), Hitachinaka, Ibaraki, Japan. He served on the Modeling and Simulation subcommittee of IEDM in 2004, 2005, 2009 and 2010. He has been awarded 57 US patents on semiconductor devices and technology. His current research interests include semiconductor device physics and process modeling. Dr. Kunikiyo is a senior member of Electron Device Society of IEEE and a member of the Japan Society of Applied Physics.

