
FOREWORD

Special Section on Fundamentals and Applications of Advanced Semiconductor Devices

In the near future, not only information terminals/home appliances, but also various sensors are arranged everywhere and connected to the Internet to gather information on various things such as machines, human bodies, structures, natural objects from all over the world and then we operate remote machines based on it. In other words, the Internet-of-Things (IoT) era will come.

However, in order to drive the sensor in an environment isolated from the outside, a small self-sustaining power source that generates electricity in the installation environment for a long time is necessary. Therefore, environmental power generation (energy harvesting) devices that recover energy from electricity such as waste heat and mechanical vibration that have not been used until now are becoming necessary. As a result, development of thermoelectric materials as well as low power consumption devices is becoming increasingly important.

This special section is arranged to discuss fundamentals and applications of semiconductor devices for future advanced electronics, responding to the demands of the times. This section contains 9 papers, which cover the fields of PdEr-Silicide formation and contact resistivity reduction, hard-type oscillators for ultra-high frequency applications based on resonant tunneling diodes, room-temperature atomic layer deposition of SnO₂ for TFT fabrication, characterization of hysteresis on SOI based super-steep subthreshold-slope FET's, thermal diffusivity in nanometer-scale thermoelectric materials, and Type II HfS₂/MoS₂ hetero-junction transistor.

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 58 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.

