

## SSDM Paper Award

Studies on Static Noise Margin and Scalability for Low-Power and High-Density Nonvolatile SRAM using Spin-Transfer-Torque (STT) MTJs

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Takashi Ohsawa was born in Tokyo on Feb. 16, 1954. He received BS and MS degrees in physics from Waseda University, Tokyo, Japan in 1977 and 1979, respectively, and Ph.D. in electronic engineering from University of Tsukuba, Tsukuba, Japan in 2009. He worked for Toshiba mainly on DRAM development for 28 years from 1982 to 2010. He developed four generations from 1Mb, 4Mb, 64Mb and to 256Mb DRAMs. From 1997 to 2000, he participated in the DRAM Development Alliance with IBM and then Siemens as a design manager in Vermont, USA. From 2000 to 2007, he initiated 1T-DRAM development in Toshiba that was called floating body cell (FBC) as an alternative to the 1T-1C DRAM that is facing scaling issues. Since 2010, he has been a professor in Center for Spintronics Integrated Systems, Tohoku University, Sendai, Japan.

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Fumitaka Iga was born in Ehime, Japan, in 1986. He received the B.E. and M.E. degree from the Electrical Engineering Department, Tohoku University, Sendai, Japan, in 2009 and 2011, respectively. He is currently at the Graduate School of Engineering, Tohoku University, and studying under Professor Endoh in the Graduate School of Engineering, Tohoku University. His main research interest focuses on nonvolatile memories. Mr. Iga received "The Encouragement Prize" in IEEE Sendai Section Student Award 2008.

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Takahiro Hanyu received the B.E., M.E. and D.E. degrees in Electronic Engineering from Tohoku University, Sendai, Japan, in 1984, 1986 and 1989, respectively. He is currently a Professor in the Research Institute of Electrical Communication, Tohoku University. His general research interests include nonvolatile logic circuits and their applications to ultra-low-power and/or PVT-variation-free VLSI processors, and multiple-valued current-mode circuit and its application to power-aware asynchronous Network-on-Chip systems. He received the Sakai Memorial Award from the Information Processing Society of Japan in 2000, the Judge's Special Award at the 9th LSI Design of the Year from the Semiconductor Industry News of Japan in 2002, the APEX Paper Award of Japanese Society of Applied Physics in 2009, the Excellent Paper Award of IEICE, Japan, in 2010, Ichikawa Academic Award in 2010, and the Best Paper Award at IEEE Computer Society International Symposium on VLSI 2010. Dr. Hanyu is a Senior Member of the IEEE.

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Professor Hideo Ohno received the Ph.D. degree from the University of Tokyo in 1982. He is Director of Center for Spintronics Integrated Systems Tohoku University, and Director and Professor of Laboratory for Nanoelectronics and Spintronics, Research Institute of Electrical Communication, Tohoku University. His current research interests include physics and applications of spin-related phenomena in semiconductor and in metal-based nanostructures. Professor Ohno received the IBM Japan Science Award (1998), the IUPAP Magnetism Prize (2003), Japan Academy Prize (2005), Presidential Prize for Research Excellence, Tohoku University (2005) and the 2005 Agilent Technologies Europhysics Prize. He has been a fellow of the Institute of Physics (IOP) since 2004, an honorary professor of Institute of Semiconductors, Chinese Academy of Sciences since 2006 and a fellow of the Japan Society of Applied Physics (JSAP) since 2007. Tohoku University appointed him as a distinguished professor. IEEE Magnetics Society named him for the Distinguished Lecturer for 2009. He was awarded the Thomson Reuters Citation Laureate (2011), the JSAP Outstanding Achievement Award and IEEE David Sarnoff Award (2012).

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Prof. Endoh received the B.S. degree in physics from the University of Tokyo in 1987. He received the Ph. D. degree in electronic engineering from Tohoku University in 1995. He joined the Research and Development Center, Toshiba Corporation in 1987. He was a Lecturer of the Research Institute of Electrical Communication, Tohoku University in 1995, where he became an Associate Professor in 1997, and he became a Professor in April 2008. He became a Professor of Center for Interdisciplinary Research, Tohoku University in May 2008. He is a Professor of Graduate School of Engineering, Tohoku University since April 2012. He is a Deputy Director of the Center for Spintronics Integrated Systems, Tohoku University since March 2010, too. He has been engaged in the research on advanced Memory such as NAND memory and Vertical Memory and 3D Memory, the Advanced CMOS device technology such as 3 dimensional MOSFET, low power and high-speed circuit technology and novel nano LSI with hybrid technology between Spintronics Memory and extended CMOS technology.