

2011 11th Annual Non-Volatile Memory Technology Symposium Proceeding

(NVMTS 2011)

**Shanghai, China
7-9 November 2011**



**IEEE Catalog Number: CFP11NVM-PRT
ISBN: 978-1-4577-1428-3**

Table of Contents

Submitted Papers

- 1. Materials Engineering for Phase Change Radom Access Memory.....1**
Simone Raoux, Huai-Yu Cheng, Jury Sandrini, Jing Li and Jean Jordan-Sweet

- 2. Electrical Properties and Microscopic Structure of Amorphous Chalcogenides.....6**
D. Ielmini and A. L. Lacaita

- 3. MOCVD GST for High Speed and Low Current Phase Change Memory....9**
J. F. Zheng, P. Chen, W. Hunks, W. Li, J. Cleary, J. Reed, J. Ricker, W. Czubytyj, C. Schell, R. Sandoval, S. Hudgens, C. Dennison and T. Lowrey

- 4. Hybrid SSD with PCM.....15**
Yining Liu, Chuangshi Zhou and Xiaohua Cheng

- 5. Spin-RAM for Normally-Off Computer.....20**
K. Ando, K.Yakushiji, H. Kubota, A. Fukushima, S. Yuasa, T. Kai, T. Kishi, N. Shimomura, H. Aikawa, M.Yoshikawa, T. Nagase, K. Nishiyama, E. Kitagawa, T. Daibou, M. Amano, S. Takahashi, M. Nakayama, S. Ikegawa, M. Nagamine, J. Ozeki, D. Watanabe, H. Yoda, T. Nozaki, Y. Suzuki, M. Oogane, S. Mizukami, Y. Ando, Y. Nakatani, T. Miyazaki and Y. Nakatani

- 6. From Dielectric Failure to Memory Fuction: Learning from Oxide Breakdown for Improved Understanding of Resistive Switching Memories. 26**
Jordi Suñé, Enrique Miranda, David Jiménez, Shibing Long and Ming Liu

- 7. High Performance Charge-Trapping Flash Memory with Highly-Scaled Trapping Layer.....32**
Albert Chin, C. Y.Tsai and Hong Wang

- 8. Overview of FeRAMs: Trends and Perspectives.....36**
Daisaburo Takashima

9. Crystallinity and its Influence on Physical and Magnetic Properties in Phase Change Magnetic Materials.....	42
J. C. Huang, W. D. Song, L. P. Shi, R. Zhao, T. C.Chong, J. A. Bain and T. E. Schlesinger	
10. Thermal Conductivity Measurements of Nitrogen-doped Ge₂Sb₂Te₅.....	46
Chun Chia Tan, Rong Zhao, Luping Shi, Tow Chong Chong, James A. Bain, T. E. Schlesinger, Jonathan A. Malen and Wee Liat Ong	
11. Physical and Electrical Characteristics for Si-Doped GeSb₉ Phase-Change Memory.....	50
Yu Hsun Perng, Shu Yu Lin, Wen Yen. Lai and Lih Hsin Chou	
12. Composition Control of GexSbyTez film for PCRAM Application by Chemical Vapor Deposition.....	54
Takafumi Horiike, Seiti Hamada, Tomohiro Uno, Hideaki Machida, Masato Ishikawa, Hiroshi Sudo, Yoshio Ohshita and Atsushi Ogura	
13. Phase Change and Optical Band Gap Behavior of Ge-Zn-Te Chalcogenide Films.....	58
Guoxiang Wang, Qiuhua Nie, Xiang Shen, Tiefeng Xu and Shixun Dai	
14. A Novel Read-While-Write (RWW) Algorithm for Phase Change Memory.....	62
Ding Sheng, Song Zhitang and Chen Houpeng	
15. Device model of Phase Change Memory.....	66
Yuefeng Gong, Feng Rao and Zhitang Song	
16. Simulation of Novel Phase Change Memory Cell with Titanium Nitride Heating Layer.....	70
Xiaofeng Du, Sannnian Song, Zhitang Song, Weili Liu, Yuefeng Gong and Yifeng Gu	
17. Circuit Design for 128Mb PCRAM based on 40nm Technology.....	74

Daolin Cai, Houpeng Chen, Xi Li, Qian Wang and Zhitang Song

18. The Influence of Field-Dependent Carrier Mobility and Permittivity on Space-Charge-Limited Leakage Current Characteristics in High Dielectric Constant and Ferroelectric Thin Films.....78

Y.G. Xiao, M.H. Tang and J. C. Li

19. Evaluation of OxRAM Cell Variability Impact on Memory Performances through Electrical Simulations.....83

H. Aziza, M. Bocquet, J-M. Portal and C. Muller

20. Nonvolatile Memories with Controllable Nanogap Structures.....88

Shigeo Furuta, Yuichiro Masuda, Tsuyoshi Takahashi, Somu Kumaragurubaran, and Masatoshi Ono, Hiroshi Suga, Yasuhisa Naitoh and Tetsuo Shimizu

21. Fast Pulse Analysis of TiO₂ Based RRAM Nanocrossbar Devices.....92

C. Hermes, F. Lentz, R. Waser, S. Menzel, K. Fleck ,U. Böttger, R. Bruchhaus, M. Wimmer, M. Salinga and M. Wuttig

22. Studies on Nonvolatile Resistance Memory Switching Behaviors in InGaZnO Thin Films.....96

Min-Chen Chen, Ting-Chang Chang, Sheng-Yao Huang, Simon M. Sze and Ming-Jinn Tsai

23. Investigation of Resistive Switching Properties in Sm₂O₃ Memory Devices.....100

Sheng-Yao Huang, Ting-Chang Chang, Min-Chen Chen, Simon M. Sze and Ming-Jinn Tsai

24. Novel Bipolar TaOx-based Resistive Random Access Memory.....103

Wenjuan Wu, Xin Tong, Rong Zhao, Luping Shi, Hongxin Yang and Yee-Chia Yeo

25. Cell-Based Models for the Switching Statistics of RRAM.....108

Shibing Long, Carlo Cagli, Daniele Ielmini, Ming Liu and Jordi Suñé

- 26. Performance optimization for TANOS by using pretreatment of plasma oxygenic ions.....113**
Zhongguang Xu, Zongliang Huo, Chenxin Zhu, Jing Liu and Ming Liu
- 27. Characteristics of atomic layer deposition-derived all-high-k-based structures for flash memory application.....117**
Y. Y. Fu, A. D. Li, X. J. Liu, X. F. Li, D. Wu and Z. J. Tang
- 28. Investigation of charge trap and loss characteristics for charge trap memory by electrostatic force microscopy.....121**
Chenxin Zhu, Rong Yang, Zongliang Huo, Zhongguang Xu, Dongxia Shi, Jing Liu, Guangyu Zhang and Ming Liu
- 29. Modeling Intrinsic and Extrinsic Asymmetry of 3D Cylindrical Gate/Gate-All-Around FETs for Circuit Simulations.....125**
S. Venugopalan, Y. S. Chauhan, D. D. Lu, M. A. Karim, Ali M. Niknejad, and Chenming Hu