

### 6D.5 Reliability Benefits of a Metallic Liner in Confined PCM by

W. Kim, Y. Xie, Y. Kim, T. Masuda, S. Kim, R. Bruce, F. Carta, G. Fraczak, A. Ray, K. Suu, C. Lam, M. BrightSky, J. J. Cha and Y. Zhu  
IBM, ULVAC Inc., and Yale University

Resistance drift is one major problem in PCM technology, leading to retention errors. The paper studies the relation between resistance drift and resistivity of the metallic liner in confined PCM cells, resulting in a choice of the liner which allows to achieve outstanding resistance drift. This is ascribed to the elimination of the generated voids during programming (see Figure), and results in a confined PCM cell with a high potential to be used as a high-density multi-level cell.

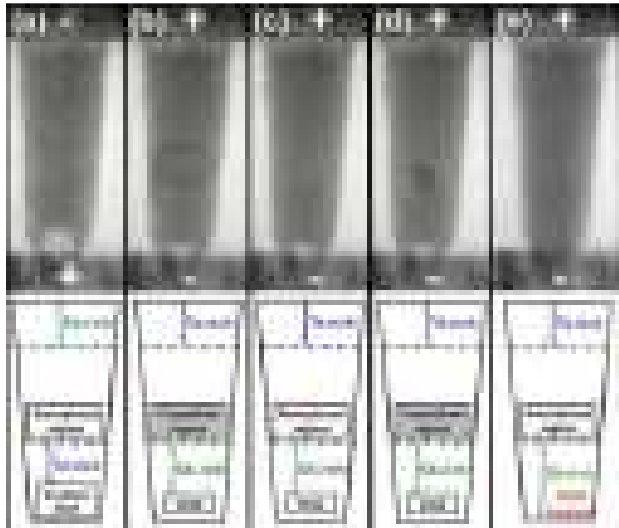


Fig.9: (a) Schematic figures of the confined PCM cells with liner A describe the switching region and elemental segregation in the PCM cell during the consecutive programming. (a) A void near BE was created by reverse-bias pulse. (b) and (d) indicate that switching occurs near center of the pore. The generated void was completely healed in (e).