

upcoming memory technologies, a nice summary

Contributed by Maciej Bajkowski
Tuesday, 04 May 2010

There is definitely a lot of work going on all over the world on finding replacement technologies for the current crop of memory technologies, which will scale better and of course cost less to manufacture. So it is nice when an article is written that gives a nice little summary for some of these technologies on their target applications. Such is the case with a piece written by Motoyuki Oishi for Nikkei Electronics Asia, titled "Successor to Post Flash Memory Approaching Volume Production." The article first examines CMOx technology from Unity Semiconductor, a startup developing transistor-less non-volatile memory. We first covered Unity Semiconductor back in June of last year and discussed the CMOx technology in some detail as well. A couple new facts that emerge from Motoyuki's article are that Unity plans to bring a 256Gbit product to market sometime in 2012, and that the expected chip area per-Gbit will be 0.78mm² in 45nm technology. With this superb bit density Unity expects to be very cost competitive with NAND flash memory, and also significantly faster when it comes to access times - eventually it seems that the company is aiming at replacing DRAM as well. The article also covers Toshiba's spin-injection MRAM which utilizes perpendicular magnetization and is aimed at replacing DRAM technology. The current 64Mbit prototype implemented in 65nm technology and presented by Toshiba at ISSCC is capable of operating at 1.2V with a cycle time of 30ns in typical conditions. Finally, the article discusses Numonyx Inc., of Switzerland, which in conjunction with Intel is developing Phase-Change Memory (PCM) that is intended as a replacement for NOR based flash memory. In particular these companies have been working on a Phase Change Memory and Switch (PCMS) architecture which just like CMOx technology intends to explore 3D stacking to increase density and decrease the cost per-bit. Anyhow, there is a lot more information in Motoyuki's article as well as many interesting illustrations that he collected from different presentations and papers, so if future memory technology is of interest to you, it would serve you well to check it out.