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Flash Is Obsolete: Numonyx Starts Sampling Phase-Change Memory

It is as fast as DRAM, but it will come cheaper

It was **only yesterday** that Intel's memory joint venture with ST Microelectronics finally got official, and the company has started shipping sampling units of its most important product, the phase-change memory. According to the company's CEO, Brian Harrison, the phase-change memory chips will start shipping in large amounts later this year. "We expect to bring it to market this year and generate some revenue," Harrison said. "It is one to two years before it becomes widely commercially available." This is the first announcement claiming the immediate availability for the PCM chips in a long time. Until now, the new technology was touted as available within a few years' time. It was born 38 years ago, when Gordon Moore described a new type of memory called Ovonics Unified Memory in an Elecronics article.The manufacturing process for the PCM memory is extremely intricate. First of all, the manufacturer has to heat up a micro-scale patch of substrate at 150-600 degrees Celsius. The intense heat melts the polymeric substrate; subsequently, it is cooled down until solidification into one of the two crystalline structures. The secret seems to be the accurate temperature control in order to achieve one of the two crystalline structures that manifest different resistance levels, translated into ones or zeros. According to Harrison, both Intel and ST Micro have progressed in controlling the process.Miniaturization is also a key factor and the continuous progress in semiconductor technology has had its share in achieving the PCM memory. Numonyx has a huge intellectual property, and it is currently sampling working chips of NOR flash built on the 32-nanometer manufacturing node. Both Intel and ST Micorelectronics managed to achieve PCM chips using the production lines initially designed for the average flash-based memory. PCM memory is much more reliable than the NAND flash and can stand tens of millions of read-write cycles. Moreover, it is touted as being as fast as DRAM memory, with data writing rates reaching 1 MB per second.