

3D NAND : Memory Technology Trends

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Nowadays five big technology trends, namely, networking, machine to machine, mobile, cloud, big data, are shaping the modern society and all human interaction. At the same time, memories are becoming more and more important in driving the system performance and cost in all electronic systems. Moreover, these trends are requiring a higher memory density lower power and improved performance. So far, since the sixty's, the semiconductor memory industry, DRAM, NOR and NAND, has been able to satisfy such requirements, delivering increasing memory performance and density, along with a continuously reducing cost structure, thanks to a very efficient manufacturing infrastructure and the continuous scaling of dimensions. But as we move into the sub 20nm regime, both NAND and DRAM scaling are becoming increasingly difficult and costly. As a result, the extension of Moore's law can be assured only introducing a different approach, with new revolutionary innovation: from pure scaling of dimensions in planar architectures to fully use the Z_dimension in stacking memory cells in 3D-dimensional arrays. New 3D NAND are now becoming the dominant player in the NVM scenario.