

Fabrication and Characterization of Multi-Bit Memory Device Based on Ferroelectricity

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A multi-bit memory is a memory device that can store more than two states in a single memory cell. Since the degree of integration can be increased, many studies have been carried out in various aspects. In this paper, we propose a method to store two bits in one memory cell using ferroelectric polymer. A ferroelectric polymer was used to fabricate a structure in which one capacitor had two different thicknesses. The structures of different thicknesses were fabricated by various methods using the characteristics of polymer, and the polarization values of four different states were confirmed.

In addition, the proposed multi-bit memory cell is applied to the memory architecture of the conventional 1 transistor-1 capacitor structure to derive the correlation between the main parameters. Also, we investigate the expected problems of multi-bit memory devices and propose a more advanced multi-bit memory device structure.

Biography:

Ms. J. Y. Lee is an undergraduate student at Jeju National University in Korea, and her research interests are semiconductor memory devices. Mr. S. A. Rahman and Mr. S. A. Khan are graduate students in master course. Prof. Dr. W. Y. Kim is an assistant professor at Jeju National University in Korea since 2017. His research fields include applications of ferroelectric polymer and graphene process.