Accepted Manuscript

Area-efficient ferroelectric multi-bit memory device

Woo Young Kim

PII: S0167-9317(18)30114-X
DOI: doi:10.1016/j.mee.2018.03.010
Reference: MEE 10766

To appear in: *Microelectronic Engineering*

Received date: 27 December 2017
Revised date: 22 February 2018
Accepted date: 11 March 2018

Please cite this article as: Woo Young Kim , Area-efficient ferroelectric multi-bit memory device. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Mee(2017), doi:10.1016/j.mee.2018.03.010

Area-efficient ferroelectric multi-bit memory device

Woo Young Kim[1]*

[1]Department of Electronic Engineering, Jeju National University, 102 Jejudaehak-ro, Jeju-si, Jeju Special Self-Governing Province, 63243, Republic of Korea

Abstract

Owing to both ferroelectricity and polymer properties, ferroelectric polymers are suitable for fabrication of high-density memory devices in a multi-layered structure. Recently, multi-bit memory devices using a ferroelectric polymer has been reported, in which two capacitors in a memory cell are horizontally positioned and they are electrically connected in a parallel. In this paper, however, a multi-bit memory device with multi-layered structure will be demonstrated, in which two capacitors are vertically positioned but they are electrically connected in parallel, equivalently. By blending crosslinking agent into ferroelectric solution, organic-solvent-tolerant ferroelectric film could be realized for vertically-stacked structure. The memory operation was observed at a maximum of 20 V, and there were four distinct states. In particular, the area efficiency of 25% is higher than that of a previous horizontal multi-bit memory device. The findings here are expected to be very useful to those involved in the creation of high-density and high-reliability organic memory devices.

Keywords: ferroelectric polymer, multi-bit memory, area efficient memory, multilayer

Email: semigumi@jejunu.ac.kr , **Tel:** +82-64-754-3668, **Fax**: +82-64-756-1745