GaMnAs-based hybrid multiferroic memory device. M. OVERBY, A. CHERNYSHOV, L.P. ROKHINSON, Department of Physics, Purdue University, West Lafayette, IN 47907, J.K. FURDYNA, X. LIU, Department of Physics, University of Notre Dame, Notre Dame, IN 46556 — In a ferromagnetic semiconductor GaMnAs grown on GaAs there are two equivalent easy axes of magnetization along the [100] and [010] crystallographic directions. These two directions can form a basis for a memory device with the binary state being encoded in the direction of the magnetization. The state can be electrostatically controlled by introducing a compressive (tensile) strain along one of the easy axes. We demonstrate a novel non-volatile hybrid multiferroic memory cell with electrostatic control of magnetization based on strain-coupled GaMnAs and a piezoelectric material. The magnetization direction is monitored via planar Hall effect, which changes sign when magnetization rotates. At zero voltage on the piezoelectric magnetization can be oriented either along [100] or [010], when voltage on piezoelectric is swept between positive and negative values magnetization forms a hysteresis loop with abrupt transitions between the two orientations.