

# Charge Storage Effect of the Vertically Stacked InAs Nanodots Embedded in Al<sub>0.5</sub>Ga<sub>0.5</sub>As Matrix

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## Abstract

This report describes the memory effect of an Al<sub>0.5</sub>Ga<sub>0.5</sub>As/GaAs field-effect (FE) structure which contains vertically aligned InAs nanodots in the barrier layer. The FE structure is grown by molecular beam epitaxy using Stranski-Krastanow islands as the nanodots. Charge storage effect of the nanodots is analyzed by a capacitance-voltage measurement and resulted in a hysteresis loop due to the stable electron trapping at nanodot potentials. The amount of charge for the long-term memory retention at 300 K is estimated to be  $\sim 14$  nC/cm<sup>2</sup>, which is promising for memory device applications of the FE structure.