

# Carbon Nanotube Based Nonvolatile Memory

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## TECHNOLOGY DESCRIPTION

Researchers at UC San Diego have developed a novel, nonvolatile memory device with major advantages over existing flash memory technology. This technology exploits the highly efficient field emission from carbon nanotube structures (CNT) to design a CNT based memory core that circumvents the issues of transistor scaling and hot electron effects that appear to limit flash memory density.

## ADVANTAGES

Advances in fabrication of nanometer-sized CNTs has enabled a nonvolatile memory architecture that operates at lower power levels due to the higher efficiency of field emissions from nanostructures, allowing greater circuit density, faster speed of operation as the electrons travel in vacuum, greater reliability due to the absence of tunneling through oxide, and immunity from ionizing radiation. Yet another advantage of the present design is that active transistors in the memory core are not necessary. The design utilizes current lithography and semiconductor fabrication methods.

## STATE OF DEVELOPMENT

The present invention, in early-stage development, can be viewed as a novel extension of flash memory using nanoscience.

## INTELLECTUAL PROPERTY INFO

Patents pending

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,541,776	09/24/2013	2006-102

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## OTHER INFORMATION

### CATEGORIZED AS

- **Semiconductors**
- Design and Fabrication

### RELATED CASES

2006-102-0