

# **Fabrication and Electrical Characteristics of a Non-Volatile Nanoelectromechanical Memory Switch employing a Carbon Nanotube Fabric Approach**

**Jonathan W. Ward, Mitch Meinholt, Brent M. Segal, Jack Berg, Rahul Sen, Ramesh Sivarajan and Thomas Rueckes**

## **Abstract:**

Nanoelectromechanical devices can be constructed by employing a carbon nanotube (CNT) fabric for non-volatile memory storage applications. A CNT fabric was produced by spin-coating a substrate with a solution of single-walled nanotubes (SWNTs) in a semiconductor grade solvent. The solution has been developed to omit any metallic or material contaminants and particulates. The CNT fabric is then lithographically patterned with photoresist and etching in an oxygen plasma, transferring the photoresist pattern to the CNT fabric. Employing a patterned CNT fabric, a Non-Volatile Random Access Memory device can be fabricated. A suspended CNT fabric can be constructed by employing standard semiconductor processes to produce an electromechanical switch between a source and release electrode. Design considerations and preliminary nanoelectromechanical switching characteristics will be presented.