USF Available Technologies

Technology Transfer Office

Nanometer-Scale Electromechanical Switch and Fabrication Process

Researchers at the University of South Florida have developed a nano-scale fabrication technique and an electromechanical switch.

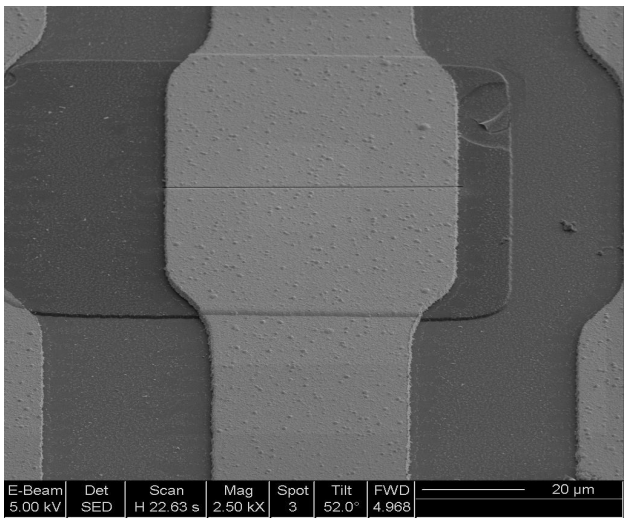
Micro-electro-mechanical-systems (MEMS) technology has shown tremendous growth in recent years. RF MEMS switches have already shown superior electrical performance to solid state p-i-n and FET switches at high frequencies. Due to these qualities, as well as their small size and their manufacturability, RF MEMS switches have the potential to be a viable replacement to their solid state switch counterparts. However, p-i-n diode and FET switches still outperform MEMS switches in switching speed and operating voltage level. Accordingly, an improved MEMS switch having a lower operating voltage and a faster switching speed in a small form factor is needed.

USF inventors have successfully developed a unique method of fabricating a nanometer-scale electromechanical systems (NEMS) contact switch with very high switching speed and low operating voltage. Some critical benefits of this (NEMS) switch are that it can be operated with less than about 3V, has sub-microsecond switching speed, and is ~50 times smaller than a MEMS design. Such advantages will reduce the cost of integrating electro-mechanical switches into microwave systems and enable them to be used in a much wider variety of systems. This has a multitude of applications in the RF, Microwave, and Wireless industries.

ADVANTAGES:

- **Low operating voltage**
- **High switching speed**
- **~50 times smaller than MEMS devices**
- **Operates in THz frequency**

Novel Nanometer-scale Electromechanical System With Increased Speed



Nano-Scale Electromechanical Switch

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