

“Charging Mechanisms in RF MEMS Capacitive Switches”

Dr. Loukas Michalas
Research Scientist
University of Athens, Greece



Friday, October 11th
12:00 pm, BRK 2001

Abstract:

MEMS capacitive switches have received important research interest mainly due to the advantages offered on RF applications. Beside this RF MEMS still are facing reliability issues with the most important one being the dielectric charging.

Regarding the mechanisms responsible for dielectric charging, two major modes have been identified. The one that takes place during the pull down state where charges are injected from the metal bridge to the insulating film and therefore entitled as contacted or injection charging and the one that occurs when the bridge is still in the up state and also at the non contact areas during down state where charging arise from redistribution of internal charges and therefore referred as contact less or induced charging. In addition charge transfer from the metal bridge to the insulating film may also occur even without contact and also before actuation. The later constitutes an additional charging mechanism that may consider as contact less charge injection and as recently demonstrated arise from the field emission process originated from sharp asperities on the metal surface.

The seminar aims to provide the features of each one of the above mentioned charging mechanism as revealed by the latest results obtained by the presenter and co-workers at the University of Athens, Greece

Speaker Bio:

Loukas Michalas (1980) graduated with a degree in Physics, a M.Sc. in Solid State Physics and the Ph.D. in Solid State Electronics from the University of Athens, Greece in 2002, 2004 and 2009 respectively. Since then he works as a research associate at the same university participating in national and EU funded research projects. Main areas of research interest are the electrical properties of semiconductor materials and devices and the dielectric/electrical properties of thin insulating films and nanostructured materials for reliable RF MEMS.