

Ruthenium Based Nanoscale Contact Coatings for Magnetically Controlled MEMS Switches

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Abstract : Magnetically controlled microelectromechanical system (MCMEMS) switches is one of the directions in the field of micropower switching technology. MCMEMS switches are a promising alternative to Hall sensors and reed switches. The most important parameter for MCMEMS is the contact resistance, which should have a minimum value and is to be stable for the entire duration of service life. The value and stability of the contact resistance is mainly determined by the contact coating material. This paper presents the research results of a contact coating based on nanoscale ruthenium films obtained by electrolytic deposition. As a result of the performed investigations, the deposition modes of ruthenium films are chosen, the regularities of the contact resistance change depending on the number of contact switching, and the coating roughness are established. It is shown that changing the coating roughness makes it possible to minimize the contact resistance.

Keywords : contact resistance, electrode coating, electrolytic deposition, magnetically controlled MEMS

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