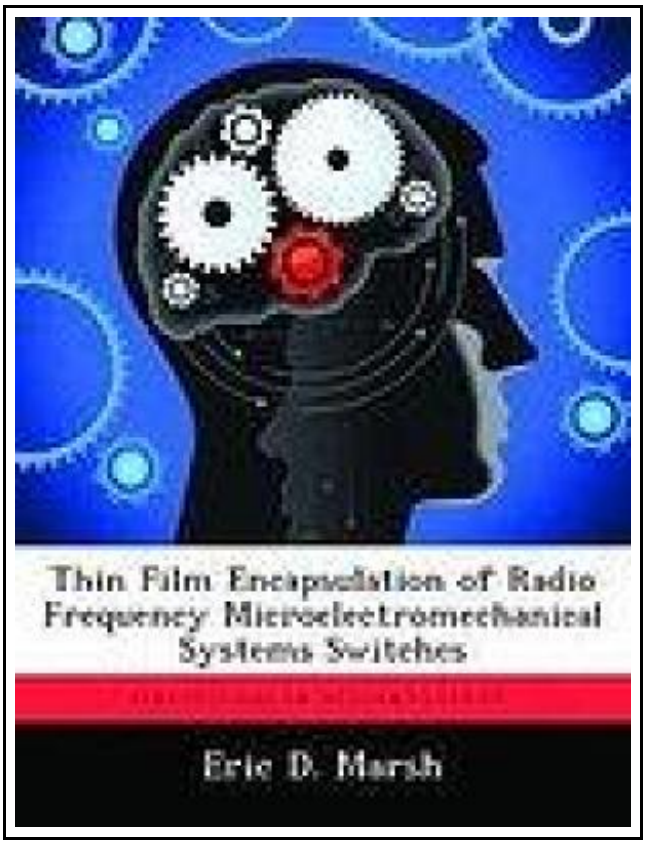
Thin Film Encapsulation of Radio Frequency Microelectromechanical Systems Switches



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THIN FILM ENCAPSULATION OF RADIO FREQUENCY MICROELECTROMECHANICAL SYSTEMS SWITCHES

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Biblioscholar Nov 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x10 mm. This item is printed on demand - Print on Demand Neuware - Microelectromechanical systems (MEMS) radio frequency (RF) switches have been shown to have excellent electrical performance over a wide range of frequencies. However, cost-effective packaging techniques for MEMS switches do not currently exist. This thesis involves the design of RF-optimized encapsulations consisting of dielectric and metal layers, and the creation of a novel thin film encapsulation process to fabricate the encapsulations. The RF performance of several encapsulation designs are evaluated wit h an analytical model, full wave electromagnetic simulation, and laboratory testing. Performance degradation due to parasitic and reflection losses due to the package is considered, and RF feed-throughs of the transmission line into and out of the package are designed and assessed. Ten different encapsulation designs were created and their RF performance was characterized in terms of insertion loss, return loss, and isolation. A switch without an encapsulation and a switch with a dielectric encapsulation were fabricated and tested by the Air Force Research Laboratory (AFRL), and the test data was used to verify the data from analytical modeling and electromagnetic simulation performed in this work. 168 pp. Englisch.

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