

High-isolation and low-loss RF MEMS shunt switches

ABSTRACT

This paper presents the design and simulation of a radio frequency (RF) microelectromechanical system (MEMS) shunt switch using a three-dimensional RF simulator, Em3ds10 (2008 version) software for the frequency range of 1-40 GHz. The shunt capacitive switch is electrostatic actuated and designed with a meander beam support to lower the pull-in voltage. Fast simulations of complex structures based on a method-of-moment approach allow for optimal design of MEMS switch. The switch has a simulated pull-in voltage of 2.5 V and the RF performances of insertion loss and isolation are less than -0.2 dB and -50 dB at 12 GHz, respectively.

Keyword: Insertion loss; Isolation; Low voltage; MEMS; Method-of-moment; RF MEMS; Shunt switch