

## عنوان مقاله:

Design of High Isolation and Low Actuation Voltage Ka-band Radio Frequency MEMS Capacitive Shunt Switch

## محل انتشار:

سومین کنفرانس ملی فناوری در مهندسی برق و کامپیوتر (سال: 1397)

تعداد صفحات اصل مقاله: 7

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## خلاصه مقاله:

Radio frequency (RF) micro electro-mechanical systems (MEMS) switches are rapidly replacing the PIN diodes and field-effect transistors (FET). Linear behavior, low power consumption, low insertion loss, high isolation, improvement power handling and etc. are benefits of MEMS switches. This paper presents a high isolation and low actuation voltage RF MEMS capacitive switch with two shunt beams for Ka -band (27- 40 GHz) applications such as in communications satellites and uplink. Simulation results using Ansoft's high frequency simulation software (HFSS) at Ka-band shows in the down-state of switch, the isolation (S21) is -41 dB and return loss (S11) is -0.15 dB. In the up-state, the insertion loss (S21) is -0.5 dB and the return loss (S11) is -7 dB. The pull down voltage of designed switch is 1.82 V and down-state to up-state capacitance ratio ( $C_d/C_u=12.11\text{pF}/0.137\text{pF}$ ) is 88.39. In this paper the Aluminum (Al) is chosen for the membrane for having low pull down voltage and silicon nitride ( $\text{Si}_3\text{N}_4$ ) is chosen for dielectric for having faster switching speed and larger down-state capacitance. Also Barium Strontium Titanate (BST) ferroelectric thin films are used for dielectric material

## کلمات کلیدی:

Aluminum, Actuation voltage, Capacitive shunt switch, Isolation, Pull down voltage, Silicon nitride

## لینک ثابت مقاله در پایگاه سیویلیکا:

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