

## 串联电容式RF MEMS开关设计与制造研究

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摘要:

介绍了一种串联电容式RF MEMS开关的设计与制造。所设计的串联电容式RF MEMS开关利用薄膜淀积中产生的内应力使MEMS桥膜向上发生翘曲,从而提高设计的开关的隔离度,克服了串联电容式RF MEMS开关通常只有在1GHz以下才能获得较高隔离度的缺点。其工艺与并联电容式RF MEMS开关完全相同,解决了电容式RF MEMS开关不能应用于低频段(<10GHz)的问题。其插入损耗为-0.88dB@3GHz,在6GHz以上,插入损耗为-0.5dB;隔离度为-33.5dB@900MHz、-24dB@3GHz和-20dB@5GHz,适合于3~5GHz频段的应用。

关键词: 射频; 微电子机械系统; 串联电容式RF MEMS开关; 串联电容式; 内应力

## Design and Fabrication of a Capacitive Series RF MEMS Switch

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**Abstract:**

The design and fabrication of a capacitive series RF MEMS switch is reported. The up-electrode warps up under the residue stress, which increases the isolation of the capacitive series RF MEMS switch. The disadvantage of capacitive series RF MEMS switch, which only has high isolation at below 1GHz, is overcome. The fabrication process is the same with capacitive shunt switch. Comparing with capacitive shunt switch, the fabricated capacitive series RF MEMS switch has the advantage in low frequency application (<10GHz). The insertion loss is -0.88dB@3GHz and -0.5dB above 6GHz; the isolation is -33.5dB@900MHz, -24dB@3GHz and -20dB@5GHz, which is for the application of frequency range from 3GHz to 5GHz.

**Keywords:** Radio Frequency; MEMS; Capacitive Series RF MEMS Switch; Capacitive Series; Residue Stress

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