Design and Characterization of Vertical Mesh Capacitors in Standard CMOS

Kåre Tais Christensen
Nokia Mobile Phones and Technical University of Denmark
Copenhagen, Denmark

This paper shows how good RF capacitors can be made in a standard digital CMOS process. The capacitors which are also well suited for binary weighted switched capacitor banks show very good RF performance: Q-values of 57 at 4.0 GHz, a density of 0.27 fF/\(\mu\)m\(^2\), 2.2 \(\mu\)m wide shielded unit capacitors, 6% bottom plate capacitance, better than 3-5% process variation and negligible series inductance. Further a simple yet accurate method is presented that allows hand calculation of the capacitance value.