Design and Characterization of Vertical Mesh Capacitors in Standard CMOS

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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/μm^2, 2.2 μm 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.