

## **Design, simulation and modeling of high Q RF MEMS inductor**

### **ABSTRACT**

Silicon integrated circuit spiral inductors and transformers are finding wide ranging applications in RF circuits. This paper presents implementation and characterization of spiral inductor using MEMS technology on silicon substrate for use in design of voltage controlled oscillator (VCO). MEMS inductors have been realized from the CMOS-compatible MEMS process. Suspended inductor has been employed in design to avoid substrate coupling. The dimensions of the inductor have been obtained using the Greenhouse formula. The inductors have been simulated using CoventorWare software. The Yue's model has been applied to compute lumped equivalent parameters and Q factor of the inductors. The resultant value of inductance and Q factor are 2.87nH and 27 respectively at 2.4 GHz, which are in good agreement with the results of Greenhouse formula.

**Keyword:** CMOS compatible inductor; Inductor model; Microelectromechanical systems (MEMS); Quality factor; Spiral inductor