

## Voltage Controlled Ring Oscillator for RF Applications in 0.18 $\mu\text{m}$ CMOS Technology

**Authors :** Mohammad Arif Sobhan Bhuiyan, Zainal Abidin Nordin, Mamun Bin Ibne Reaz

**Abstract :** A compact and power efficient high performance Voltage Controlled Oscillator (VCO) is a must in analog and digital circuits especially in the communication system, but the best trade-off among the performance parameters is a challenge for researchers. In this paper, a design of a compact 3-stage differential voltage controlled ring oscillator (VCRO) with low phase noise, low power and higher tuning bandwidth is proposed in 0.18  $\mu\text{m}$  CMOS technology. The VCRO is designed with symmetric load and positive feedback techniques to achieve higher gain and minimum delay. The proposed VCRO can operate at tuning range of 3.9-5.0 GHz at 1.6 V supply voltage. The circuit consumes only 1.0757 mW of power and produces -129 dbc/Hz. The total active area of the proposed VCRO is only 11.74 x 37.73  $\mu\text{m}^2$ . Such a VCO can be the best choice for compact and low-power RF applications.

**Keywords :** CMOS, VCO, VCRO, oscillator

**Conference Title :** ICEMP 2014 : International Conference on Electronics and Materials Physics

**Conference Location :** Zurich, Switzerland

**Conference Dates :** July 30-31, 2014