

Design and simulation of a 2.4 GHz VCO with high Q MEMS inductor and CMOS varactor

ABSTRACT

This paper presents design of high-performance MEMS inductor and CMOS varactor for use in CMOS voltage controlled oscillators (VCO) operating at 2.4 GHz. The high-Q air suspended inductor has been designed by inductance of 2.87 nH using MEMS technology to reduce the resistive loss and the substrate loss. A CMOS varactor has been designed. The DC voltage is 2.5v which is applied to the CMOS and the results of 0.6 pF could be achieved. Through this optimization, less phase noise (-117.7 dBc / Hz at 100 KHz) and lower power consumption (11 mW) have been obtained.

Keyword: VCO; MEMS; CMOS; Inductor; Varactor; Q factor