

ABSTRACT

RING OSCILLATOR WITH VARIABLE LOADING

A ring oscillator circuit device is achieved. The device comprises an odd number of inverting stages. Each inverting stage has an input terminal and an output terminal. The inverter stages are coupled in a ring such that the output terminals of preceding inverting stages are coupled to the input terminals of subsequent inverting stages. A variable capacitor is included. The variable capacitor comprises a conductive layer overlying a bulk semiconductor region with a dielectric layer therebetween. The conductive layer is coupled to the output terminal of one of the inverting stages. The value of the variable capacitor depends on a bulk voltage that is coupled to the bulk semiconductor region. The ring oscillator is used for analyzing load dependence of hot carrier injection. The ring oscillator is used as a voltage-controlled oscillator in a phase-locked loop circuit.

FIGURE 3