Chapter 2

The Modulator Driver

2.1 Introduction

Whether in a carrier-injection or a carrier-depletion topology, the modulator driver changes the charge concentration inside the modulator diode, resulting in a change in the index of refraction inside the waveguide thus shifting the ring modulator's resonant frequency. From the previous chapter, for both designs, we have a link between a target extinction ratio and the carrier concentration change. Several driver topologies are presented, along with their applicability toward different scenarios. First we analyze a generalized model for a modulator driver, and then go into specific details for each type of design.

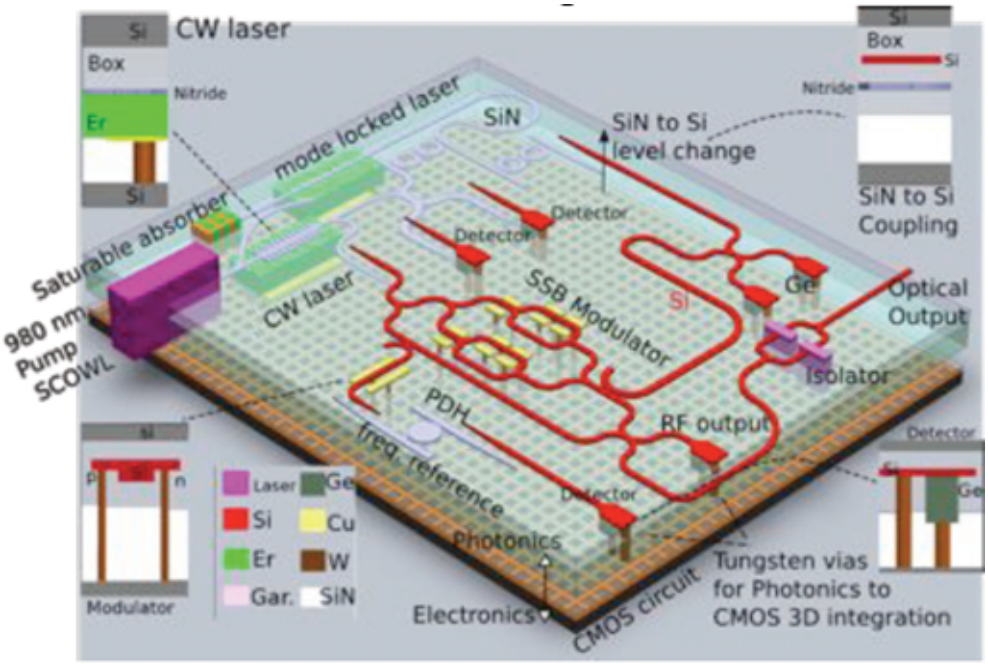

Figure 2-1: Ephi proposal.

$$Delay = \frac{R_0}{W} \cdot [C_g \cdot \chi \cdot W + C_w + C_{eff}] + R_{mod} \cdot C_{eff} \tag{2.1}$$