

# simulation and analysis of Effect of Temperature and Capacitive effects in quantum efficiency and bandwidth of a particular type PIN photodiodes

roshank alizadeh\*, abbas ghadimi,

**Abstract** In this Thesis quantum efficiency and bandwidth of PIN photodiode, with an arbitrary electric field profile in absorption region and non-uniform illumination is investigated. The implemented numerical model is very general and complete. The absorption region is divided into any desired number of layers and the continuity equations are solved for each layer assuming that, within the layer, the carriers' drift velocities are constant. The transit time effect and the capacitance effect of bandwidth is investigated taking into account bias voltage, the absorption region width and Temperature. The dependence of quantum efficiency on wavelength, is analyzed. **KEYWORDS:** Photodiode PIN, Bandwidth, Quantum efficiency, Capacitive effects

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