

# Fabrication of p-n Junction Photodiodes using Low-Temperature ALD grown ZnO and NiO films on Si substrates

## 1. Layout design

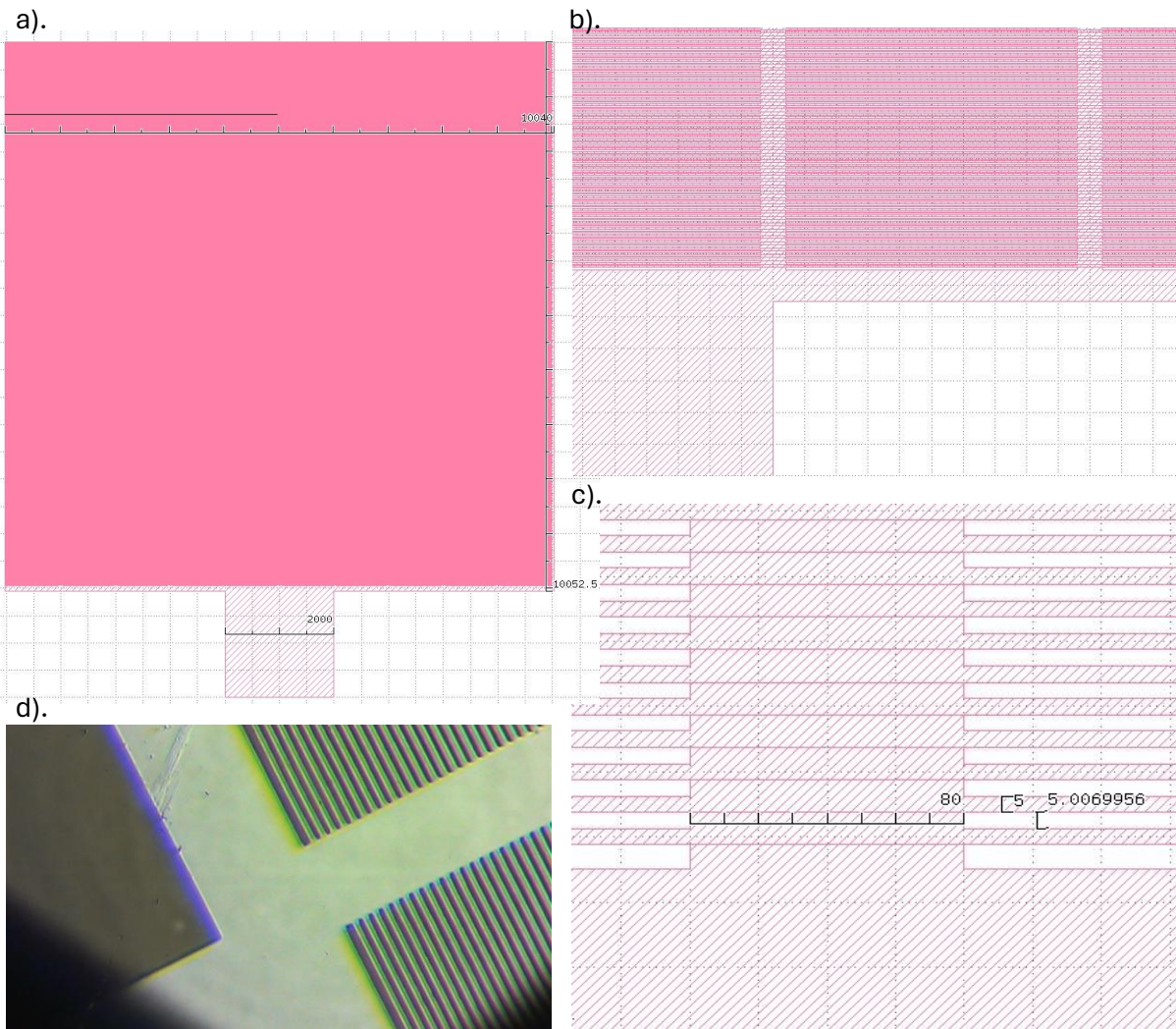


Fig. 1. The layout design of the devices. See a). the overall pattern. b). represent the zoomed in part of a). in the red box. c). is the zoomed in area of b)., and picture d). represent the pattern taken by optical microscope.

## 2. Measurements:

Electrical measurements are done in both solar simulator and probe station. In solar simulator 300W optical power was used. We measured currents at each voltage for both dark and under light conditions. In the probe station, we used parameter analyzer to get IV sweeps under dark and light conditions. However, the light and dark conditions aren't the same for both solar simulator and probe station.

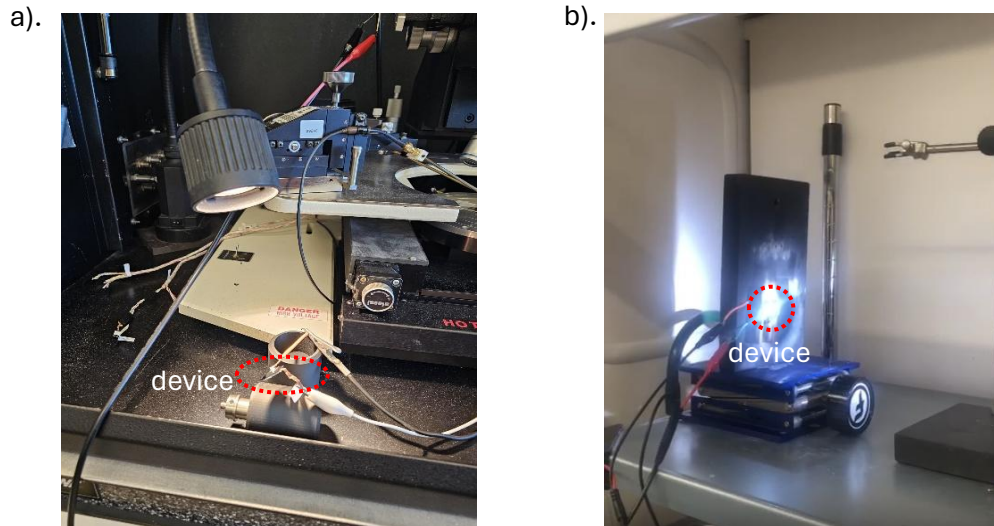


Fig. 2. I-V measurement setups. Picture a). represents the probe station setup. The light source used here is a low power incandescent light bulb, which was pointing towards the devices. Picture b). represents the setup for solar simulator. The light is 300 W.

### 3. Data

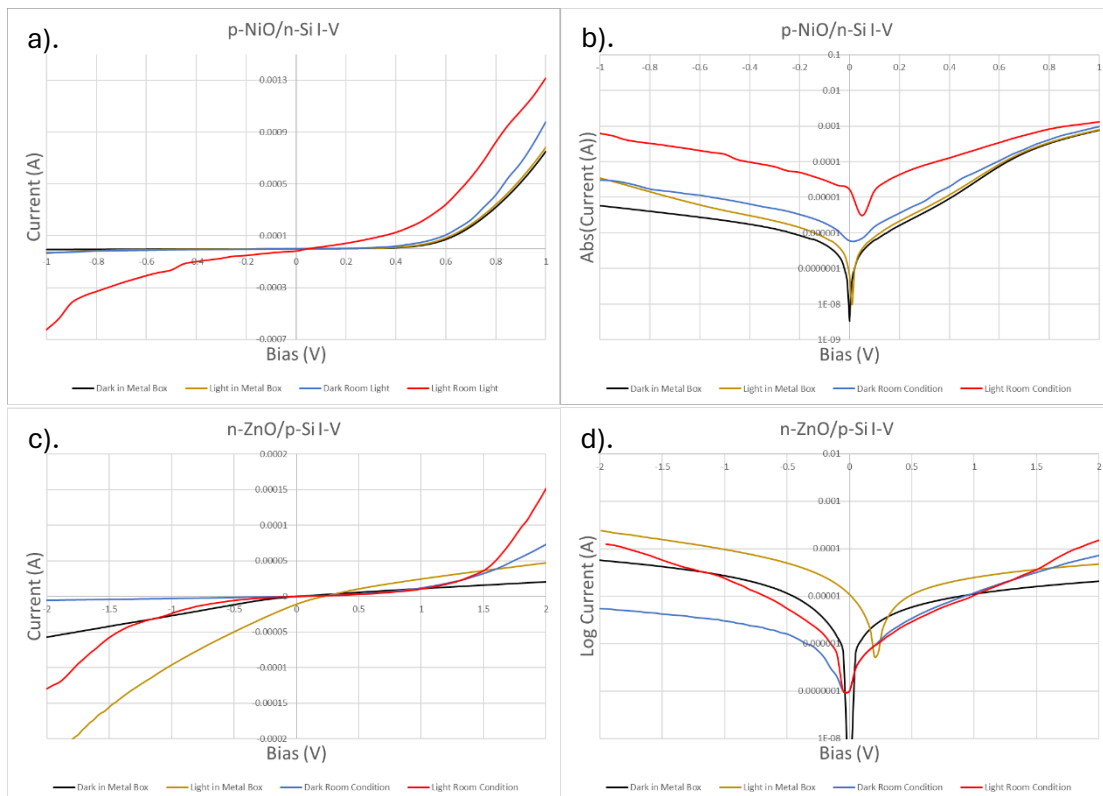


Fig. 3. I-V measurement for the samples using metal shielded probe setup with a low-power incandescent light source, and room condition wet bench with high power solar simulator. a). and c). represent I-V curve for NiO and ZnO devices under linear scale, whereas b). and d). show the same devices' absolute current in log scale.