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## Fabrication of Schottky junction based on p-type GeSe by asymmetry of metal contacts

Metal-2 dimension semiconductor schottky-barrier diodes with forward and reverse I-V characteristics have been fabricated using asymmetric metal contacts. In this research work a p-type Germanium selenide (p-GeSe) was fabricated. p-GeSe belongs to the family of IV–VI layered chalcogenide semiconductors with orthorhombic structure (Pnma) [1] and band gap, 1.07 eV [2]. A single unit cell contains eight atoms situated in two adjacent double layers along the z axis. The atoms in each double layer are bonded to their three nearest neighbors in a zig-zag fashion. The neighboring Ge atoms surrounding the Se atoms. The van der Waals force between the adjacent layers makes the crystal cleavable along its x-y plane [3]. Single crystalline flakes of p-GeSe were mechanically exfoliated by using 3M scotch tab [4] and Deterministic dry transfer method was used to transfer good quality of few layers flakes onto the Si/SiO2 [5].Electrodes were designed in desired geometry over p-GeSe flakes by Electron Beam Lithography.

The schotky-barrier has been made due to asymmetry of ultra-low Palladium/Gold (Pd/Au) and high resistive Chromium/Gold (Cr/Au) metal contacts. The schottky diode has performed an explicit rectifying behavior with an on/off ratio of ~10<sup>3</sup>.

## References

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**Figure 1:** a) Transfer Characteristics of p-GeSe under various Vds Voltages. b) Asymmetric metal contact effect of p-GeSe with Pd/Au and Cr/Au.