

Characterization of irradiated thin n-in-planar pixel and active edge sensors

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Latest productions of thin n-in-p pixel sensors designed at MPP will be presented. Sensors of thicknesses of 50, 100 and 150 μm have been produced at ADVACAM and CiS (100 and 150 μm) and interconnected to FE-I4 chips. At ADVACAM SOI wafers were employed, while at CiS anisotropic KOH etching was carried out to create backside cavities in the wafer leaving thicker frames around each single structure.

To maximize the active area of the thin sensors, slim and active edges were implemented in the sensors of the ADVACAM production. The evaluation assemblies in the entire thickness range have been measured at beam tests and the results on charge collection and edge efficiency will be discussed for unirradiated and irradiated modules up to 3×10^{15} .

The performance of modules with a standard edge and with 150 μm thick sensors after irradiation to 1×10^{16} will be discussed in terms of charge collection and hit efficiency. In addition, the charge collection properties and efficiencies at different depths inside the silicon bulk have been studied before and after irradiation in a thickness range of 50 to 200 μm with the grazing angle technique.

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