

Module development with the MALTA monolithic pixel chip

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The MALTA silicon pixel detector combines a depleted monolithic active pixel sensor (DMAPS) with a fully asynchronous front-end and readout. It features a high granularity pixel matrix with a 36.4 μm symmetric pixel pitch, low power consumption of $<1 \mu\text{W}/\text{pixel}$ and low material budget with detector thicknesses as little as 50 μm . It achieves a radiation hardness to 100MRad TID and more than $1 \times 10^{15} \text{ 1 MeV n}_{\text{eq}}/\text{cm}^2$ with a time resolution of $< 2 \text{ ns}$ [1].

In order to cover large sensitive areas efficiently with a minimum of power and data connections the development of modules, comprising of up to 4 MALTA detectors, is studied.

This contribution presents the beam test performance of parallel and serial powered MALTA 4-chip modules in an effort to characterize the sensor's chip-to-chip data and power transmission and prepare the production of a first prototype of an ultra-light weight 4-chip module on a flexible circuit with next generation MALTA2 sensors.

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