

TIMEPIX3

A pixel detector read-out chips for X-ray imaging and particle track reconstruction developed by the Medipix 3 Collaboration.

Timepix3 is a general-purpose integrated circuit suitable for readout of both semiconductor detectors and gas-filled detectors. Timepix3 can be used in a wide range of applications varying from X-rays imaging to particle track reconstruction. Depending on the application requirements user can choose one out of three data acquisition modes available in the Timepix3. In the data driven mode both arrival time information and charge deposit information are sent off chip for each hit together with the coordinates of the active pixel. The chosen architecture allows for continuous and trigger-free readout of sparsely distributed data with the rate up to 40Mhits/s/cm². For imaging applications and for calibrations the possibility exists of operating in frame-based (non-continuous) data readout mode.

Features

- Pixel size 55µm x 55µm
- 256 x 256 pixels
- Timepix3 is suitable for readout of both semiconductor detectors and gas-filled detectors
- Single thresholds per pixel each with 4 bits of local adjustment
- Two main measurement modes: (1) simultaneous 10 bit ToT and 18 bit TOA and (2) 10 bit event counting and 14 bit integral TOT
- TOT monotonic for large positive charges
- Fast TOA for time stamping with a precision of 1.56 ns
- Data driven readout: dead time free, for a maximum hit rate of 40 Mhits/s/cm²
- Shutdown/wake-up features for power pulsing tests on a full system
- 3-side buttable (with a single 1.2mm dead edge)
- TSV ready

Applications

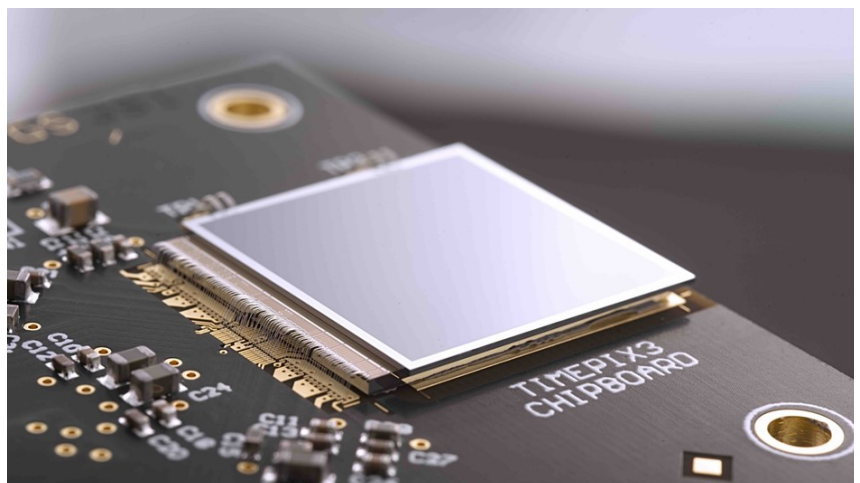
- X-rays imaging
- Particle track reconstruction
- Timepix3 is suitable for readout of both semiconductor detectors and gas-filled detectors
- Electron microscopy

Commercially available

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