

TITLE OF THE INVENTION

GASTONE64: the KLOE2-IT Front-End chip

upgrade.

ABSTRACT

The GASTONE (GEM Amplifier Shaper Tracking ON Events) is a low-noise low-power mixed analog-digital ASIC designed to host 64 channels to readout the cylindrical GEM Inner Tracker (IT) detector foreseen in the upgrade of the KLOE apparatus at the LNF e^+e^- collider. Each channel is made of a charge sensitive preamplifier, a shaper, a discriminator and a monostable. Digital output data are transmitted via serial interface at 100 Mbit/s data rate. The chip has been designed in $0.35\mu\text{m}$ AMS CMOS process. The 2nd release is ready to take data at PS Test Beam at CERN on the first “big” GEM chamber built according the new “single mask” technology to validate the project.

TECHNOLOGY STAGE

For the end of 2010 will start a pre-production to instrument the first 2 layers of the IT detector foreseen for the KLOE apparatus upgrade.

An *ad-hoc* Very Front-End Board (VFEB) has been also designed for housing and suitably driving the ASIC.

POSSIBLE APPLICATIONS

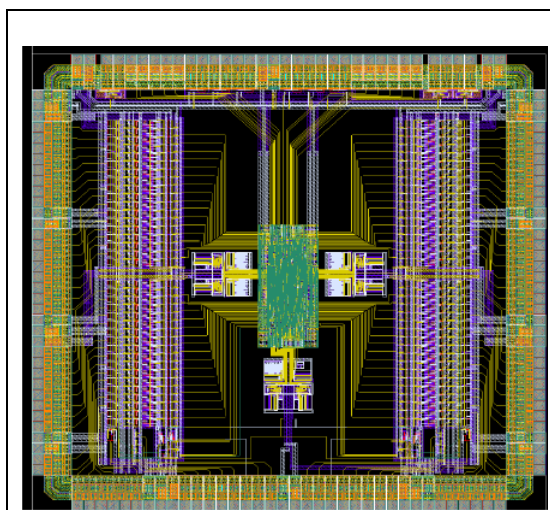
- High-Energy Physics.
- Medical Imaging.

EXISTING APPLICATIONS

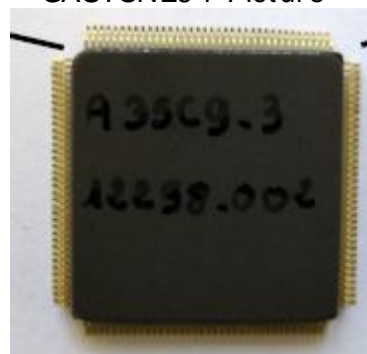
- Front-End readout of the GEM Inner Tracker of the KLOE apparatus

SPECIFICATIONS

- Gain sensitivity: 22mV/ fC
- ENC (rms): $\sim 800e^- + 40e^-/ \text{pF}$
- non linearity: $< 1\%$ (0 – 30 fC)
- Power consumption: $\sim 2.4\text{mW/ ch}$
- Bias: 3.3V



GASTONE64 Picture





GASTONE64 VFEB picture

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