

Discontinued

CATIROC 1

**Large
photomultiplier
arrays read out chip**



Features



Optimized for

- PMT
 - PMT arrays
- **Number of channels:** 16
- **Type of measurement:** Self triggered, Charge, Time
- **Outputs:** 16 trigger outputs, 16 shaper output, 1 or of the 16 trigger output, 1 serialized digital data output (50bits/channel)
- **Input Polarity :** Negative
- **Main performances :** Energy measurement, Time stamping, Full system-on-chip, No dead time

Description

CATIROC IS DEPRECATED - NOT RECOMMENDED FOR NEW DESIGN Please consider **Poproc** for new design

Catiroc 1 is a 16-channel front-end ASIC designed to readout **photomultiplier tubes (PMTs)** in large scale applications such as water Cerenkov experiments. The concept of the ASIC is to combine an auto-trigger chip to 16 PMTs to obtain an autonomous macro-cell for **large area of detection**.

An adjustment of the gain of each channel compensates for the gain variation of the PMTs and allows using only one HV cable for the 16 PMTs. In the ASIC, **the 16 channels are totally independent**. In each channel, the auto-trigger starts the charge and time measurements which are then converted and stored. Only the hit channels are read out by one serialized output. The time measurement is done by a 26-bit counter at 40 MHz for the coarse time and a Time to Amplitude Converter (TAC) for the fine time, giving a resolution of 200ps RMS. The charge measurement is done by a dual gain preamplifier followed by a shaper with variable shaping times (25 ns, 50 ns or 100 ns). Charge and fine time values are converted by a 10 bit ADC.

Moreover Catiroc 1 can be used as an analogue front-end ASIC for PMTs. The 16 triggers and 16 shapers output can be used in an application specific optimized front-end board.

Technical Specifications

Detector Read-Out

PMT, PMT array

Number of Channels

16

Signal Polarity

Negative

Sensitivity

Trigger on one third of photo-electron on each channel

Timing Resolution

200 ps RMS on single photo-electron

Dynamic Range

- 400 photo-electrons (106 PMT gain)
- Integral Non Linearity 1% up to 400 p-e

Packaging & Dimension

TQFP 208 28x28mm

Power Consumption

21 mW / channel - supply voltage 3.3V

Inputs

16 voltage inputs

Outputs

- 16 trigger outputs
- 16 shaper output
- 1 or of the 16 trigger output
- 1 serialized digital data output (50bits/channel)

Internal Programmable Features

- 16 channel gain adjustment (16x8bits)
- trigger and gain threshold adjustment (2x10bits)
- charge measurement tuning
- 16 trigger masks
- channel by channel trigger output enable

Evolution systems

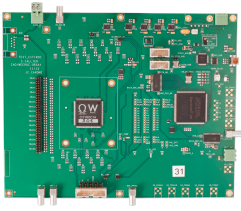
Evaluation board: Available

Ordering Options

Code	Description
WWCATIROC1QA	CATIROC 1 - Large photomultiplier arrays read out chip - QFP (Quad Flat Pack) (Discontinued)

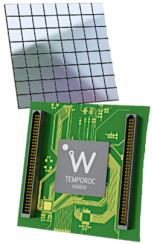
Related Products

Weeroc Testboards



Control Systems for Weeroc ASICs

TEMPOROC



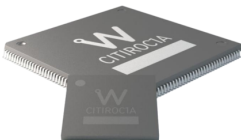
Multi-Purpose Mixed-Signal SiPM read-out ASIC

GEMROC 1



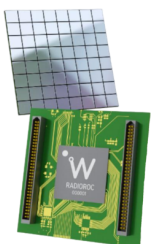
Micromegas and GEMs semi digital read out chip

CITIROC 1A



Scientific instrumentation SiPM read out chip

RADIOROC 2



Multi-purpose SiPM analogue read-out chip

PSIROC



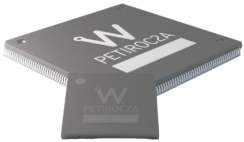
PIN Diodes, Silicon Strips amnd GEMs Read-Out Chip

MAROC 3A



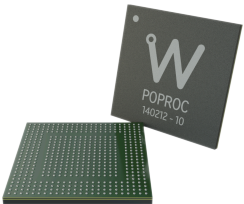
Photomultiplier tubes read out chip

PETIROC 2A



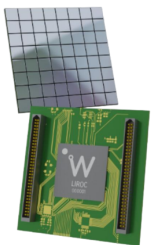
SiPM read out for time of flight PET

POPROC



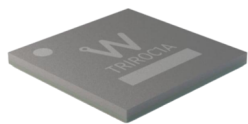
MA-PMT readout out chip

LIROC 1



SiPM Analogue Read-out Chip for Lidar and Photon Counting Application

TRIROC 1A



All in one SiPM read out for multimodal PET inserts



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