

TEMPOROC

Multi-Purpose Mixed-Signal SiPM read-out ASIC



Features



- **Optimized for SiPM**
- **Number of channels:** 64
- **Outputs:** Digital output (dual ADC and dual TDC per channel) – selectable transmission mode. 1 multiplexed time trigger output, 2 ASIC trigger OR outputs (64 channels, 2 levels)
- **Input Polarity:** Positive

Description

Temporoc is a 64-channel front-end ASIC designed to readout silicon photomultipliers (SiPMs) for particle time-of-flight measurement applications. Temporoc combines a very fast and low-jitter trigger with accurate charge and time measurements. Energy and time are digitized internally with a 10-bit ADC and 50ps-bin TDC. In total, Temporoc is capable of providing two distinct time tagging and two energy measurement of each event.

The concept of this ASIC is combining two measurement lines that won't interfere one with each other to measure both first incident photon timing measurement and whole crystal light charge integration. Additionally, Temporoc features clustering triggers readout which could be useful for particle detection with monolithic scintillator.

An adjustment of the SiPM high voltage is possible using a channel-by-channel input DAC. It allows a fine SiPM gain and dark noise adjustment at the system level to correct for the non-uniformity of SiPMs.

The power consumption is 5 mW/channel. Temporoc is suitable for any application that requires both accurate time resolution and precise energy measurement such as time-of-flight gamma detection.

Visit the **Weeroc website** for more information.

Technical Specifications

Detector Read-Out

SiPM

Number of Channel

64

Signal Polarity

Positive

Sensitivity

Trigger on first photo-electron

Timing Resolution

20 ps rms (TBC)

Dynamic Range

3000 photo-electrons (106 SiPM gain), Integral Non Linearity: 1% up to 2000 ph-e

Packaging & Dimension

BGA (20x20mm, 500 balls - TBC)

Power Consumption

Power supply: 1.2V, 330 mW

Inputs

64 voltage inputs with DC adjustment for SiPM HV tuning

Outputs

- Digital output (dual ADC and dual TDC per channel) - selectable transmission mode.
- 1 multiplexed time trigger output
- 2 ASIC trigger OR outputs (64 channels, 2 levels)

Internal Programmable Features

- 64 HV adjustment for SiPM (64x8bits)
- time trigger threshold adjustment (10bits)
- charge measurement tuning
- ADC Peak Sensing, 64 trigger masks
- internal temperature sensor
- channel by channel output enable
- trigger latch
- programmable data output

Evaluation systems

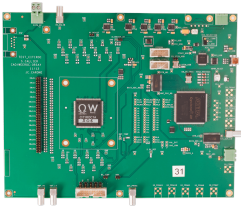
Evaluation board : 64 channels - available

Ordering Options

Code	Description
WWTEMPOR3AAA	TEMPOROC 3 64-ch for silicon photomultipliers (SiPMs) for particle time-of-flight application

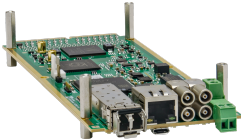
Related Products

Weeroc Testboards



Control Systems for Weeroc ASICs

A5204



64 Channel Radioroc unit for FERS-5200

DT5204



64 Channel Radioroc unit for FERS-5200



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