weeroc

Triroc 1A

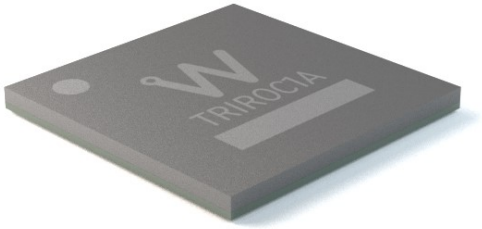
All-in-one SiPM read-out for multimodal PET inserts

Triroc is a 64-channel front-end ASIC designed to readout silicon photomultipliers (SiPMs) with both polarities for particle time-of-flight measurement applications. Triroc 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 30ps-bin TDC.

The concept of the ASIC is to combine 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.

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 10 mW/channel, excluding buffers used to output the signals. The main application of Triroc is PET time-of-flight but it can also be used for any application that requires both accurate time resolution and precise energy measurement. Triroc is available in naked dies or BGA packaging (12x12mm, 353 balls).



Detector Read-Out	SiPM, SiPM array
Number of Channels	64
Signal Polarity	Positive or Negative
Sensitivity	Trigger on first photo-electron
Timing Resolution	88 ps RMS
Dynamic Range	3000 photo-electrons (10^6 SIPM gain), Integral Non Linearity: 1% up to 2000 ph-e
Packaging	BGA (12x12mm, 353 balls)
Power Consumption	Power supply: 3.3V 10mW/ch
Inputs	64 voltage inputs with DC adjustment for SiPM HV tuning
Outputs	Digital output (energy on 10 bit, time on 10 bit - 30ps bin) 1 multiplexed time trigger output 2 ASIC trigger OR outputs (64 channels, 2 levels)
Internal Programmable Features	64 HV adjustment for SiPM (64x8bits), trigger threshold adjustment (10bits), charge measurement tuning, ADC Track & Hold/Peak Sensing, 64 trigger masks, internal temperature sensor, trigger latch, Power Pulsing

They are using Triroc 1A

Trimage collaboration (PET/IRM/EEG)
Industrial application
Cannot be disclosed

More about Triroc 1A

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