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Liroc

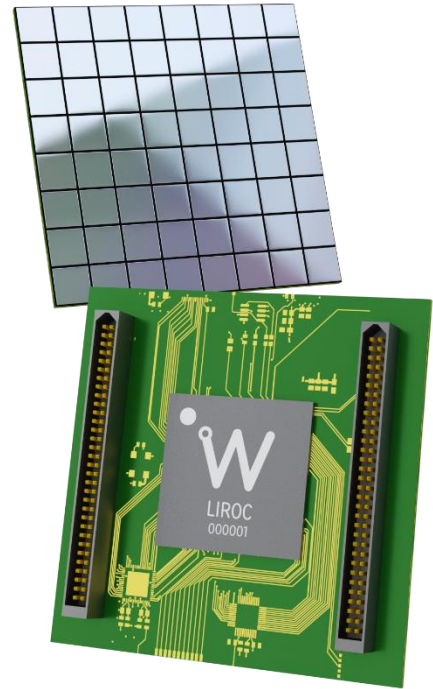
SiPM Analogue Read-Out chip for Lidar Application
Available June 2021

Liroc is a 64-channel front-end ASIC designed to readout silicon photo-multipliers (SiPM) for LIDAR application.

Liroc allows triggering down to 1/3 p.e. and provides low-voltage differential trigger output for each channel with an excellent timing resolution (better than 20ps FWHM) and excellent double-peak separation (100% efficiency on 5ns separated single photo-electrons). Liroc allows fast single photon counting over 100MHz per channel.

An adjustment of the SiPM high-voltage (gain) is possible using a channel-by-channel 6-bit DAC connected to the ASIC inputs. Channel-by-channel calibration on the trigger threshold is also possible thanks to 7-bit DACs. Liroc can be calibrated using the dark noise of the SiPM.

Liroc features a GHz measurement line composed of an RF preamplifier with pole-zero cancellation followed by a fast discriminator and low swing LVDS fast driver.



Detector Read-Out	SiPM, SiPM array
Number of Channels	64
Signal Polarity	Positive or Negative (selectable ASIC-wise)
Sensitivity	Trigger on 1/3 of photo-electron
Timing Resolution	Better than 20 ps FWHM on single photo-electron Better than 5ns double-peak separation on single photo-electron
Dynamic Range	Over 100MHz photon counting rate
Packaging & Dimension	BGA 20x20 mm ² Flip-Chip low inductance packaging technology
Power Consumption	210mW (TBC) – Supply voltage : 1.2 V
Inputs	64 analogue inputs with independent SiPM HV adjustments
Outputs	64 LVDS triggers with time window validation (ASIC-wise)
Internal Programmable Features (I²C)	64 HV adjustment for SiPM (64 x 6 bit), trigger threshold programming (10bits), 64 x 7 bit channel-wise threshold adjustment, ASIC-wise polarity selector, pole-zero cancellation adjustment, individual trigger masking.

More about Liroc

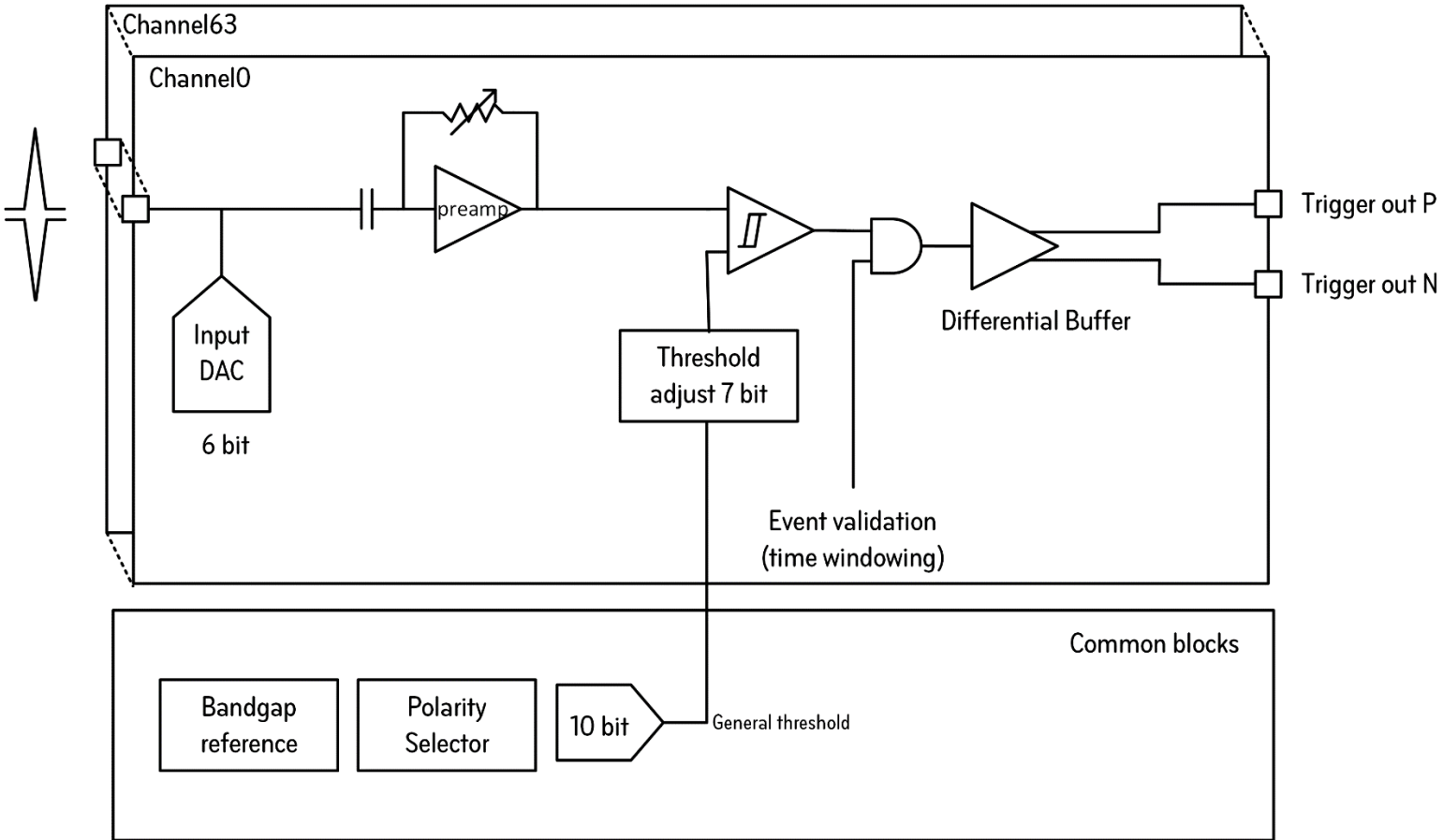
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SIPM Analogue Read-Out chip for Lidar Application

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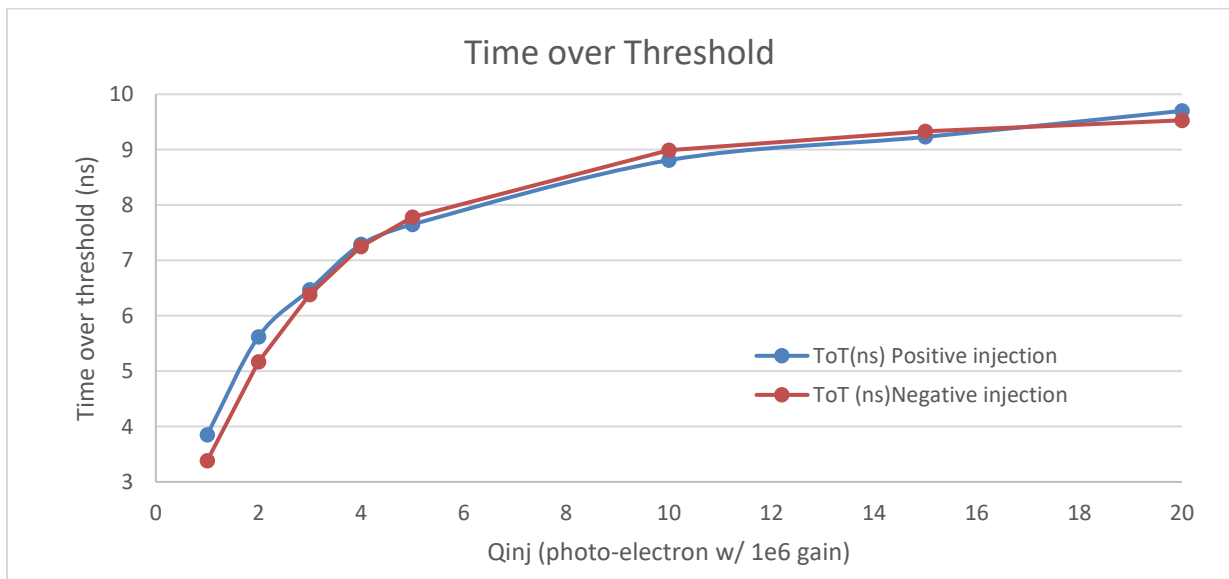
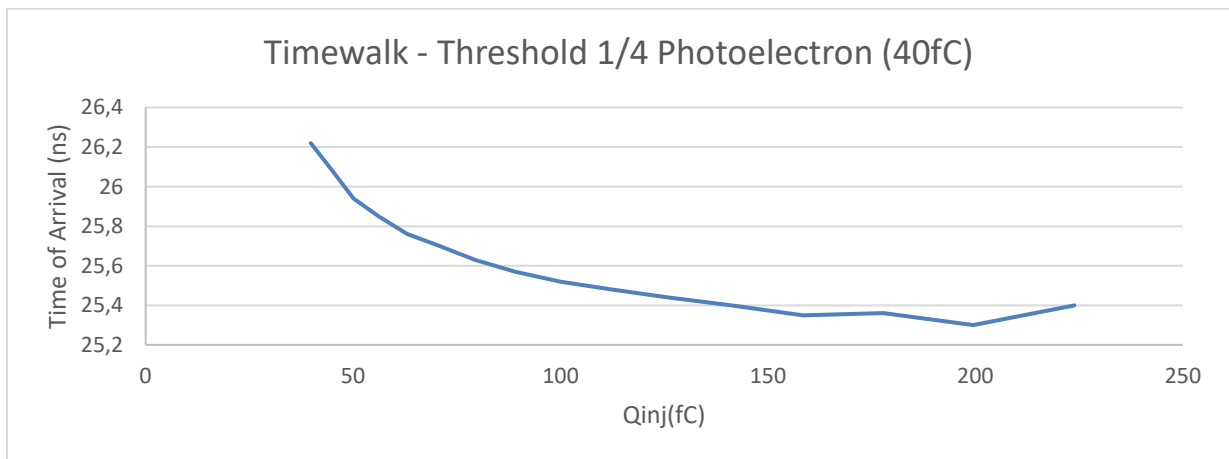
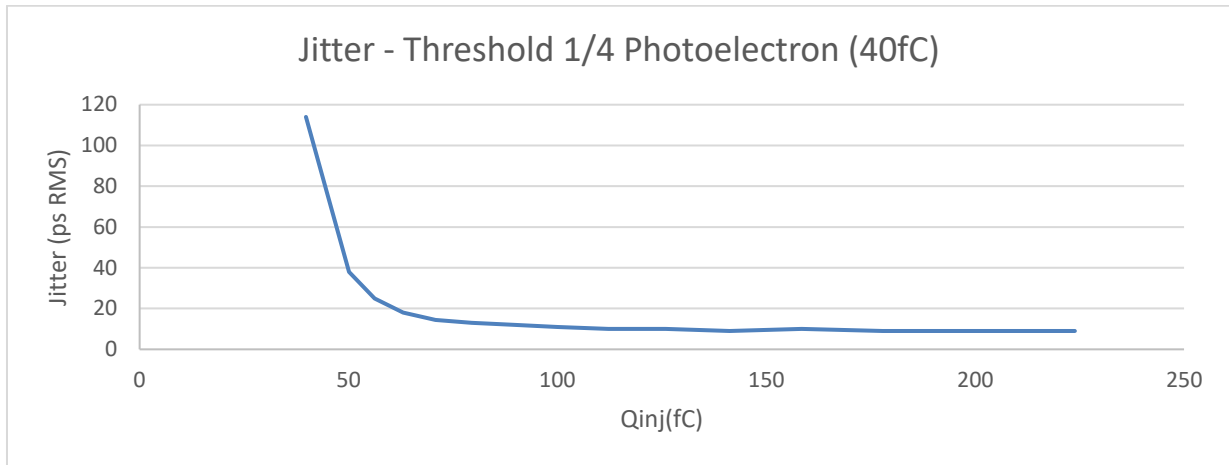




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LIROC Main Performances (Measurement)