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CMOS peak detect and hold using diode connected MOSFET

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Peak detectors (peak-detect-and-hold circuits, PDHs) are a key element in nuclear electronics signal processing and have been incorporated as a fully integrated block in several front-end readout chips.

The passive type PDH using diode has very simple structure and high energy efficiency. Though the virtues of a diode PDH, it is not easily employed because of the loss and the distortion of a signal due to its potential barrier.

On the other hands, in CMOS designs, the active type PDH uses an MOS current source as the rectifying element inside the feedback loop of a high-gain amplifier. This type of PDH is recently widely used by virtue of the accuracy. However, the active type CMOS PDH has complicated structure and heavy power consumption compared with the passive type PDH.

We propose the passive PDH using diode connected MOSFET and overcome the loss and the distortion of the signal occurred by threshold voltage of MOSFET similar with the diode potential barrier.

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