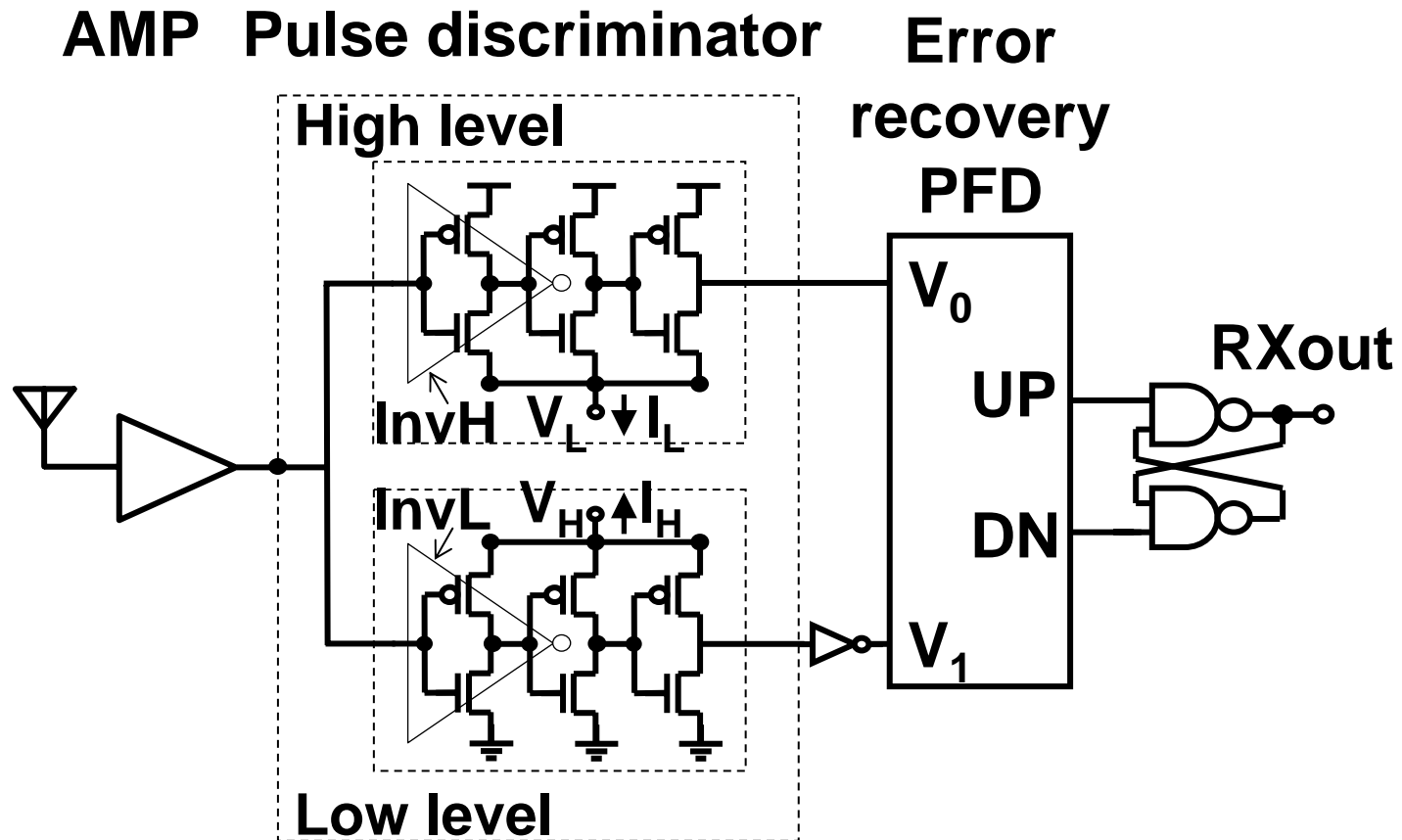


A 100Mbps, 0.19mW Asynchronous Threshold Detector with DC Power- Free Pulse Discrimination for Impulse UWB Receiver

L. Liu, Y. Miyamoto, Z. Zhou, K. Sakaida, J. Ryu, K.
Ishida, M. Takamiya and T. Sakurai

University of Tokyo

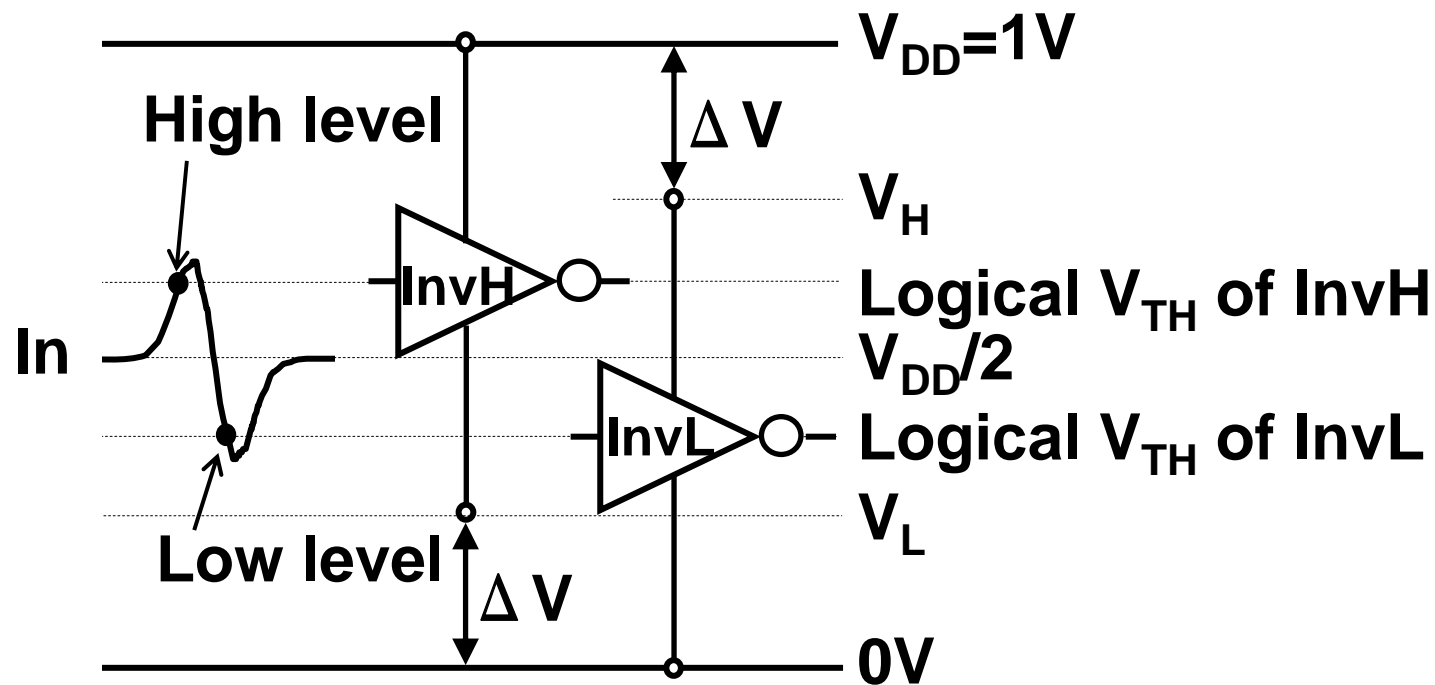
Receiver Structure



- Asynchronous threshold detector with DC power-free pulse discrimination.

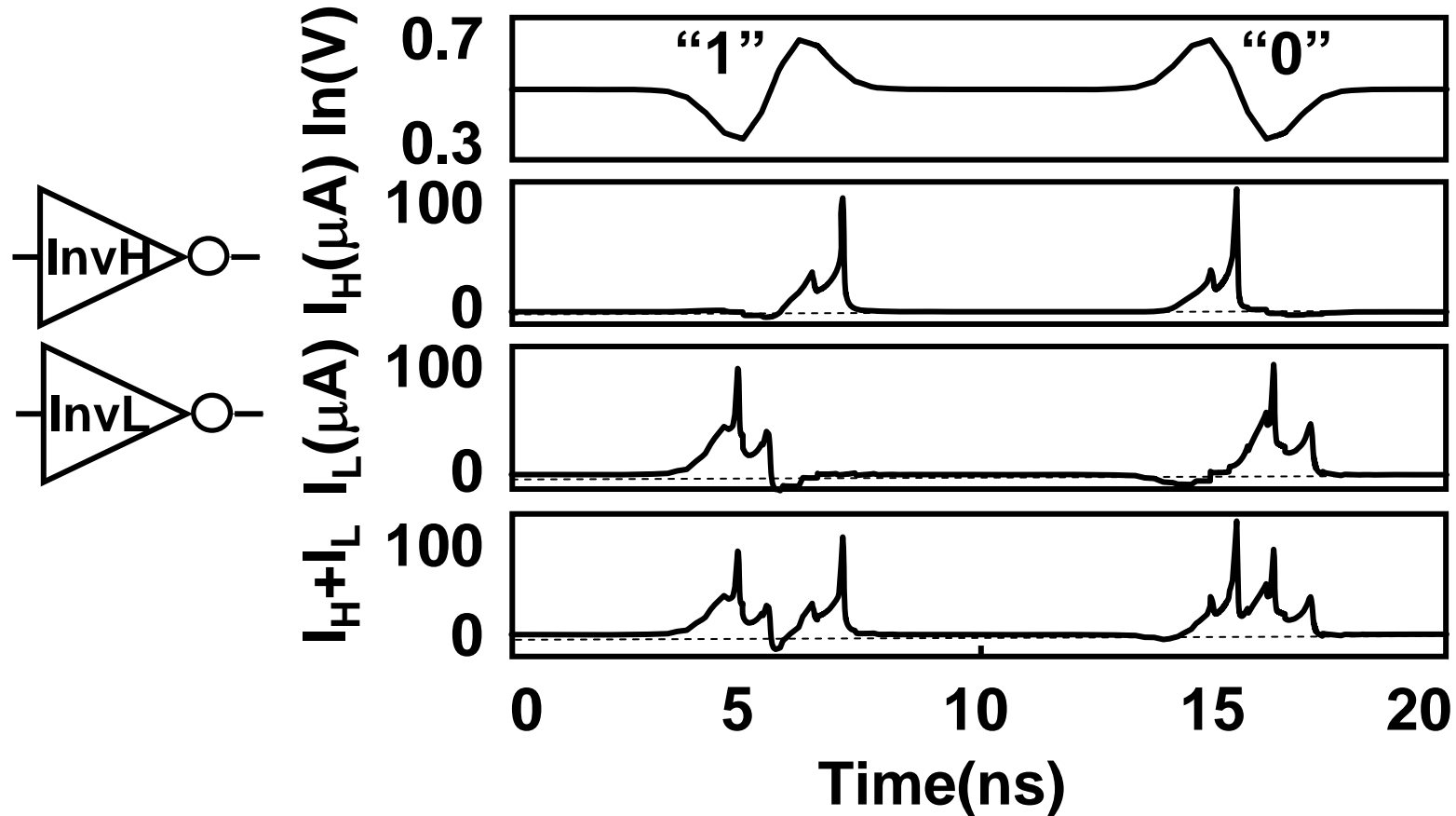
Pulse Discriminator

- Problems of conv. RX: Large DC power



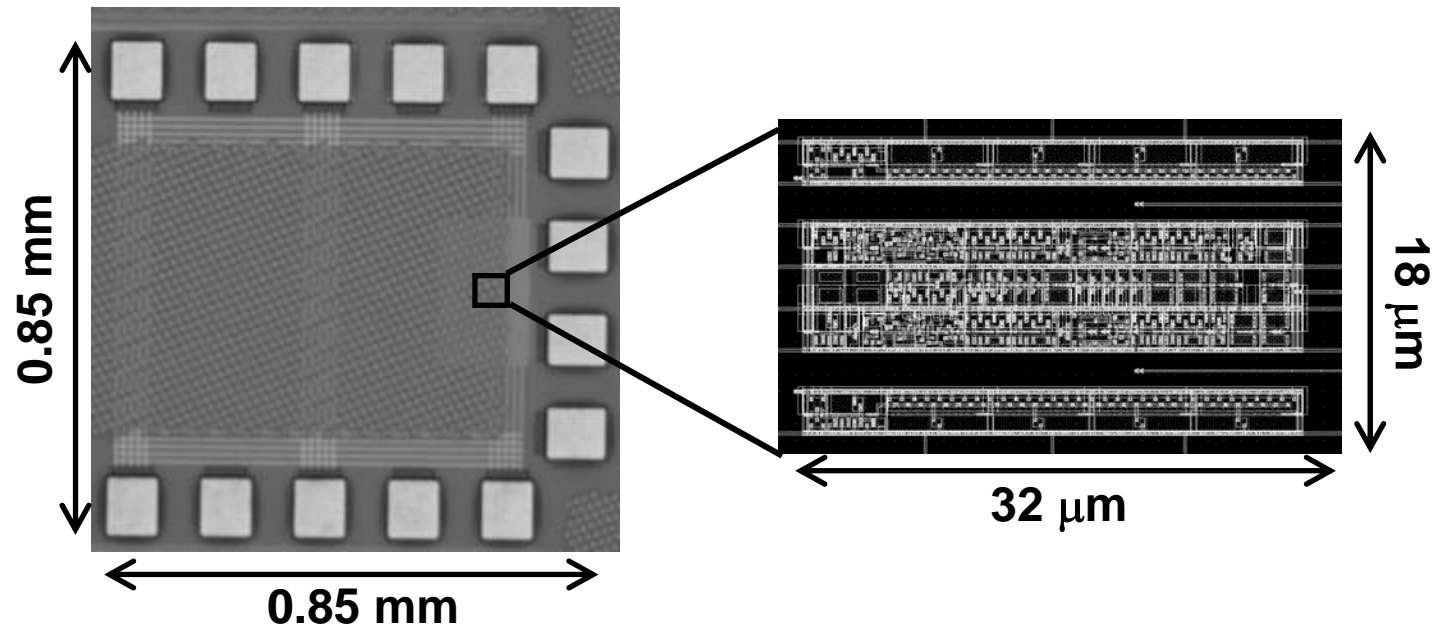
- Two inverters with different logical V_{TH} 's achieve DC power-free pulse discrimination.

Simulated Waveforms



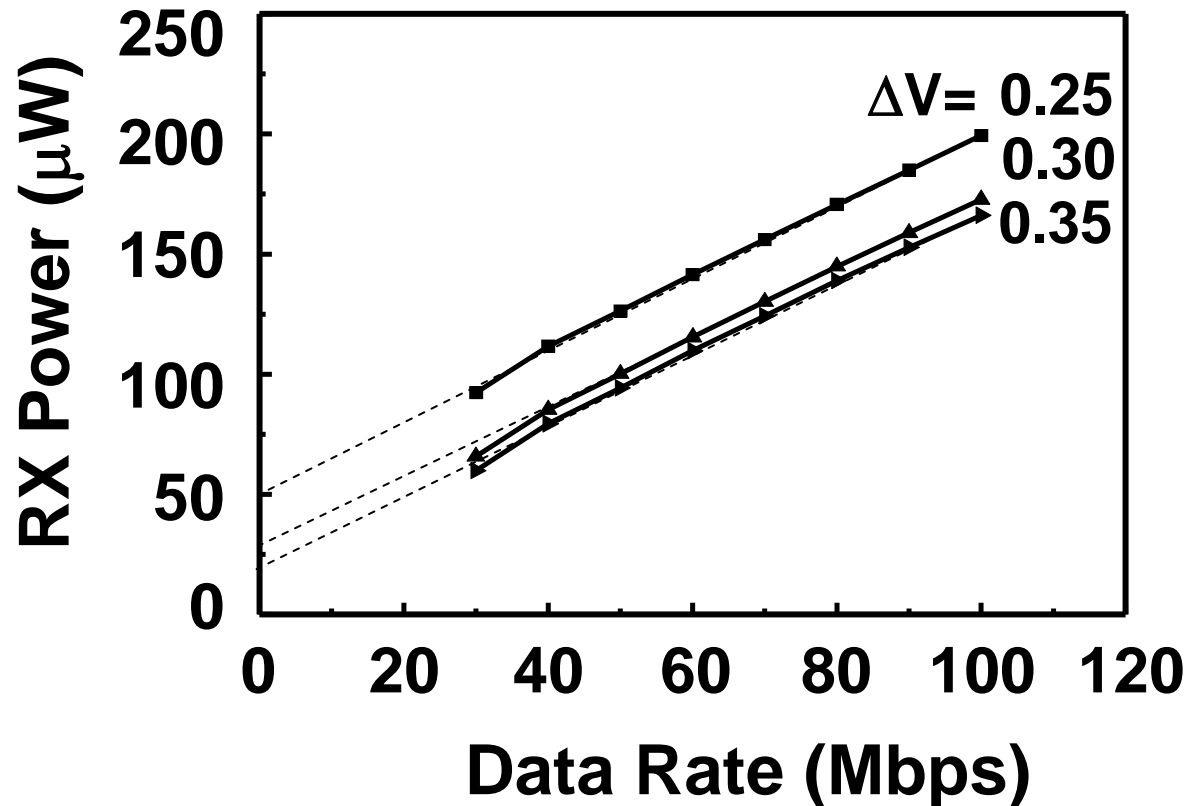
- Essentially zero power dissipation for no AC input.

Chip Micrographs and Layout



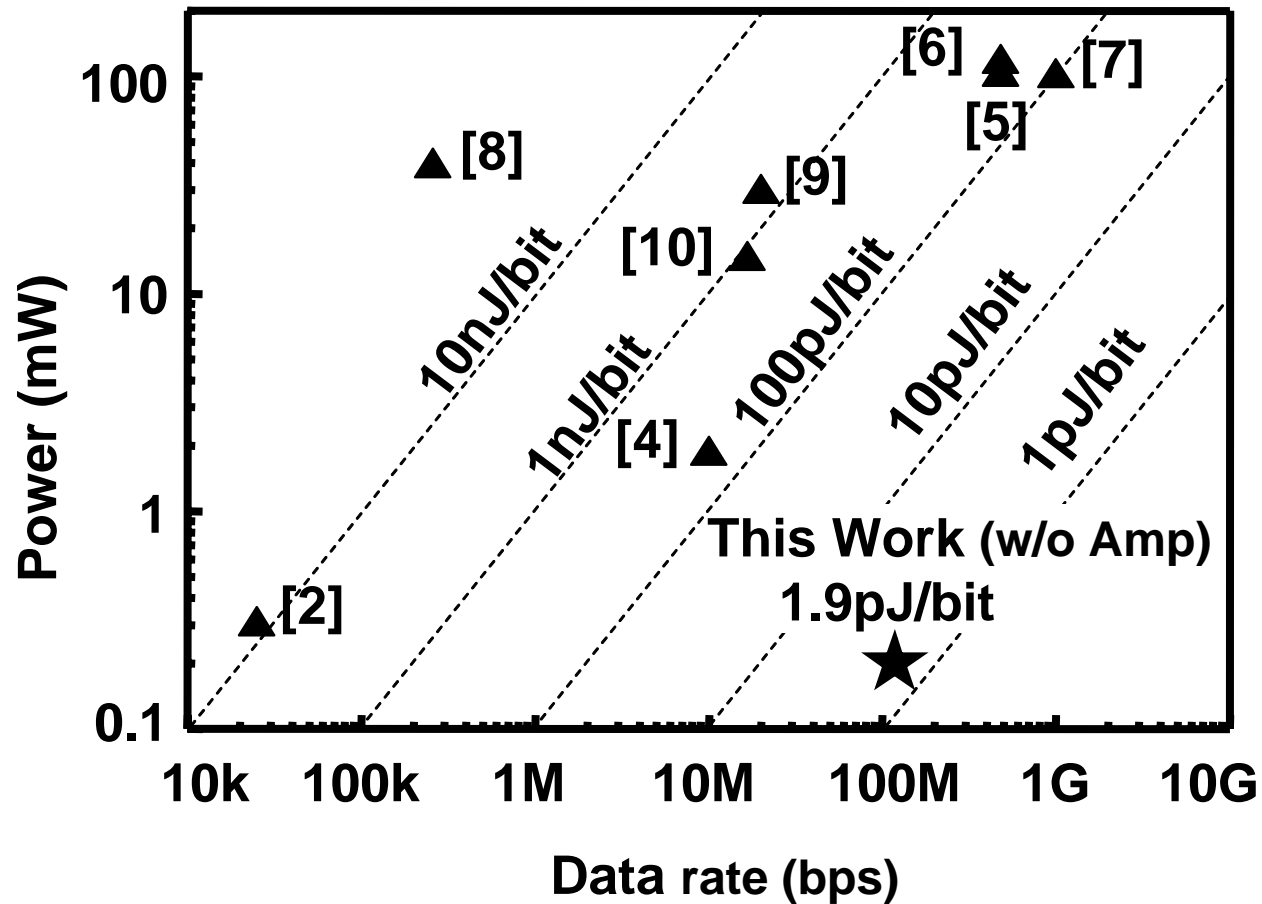
- Core area: $576\mu\text{m}^2$.

Measured Power vs. data rate



- Tradeoff between power consumption and sensitivity can be tuned by bias voltage ΔV .

Comparison



- Achieves the lowest energy consumption at 100Mbps.