A Wireless Real-Time On-Chip Bus Trace System

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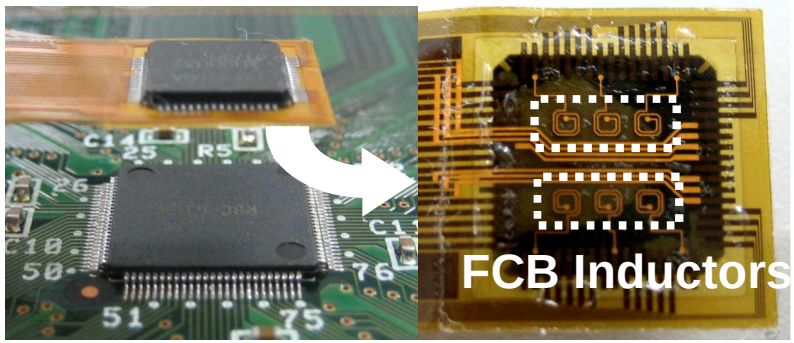
Background

- Inductive coupling technique
  - High speed, low power
  - Communication range: 10um-1mm
- New applications: Wireless detachable interface
  - Real time on chip bus trace system
  - High speed memory access
  - Wireless connector

- Real time on chip bus trace system

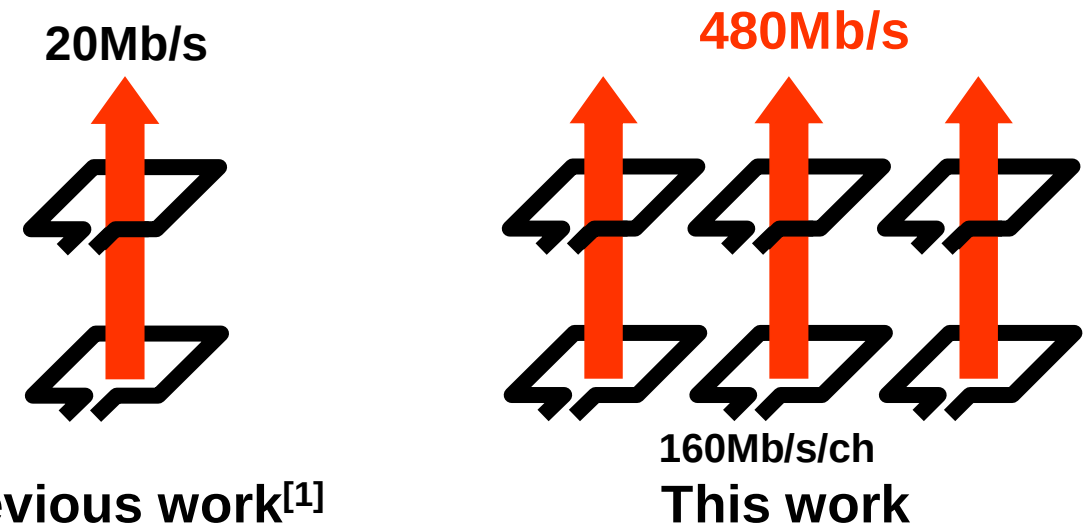
Probe (FCB)

Target LSI



Problems

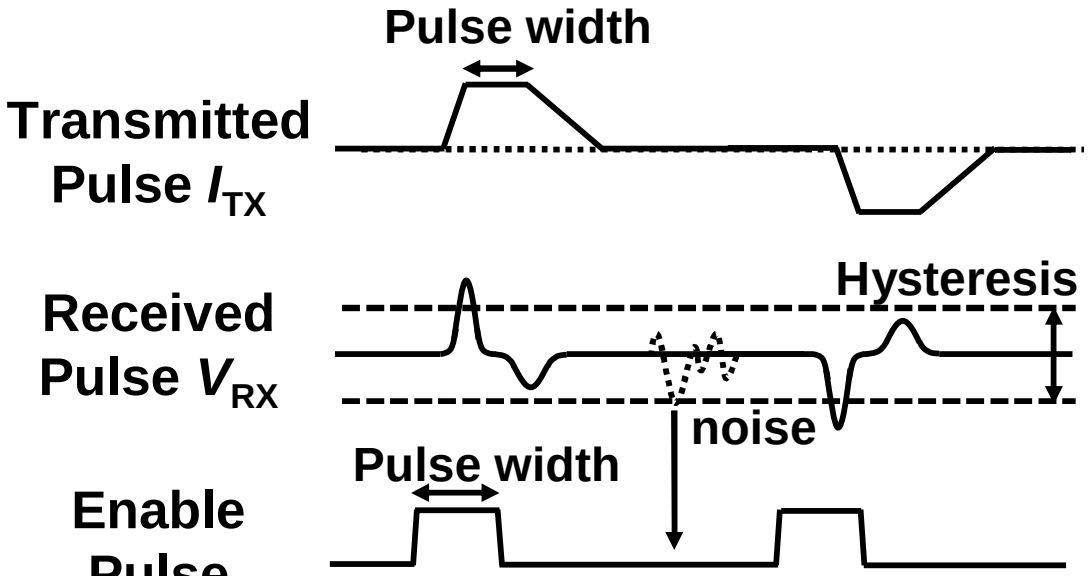
- Real time on chip bus trace system
  - several hundred Mb/s
- High speed communication
  by arranging channels in parallel



- Crosstalk and timing margin must be considered

[1]H.Ishikuro *et al.*, *ISSCC*, 2007.

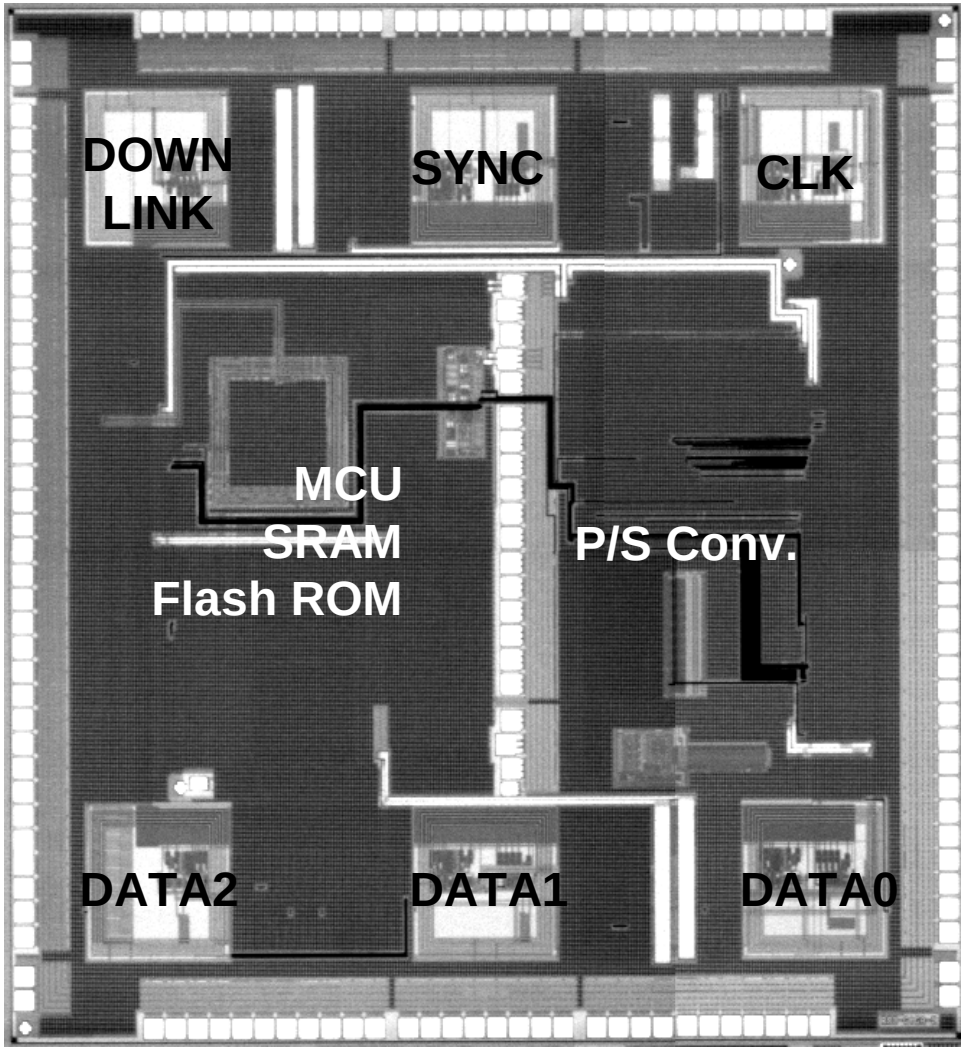
Quasi-Synchronous System



- Enough timing margin
- High noise immunity

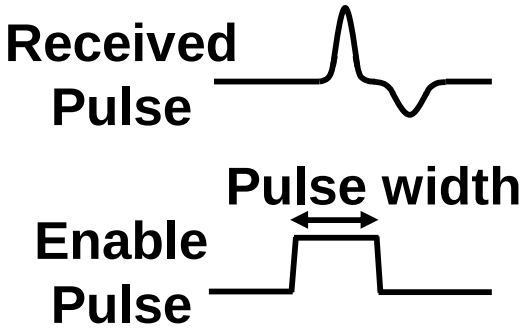
	Sync	Async	Quasi-Sync
Noise immunity	○	×	○
Timing margin	×	○	○

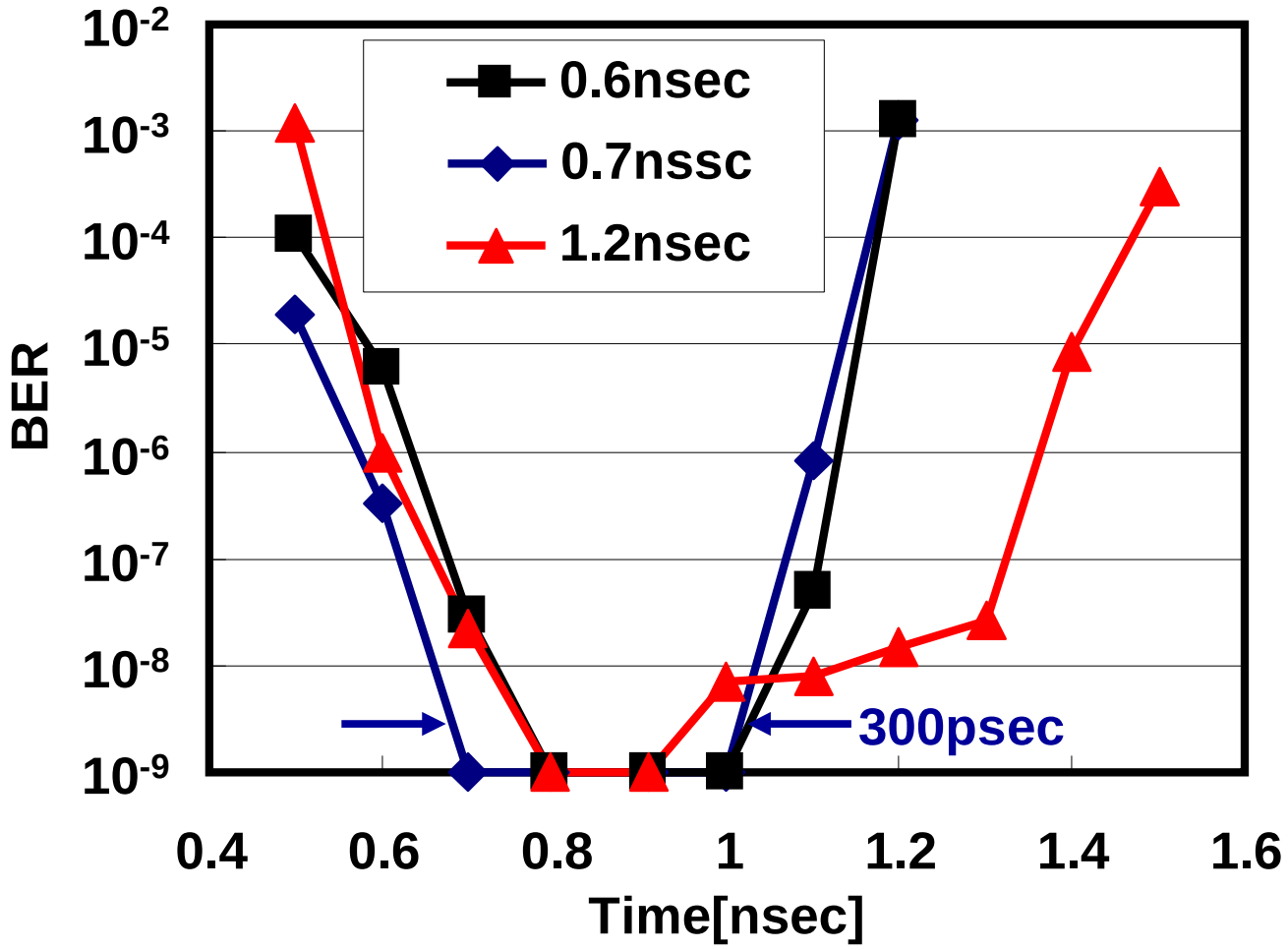
Die Photo



- Technology
  - 0.25μm CMOS
  - Standard digital process
- Die size
  - 4mm x 4mm

BER measurement





Conclusion

- Wireless real-time on-chip bus trace system is developed using a 0.25μm CMOS process
- The quasi-synchronous system is proposed to obtain an enough timing margin and high noise immunity
- Timing margin of 300psec is obtained with a BER less than 10^{-9}