High speed serial interface
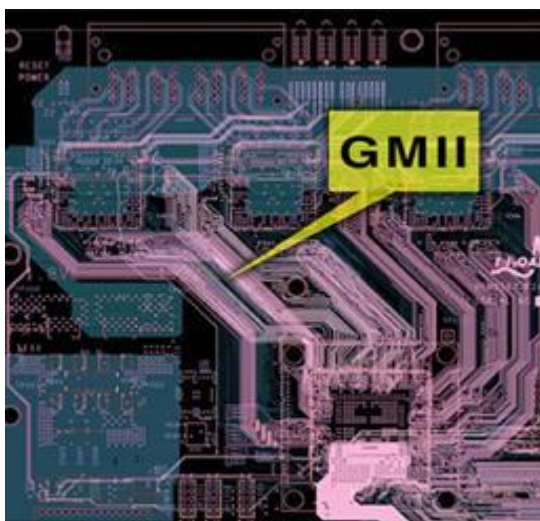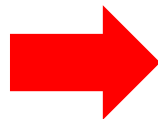
- Why serial interface?
  - Simpler wiring!
  - Much less crosstalk!

**Gigabit Media
Independent Interface (GMII)
: Total 24 lines for 1 Gb/s**
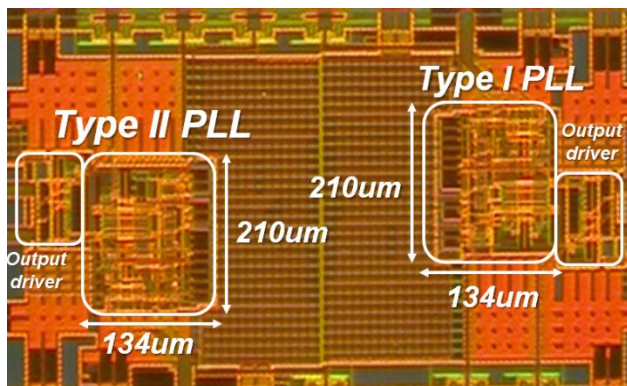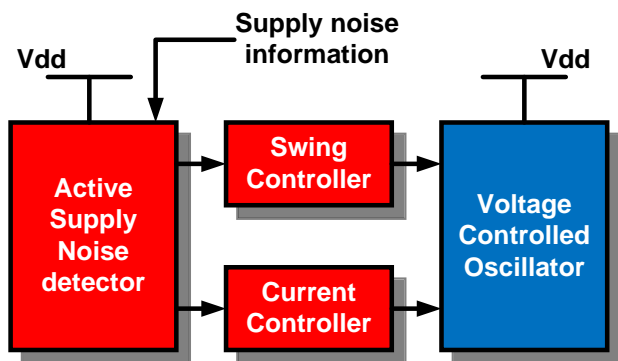
**Serial Gigabit Media
Independent Interface(SGMII)
: Total 8 lines for 1.25 Gb/s**

- Research area → Serial interface building block design
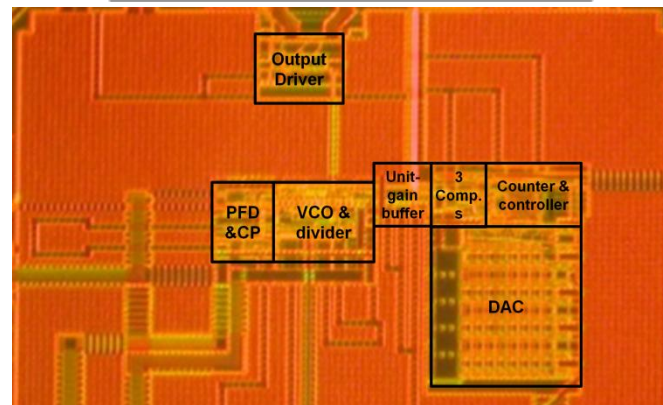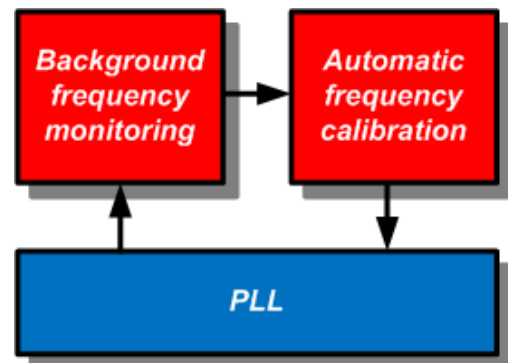 - *PLL, CDR, Serializer, De-serializer*

Serial-interface building block - PLL

- Process, Voltage, Temperature (PVT) robust PLL
  - Low noise PLL with supply noise insensitive VCO
  - A PLL with fast and continuous automatic frequency calibration

Supply noise insensitive VCO

Continuous frequency calibration technique

Serial-interface building block - CDR

- Robust and smart CDR
  - CDR with multi-level Bang-Bang PD
  - Jitter monitoring for loop dynamics optimization

Block diagram & PD characteristic

Layout