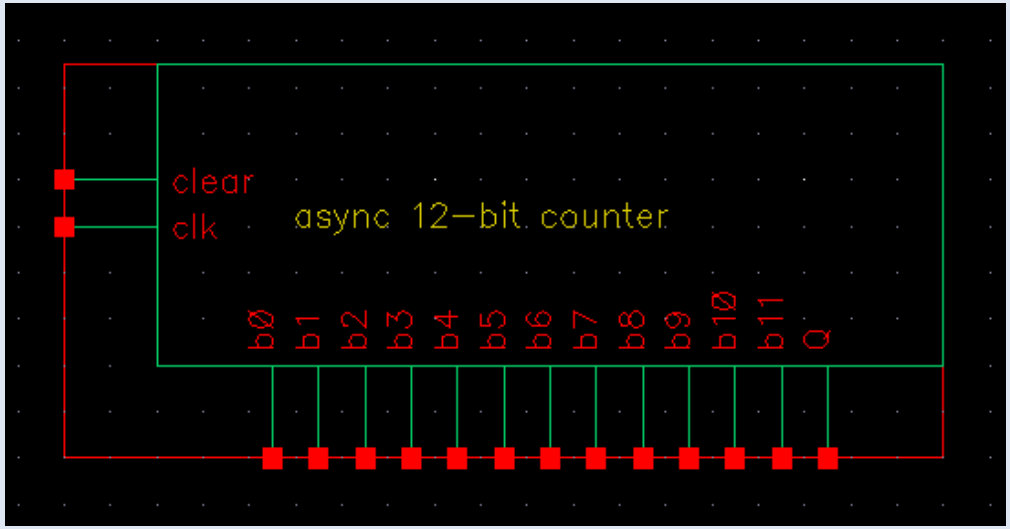
12-bit counter and 2GHz oscillator

Émilien Chapon

12-bit counter

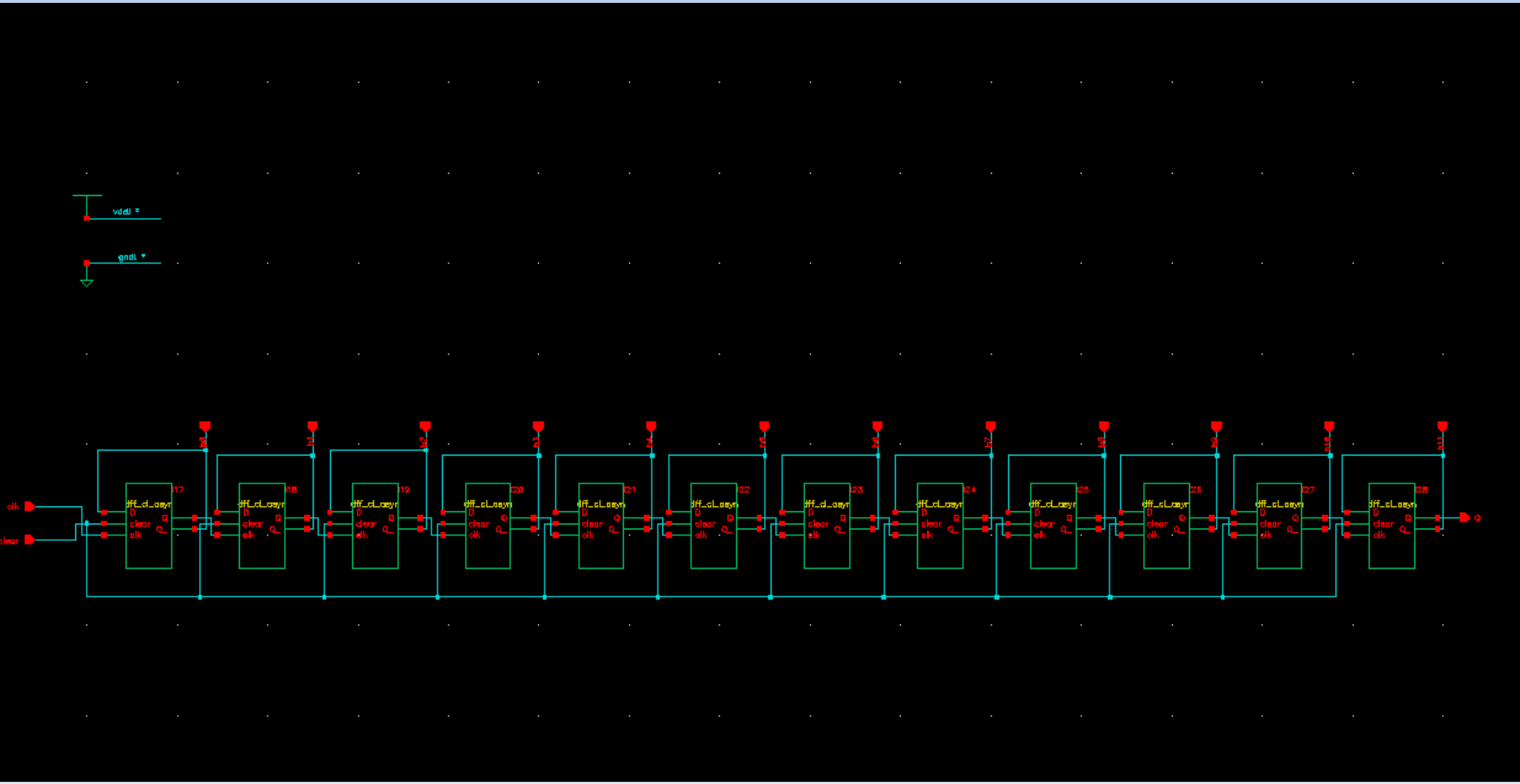
- 12-bit counter and register with clear
- Counts the number of rising edges on the *clk* input and codes it into a 12-bit number in natural binary code
- Sending a 1 to *clear* sets all 12 outputs to 0 asynchronously (whatever the clk input says)



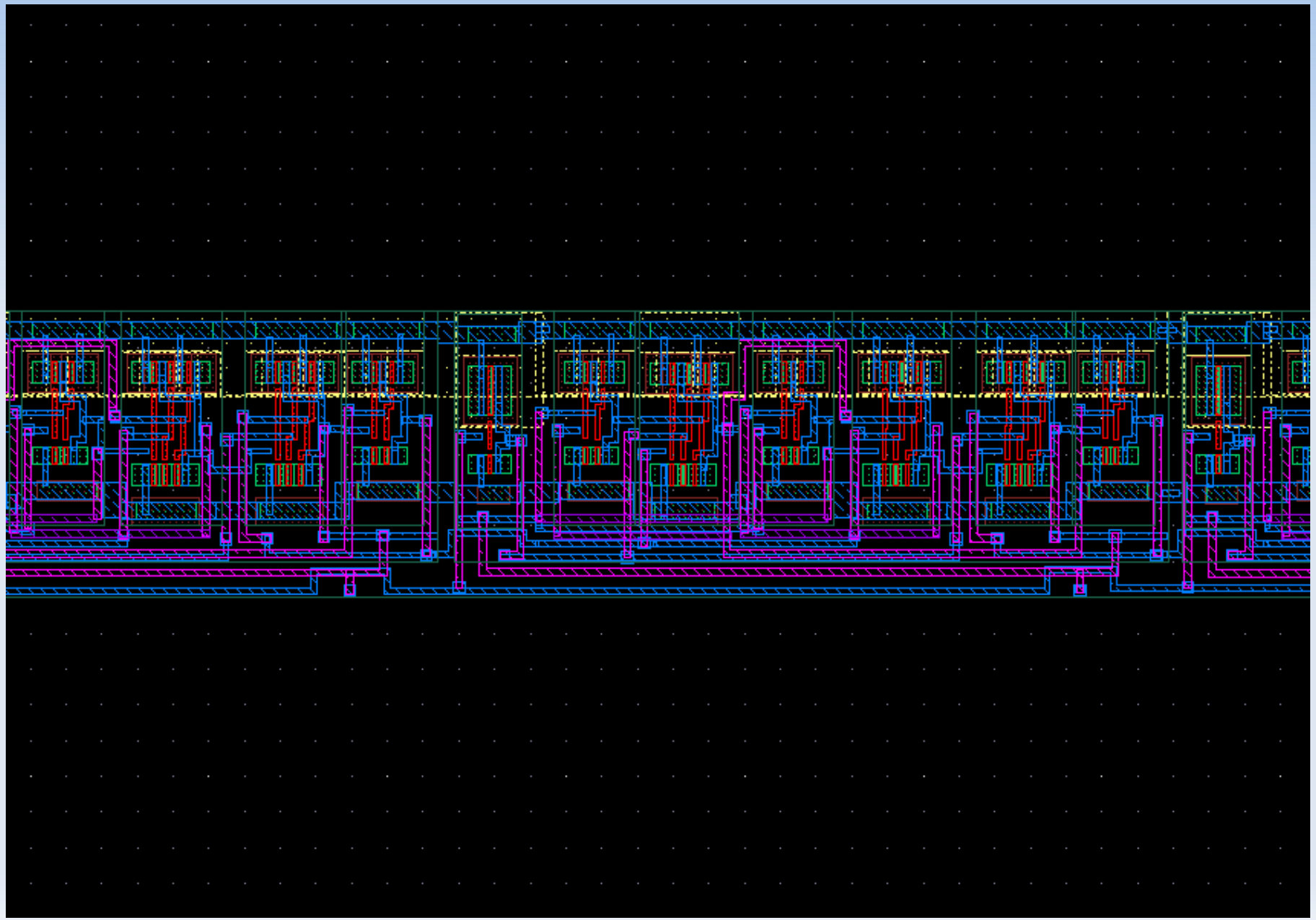
12-bit counter

- Made from D flip-flops from the digital library
- Characterestics:
  - Asynchronous
  - With clear
  - Runs up to about 2GHz
  - 8 x 245 µm

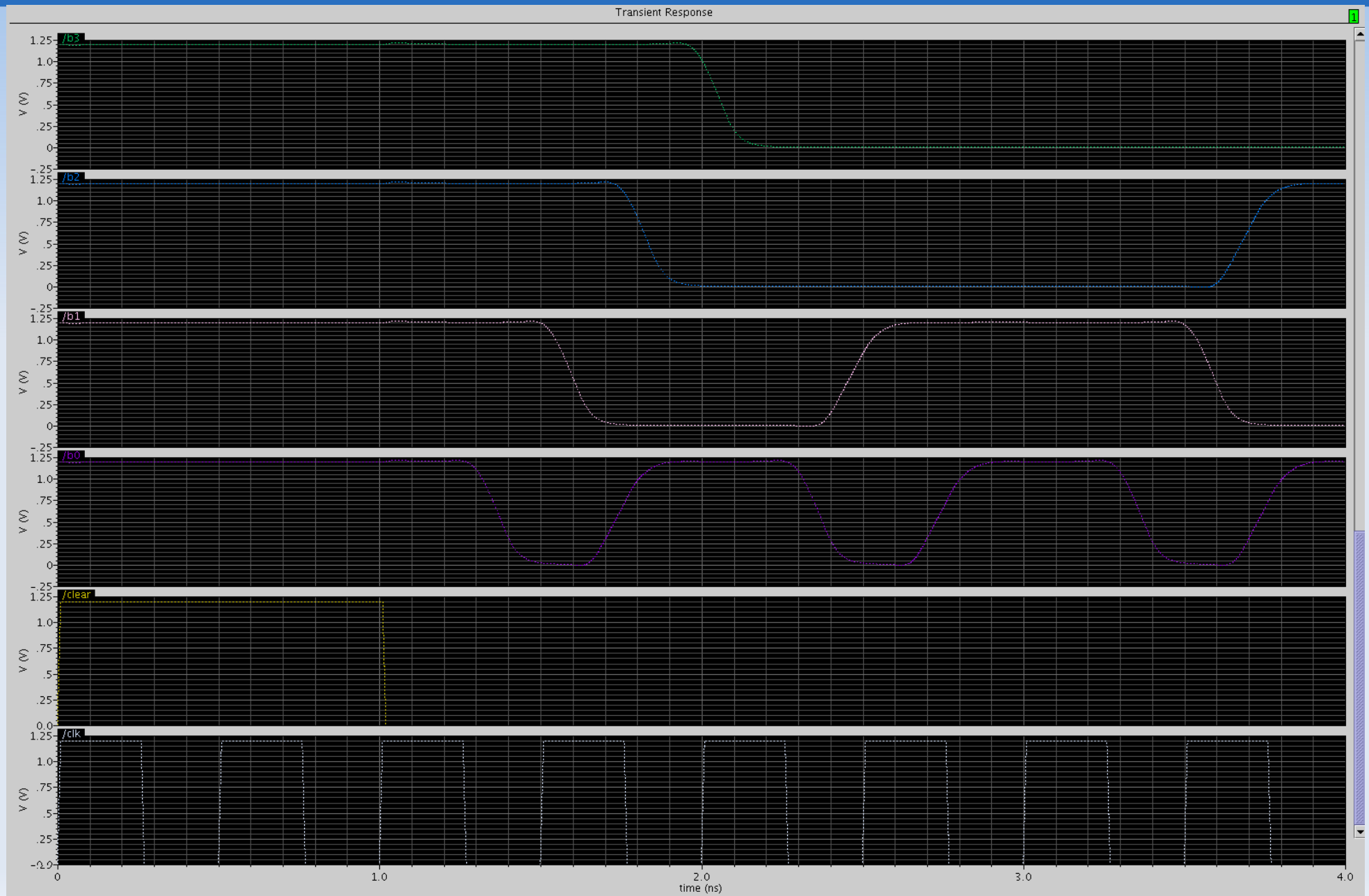
12-bit counter



12-bit counter

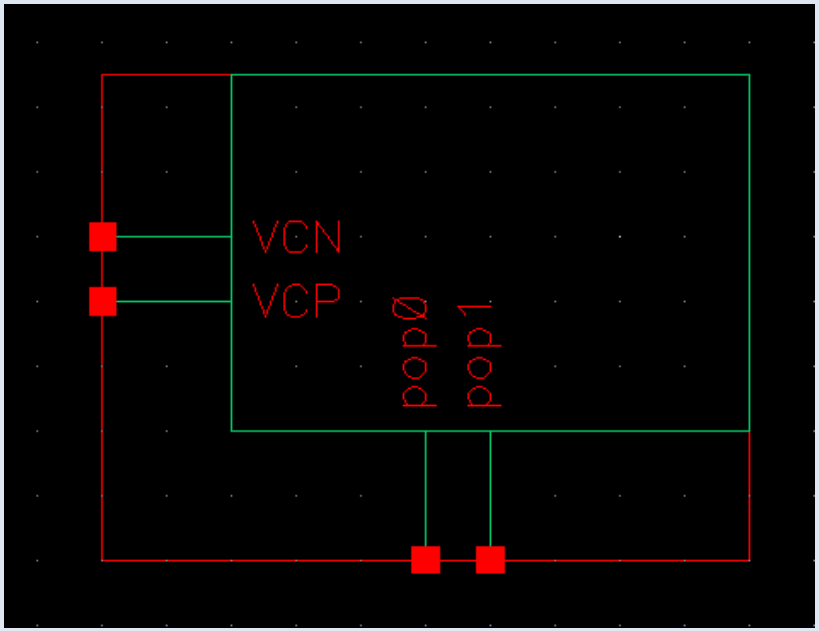


12-bit counter

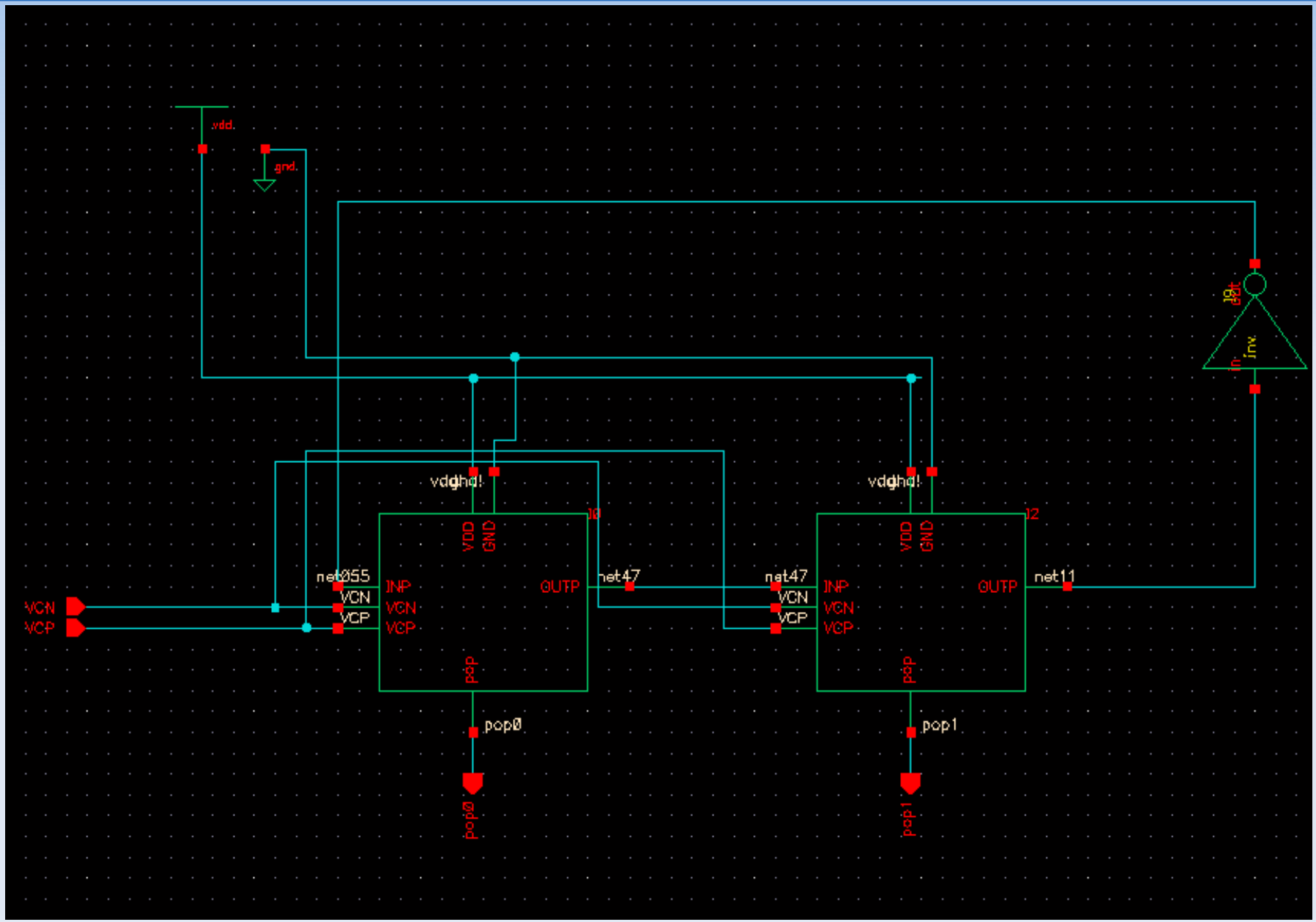


Ring oscillator

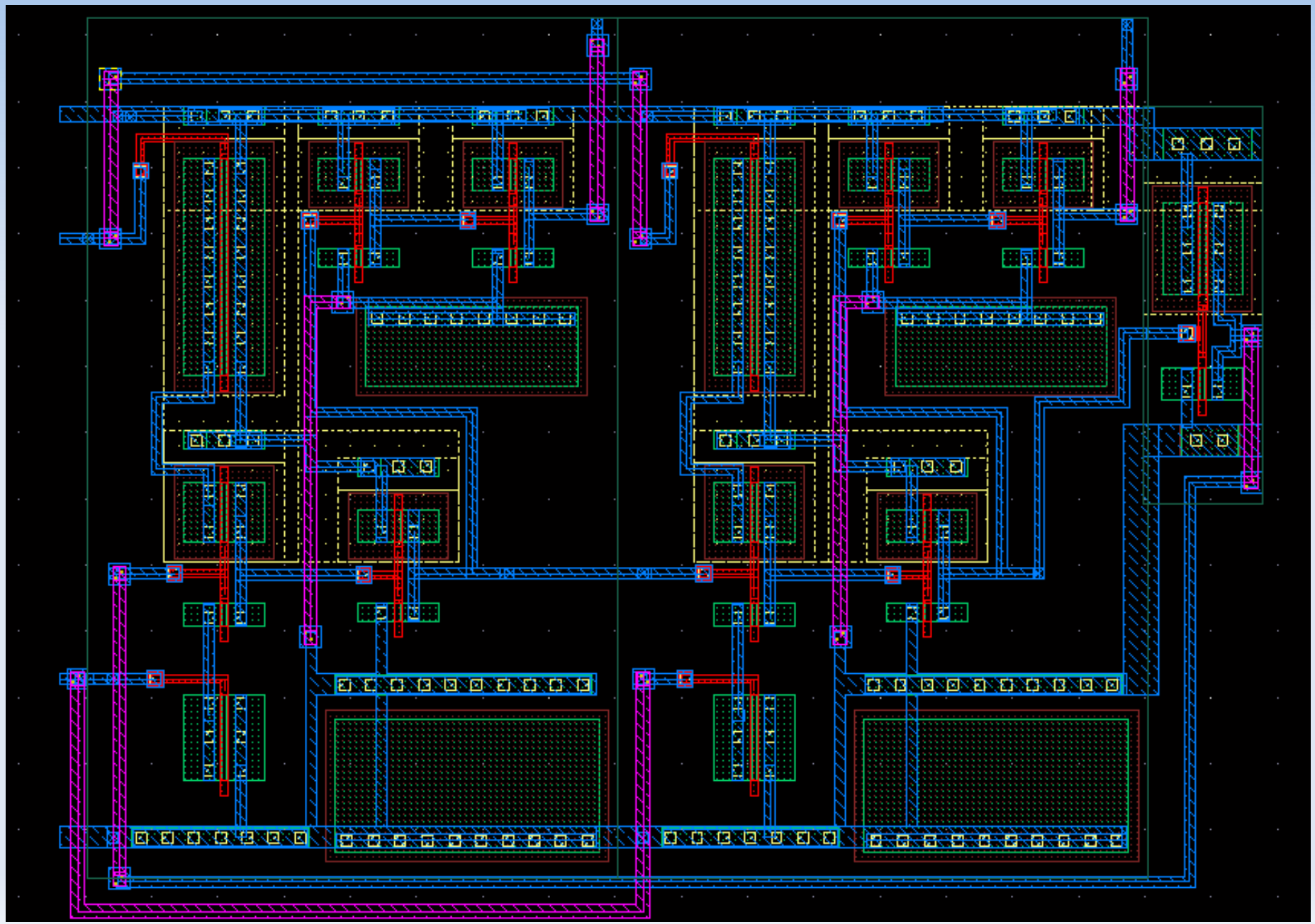
- Made from 2 of Fukun's timing cells and one of my inverters
- Frenquency tunable around 2GHz, with input VCN and VCP
- 13.6 x 18.2 µm



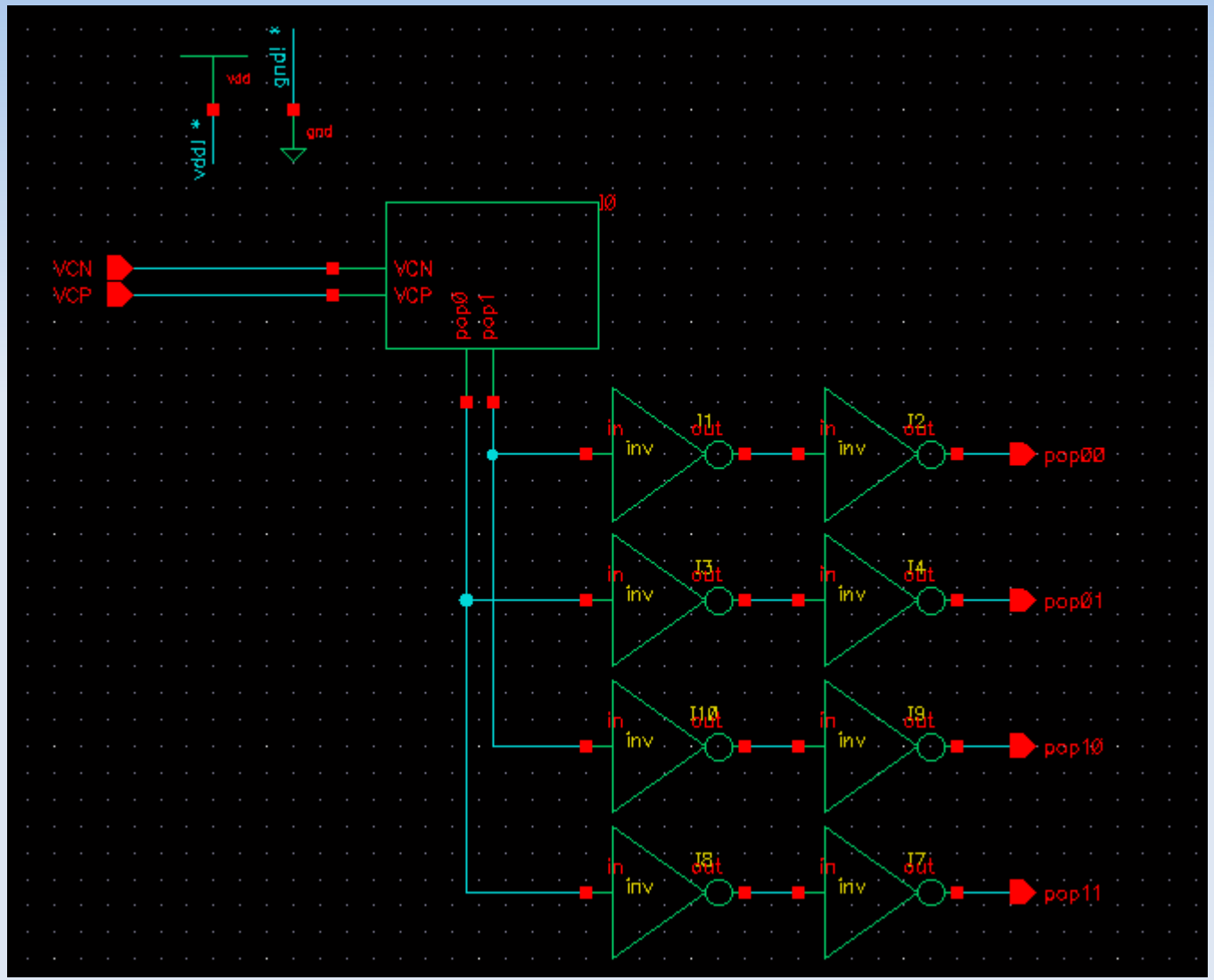
Ring oscillator



Ring oscillator

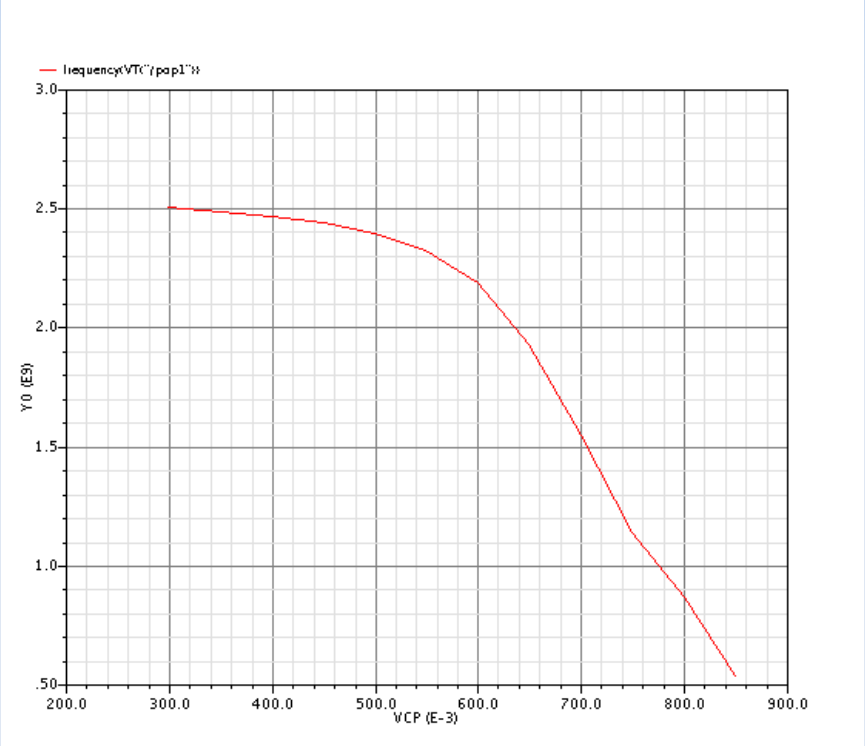


Ring oscillator

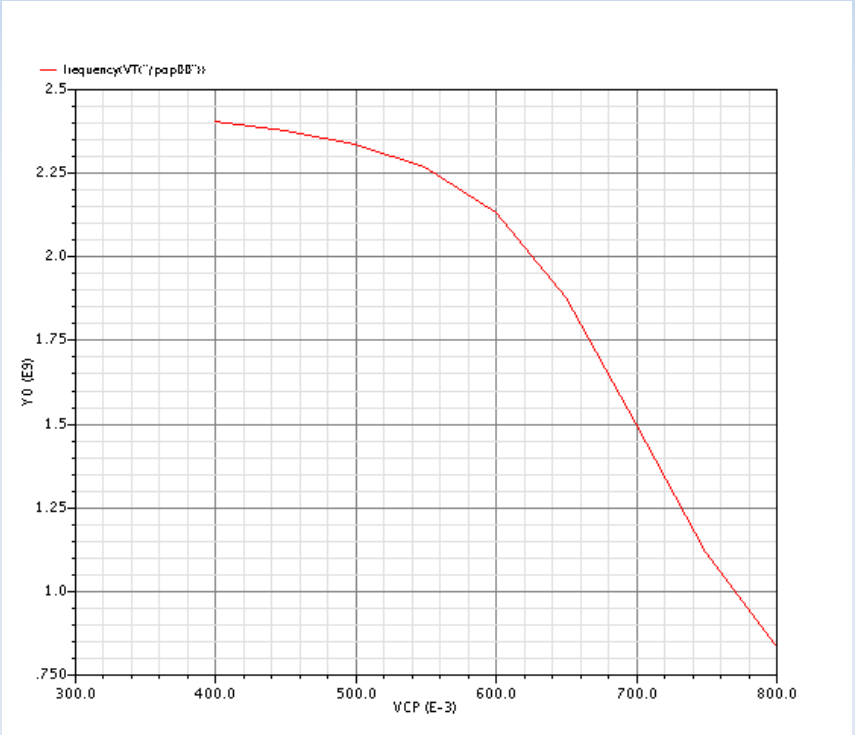


Schematics for test of ring oscillator with load

Ring oscillator



Without any load



With 2 inverters in parallel on the output