12-bit counter and 2GHz oscillator

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12-bit counter

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

- Made from D flip-flops from the digital library
- Characteristics:
  - 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
- Frequency tunable around 2GHz, with input VCN and VCP
- 13.6 x 18.2 µm
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