

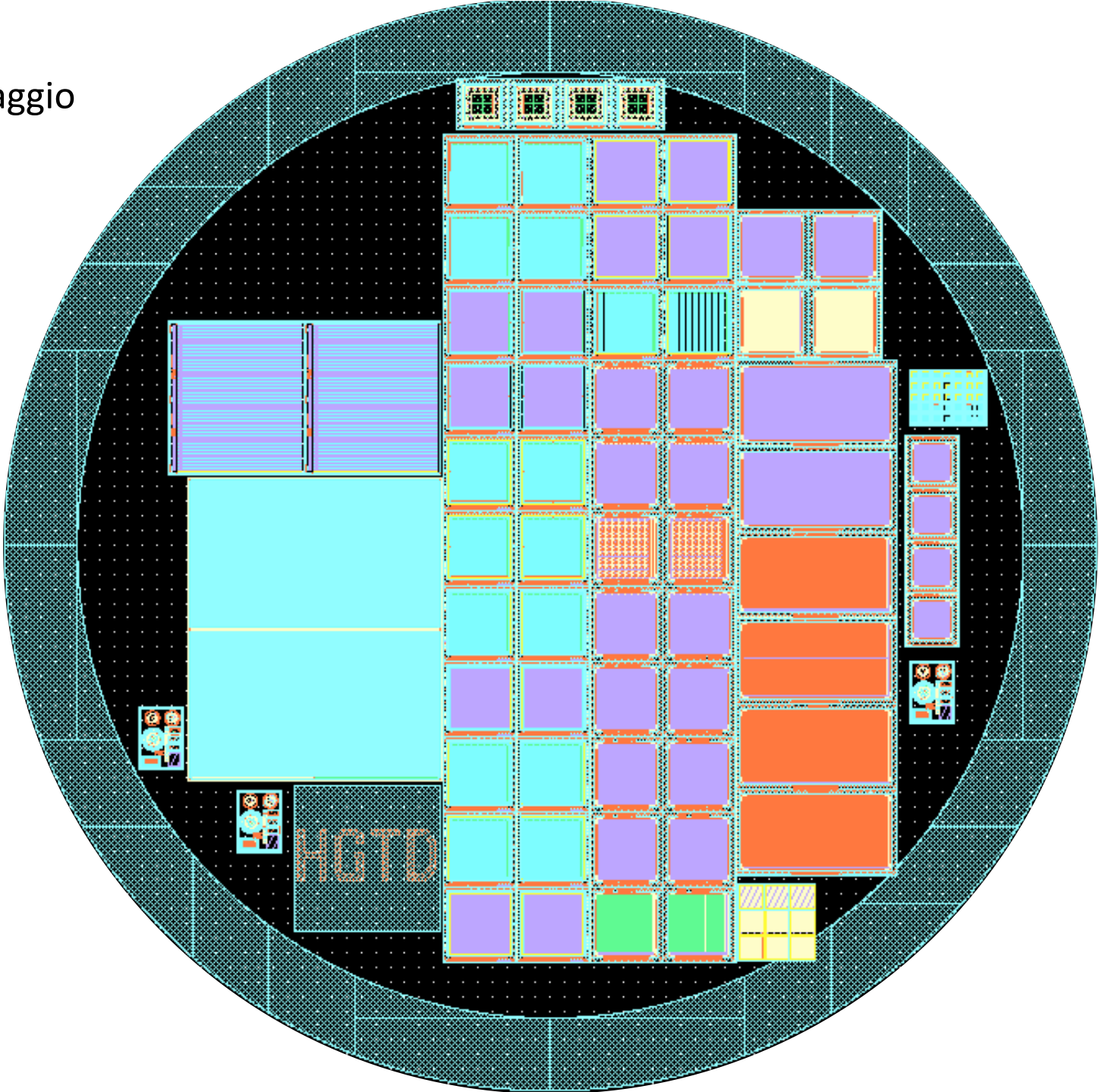
AE planar devices

Wafer Layout

Design items

- Pixel detectors: CMS ($\sim 48 \text{ cm}^2$)
 - Slim and Active Edge
 - Optimized bias and gr design
 - Small pitch
 - New devices readout by PSI46dig ROC
 - New devices readout by new ROCs
 - ROC4sens
- Pixel detector: common ($\sim 18 \text{ cm}^2$)
 - New devices readout by new ROCs
 - RD53a
- Pixel detectors: ATLAS ($\sim 28 \text{ cm}^2$)
 - FeI4, standard edge.
 - 2 X 4 cm^2 doublet
 - HGTD
 - 2X2 singlet AE
 - Standard pitch

Layout 9 Maggio



Slim and Active edge

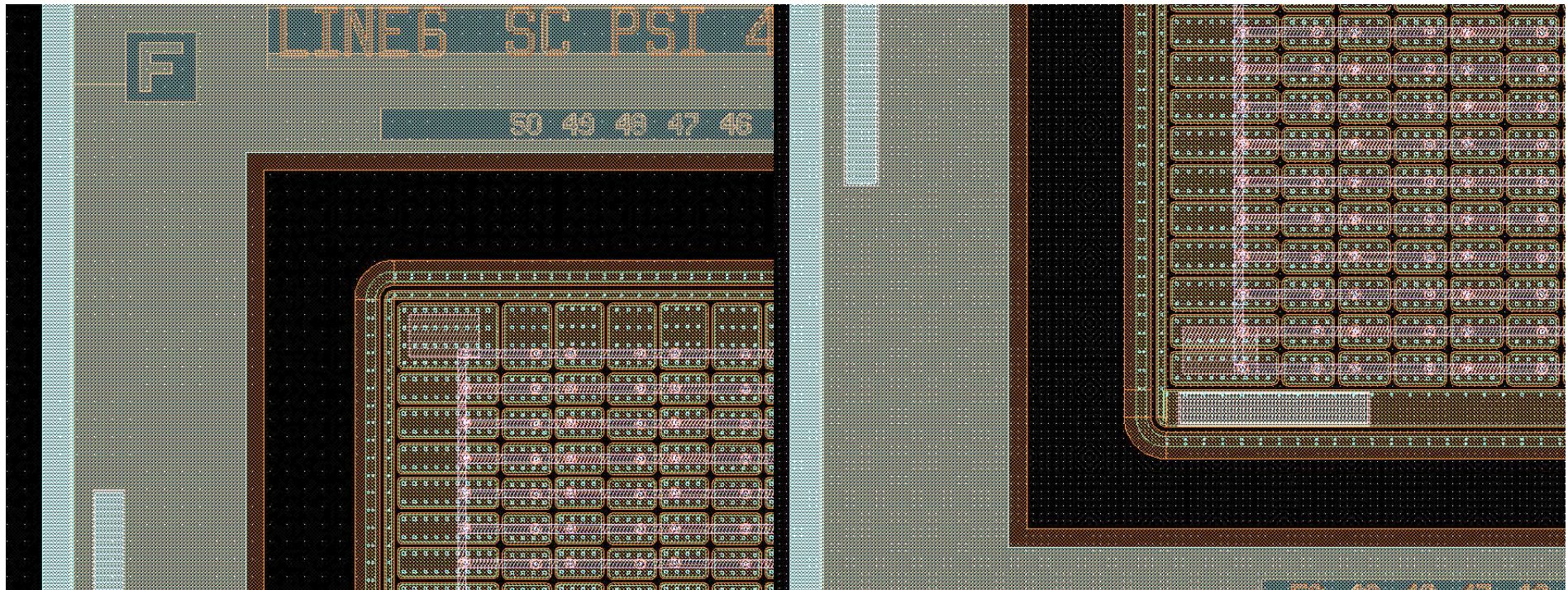
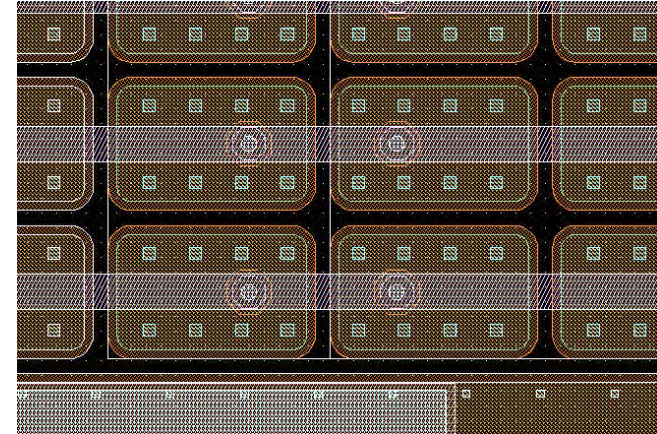
- Periphery design for standard PSI46 devices
 - Effect of a slim periphery for thin devices
 - Edge geometry
 - Staggered trench
 - Safer for back thinning

Pixel Matrix

- With and without Punch through
 - Polarization network
 - Metal and PT implant bias dot
 - Temporary metal grid: full device connected

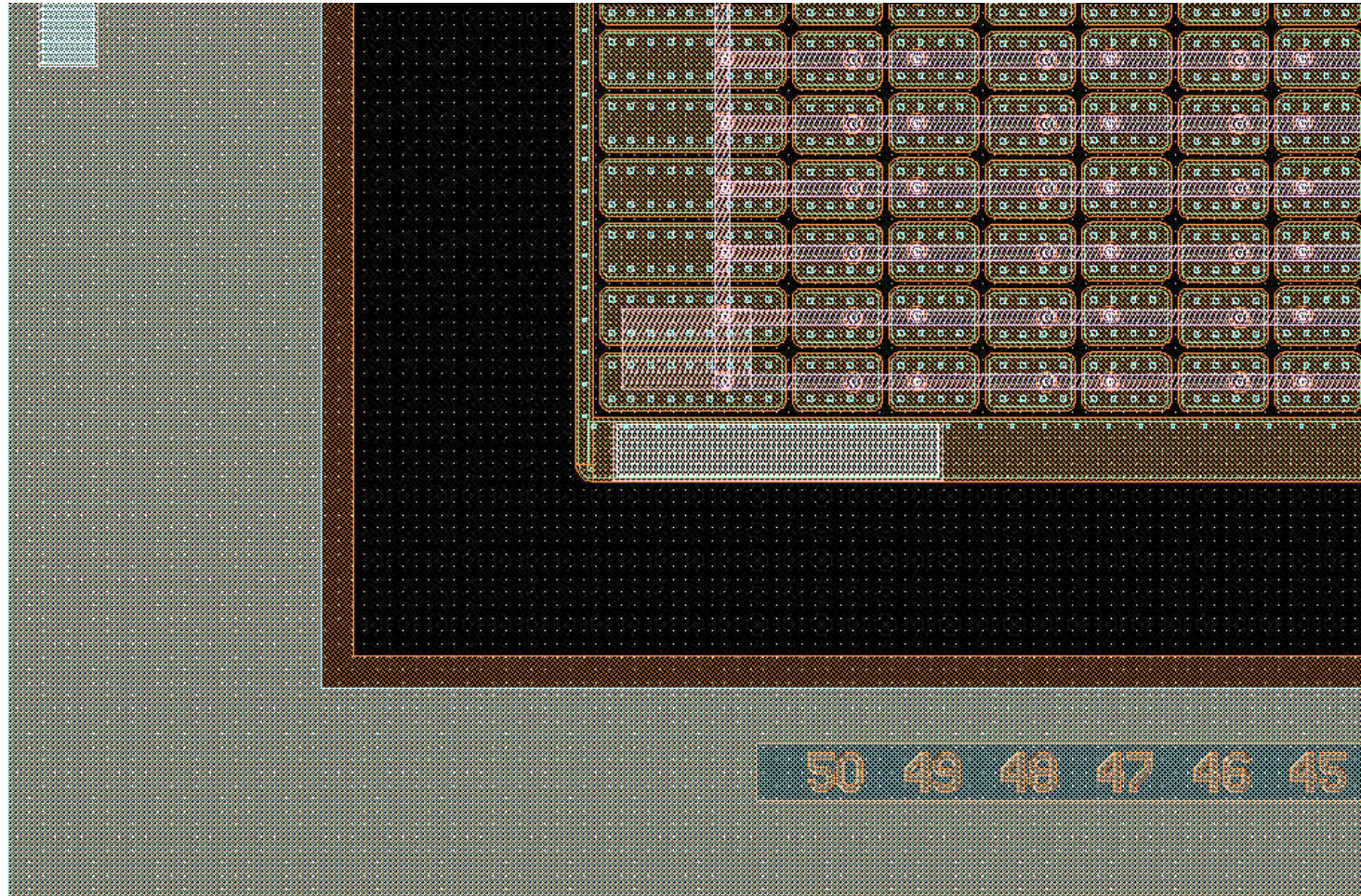
Line 6

- Metal temporary grid
- Not symmetric guard ring
- Larger implants without PT



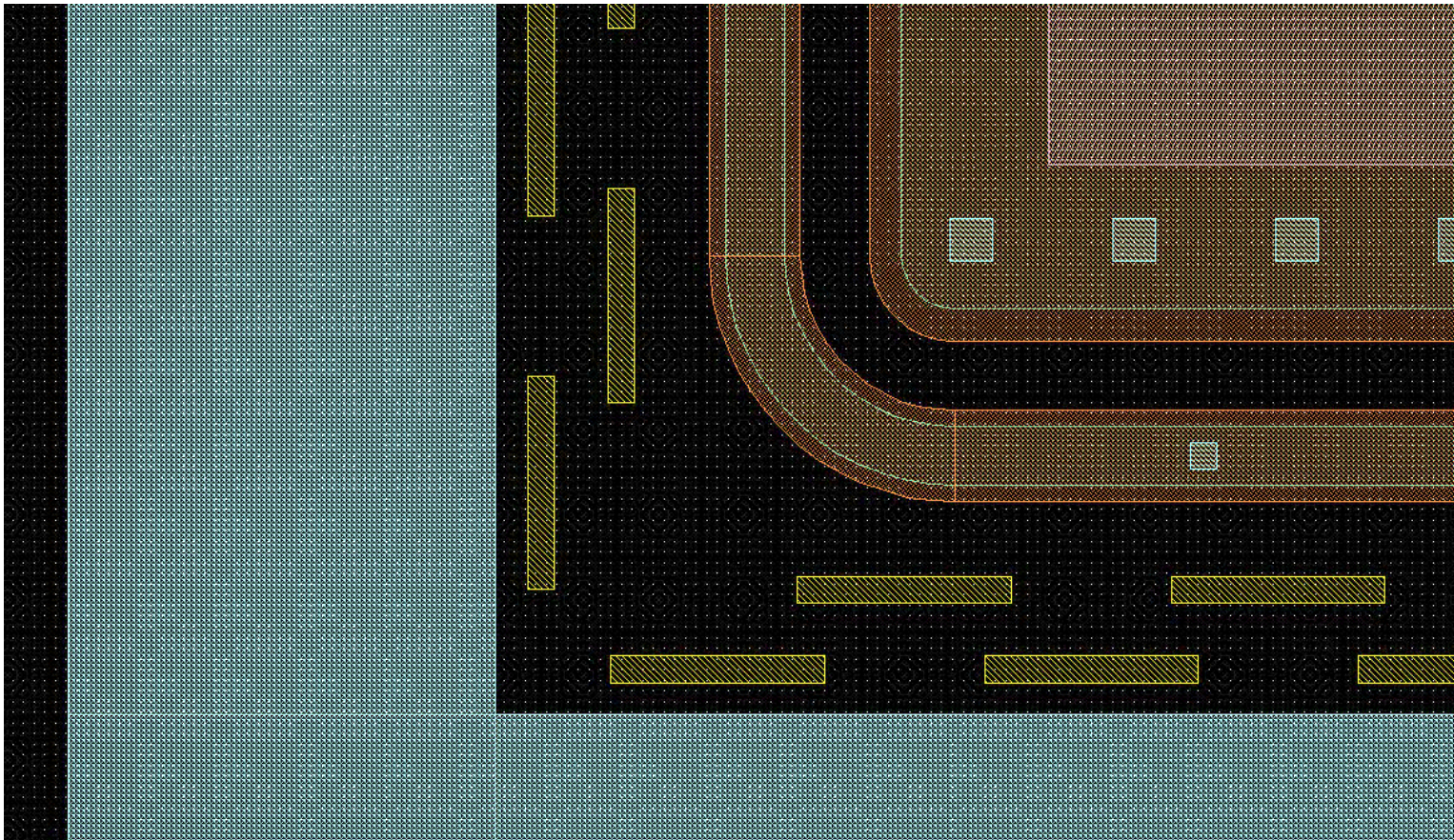
Line7

- Removed g.r.



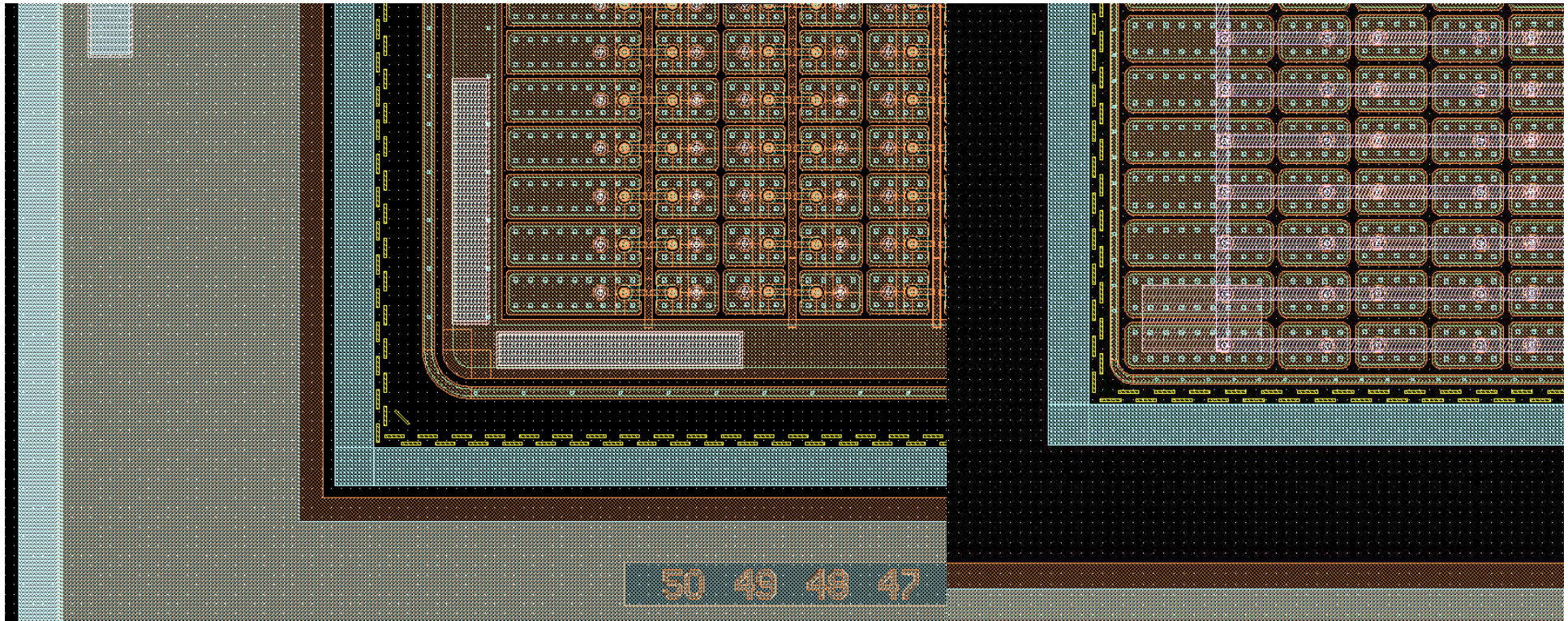
Trench and slim/active edge

- Trench geometry: 5 width, 10 dist, 5 ovlp.



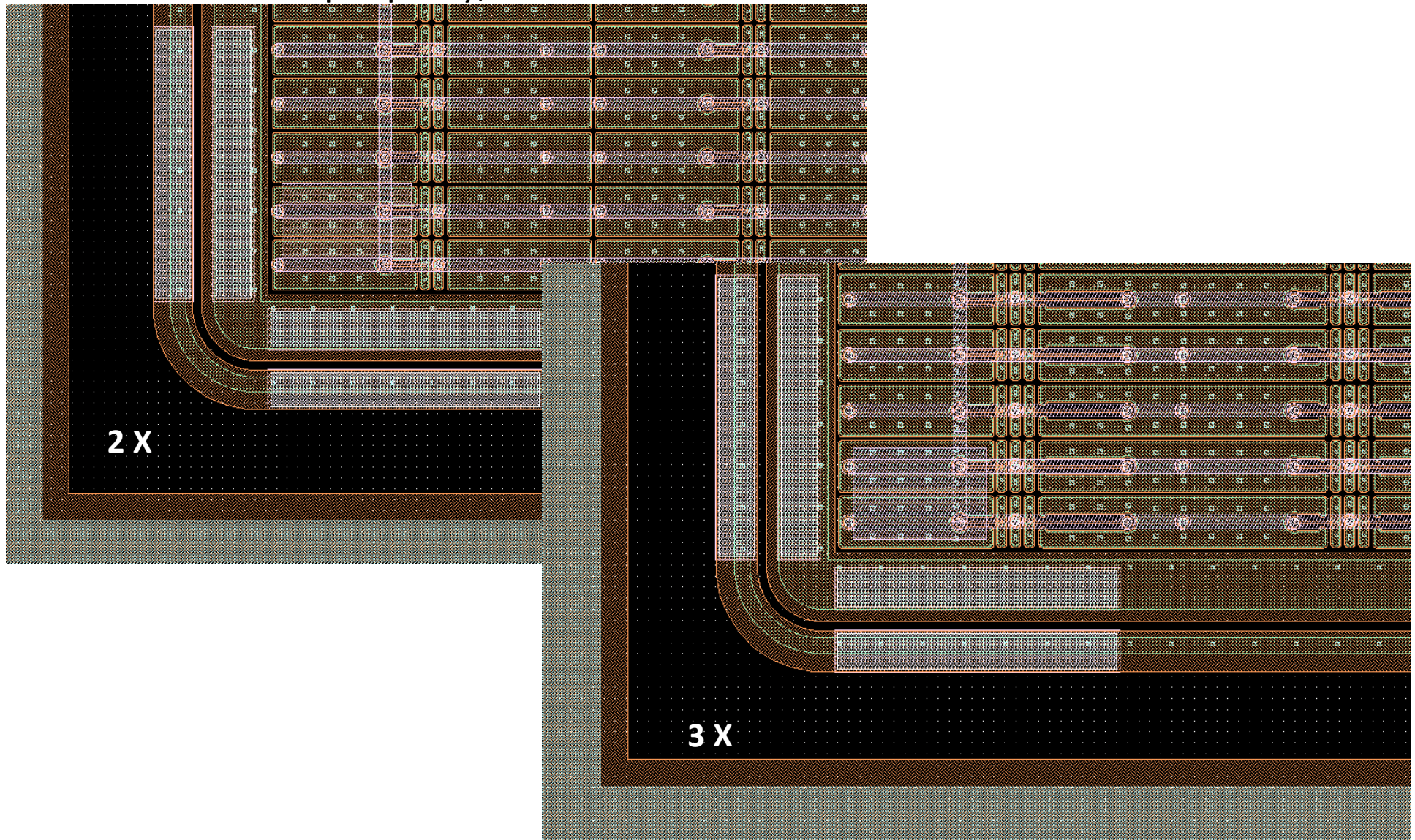
Trench to first implant distances

- Max 80 μm , min 17 μm
 - Bias+gr: option for different combinations
 - A few designs comparable to present planar batch



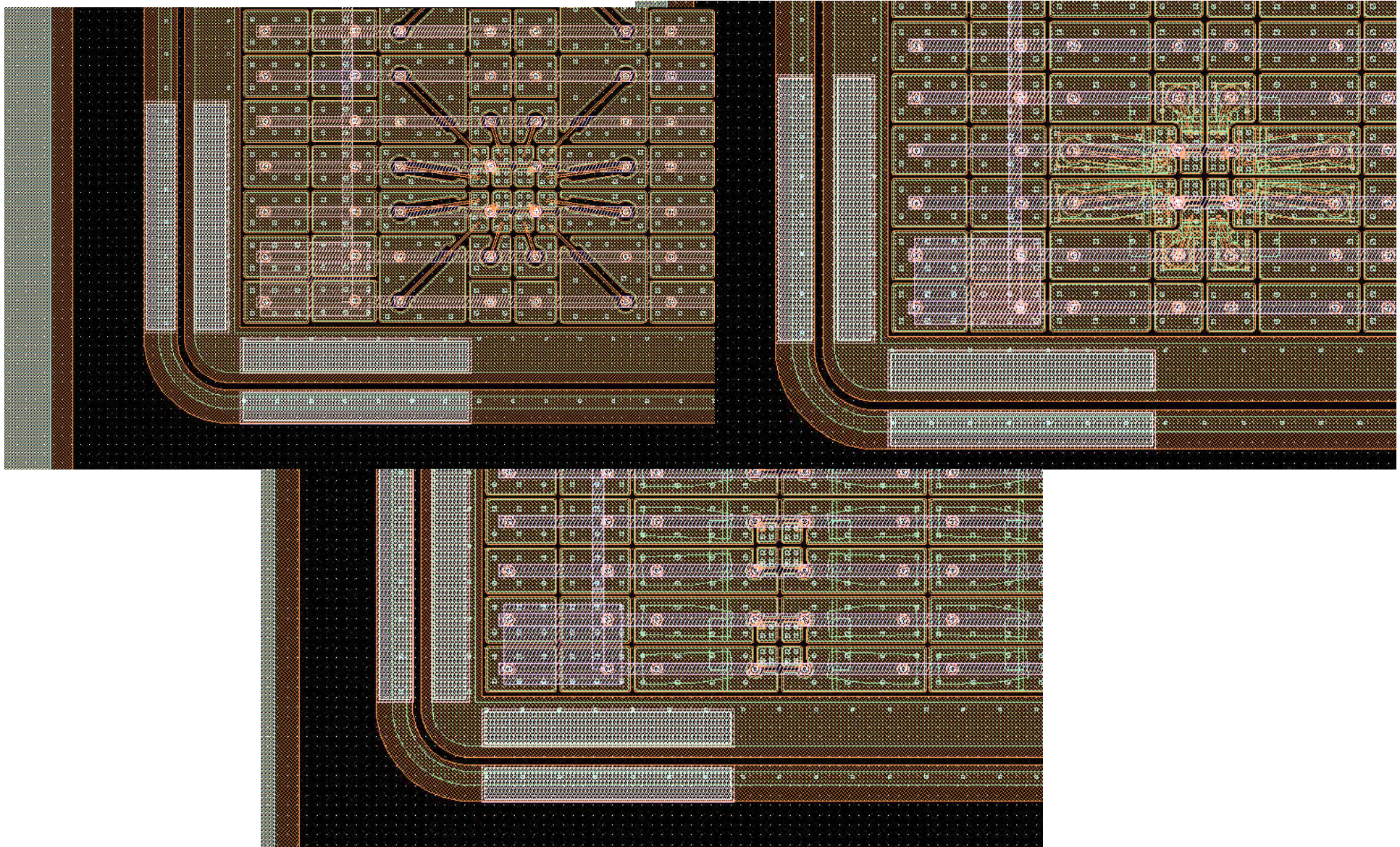
Small pitch 25 X 100

- PSI46dig pitch adapter:
 - Standard periphery, no trench



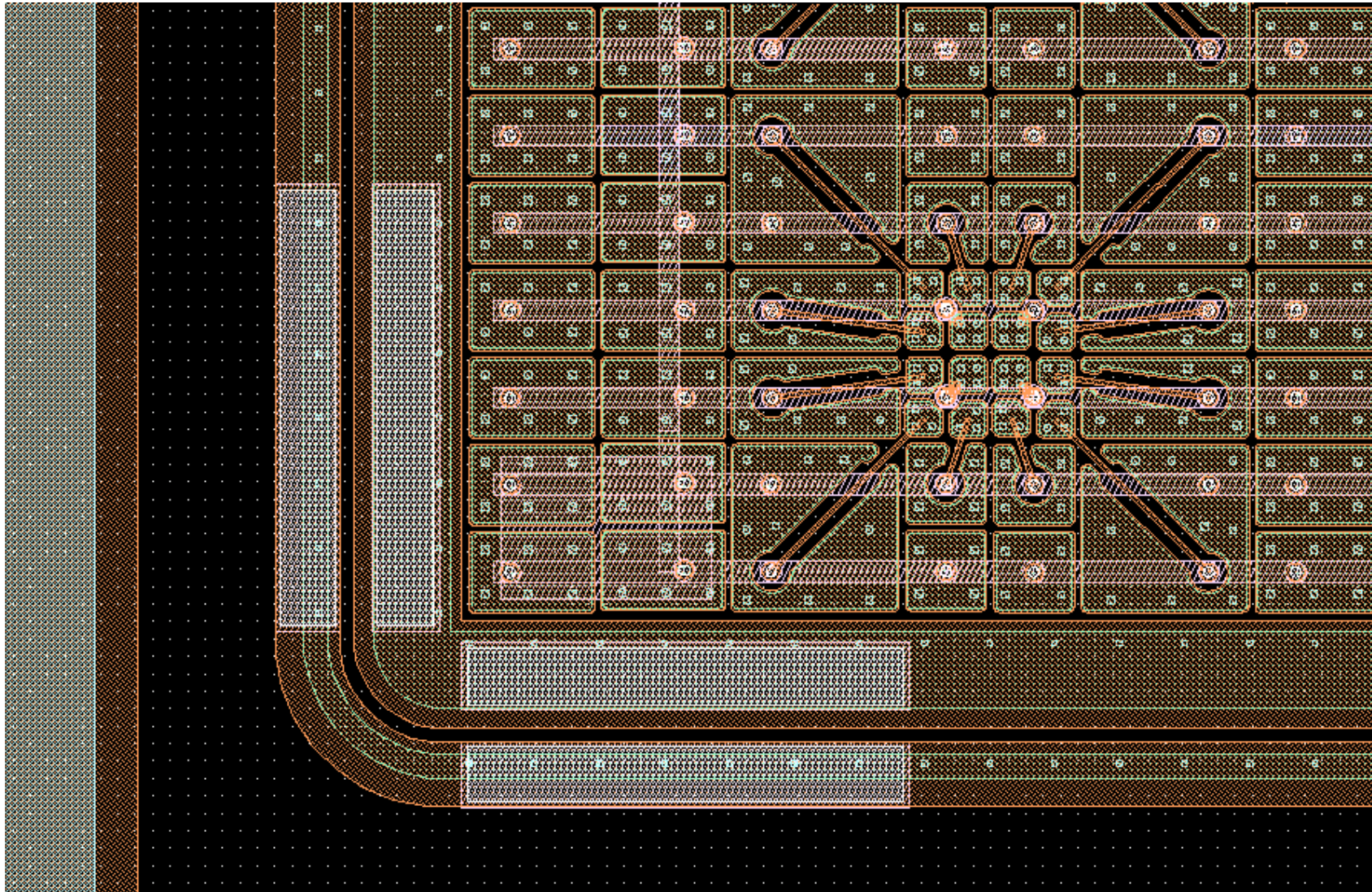
Small pitch 50 X 50

- PSI46dig pitch adapter:
 - Standard periphery, no trench



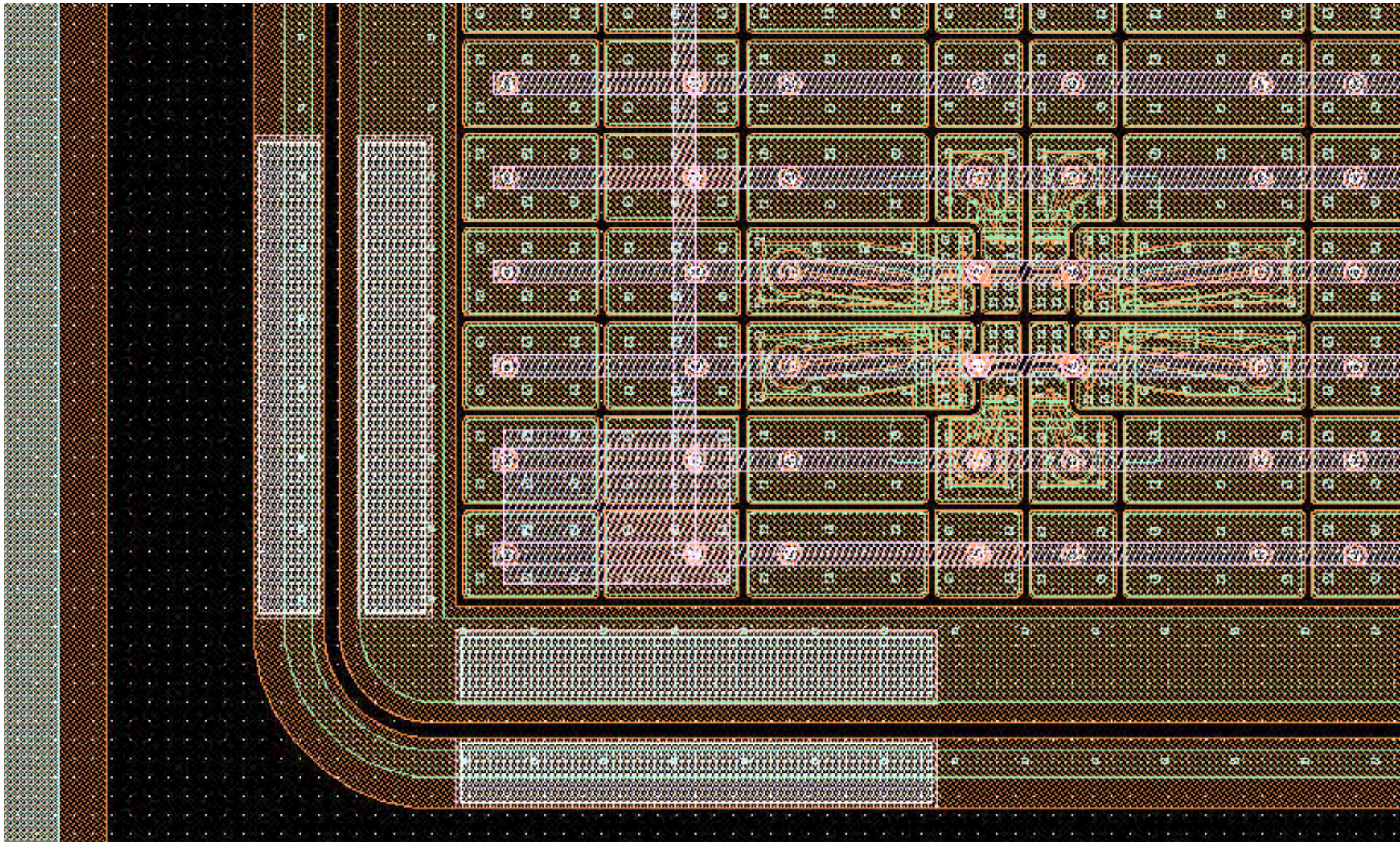
Small pitch 50 X 50

- PSI46dig pitch adapter:
 - Standard periphery, no trench



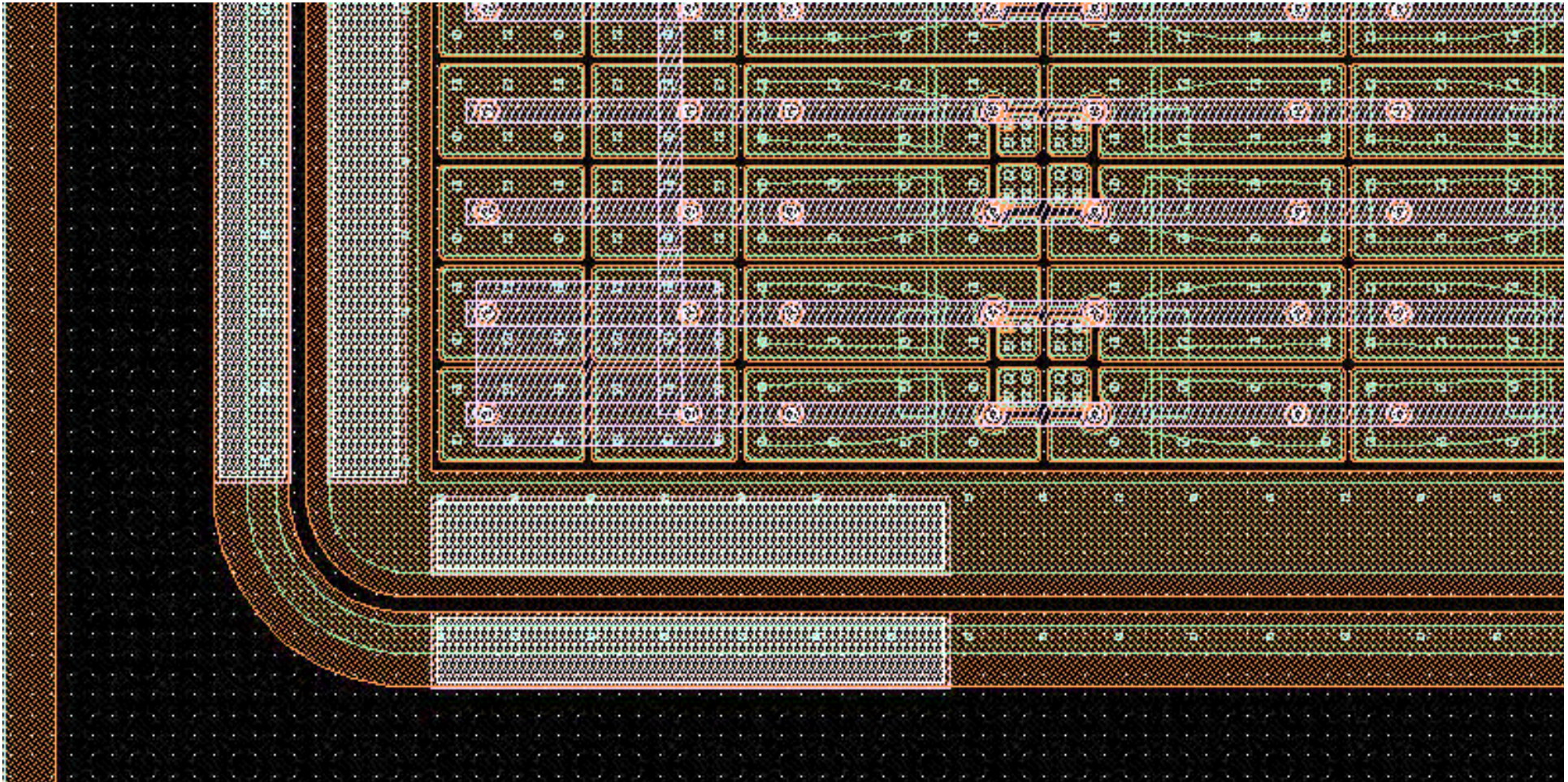
Small pitch 50 X 50

- PSI46dig pitch adapter:
 - Standard periphery, no trench



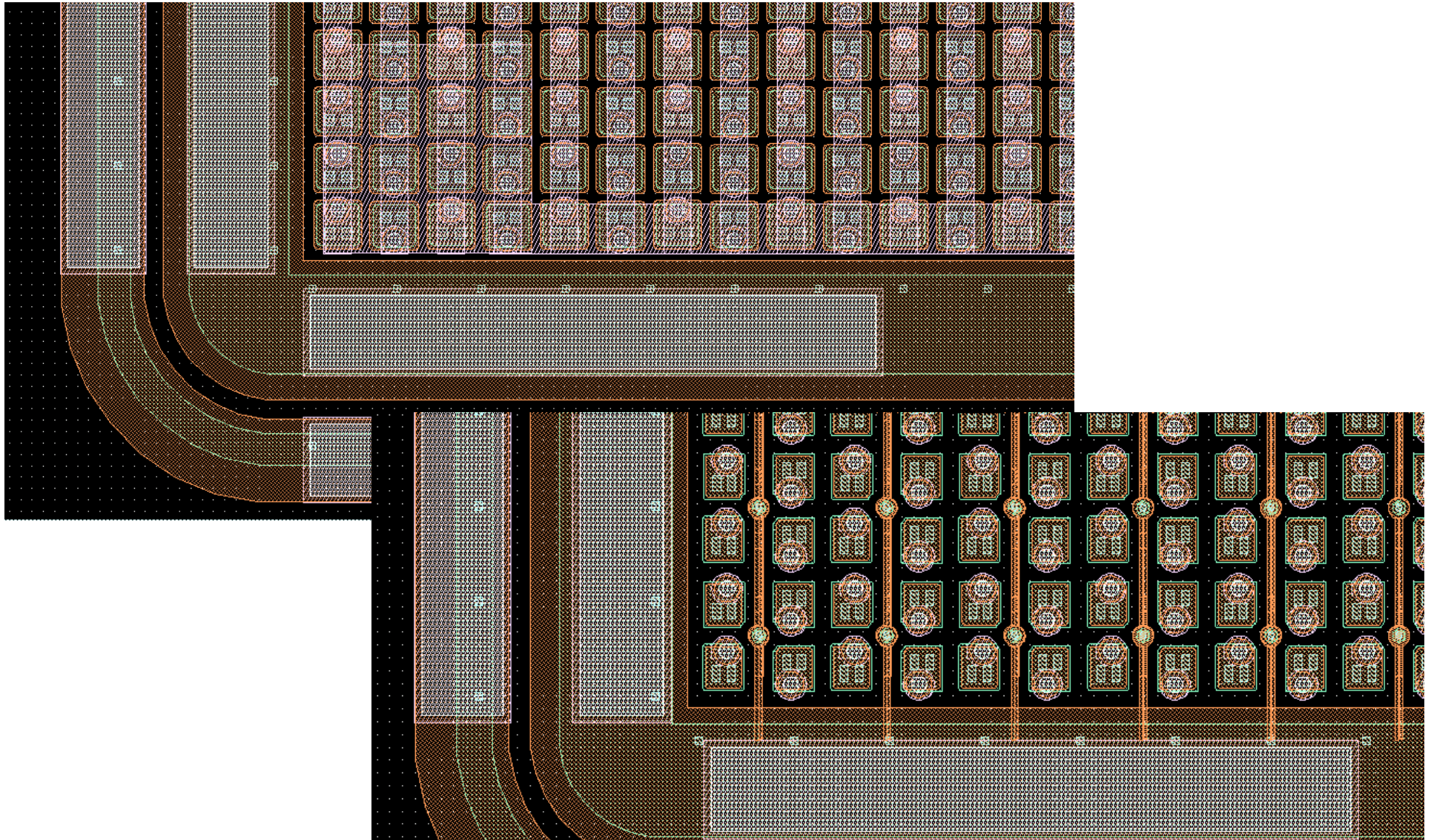
Small pitch 50 X 50

- PSI46dig pitch adapter:
 - Standard periphery, no trench



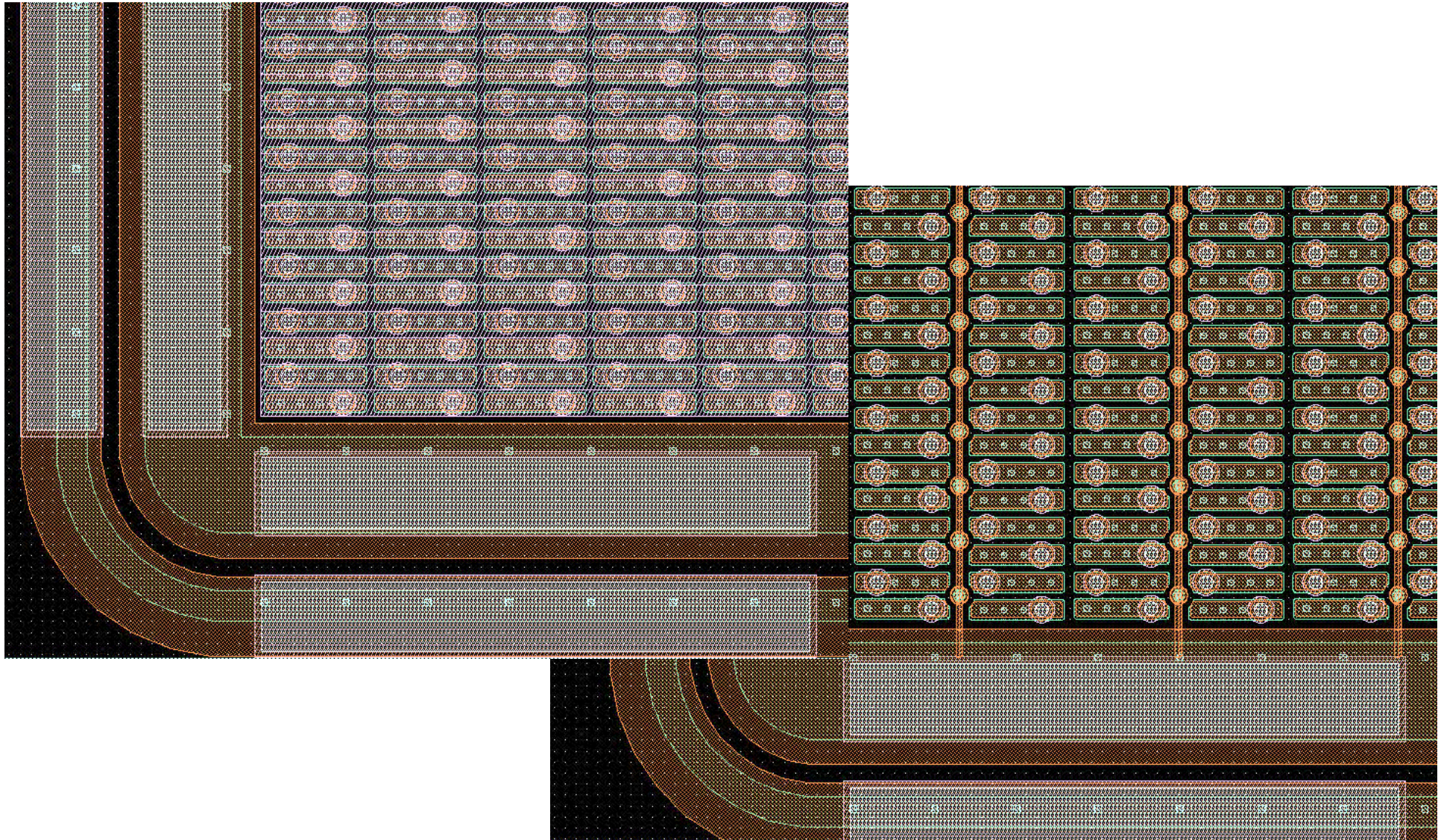
Small pitch

- ROC4sens
 - Standard periphery, no trench: tune MO and PT



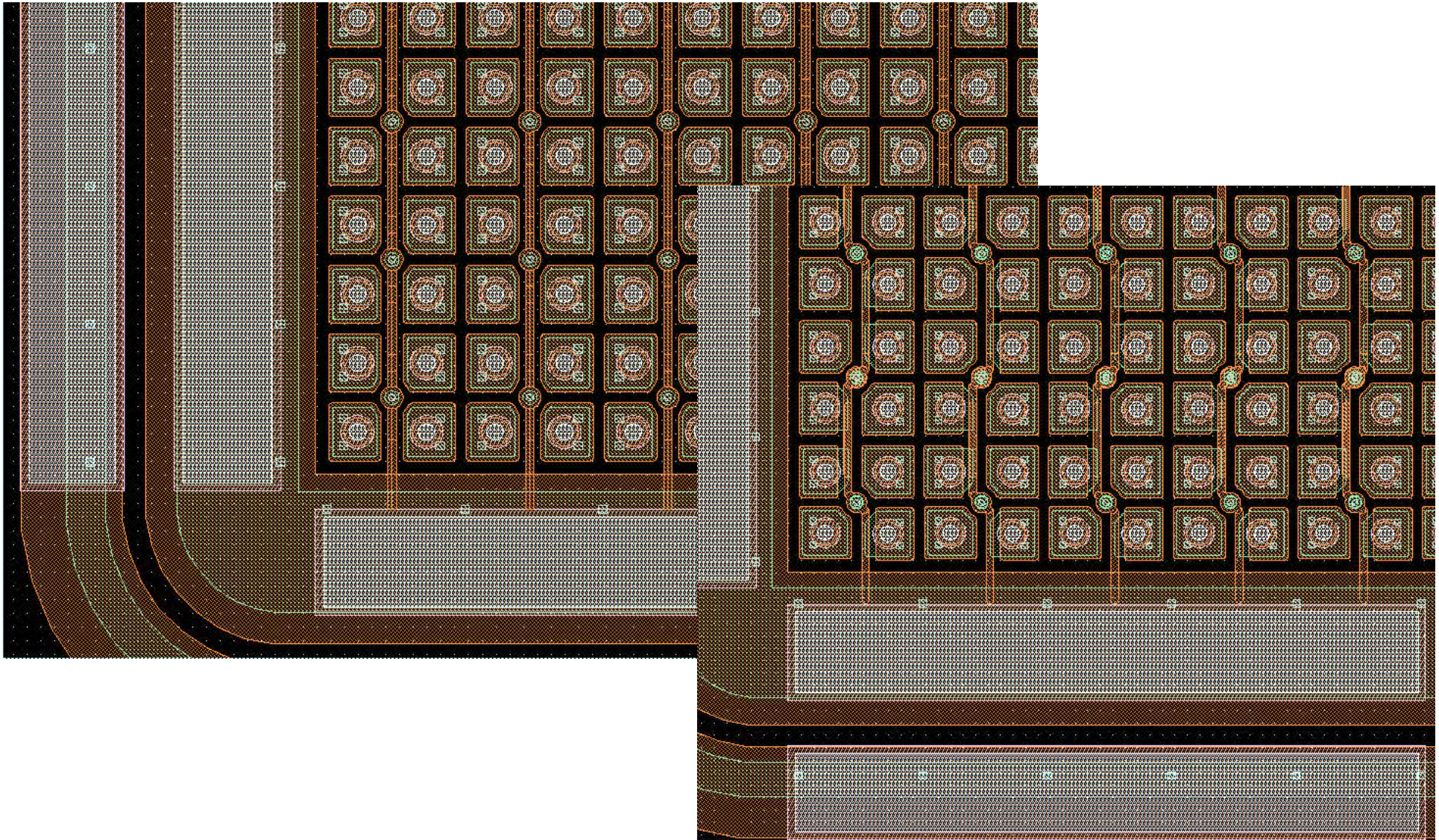
Small pitch

- ROC4sens
 - Standard periphery, no trench: tune MO and PT



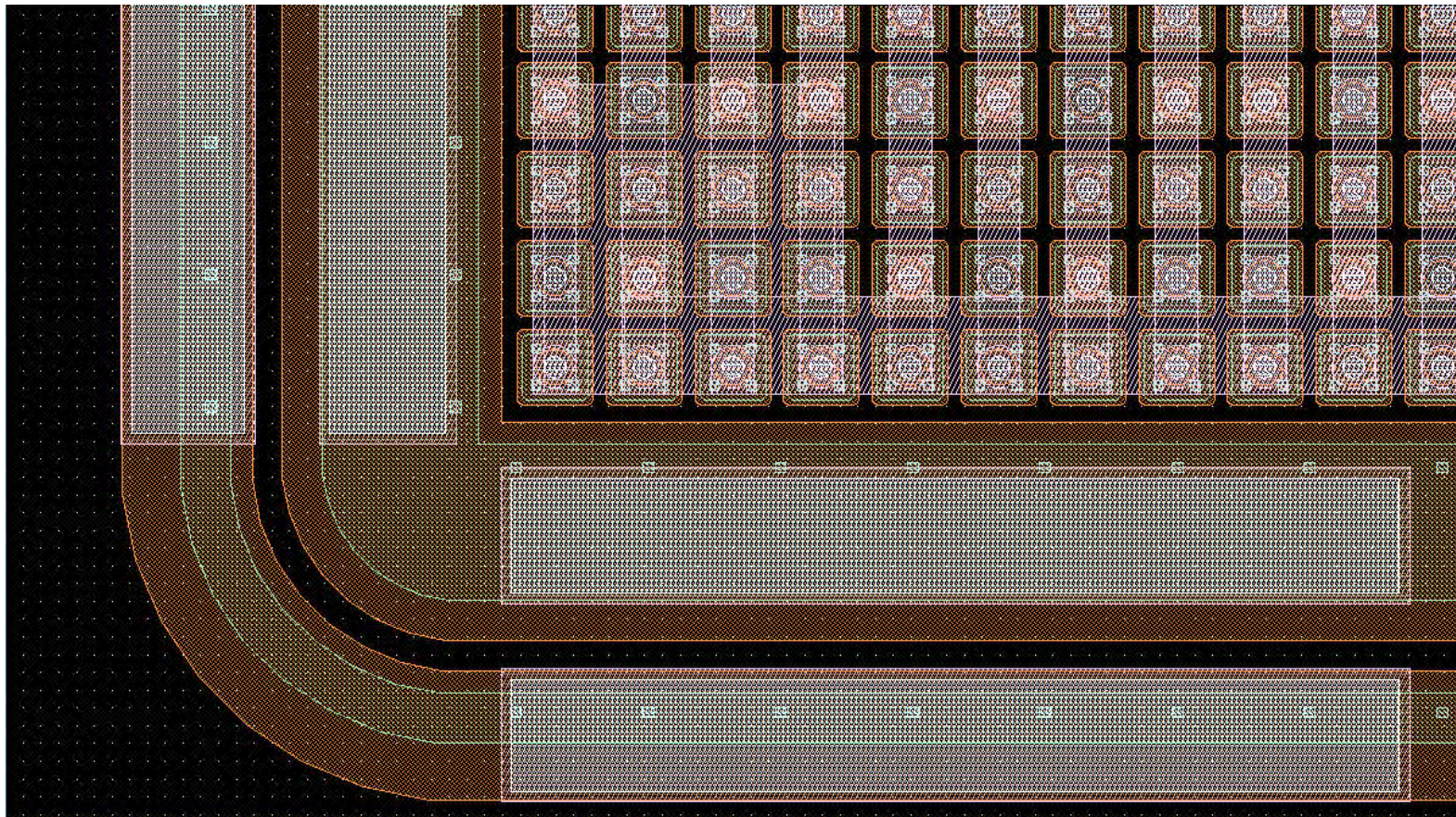
Small pitch

- RD53A
 - Standard periphery, no trench: tune MO and PT



Small pitch

- RD53A
 - Standard periphery, no trench: tune MO and PT



ATLAS devices

- Double + single

