AE planar devices

Wafer Layout

Design items

- Pixel detectors: CMS (~48 cm²)
 - 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 (~18 cm²)
 - New devices readout by new ROCs
 - RD53a
- Pixel detectors: ATLAS (~28 cm²)
 - Fel4, standard edge.
 - 2 X 4 cm² doublet
 - HGTD
 - 2X2 singlet AE
 - Standard pitch



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 um , min 17 um
 - 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



- PSI46dig pitch adapter:
 - Standard periphery, no trench





- PSI46dig pitch adapter:
 - Standard periphery, no trench



- PSI46dig pitch adapter:
 - Standard periphery, no trench

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- PSI46dig pitch adapter:
 - Standard periphery, no trench

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



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



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



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



ATLAS devices

• Double + single

