

## Agenda - Part I (start 14:00)

- 1. Last meeting's action points**
- 2. Progress and issues to be raised per partner**
  - a. TU/e**
  - b. Smart Photonics**
  - c. Bright Photonics**
  - d. Effect Photonics**
  - e. Technobis**
- 3. Summary**

## Chips WP3

MPW parallel chips    MPW commercial chips    (x) = reserve space for design

|              |                                     | SP19<br>Dec-16 | SP20<br>Mar-17<br>1st | SP21<br>Jun-17 | SP22<br>Sep-17 | SP23<br>Dec-17 | SP24<br>Mar-18 | SP25<br>Jun-18<br>2nd | SP26<br>Sep-18 | SP27<br>Dec-18 | SP28<br>Mar-19<br>3rd | SP29<br>Jun-19 | SP30<br>Sep-19 |
|--------------|-------------------------------------|----------------|-----------------------|----------------|----------------|----------------|----------------|-----------------------|----------------|----------------|-----------------------|----------------|----------------|
| Modulator    | Plating chip + parameter extraction | x              |                       | x              |                | x              |                | x                     |                |                |                       |                |                |
|              | Modulator chip (Effect+SI+plating)  | in meas.       |                       | x              | x              | x              | x              | →WP2                  |                |                |                       |                |                |
|              | Al-MQW parallel wafer CL-TWE chip   |                | Out of fab            |                |                | submitted      |                | x                     | x              | x              | x                     | →WP2           |                |
| RF Line      | Conventional design                 |                |                       |                | x              | x              | x              |                       |                | x              | x                     | x              |                |
|              | 2 <sup>nd</sup> level metal RF line |                |                       |                | x              | x              | x              | x                     | x              |                |                       |                |                |
| BB test cell | Wafer level test                    | x              | x                     | x              | x              | x              | x              | x                     | x              | x              | x                     | x              | x              |
|              | Die level test                      | x              | x                     | x              | x              | x              | x              | x                     | x              | x              | x                     | x              | x              |
|              | Composite BBs                       |                | Out of fab            |                | x              | submitted      |                |                       |                |                |                       |                |                |
| Prec. Filter | (ring, AWG, MZI)                    |                |                       | ?              |                |                | ?              |                       |                | ?              |                       |                |                |
| Low LW LD    |                                     |                |                       |                |                |                |                |                       |                |                |                       |                |                |
|              | DBR laser                           |                |                       |                | x              |                | x              |                       | x              |                | x                     |                | x              |
|              | Triplex Hybrid                      |                |                       |                | X (tbd)        |                |                |                       |                |                |                       |                |                |
|              | High Q cavity laser                 |                |                       |                |                |                |                |                       |                | ?              |                       |                |                |
| Demo         | both chips                          |                |                       |                |                |                |                |                       | x              |                |                       |                |                |

# RF Line Design (sig-sep-gnd)

- Reference: (20-12.5-25)  $\mu\text{m}$
- 18 – parameter matrix for gnd x sep on reference: [12.5, 25, 50]  $\mu\text{m}$  x [5,10,15,20,40,60]  $\mu\text{m}$
- Gnd sweep: 8,12.5,25,35,50  $\mu\text{m}$
- Sig sweep: 6,10,20,30,40

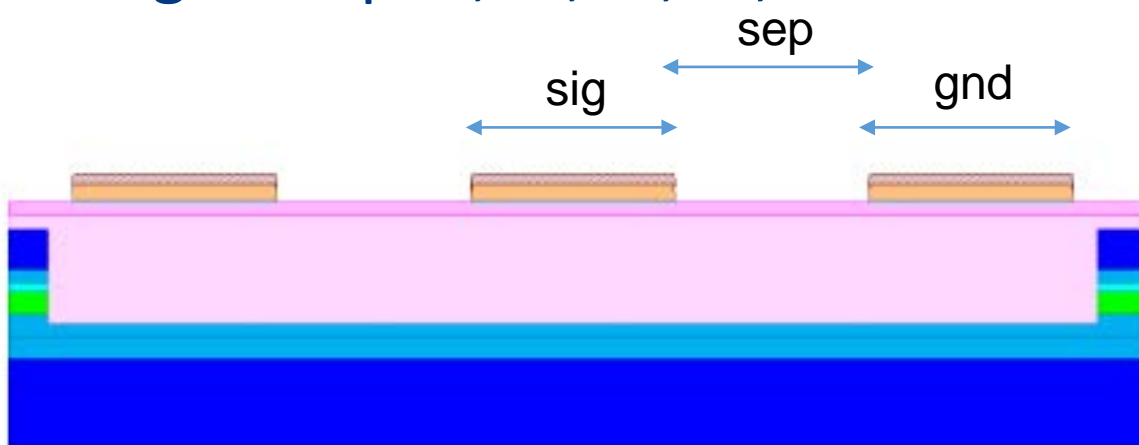
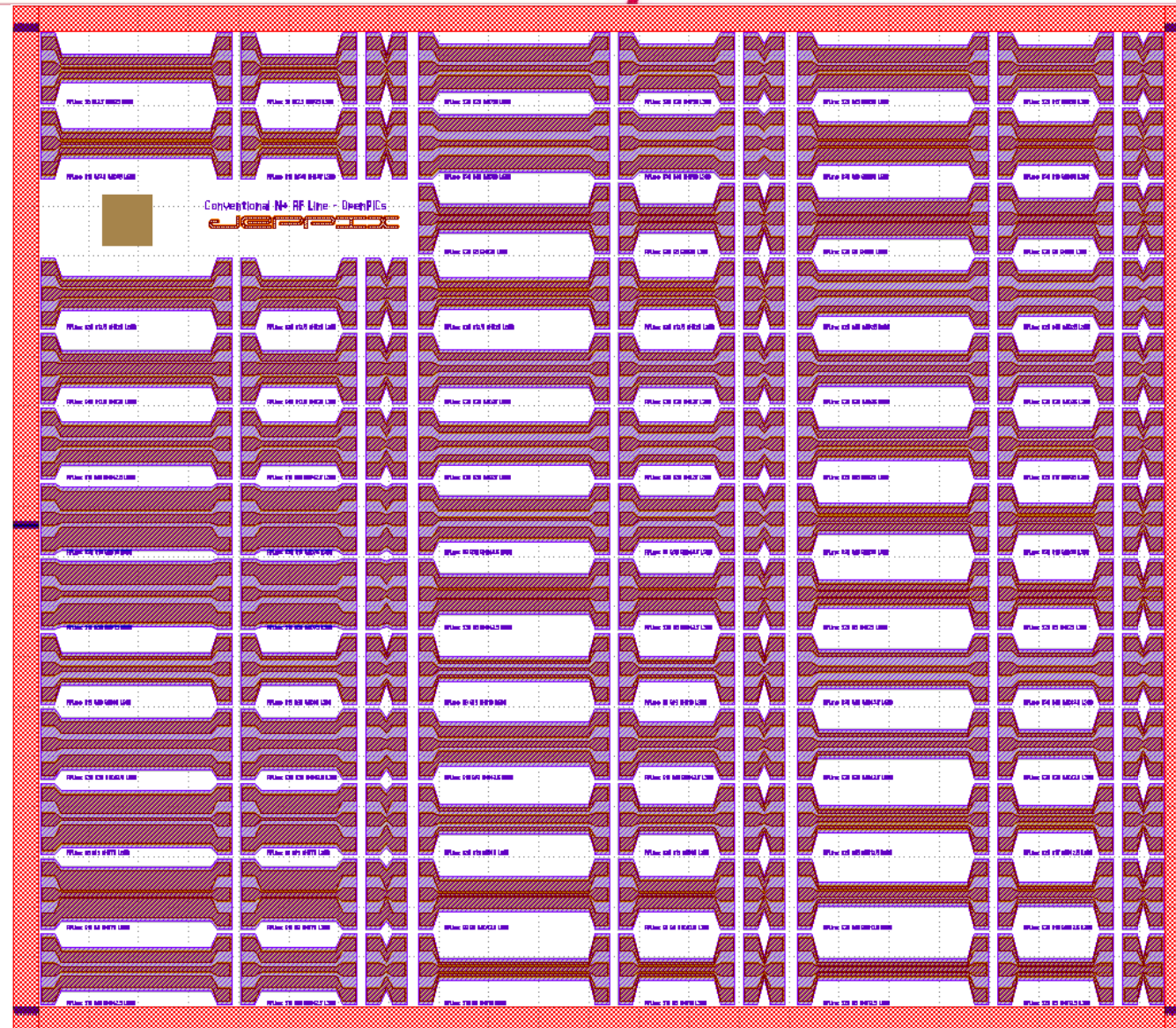
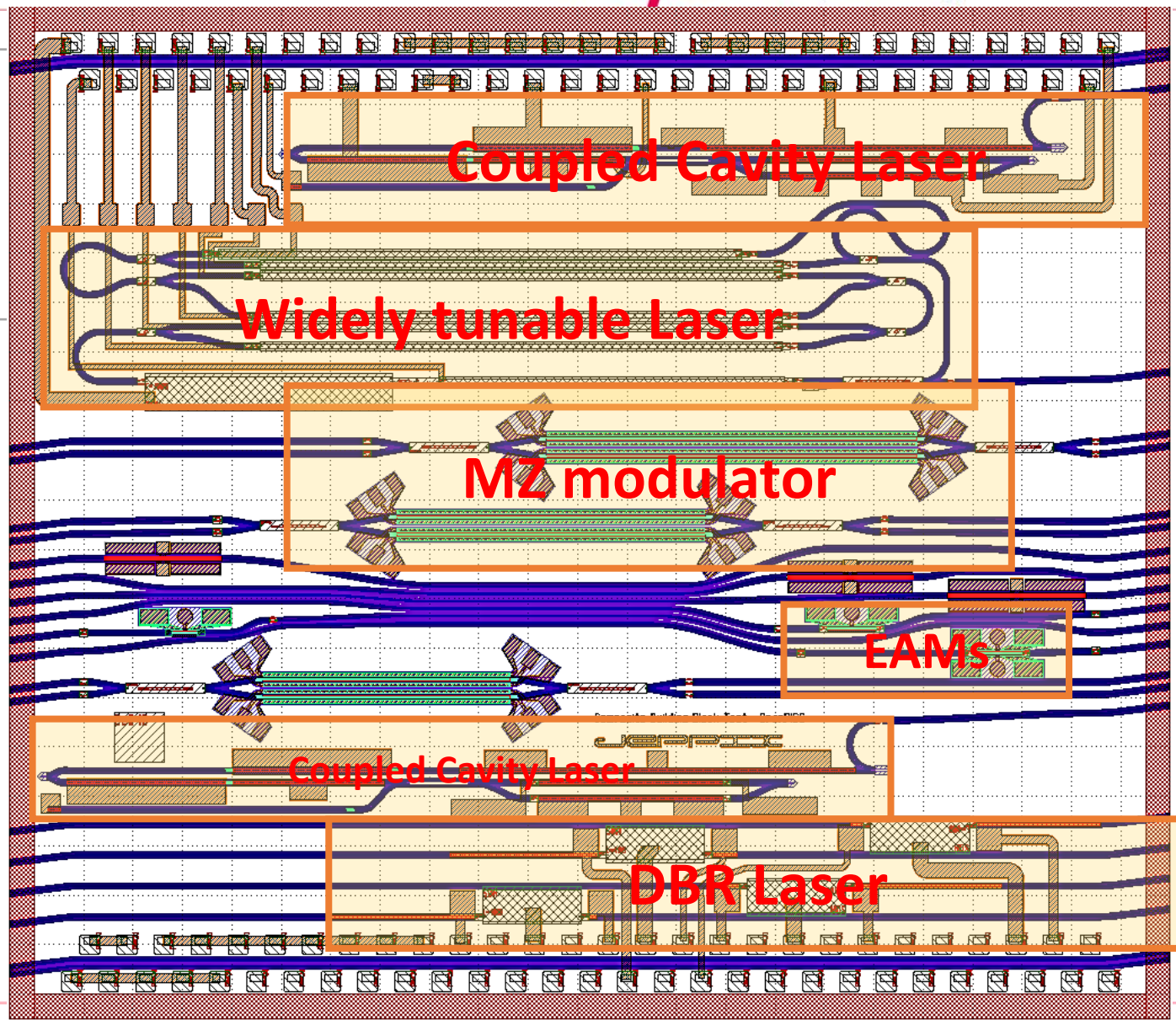


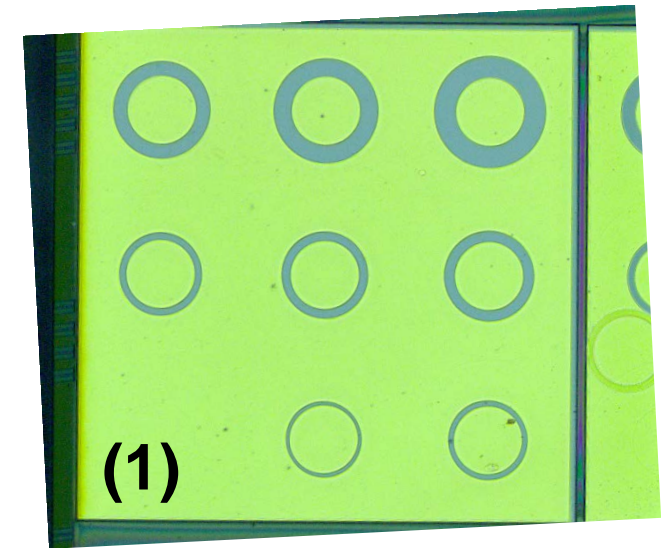
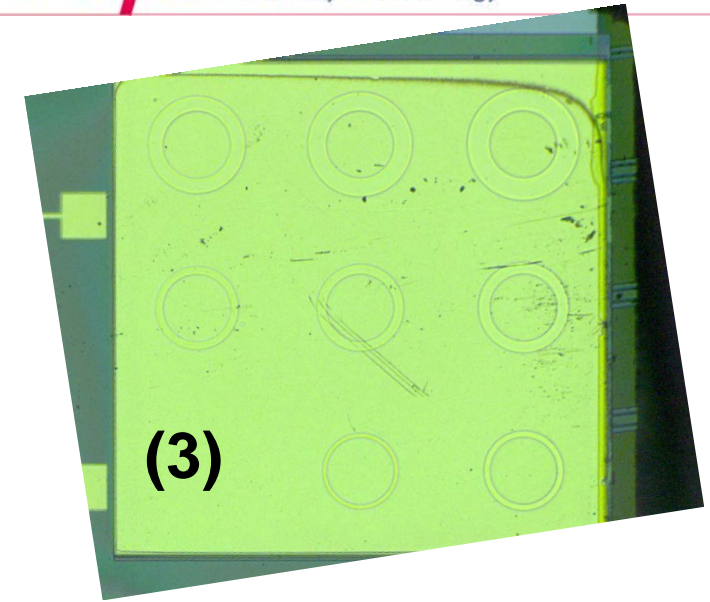
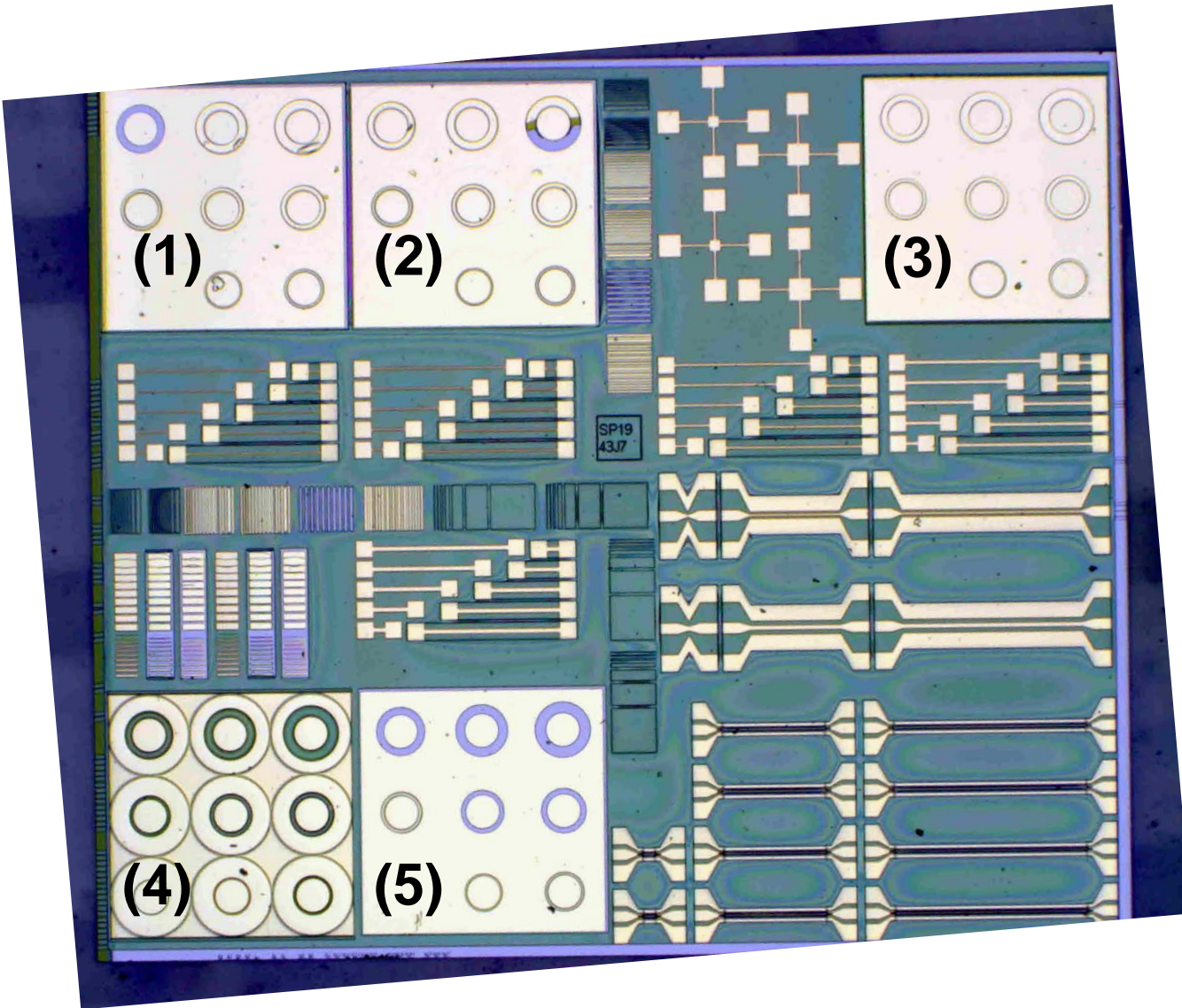
Figure 12.1: Cross-section of a GSG CPW pad.



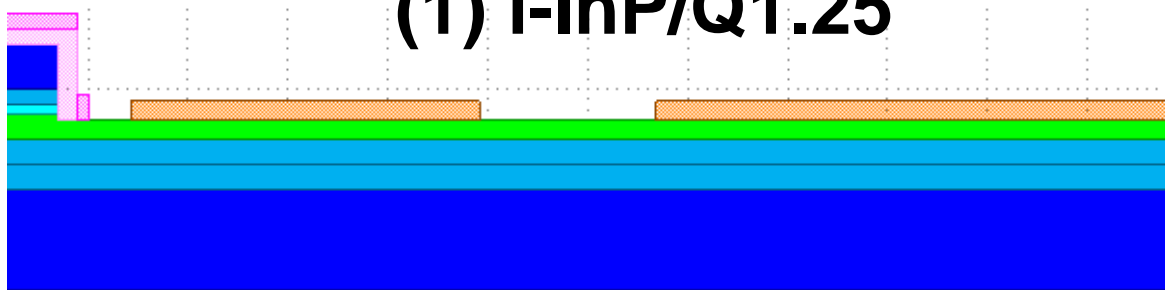
# Composite BBs

|                                      |   |
|--------------------------------------|---|
| Electro-absorption modulator         | Marija Trajkovic                        |
| Mach-Zehnder modulator               | Weiming Yao                             |
| Widely tunable laser with MZI filter | Sylwester Latkowski                     |
| coupled-cavity laser with MZI        | Domenico D'Agostino (last rev. Weiming) |
| DBR grating laser                    | Dan Zhao                                |

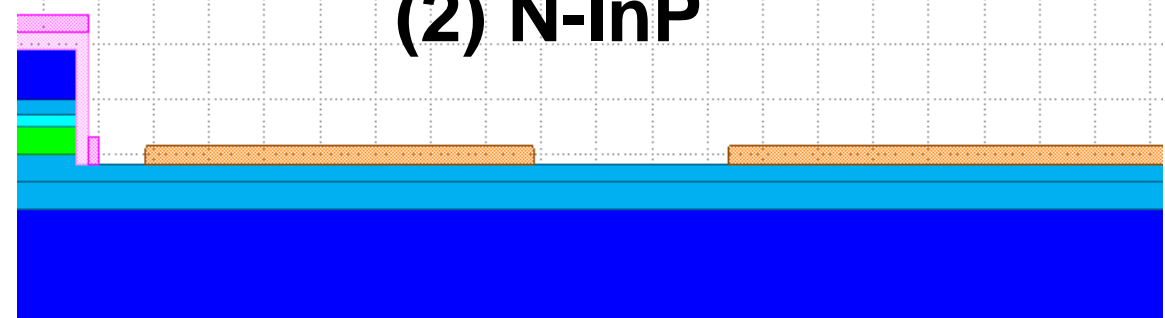




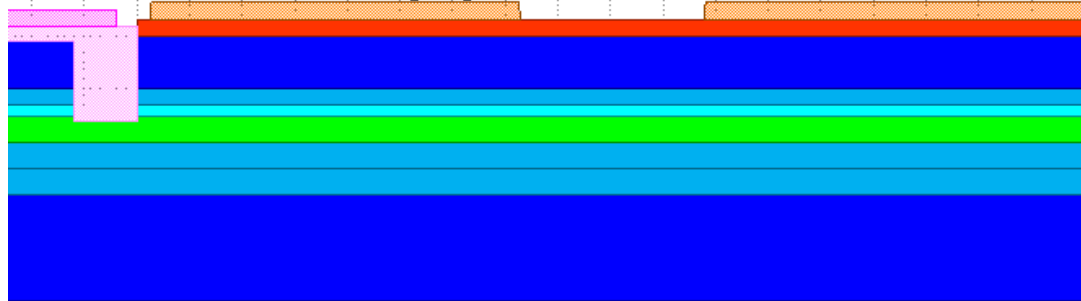
## (1) i-InP/Q1.25



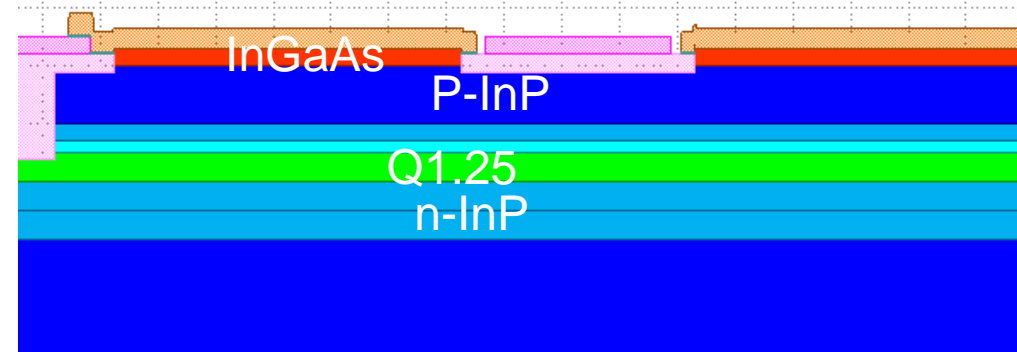
## (2) N-InP



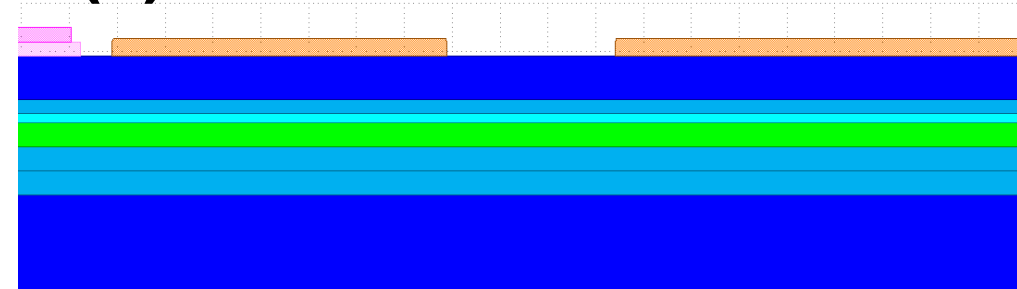
## (3) P++ InGaAs



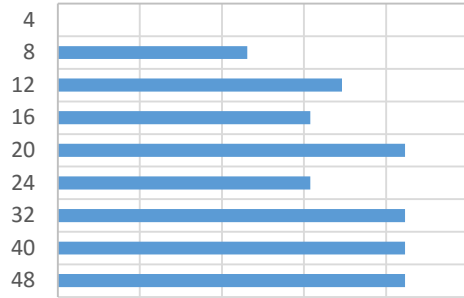
## (4) P-InP



## (5) P-InP without contact

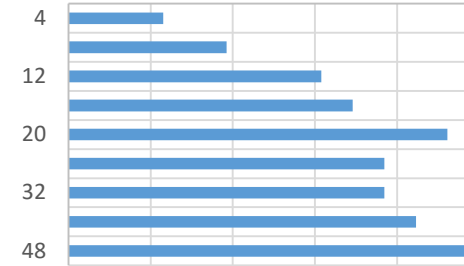


0.00% 20.00% 40.00% 60.00% 80.00% 100.00%



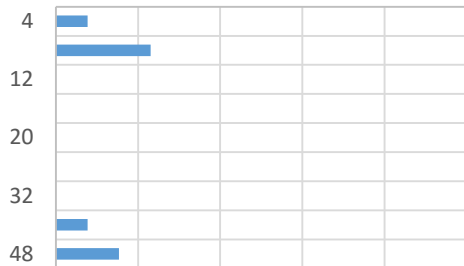
## (1) i-InP/Q1.25

0.00% 20.00% 40.00% 60.00% 80.00% 100.00%



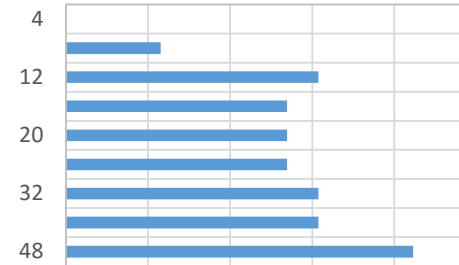
## (4) P-InP

0.00% 20.00% 40.00% 60.00% 80.00% 100.00%



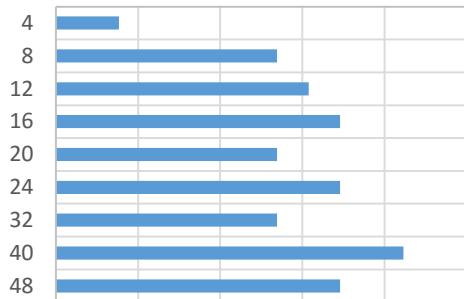
## (2) N-InP

0.00% 20.00% 40.00% 60.00% 80.00% 100.00%



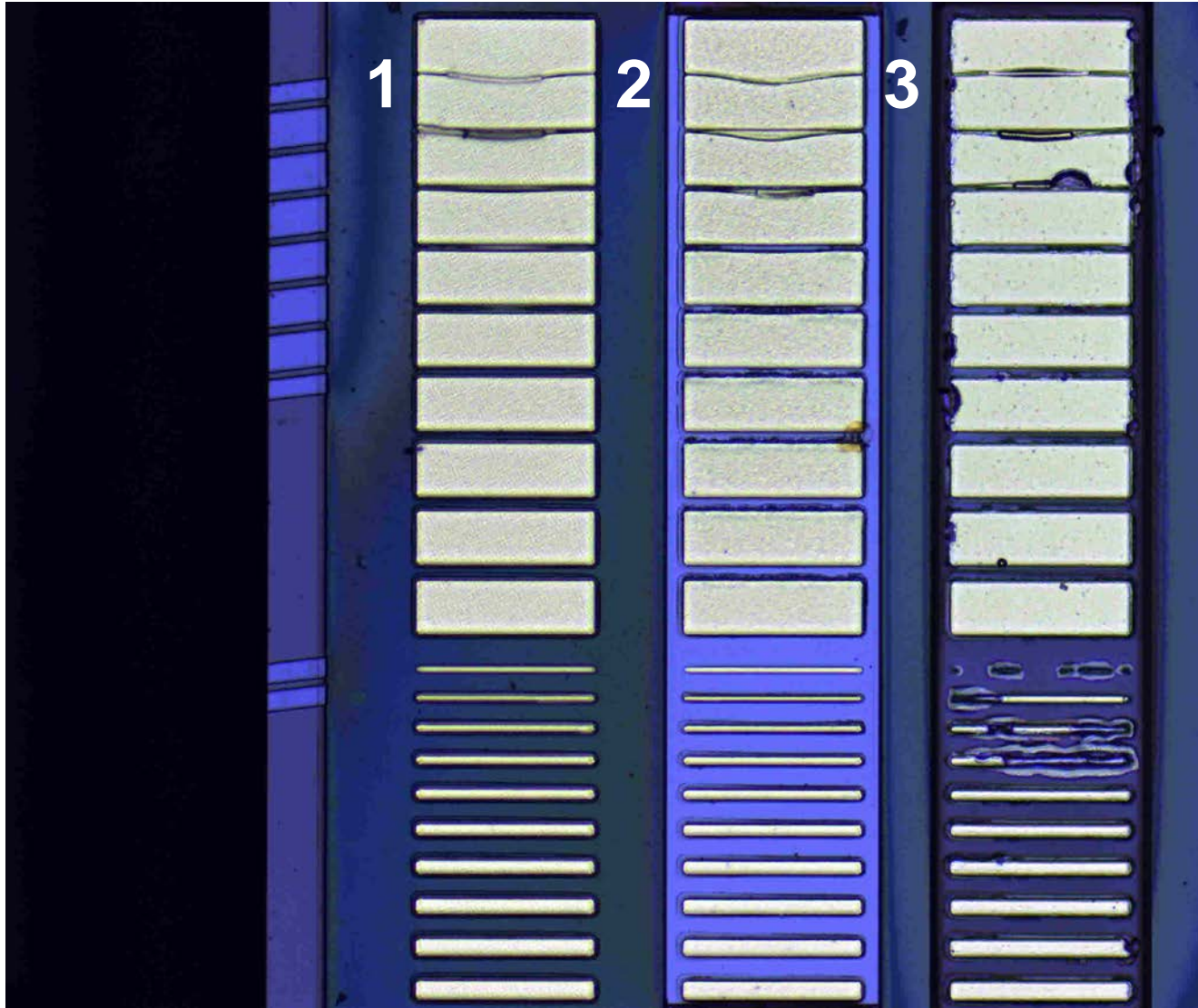
## (5) P-InP without contact

0.00% 20.00% 40.00% 60.00% 80.00% 100.00%

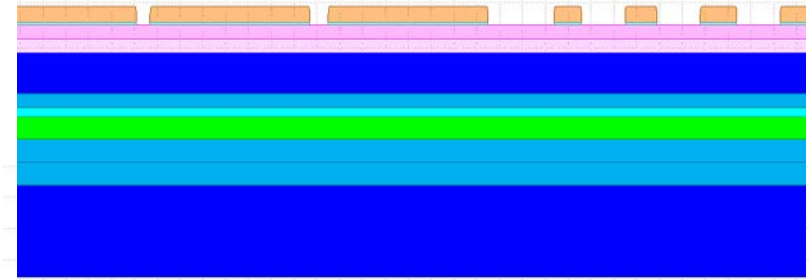


## (3) P++ InGaAs

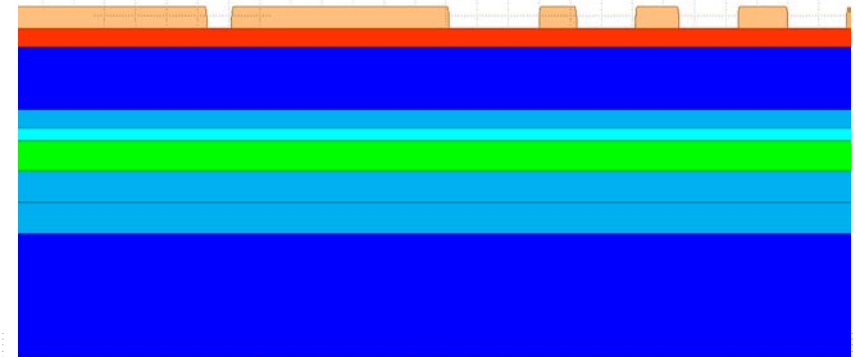
# Metal definition



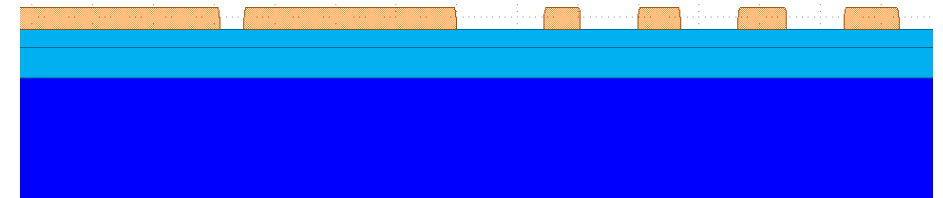
Normal metal on polyimide/SiO<sub>2</sub>



Metal on InGaAs



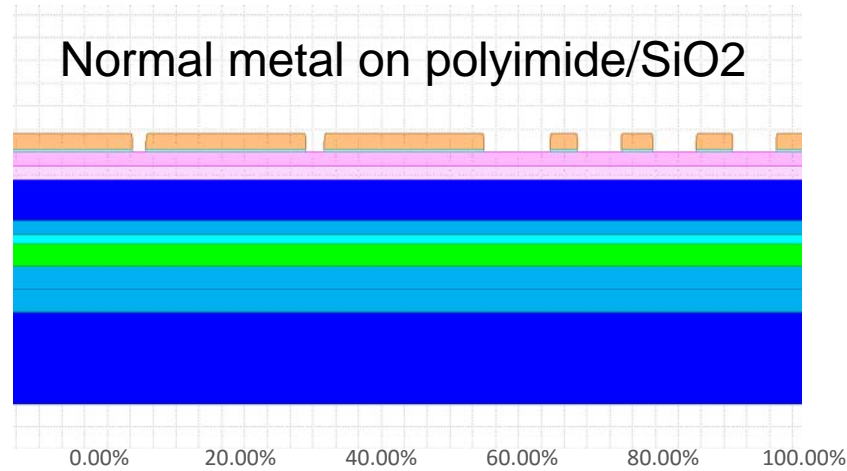
Metal on n



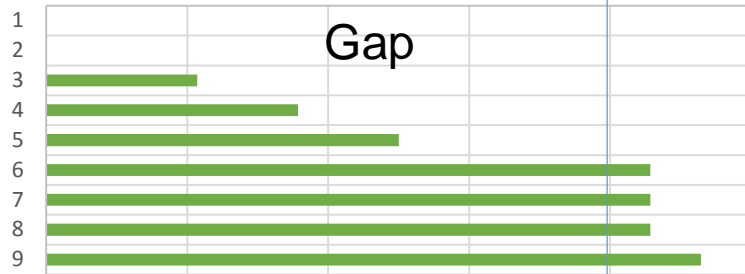


# Results - 14 test structures

## Normal metal on polyimide/SiO2

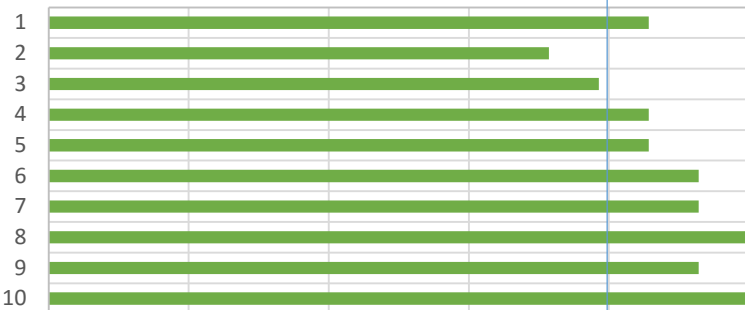


0.00% 20.00% 40.00% 60.00% 80.00% 100.00%

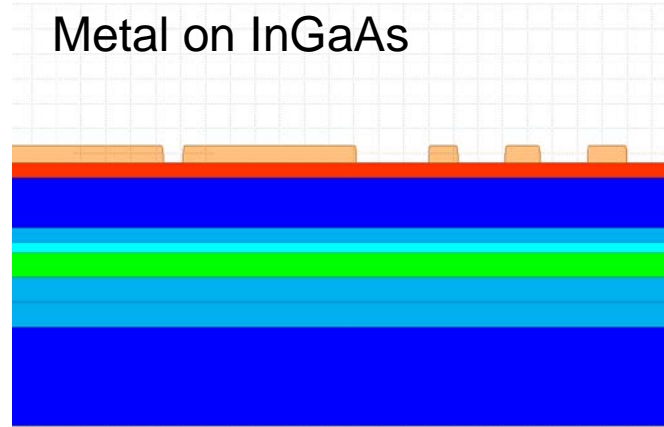


### Width

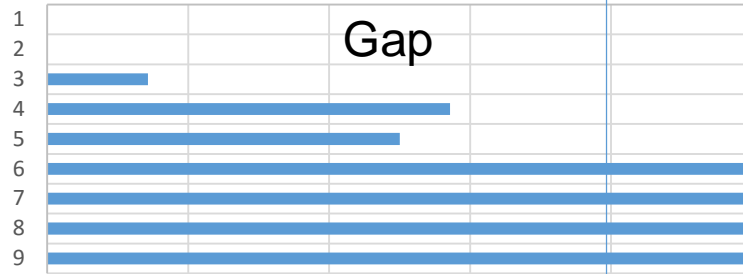
0.00% 20.00% 40.00% 60.00% 80.00% 100.00%



## Metal on InGaAs

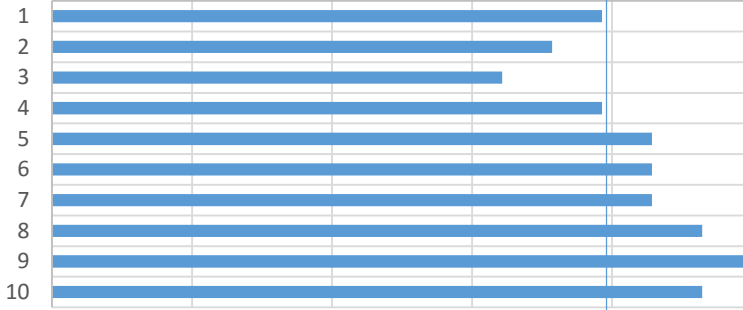


0.00% 20.00% 40.00% 60.00% 80.00% 100.00%

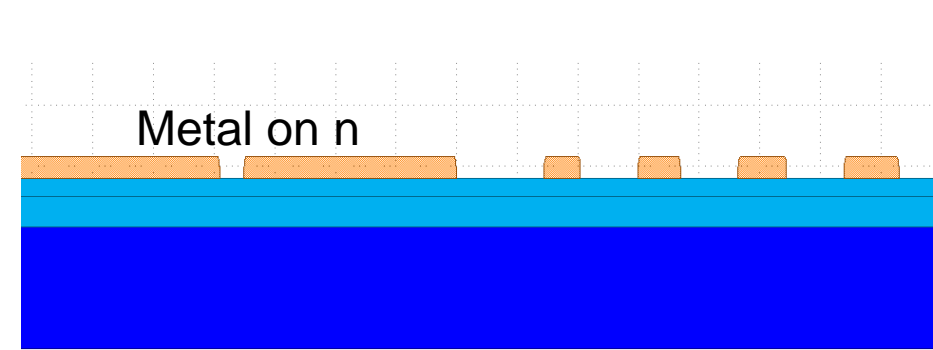


### Width

0.00% 20.00% 40.00% 60.00% 80.00% 100.00%



## Metal on n



0.00% 20.00% 40.00% 60.00% 80.00% 100.00%



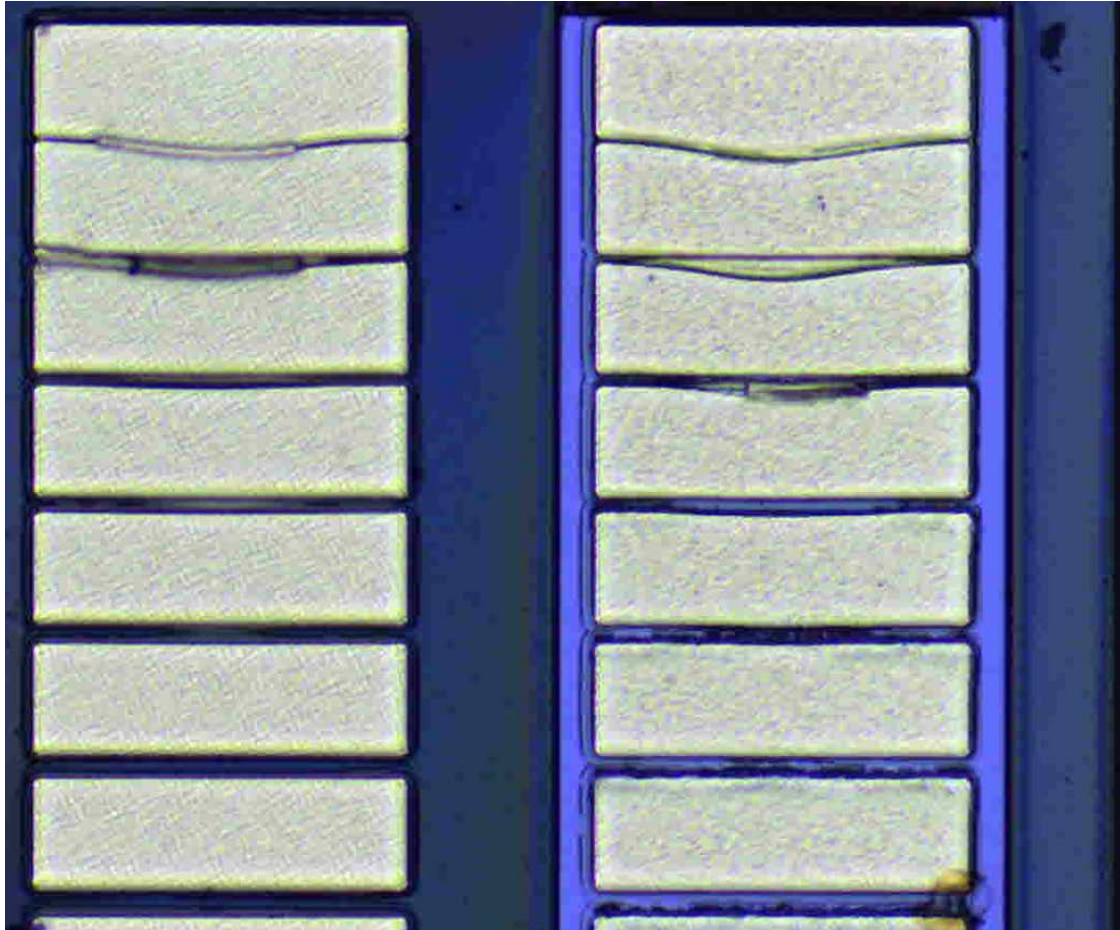
### Width

0.00% 20.00% 40.00% 60.00% 80.00% 100.00%



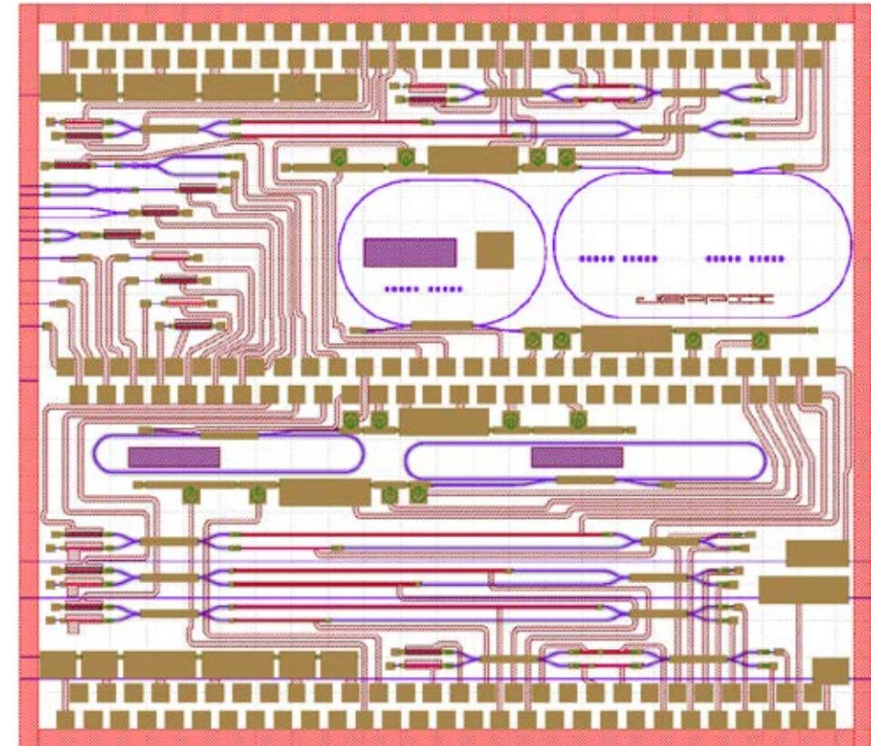
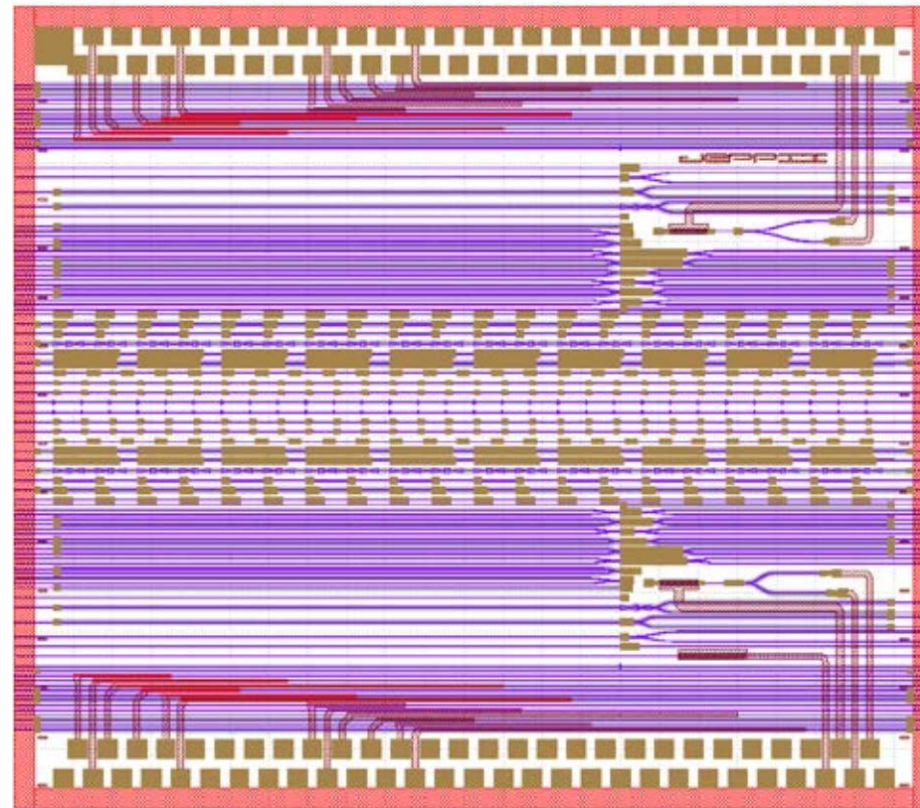
# Sheet below metal

No plating



# Status for automated testing

- SP20 BB test cells
- Multiprobe layout



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  - c. Bright Photonics
  - d. Effect Photonics
  - e. Technobis
3. Summary

## Agenda - Part II (start 15:00)

1. Last meeting's action points
2. Progress and issues to be raised per partner
  - a. TU/e
  - c. Bright Photonics
  - d. Phoenix
3. Summary