# Proposal for intermediate tests and process of assembly BM@N STS module

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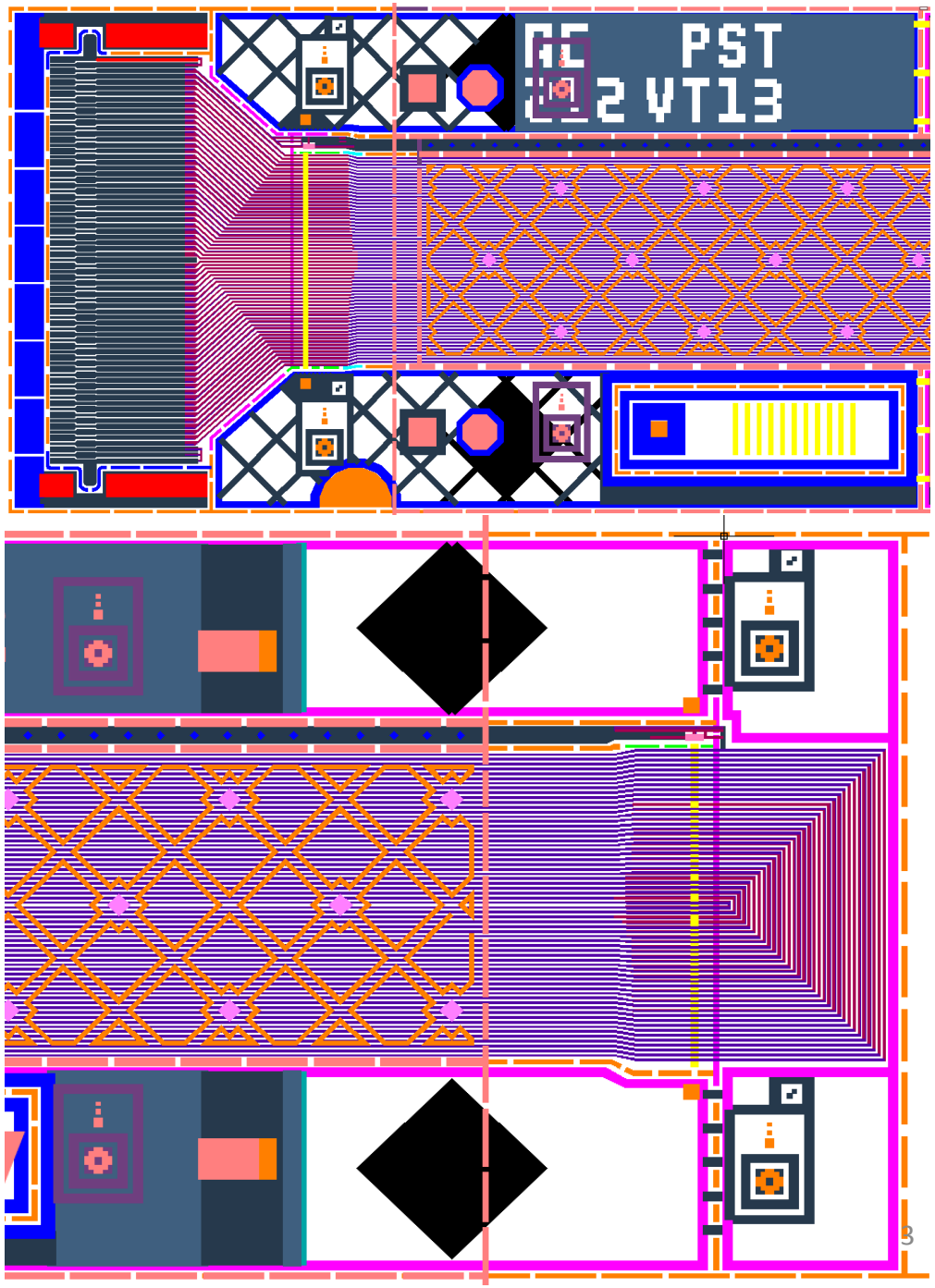
# Main stages of assembly process of STS BM@N module

- *Inspection of the cable set*
- *Inspection of the ASIC*
- *Inspection of the Si – sensor*
- *Inspection of the PCB*
- *Bonding Cable to ASIC (same procedure for both rows)*
- *Bonding "CABLE – ASIC" to Sensor (same procedure for both rows)*
- *Installing of the ASIC to the PCB*
- *Bonding of the ASIC to the PCB*
- *Assembly of the shielding layers on module*
- *Testing of completely assembly module*

Testing of completely assembly module: https://cernbox.cern.ch/index.php/s/yCtBinxqw5p8sxS

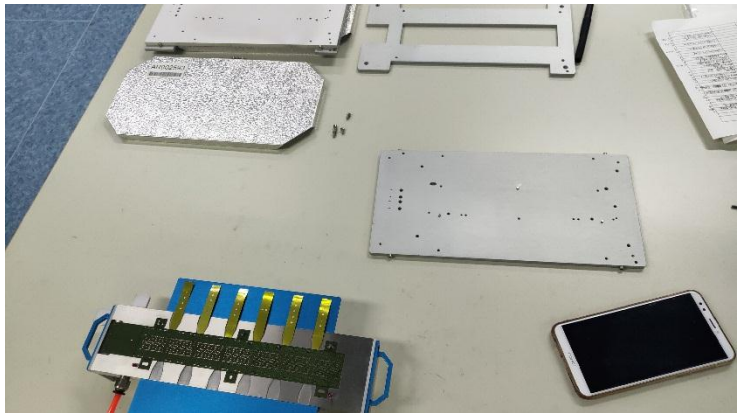
# Inspection of the cable set

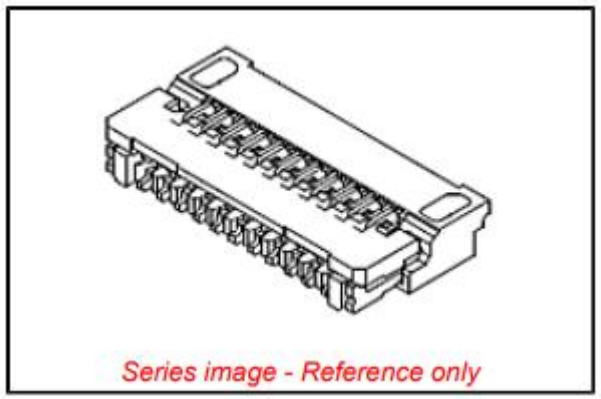
- Visual inspection after delivery (Several cable sets can be inspected).
- Measuring of the resistance of signal lines (Could be used with tail of cable).
- Load photos and data to local database.

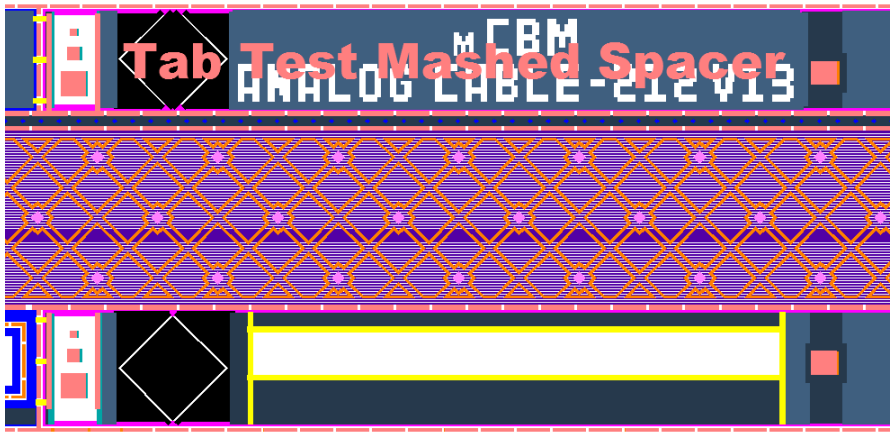


## Proposal for inspection of the cable set

- Manufacturing of new transport jigs for set of the microcables
- Design a new device for the test of resistance using tail of the cable (The connector for tail Molex 503419-0710)

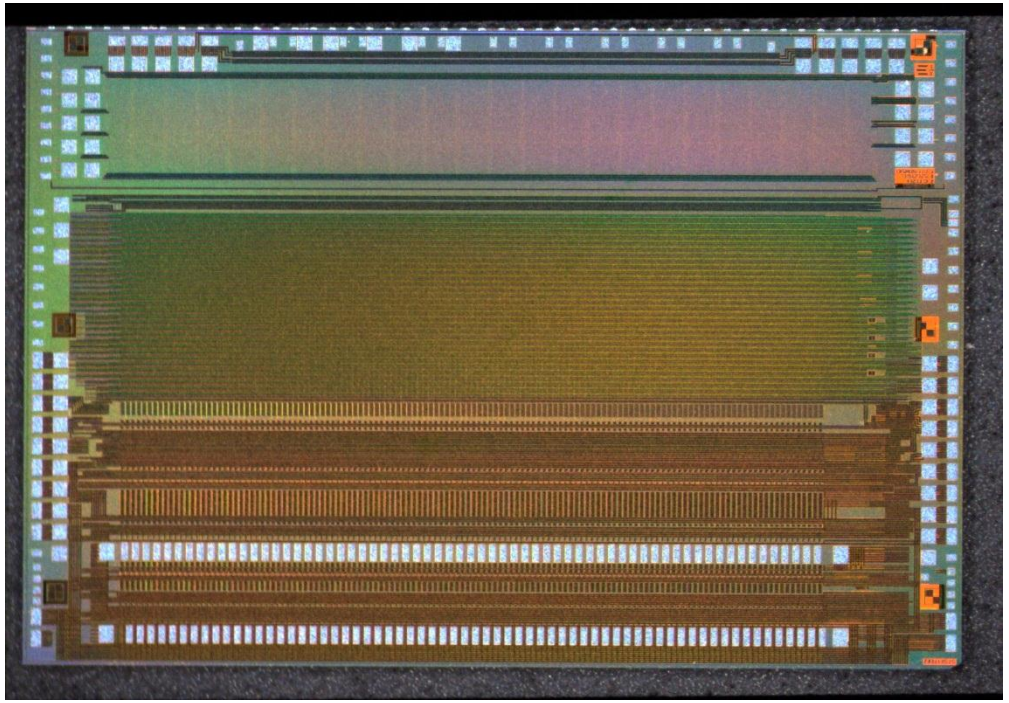


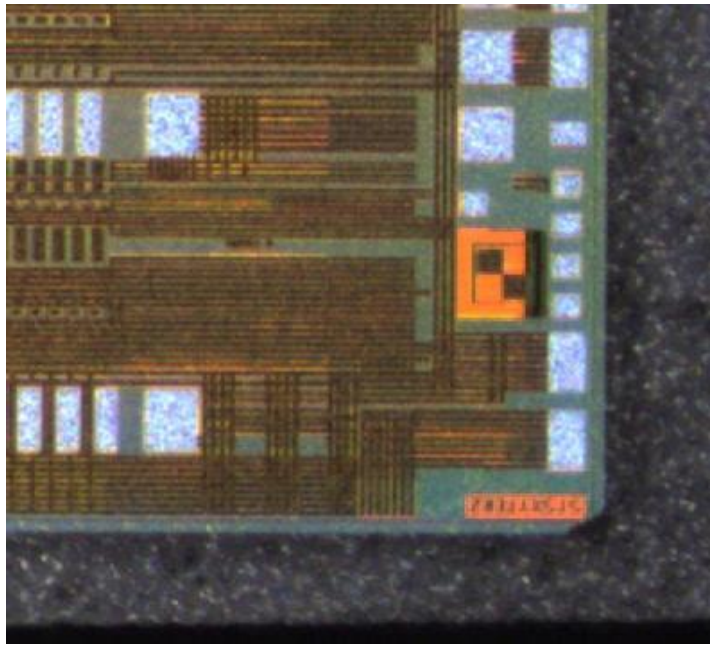


# Inspection of the ASIC

- Visual inspection (Before assembly).
- Testing of the ASIC with POGO pin tester.
- Preparation of the chips in ultrasonic bath (optional)
- Storage photos and data to local database.

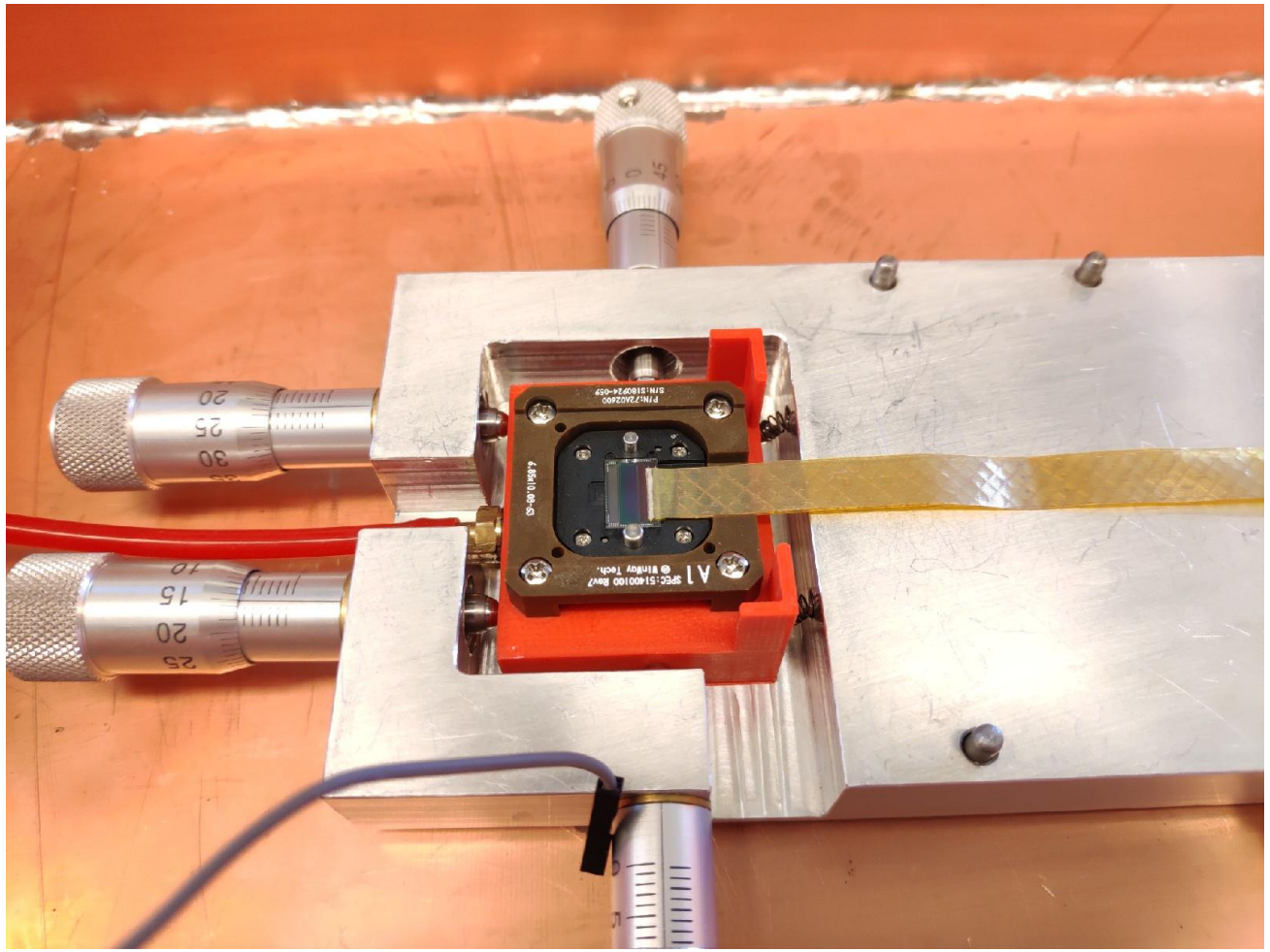




# Proposal of the inspection of the ASIC

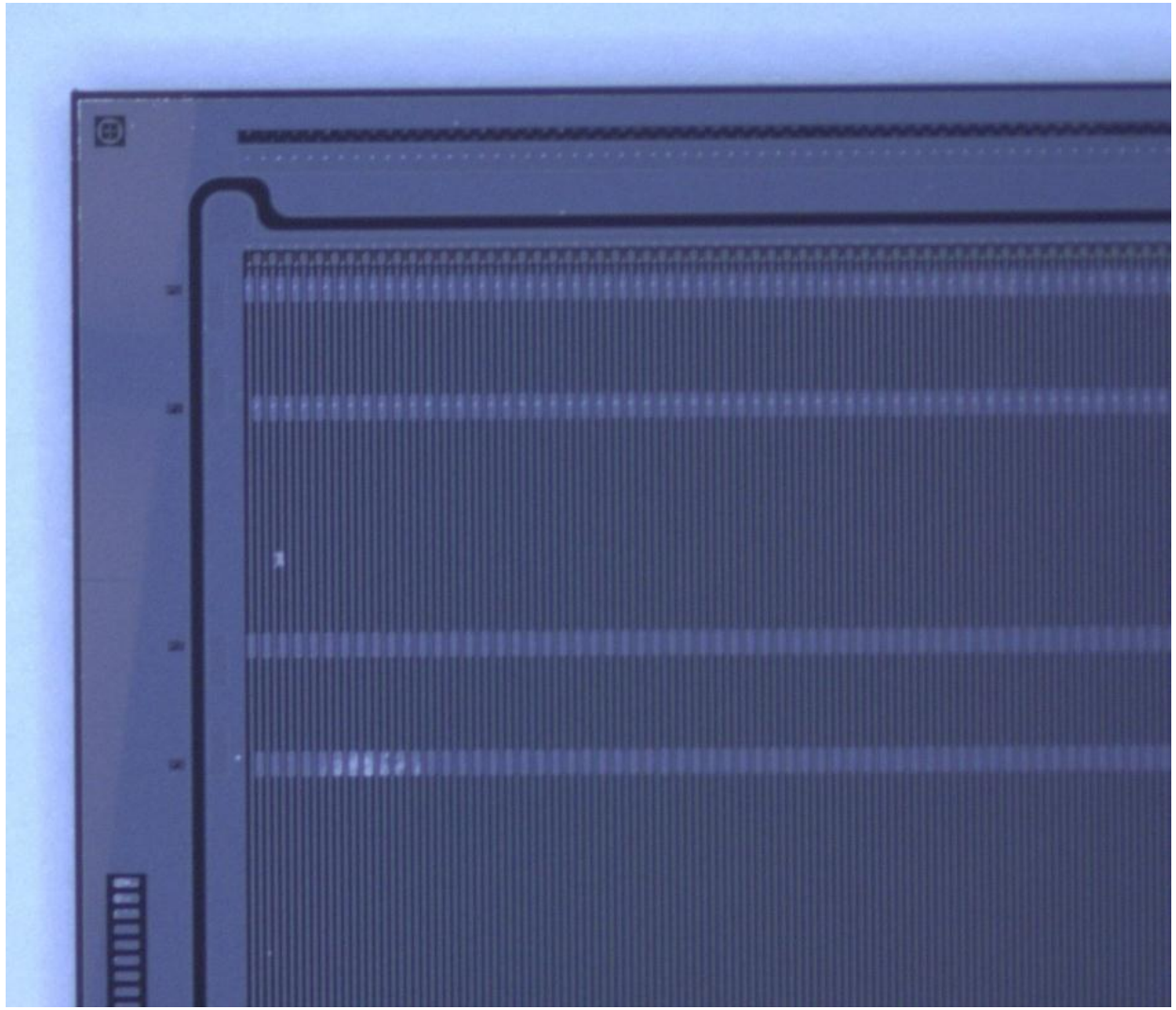
- Redesign base for the bonding «chip-cable» tooling

- Using the tail of the cable for intermediate testing during assembly of the "chip-cable“



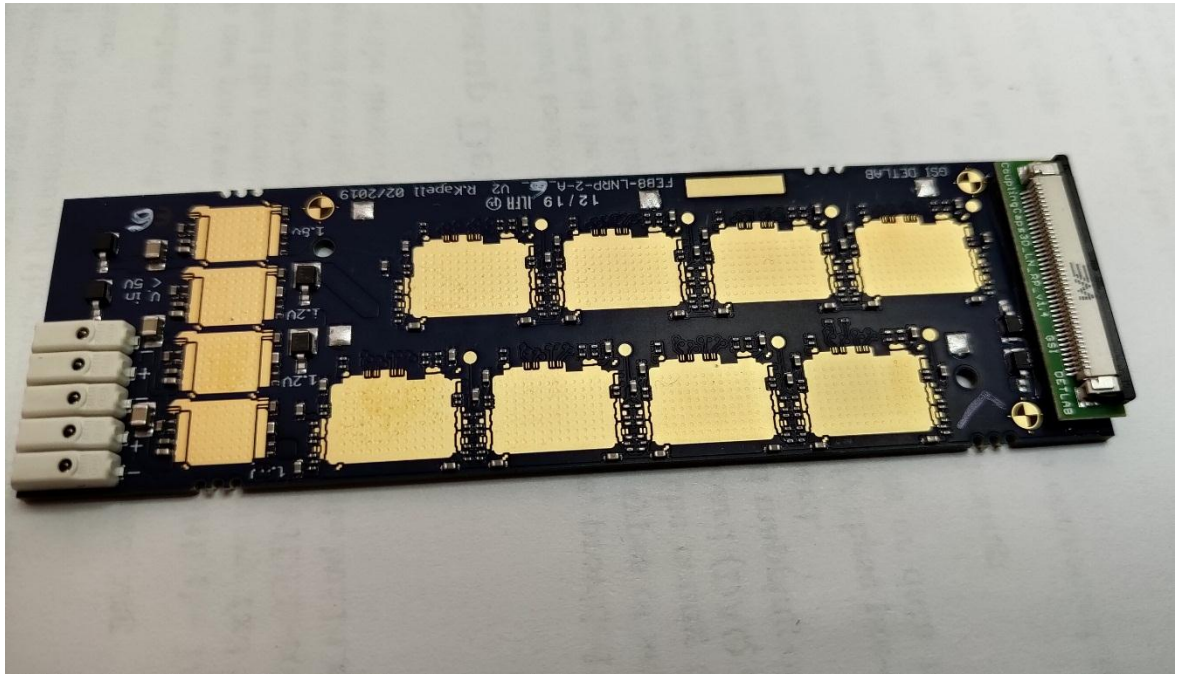
## Inspection of the Si – sensor

- Visual inspection (Before assembly).
- Tests with Probe station
- Storage photos and data to local database.



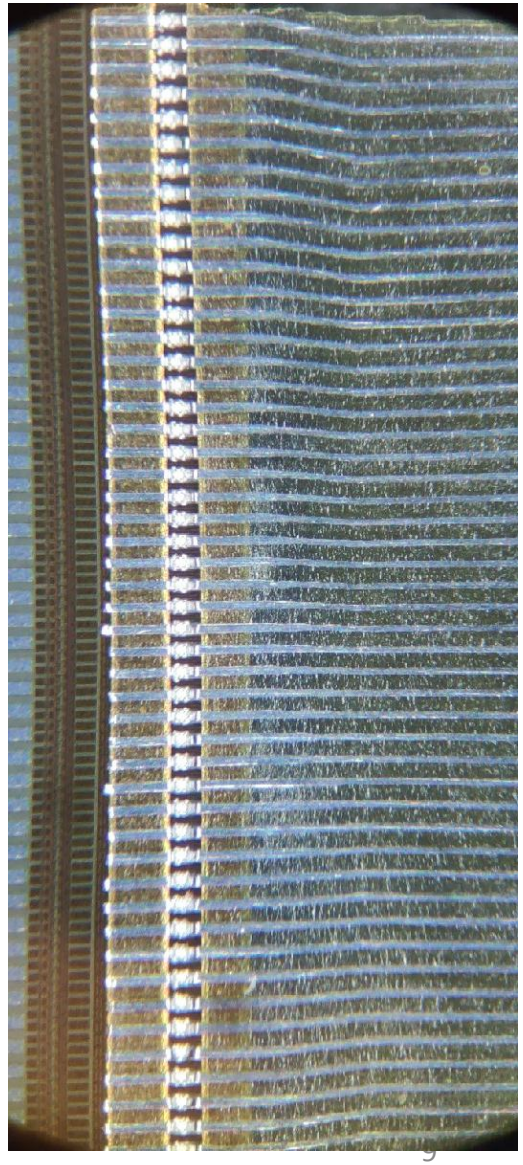
# Inspection of the PCB

- Prepare PCB with ultrasonic bath (Vigon US and Alcohol)
- Visual inspection of bonding pads.
- Electrical test of the PCB
- Storage photos of bonding pads and places for glue ASIC to the local database.



# Bonding “Cable to ASIC” (same procedure for both rows)

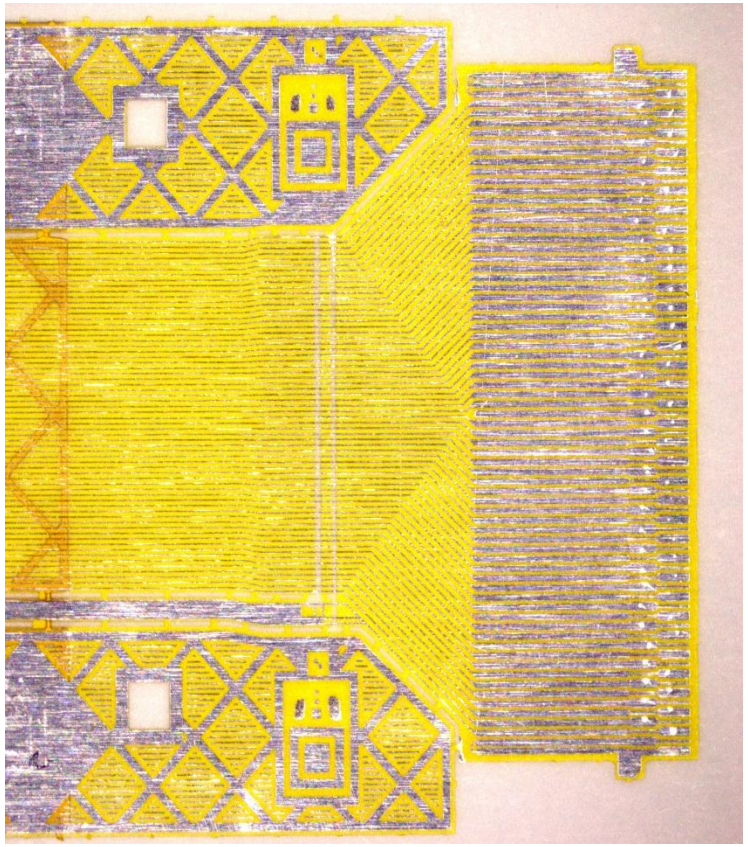
- Adjustment of the bonding machine (Cutting of the test areas on the cable. Selection of the optimize parameter of bonding).
- Pull test with DOGE4000 (Storage of the log file to database).
- Bonding cable to ASIC (Storage of the log file on Delvotec G5 to database and load the photo of bonding).
- Test of the “ASIC – CABLE” (Measuring noises with test tail on the cable with special jig and Arduino).
- Bond row protection with glue Fuller Epolite FH-5313 (Storage photo of the protected row to the database).

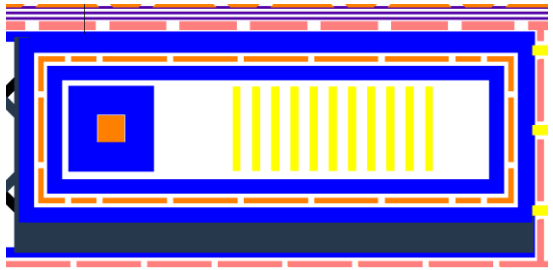


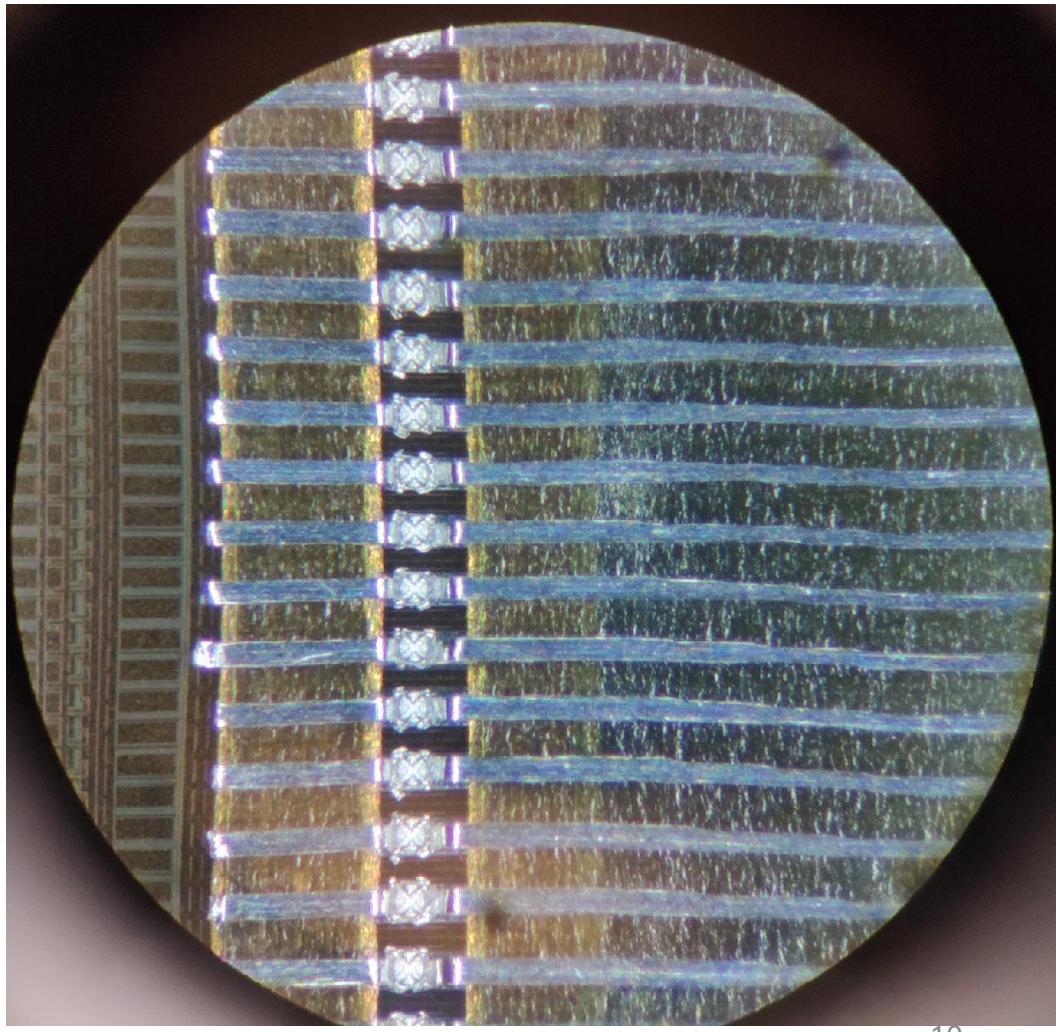
# Proposal of the bonding Cable to ASIC

# (same procedure for both rows)

- Redesign of the test area on the cable for optimize to pulltest machine

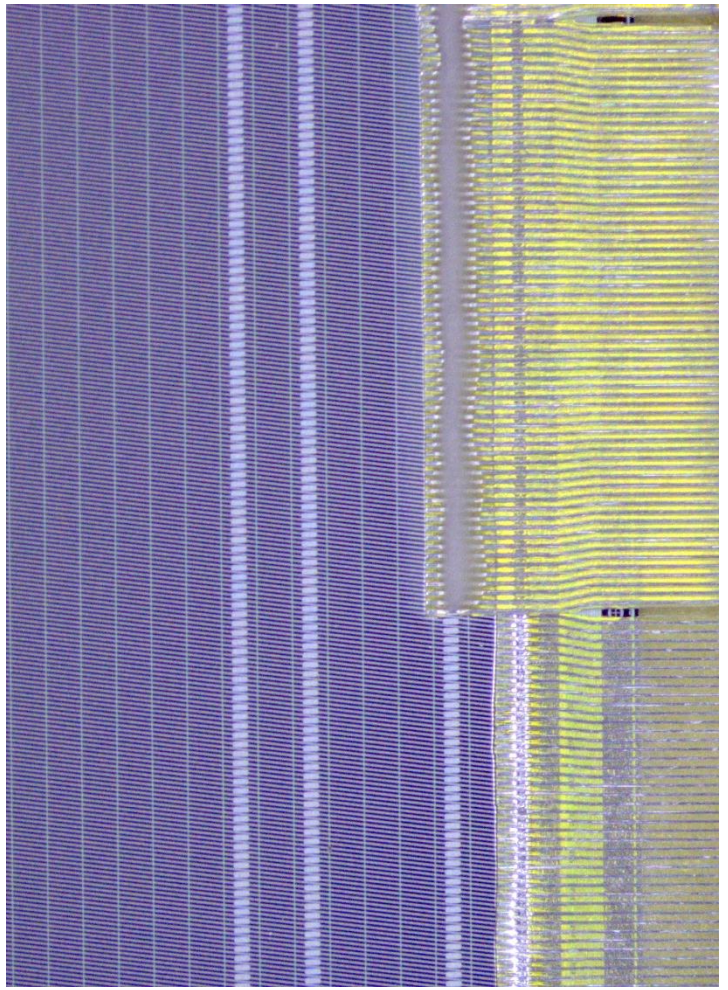






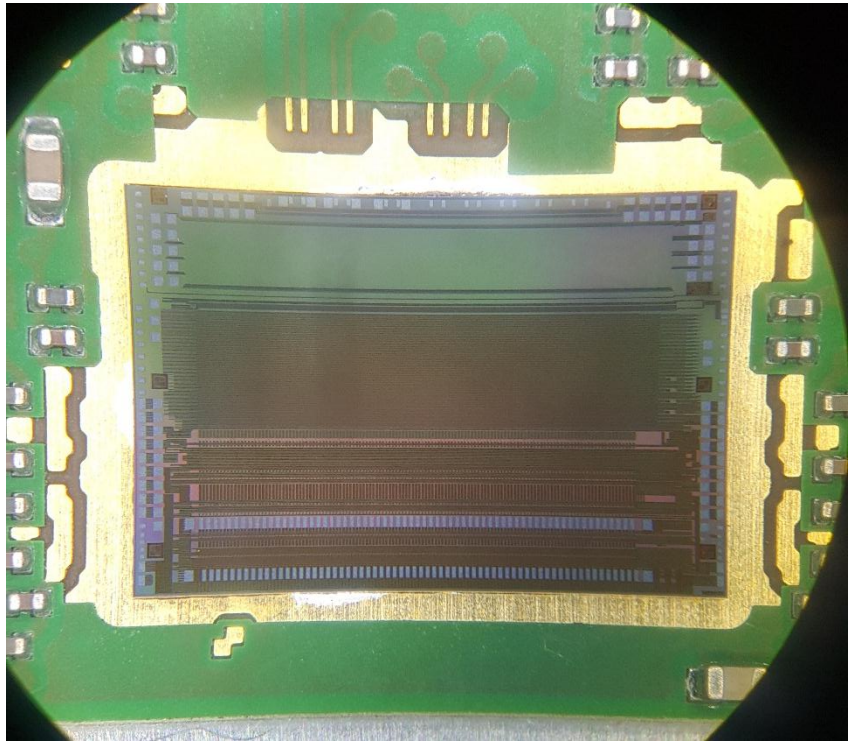
# Bonding “CABLE – ASIC” to Sensor (same procedure for both rows)

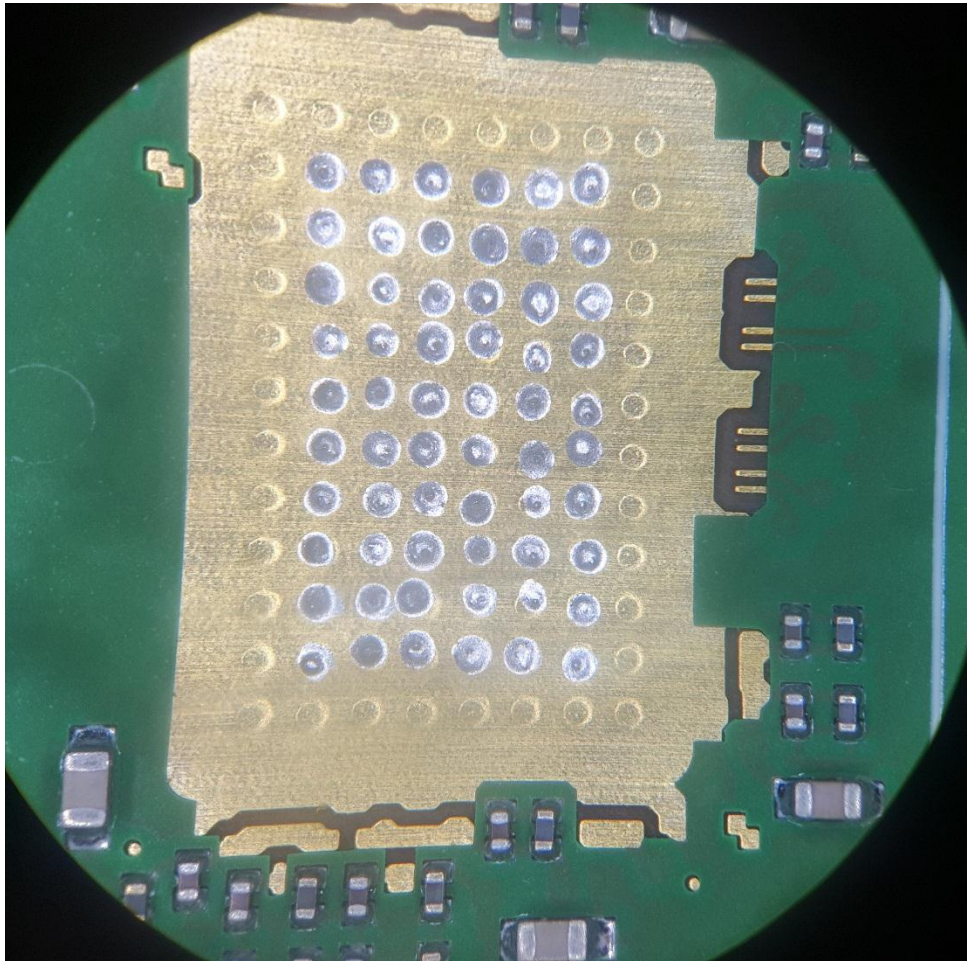
- Adjustment of the bonding machine (using previously selected parameters for bonding cables).
- Bonding of first row “CABLE – ASIC” to Sensor (Storage log file on Delvotec G5 to database and save photo of bonding).
- Test of the “ASIC – CABLE – SENSOR” first bonding row (used POGO pin tester).
- Bonding of the firth row protection with glue Fuller Epolite FH-5313 (Storage photo of the protected row to database).
- Bonding of the second row “CABLE – ASIC” to Sensor (Storage of the log file on Delvotec G5 to the database and load photo of bonding).
- Test of the “ASIC – CABLE – SENSOR” second bonding row (used POGO pin tester).
- Bond row protection with glue Fuller Epolite FH-5313 (Storage photo of the protected row to the database).



# Installing of the ASIC to the PCB

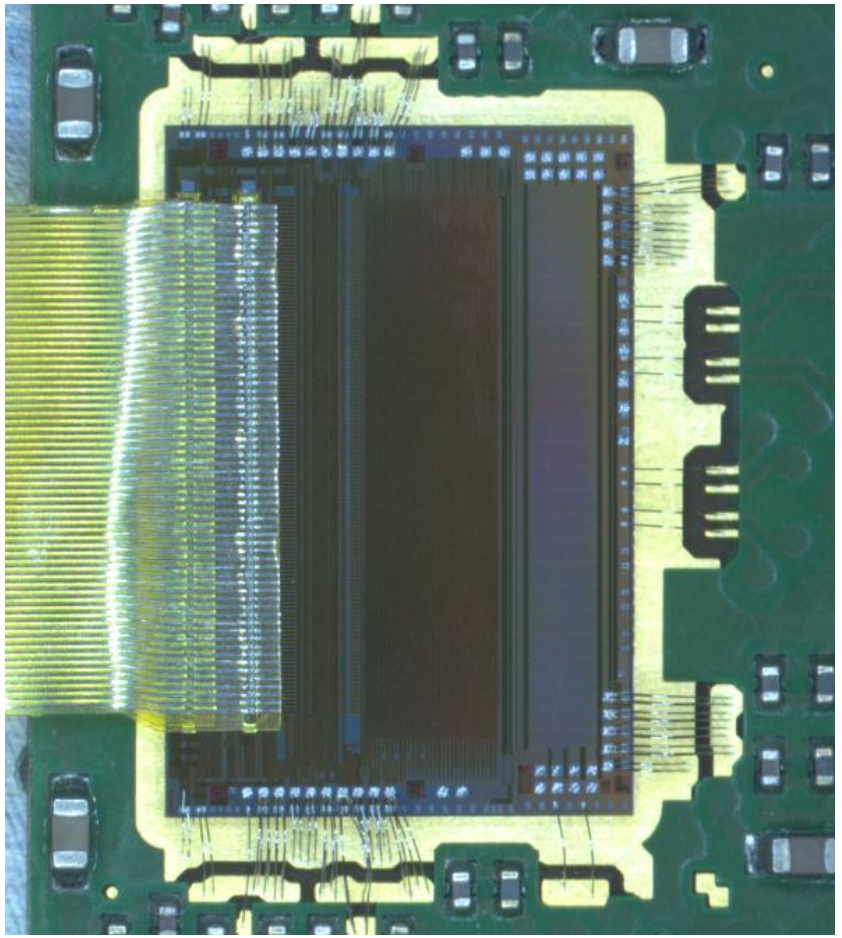
- Glue preparation with mixer Thinky ARE-250
- Encapsulation with glue EpoTex T4110 in oven 60 $^{o}$C
- Photos of each ASIC's (Storage in database)





# Bonding of the ASIC to the PCB

- Adjustment of the bonding machine (used test pads on PCB).
- Pulltest on DOGE4000 (The log file will be storage to database)
- Wire bonding “ASIC – CABLE” (Storage of the log file on Delvotec G5 to the database and load photo of bonding).
- Test of the “ASIC – CABLE” (load photos each bonding ASIC to database).
- The ASIC protection with Polytec UV 2257 and Polytec UV2249 glue (save photo of the protected chips to the database).



# Assembly of the shielding layers on module

- Soldering of the shielding cables to the PCB
- Protected of glue shielding cables to the PCB
- Assembly of the shielding layers for P- and N-side on STS module (with araldite 2011).