sPHENIX INTT

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Takahito Todoroki, Itaru Nakagawa (RBRC)

Takashi Hachiya, Ayaka Suzuki, Miu Morita, Mika Shibata (NWU)
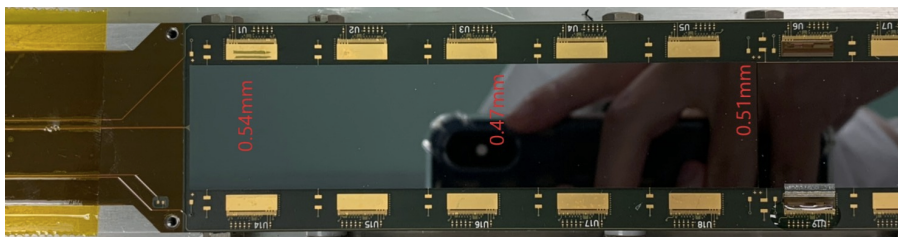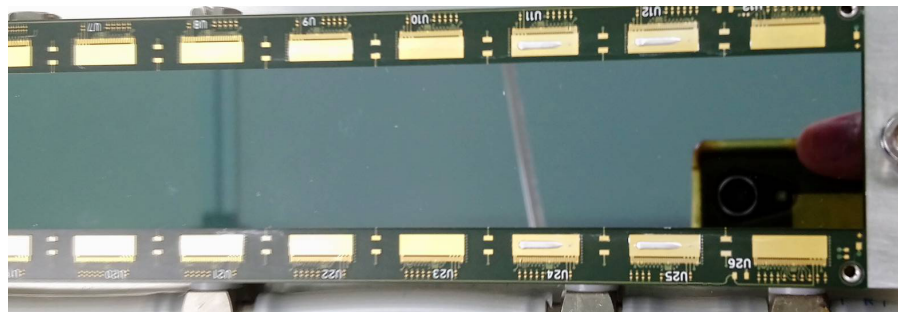
Rachid Nouicer (BNL)

Dummy sensor placing error

Test area : type A and B (dummy sensor (320μm), rejected HDI were used)

Assembly in 2020/05/20

Measurements done by OGP

Name	Midpoint (x,y) mm
Dummy sensor A	(12.561,-167.203)
HDI	(12.575,-167.176)

Type A

Name	Midpoint (x,y) mm
Dummy sensor B	(12.577,-51.004)
HDI	(12.553,-50.986)

Type B

Placing error
Type A -> X : 14μm, Y : 27μm
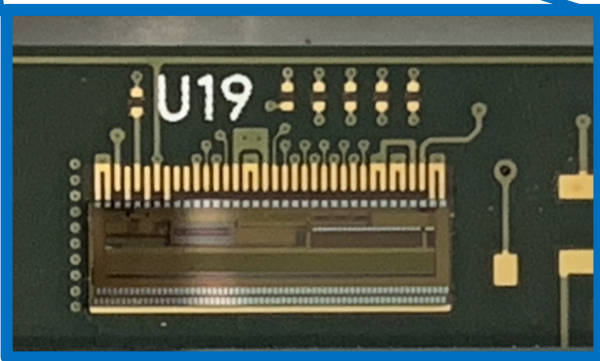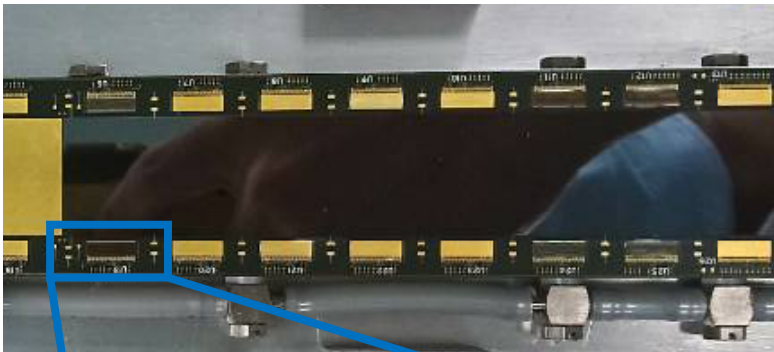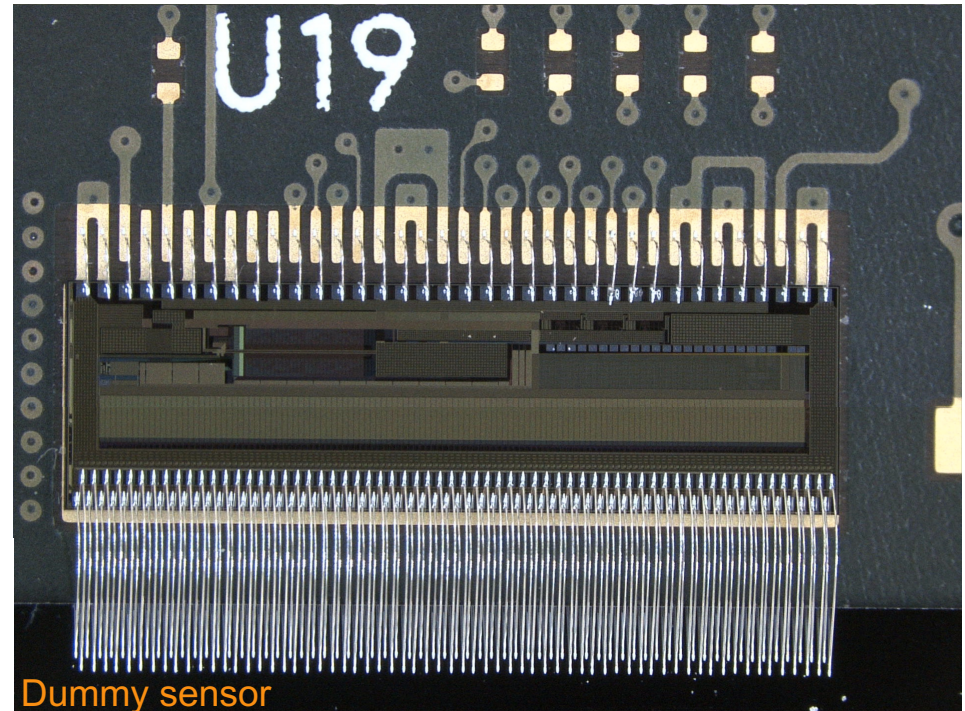Type B -> X : 24μm, Y : 18μm

Reach the requirement !!!

Test area : type A (dummy sensor (320μm), rejected HDI were used), Test Chips : 6 (new bad chips)

assembled in 2020/05/19

Bonding in 2020/05/20

Dummy sensor
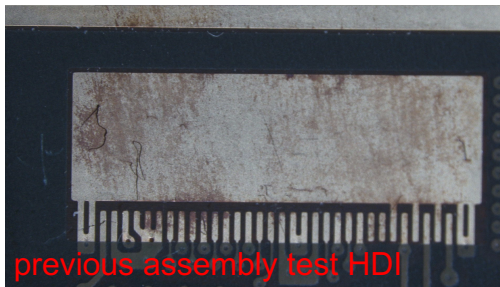
Area : type A and B (good sensors, pre production HDI were used), 26 good chips

Before module assembly

oxidation rust appears

previous assembly test HDI

Cleaned by eraser

Bonding test
Too make sure the surface is smooth enough

First real module assembly in Taiwan

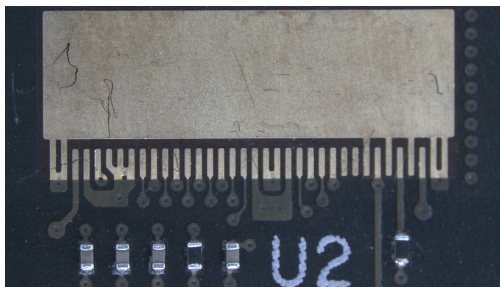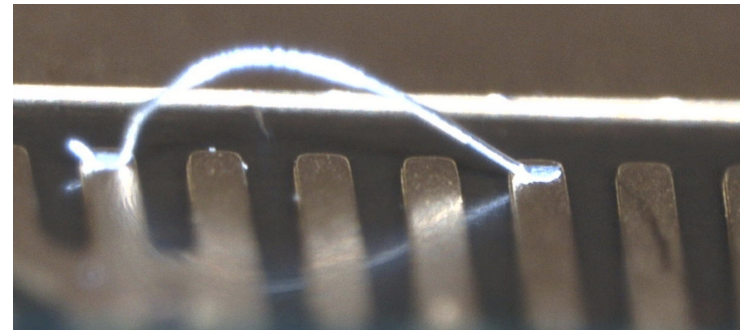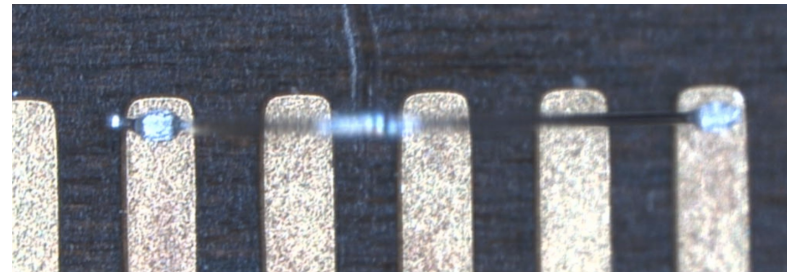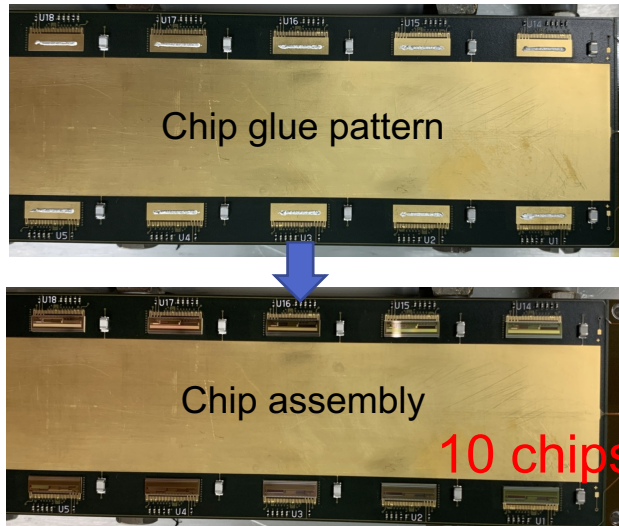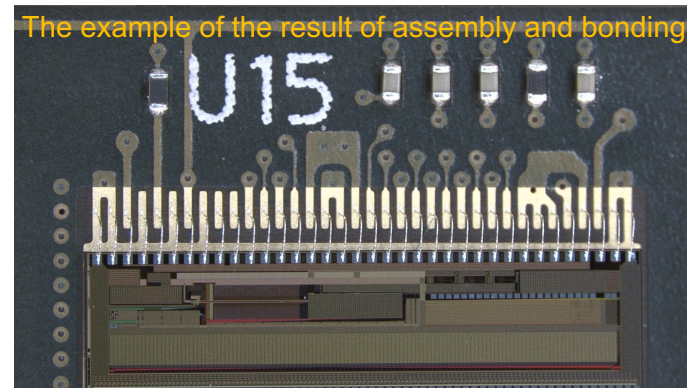Area : type A and B (good sensors, pre production HDI were used), 26 good chips

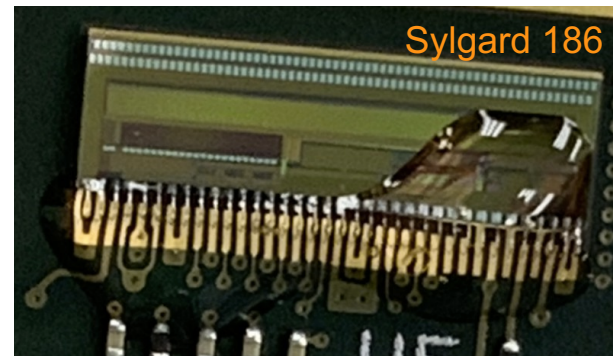First : Type B area, 10 chips assembly and bonding in NTU

Chip glue pattern

Chip assembly

The example of the result of assembly and bonding
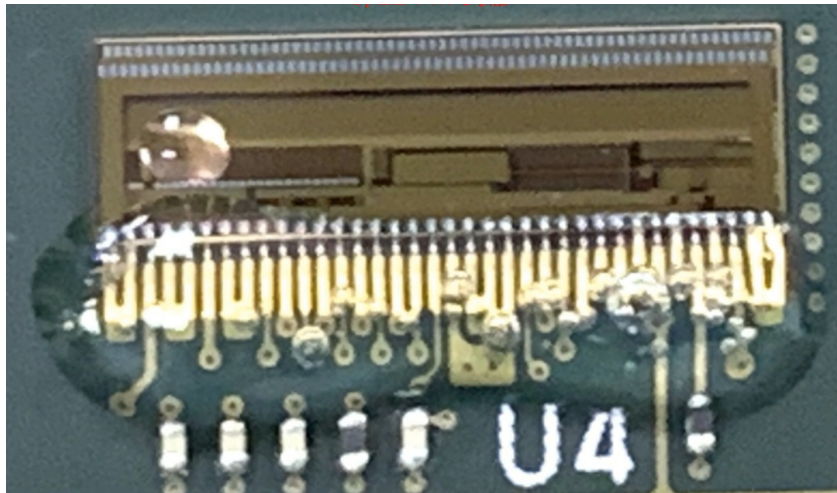
10 chips are looked to be good !!!

To cure the glue fast,
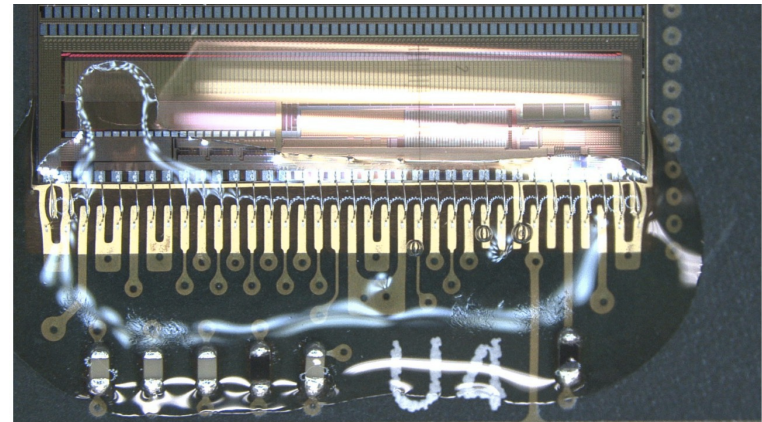Bake HDI for 45 ^0C 1.5 hrs, then 25 ^0C 0.5 hr

Sylgard 186

Bonding wire is encapsulated to avoid the oxidation rust happen

Assembly problem

The sylgard 186 spreads during 3 days curing

2020/05/22　　　　　　　　　　　　　　　2020/05/25

Some of channels of chips in type B area can not work…..

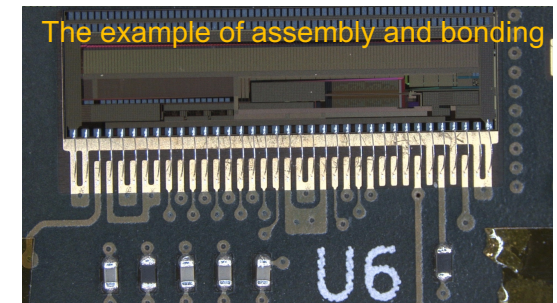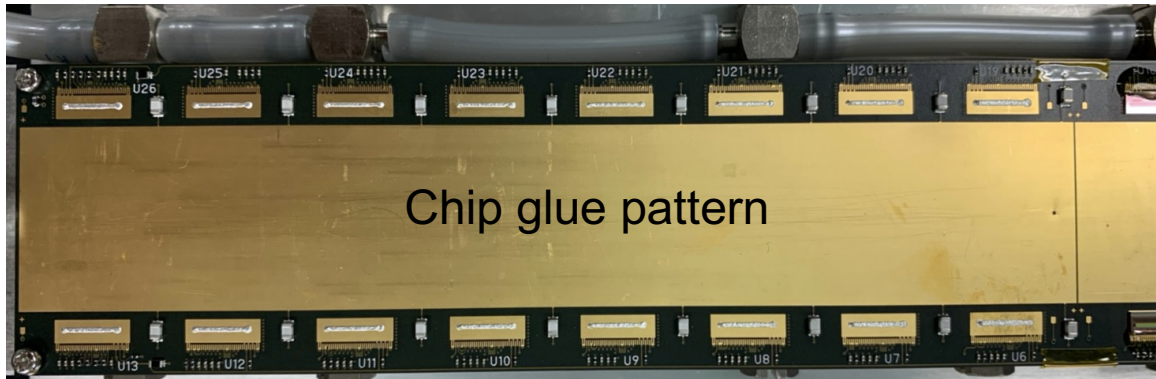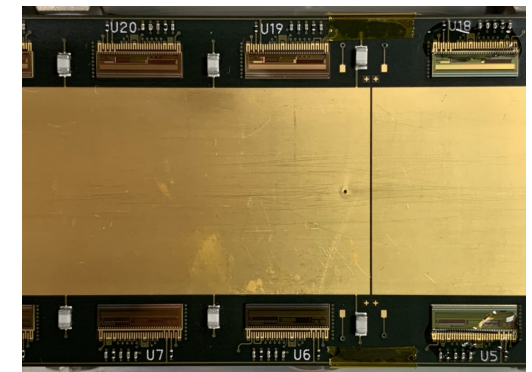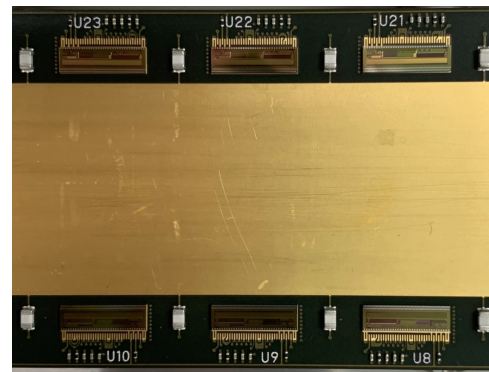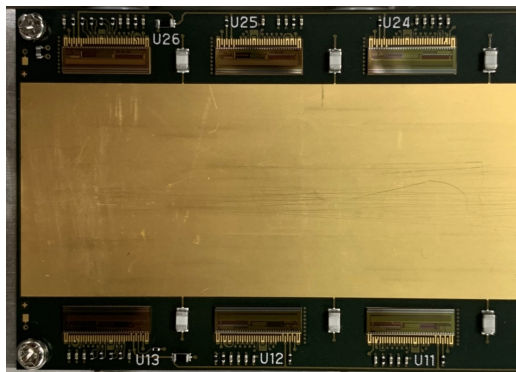Area : type A and B (good sensors, pre production HDI were used), 26 good chips

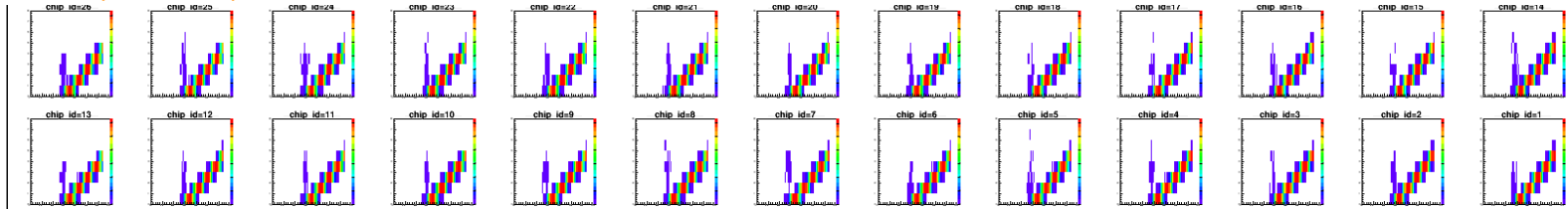Second : Type A area, 16 chips assembly and bonding in NTU

Chip glue pattern

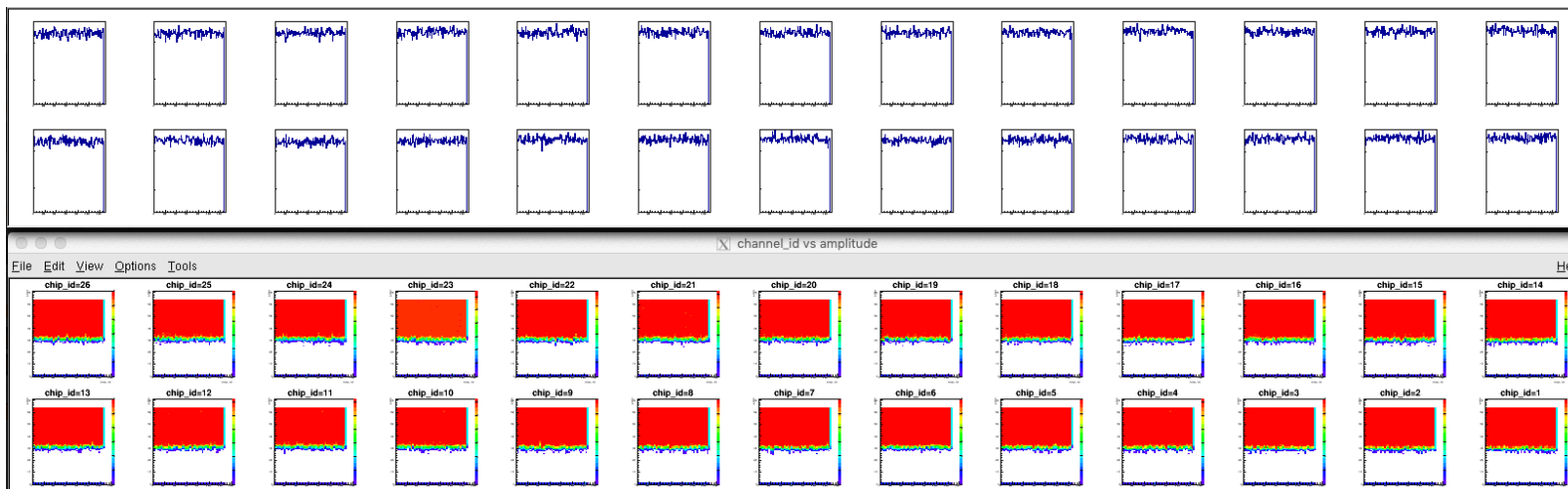The example of assembly and bonding

U6

16 chips are looked to be good !!!

Calibration test in NCU

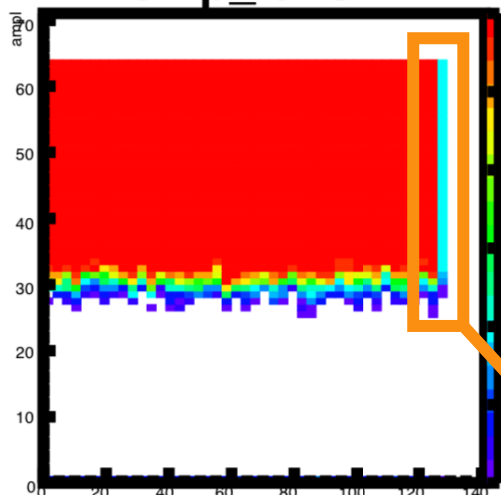Draw("COLZ0")

All chips are working functionally !!!

HDI

FPHX

Bond wire

Weird scratch

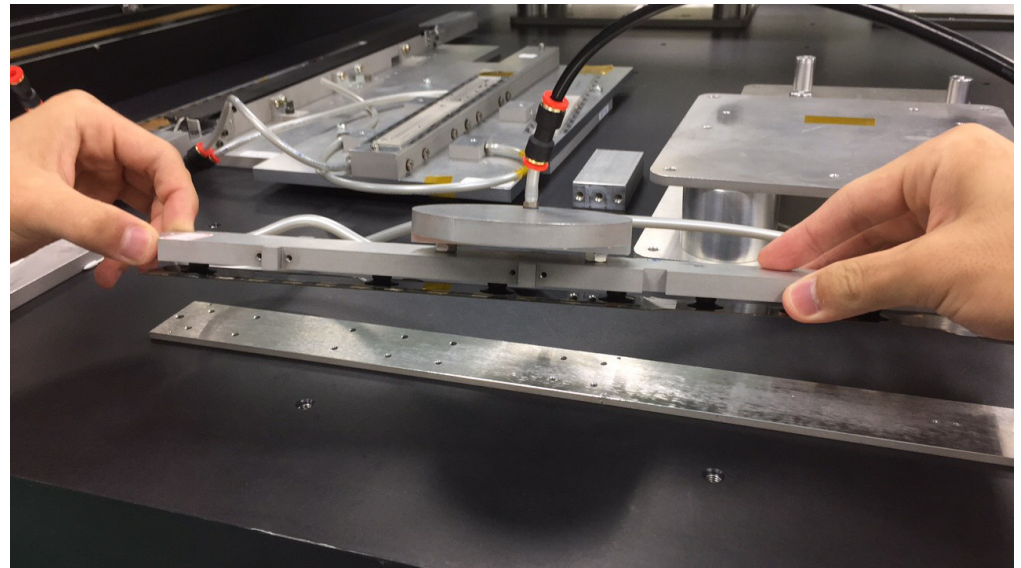|			Read	Write	Set	Reset	Default
DAC0	20		Read	Write	Set	Reset	Default
DAC1	25		Read	Write	Set	Reset	Default
DAC2	30		Read	Write	Set	Reset	Default
DAC3	35		Read	Write	Set	Reset	Default
DAC4	40		Read	Write	Set	Reset	Default
DAC5	45		Read	Write	Set	Reset	Default
DAC6	50		Read	Write	Set	Reset	Default
DAC7	55		Read	Write	Set	Reset	Default

chip_id=8

Change the bin width

Unfunctional channel 128?

Module pick up tool

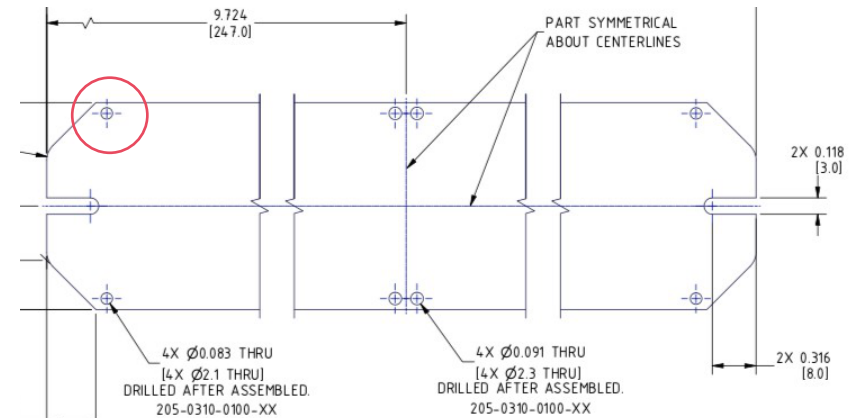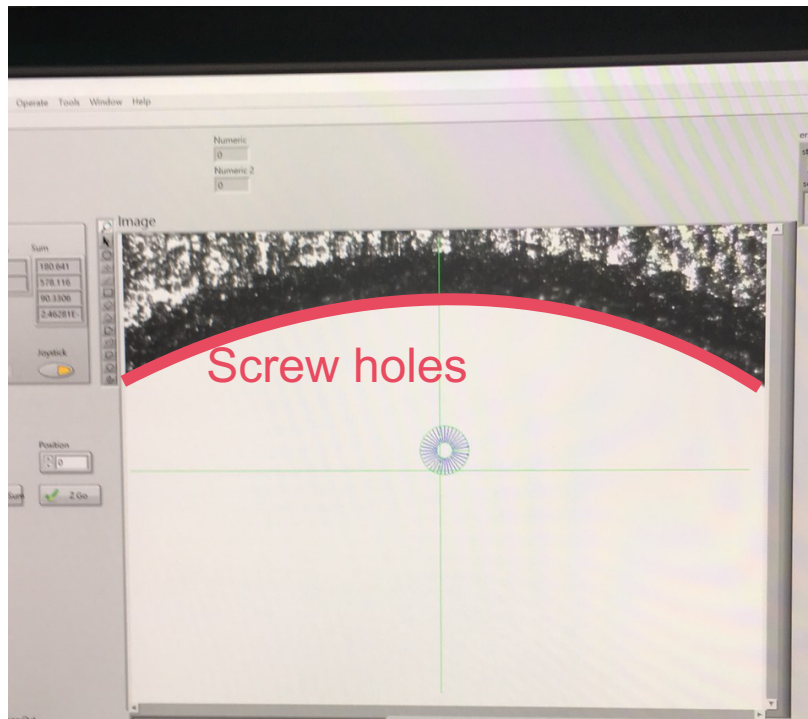Ladder assembly tray

Module pick up tool

- ## No alignment holes on stave

We try to use the screw holes as alignment holes, it is too big

Screw holes

9.724
[247.0]

PART SYMMETRICAL
ABOUT CENTERLINES

2X 0.118
[3.0]

2X 0.316
[8.0]

4X Ø0.083 THRU
[4X Ø2.1 THRU]
DRILLED AFTER ASSEMBLED.
205-0310-0100-XX

4X Ø0.091 THRU
[4X Ø2.3 THRU]
DRILLED AFTER ASSEMBLED.
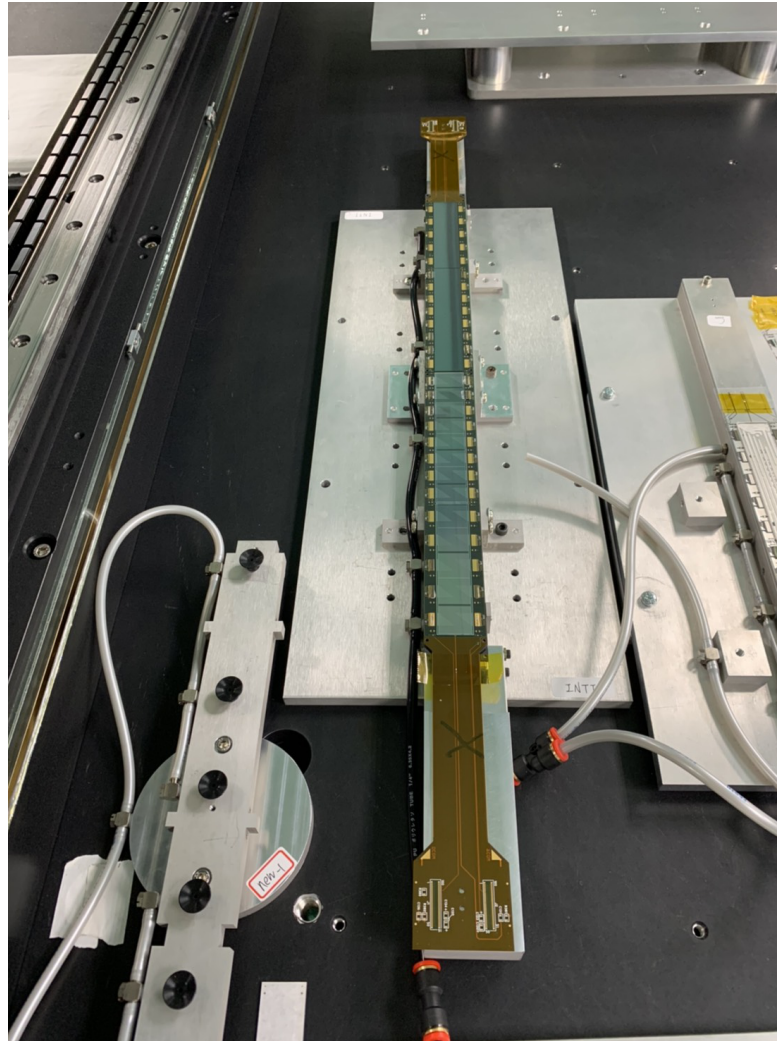205-0310-0100-XX

Is it possible to add the alignment marks on stave ?

- Assemble and bond good sensors on HDI.
- Measure the placing error by OGP
- Produce first two real modules ASAP

Back up

Cheng Wei, Shih (NCU HEP, Taiwan)
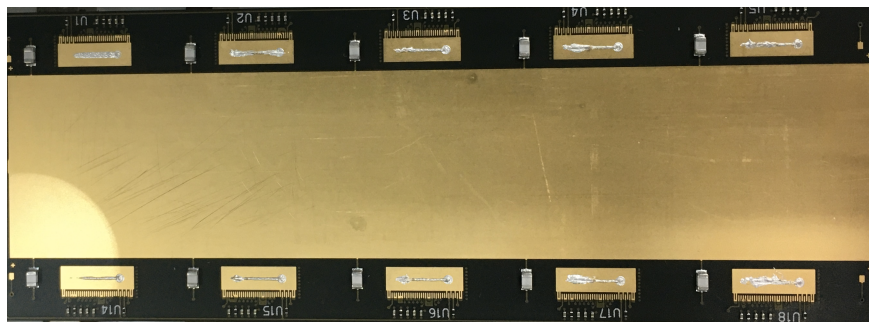
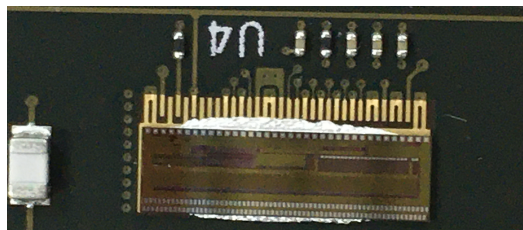# First chips assembly test

Test area : type B
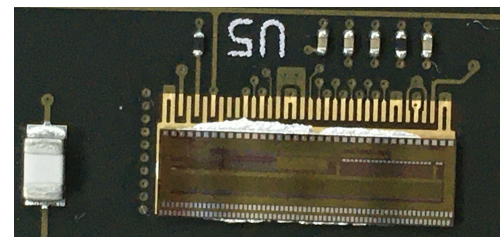Test Chips : 10

Apply glue

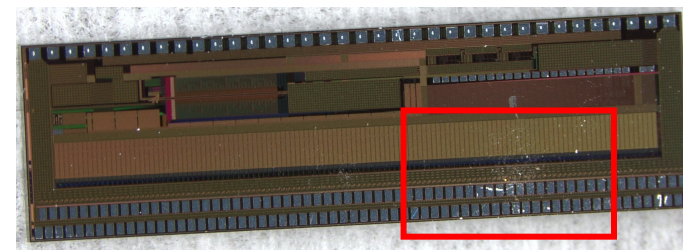Place all chips →

Place all chips ↓

The leakage of glue is too much

Remove all chips
Clean the HDI ↓

Remove all chips
Clean the HDI →

The HDI looks ok, 10 chips is considered to be bad