

The left side of the slide features a decorative design consisting of several vertical bars of varying heights and widths, and a cluster of five circles of different sizes, all in shades of gold and beige. The largest circle is positioned near the top left, with smaller circles arranged below and to its right.

# **DESIGN REVIEW**

## **STURM2**

**SAMPLER OF TRANSIENTS FOR THE  
UNIFORMLY REDUNDANT MASK**

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# OVERVIEW

- ❑ STURM2 device is a part of the KEKB particle accelerator upgrade and it is used to monitor electron beam bunches profile
- ❑ When electron beam is bended, it emits an X-ray beam and that's focused to the fermionics sensor
- ❑ The STURM2 can measure the location, profile and angle of the beam right before the collision point, allowing the physicist to adjust the beam as he desires.
- ❑ When implemented, the STURM2 device will be the most accurate real-time, turn-by-turn monitoring system.



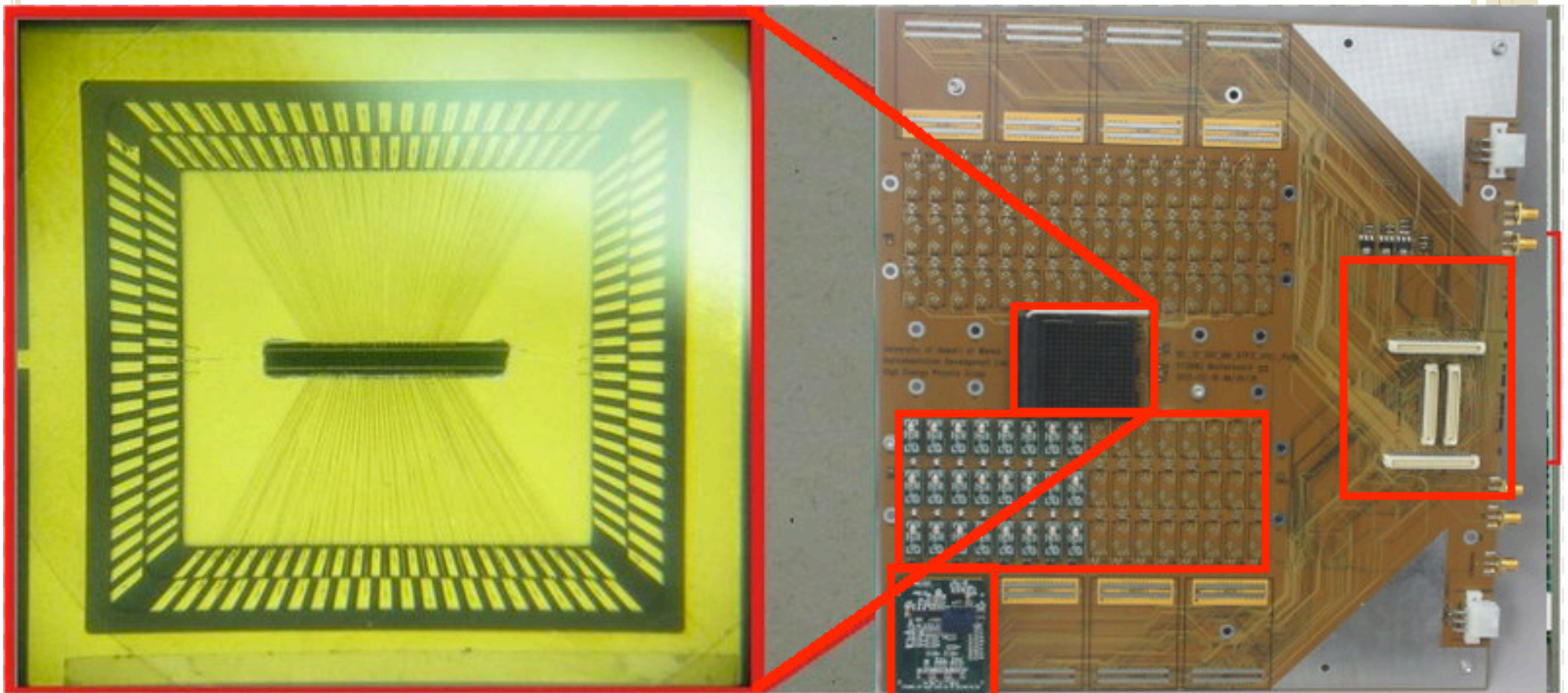
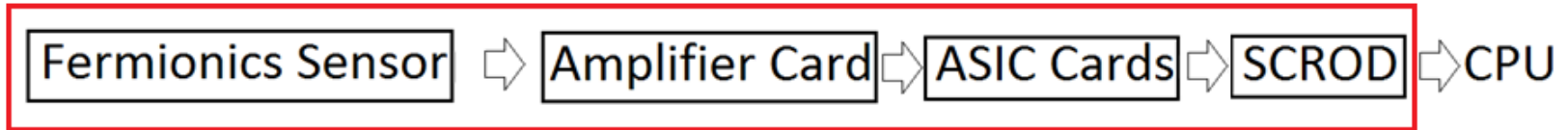
# SPECIFICATIONS

- ❖ 192 amplifier cards
- ❖ 8 ASIC cards
- ❖ The sampling speed of the device is 10 giga samples per second
- ❖ Input signal is  $35 \mu\text{V}$
- ❖ Analog signal is amplified by 60dB with 3x20dB amplifier
- ❖ ASIC cards makes an 12 bit analog / digital conversion



# BLOCK DIAGRAM

Motherboard



## PROBLEMS / SOLUTIONS

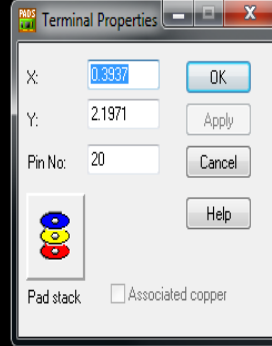
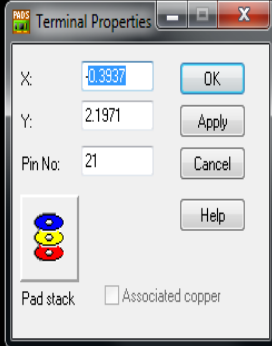
- Footprint of the connectors on the motherboard and ASIC card was wrong
  - The gap between connectors legs was 0.7875mm → supposed to be 0.8mm
- Changed DCs regulator LD39015 (V4) and MBs regulator LT3020ED (V39) to AP7333
  - Simpler
- Part of MBs top solder mask was missing → added
- MBs 6PIN\_MOLEX connector had wrong functions → made new decal
- Added more vias to MBs cooling areas for more reliability



## PROBLEMS / SOLUTIONS

- Amplifiers doesn't work on the motherboard like wanted → lot of oscillation
  - Tried with bigger attenuator → still lot of oscillation
  - Using two amplifiers the oscillation wasn't that big
- Firmware doesn't work properly yet...
  - STURM2eval-Board got broken
  - Moving to work with firmware with SCROD



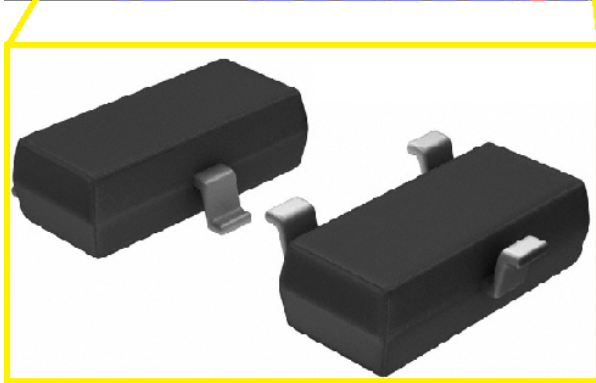
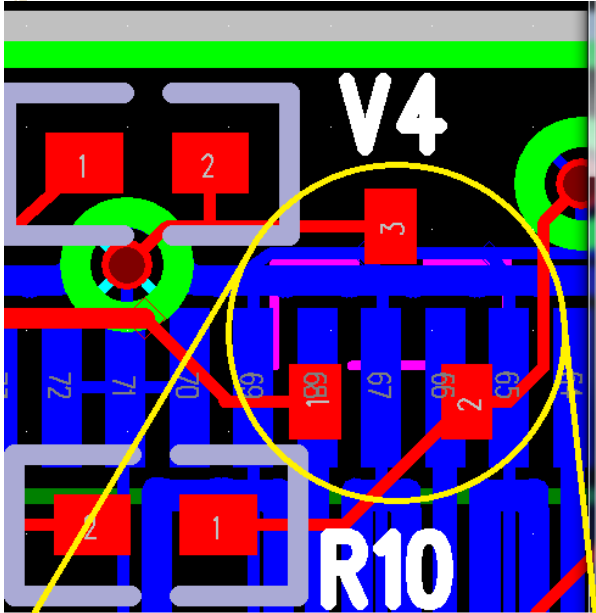


$$0.3937\text{mm} - (-0.3937)\text{mm} = 0.7874\text{mm}$$

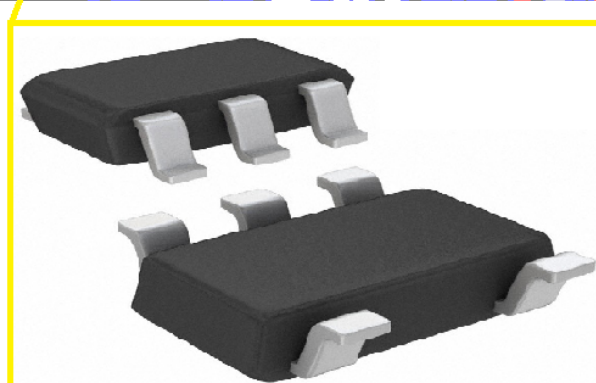
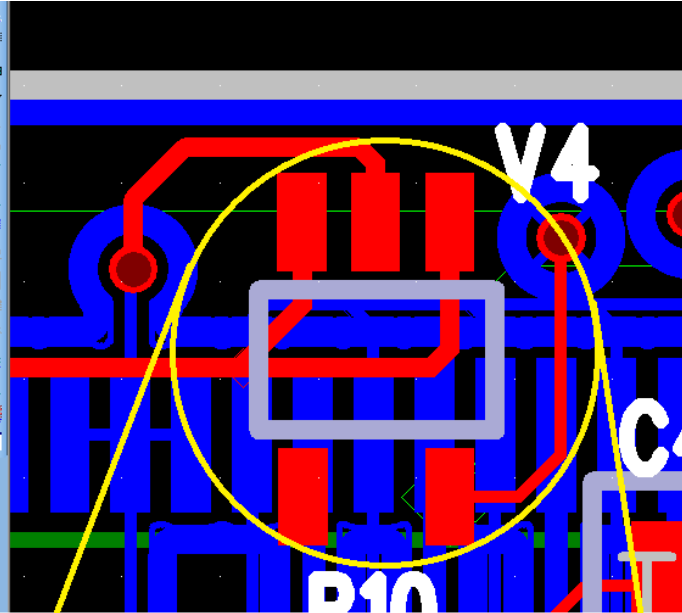




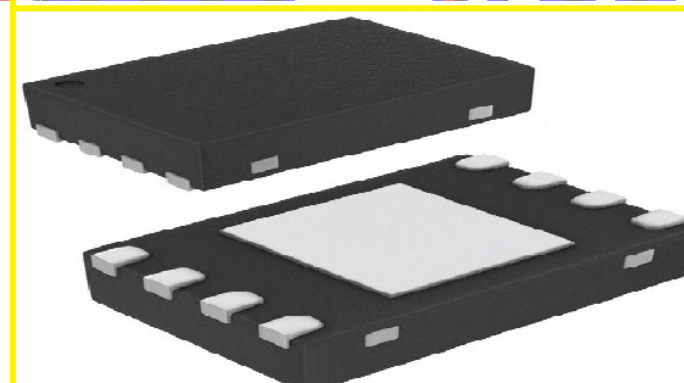
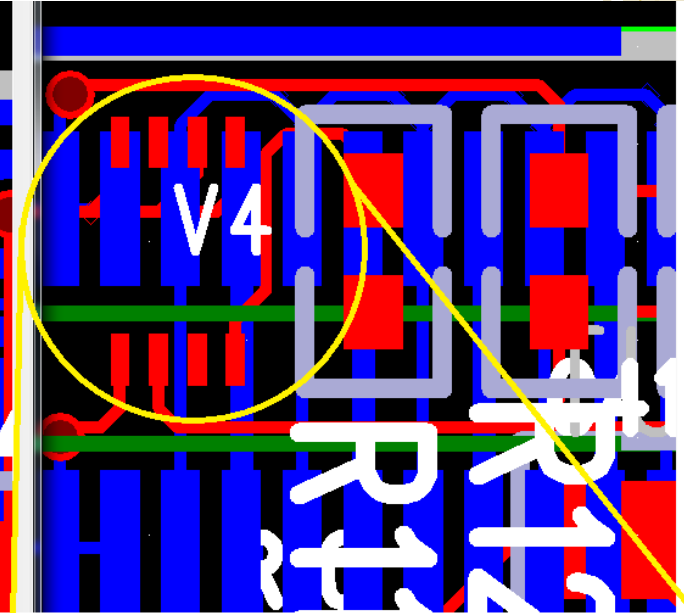
AP7333

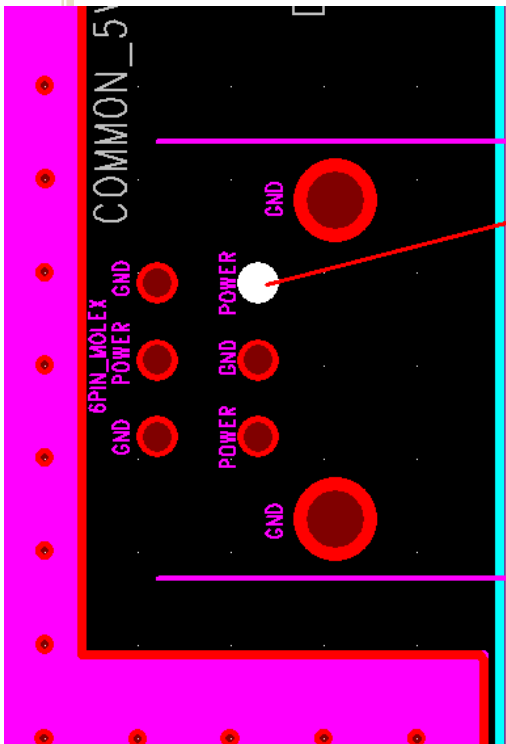


LD39015



LT3020EDD





Pin Properties

Ref. des.: COMMON\_5V

Pin No: 6

Pin type: G

Function: GND

Swap id: Unswappable

Net: 5V

Coordinates

X: 10060

Y: 1577

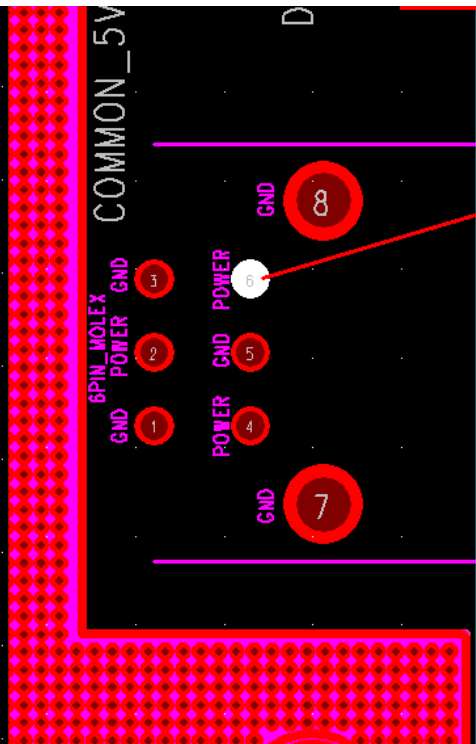
Connection:

COMMON\_5V.4-COMMON\_5V

Teardrops  Test point

Plane thermal  Top access

Pad stack Component Attributes



Pin Properties

Ref. des.: COMMON\_5V

Pin No: 6

Pin type: P

Function: POWER

Swap id: Unswappable

Net: 5V

Coordinates

X: 255.524

Y: 40.0558

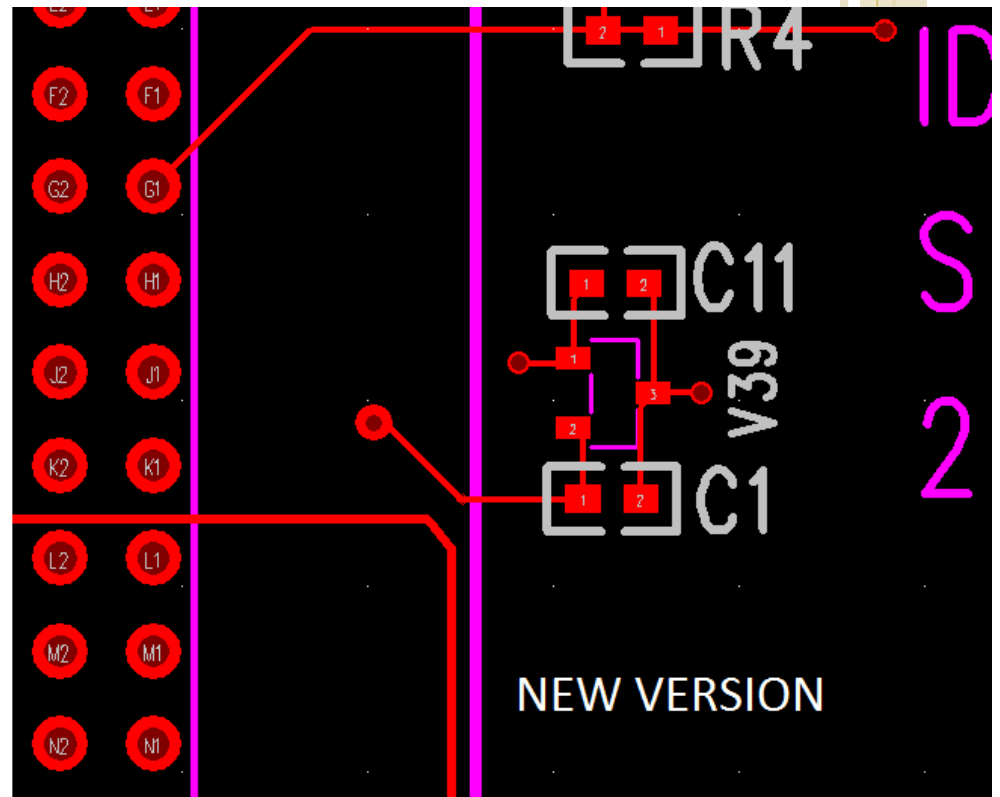
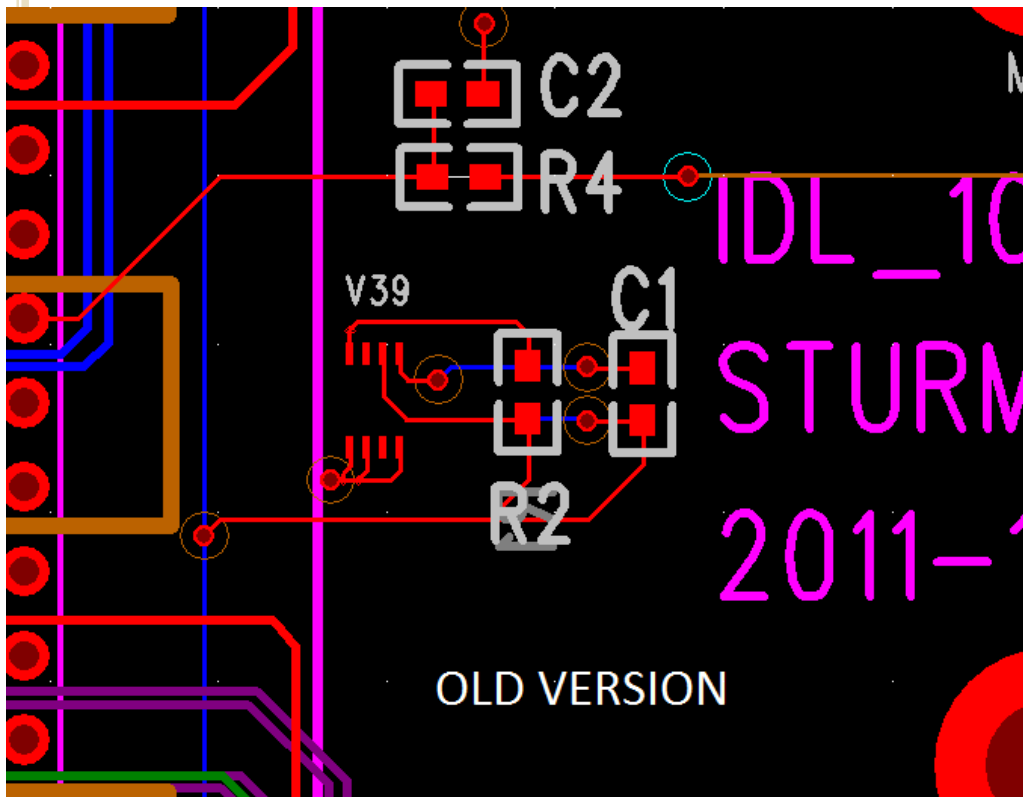
Connection:

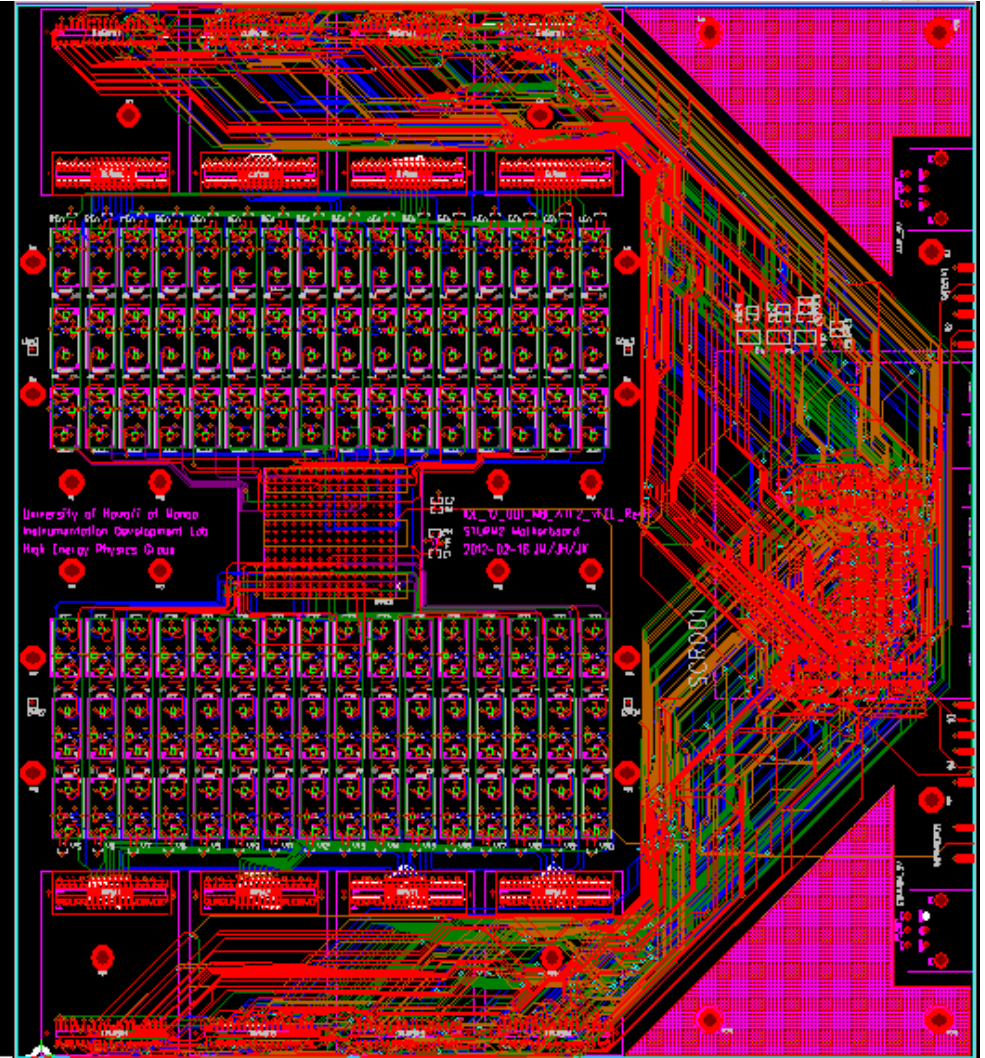
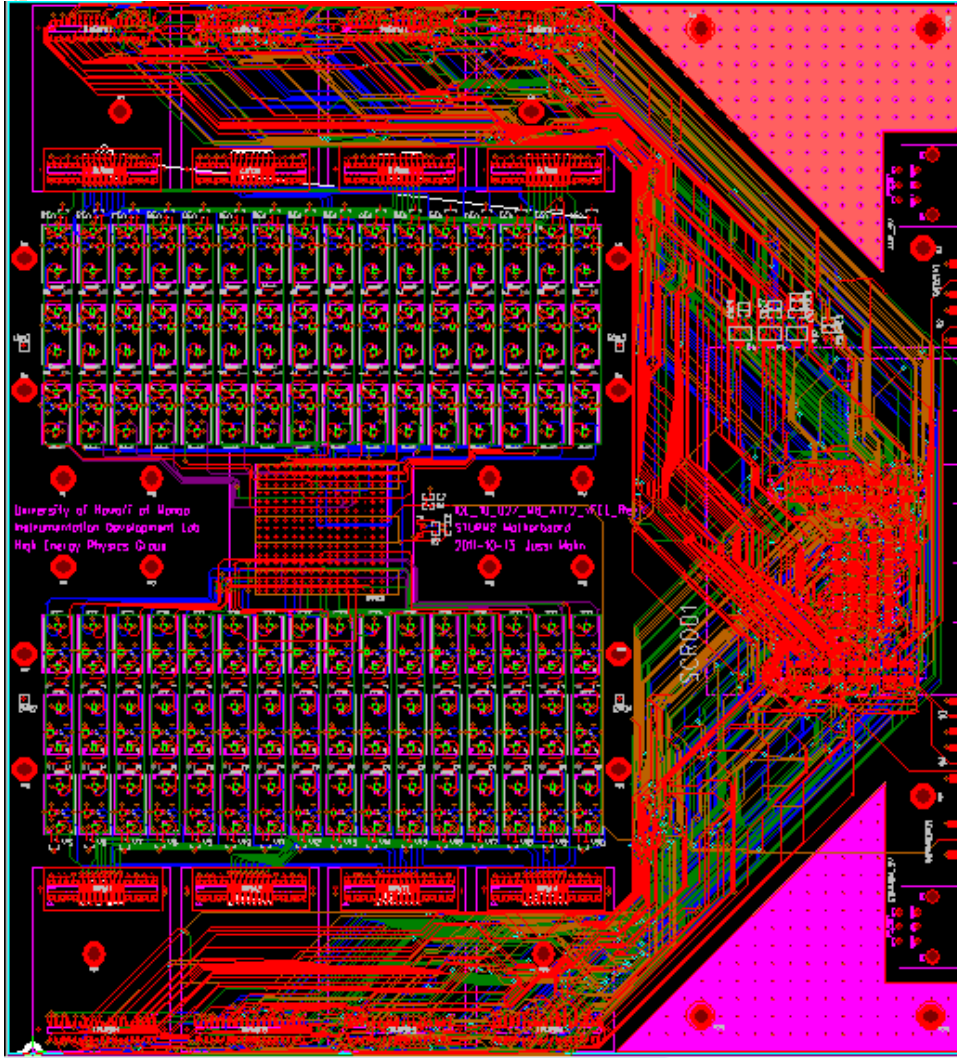
COMMON\_5V.6-COMMON\_5V

Teardrops  Test point

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THANKS FOR ATTENDING

