New idea for mechanical structure

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Motivation

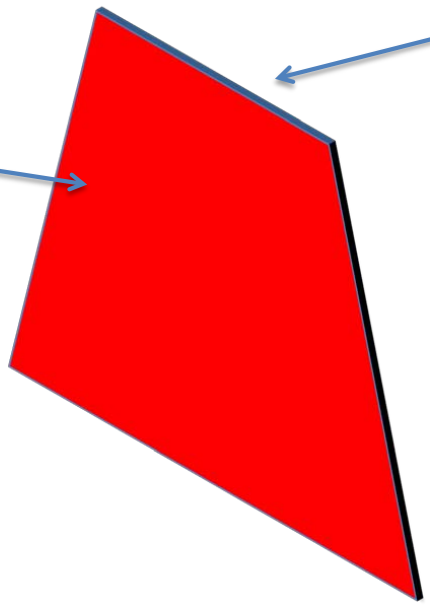
- In the context of this test beam we started to think on the next step toward a full prototype.
- One of the main issue for a realistic design of the calorimeter is compactness.
- The 1 mm pitch is between absorber layer is a key element in the FCAL design.
- For current of further readout.
- What will we do next test beam?
- We tried to started some discussion on this issues in the last weeks.

NEW SENSOR BOARD FOR TEST BEAM

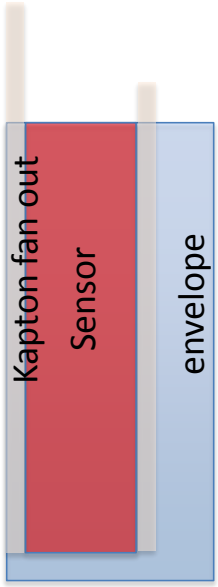
Sensor : 320 μm thickness

Need to glue fan-out on other side

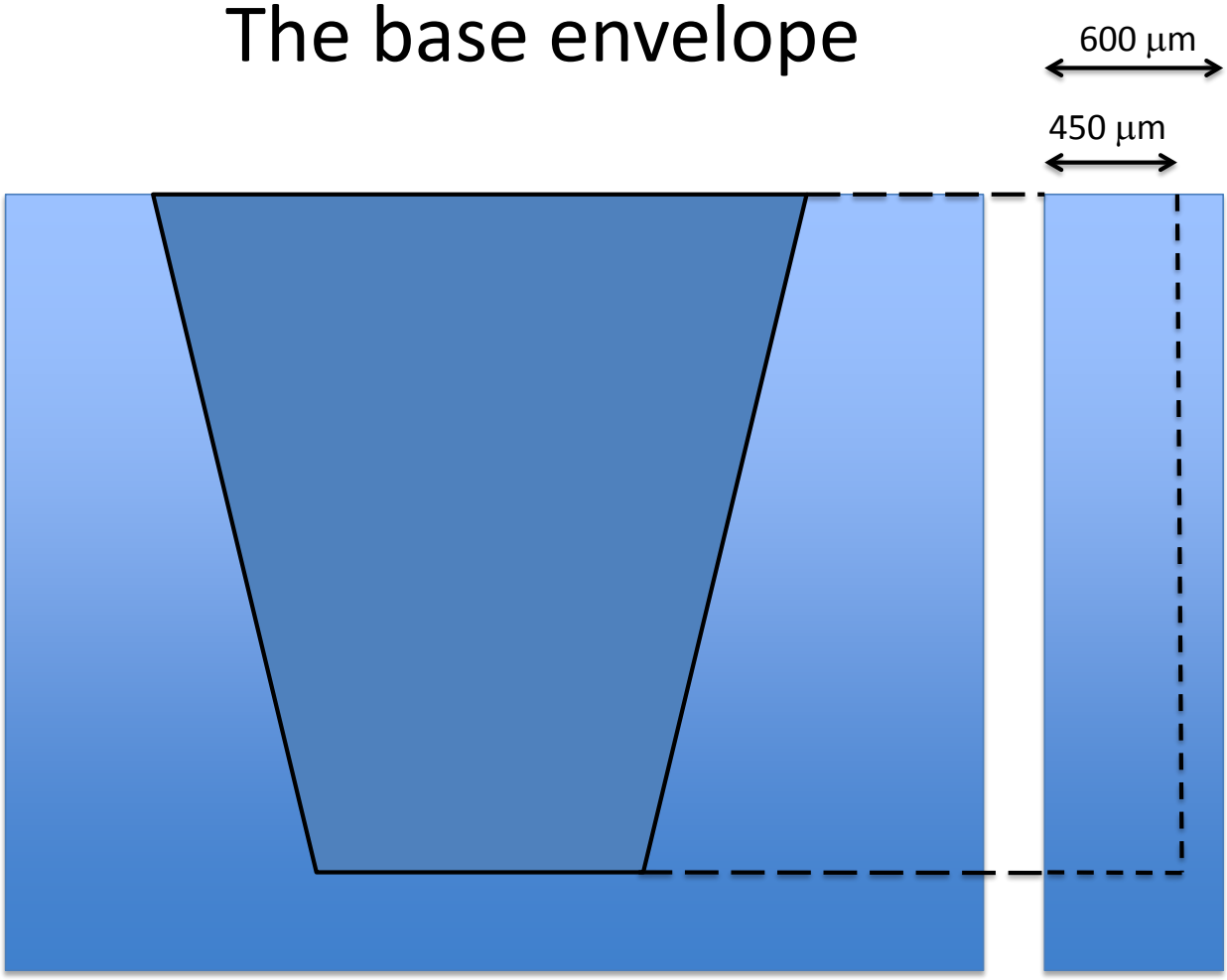
Need to put 150 V On one side



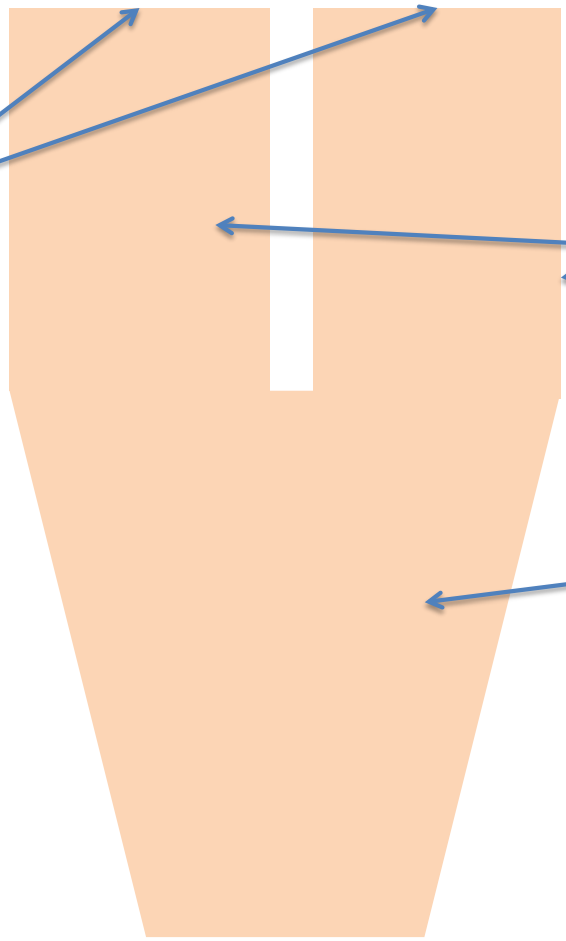
Need some support also…



The base envelope



Fan-out : kapton 50 μm thickness

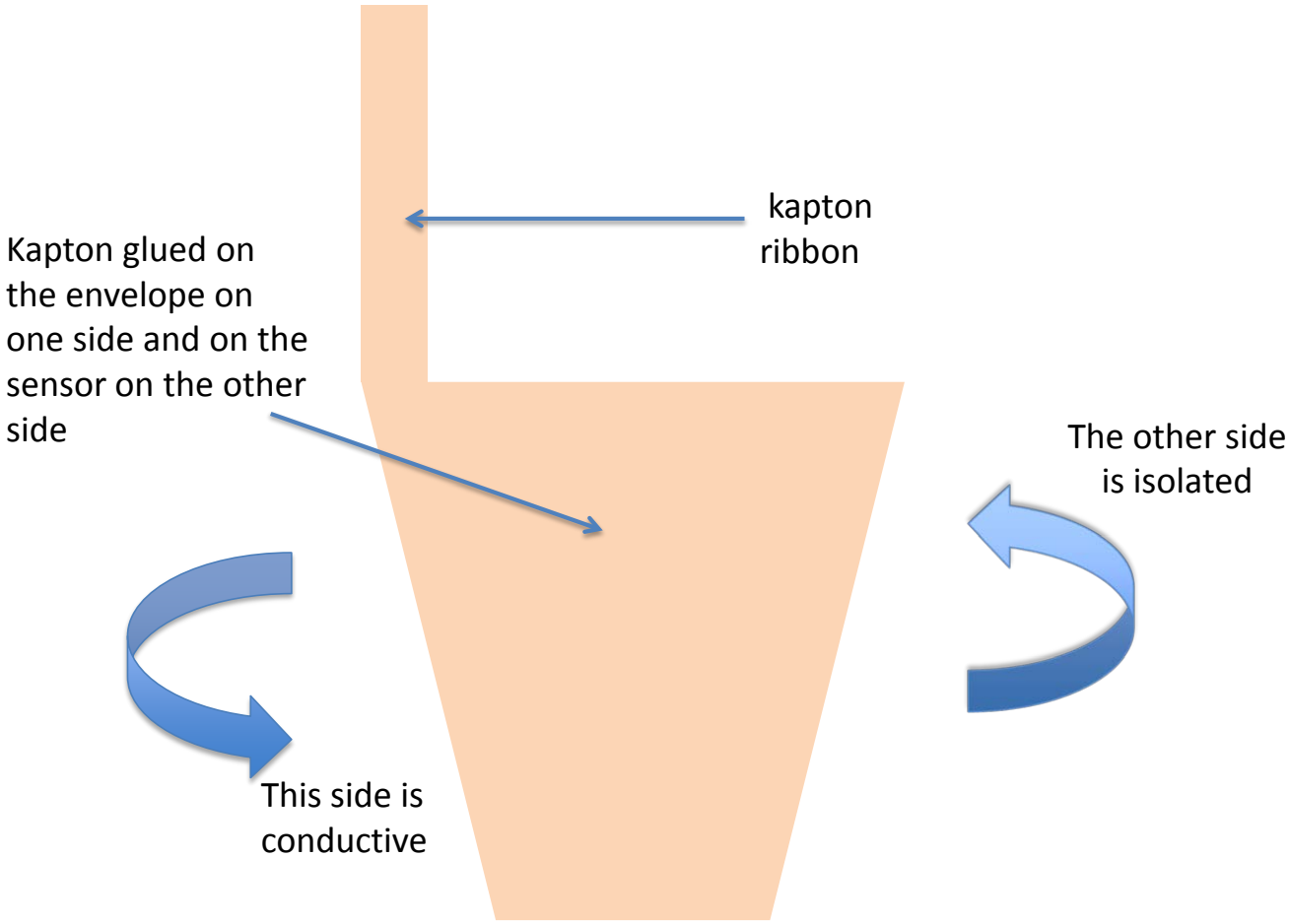


Different connector can be attach.

2 kaptons ribbons drive out the signal

Fan-out glued on the detector and bonded

HV: kapton 50 μm thickness

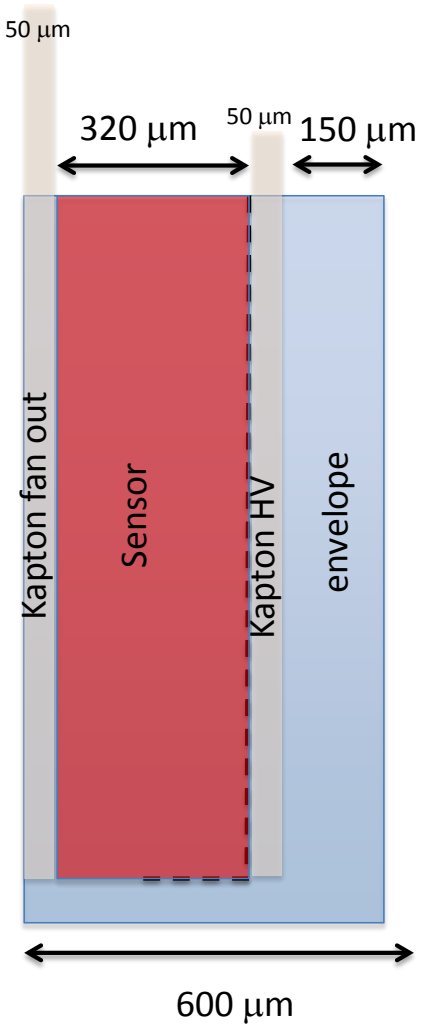


The complete “edge” : 600 µm

Full detector is 450 µm depth :

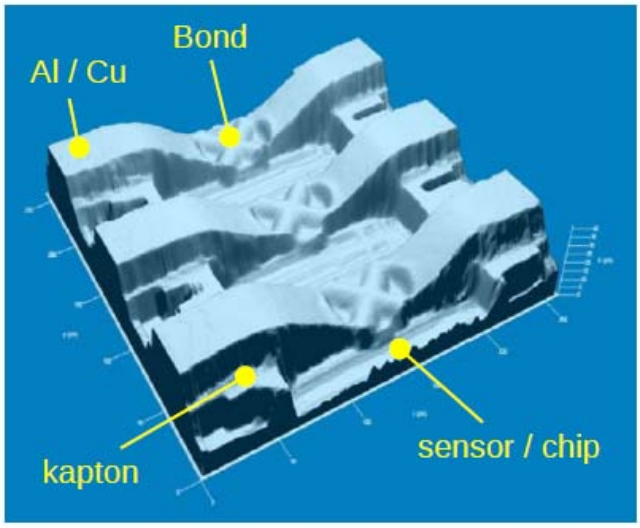
- 320 µm detector
- 50 µm kapton HV
- 50 µm kapton fan out
- 30 µm glue

Envelope is 600µm with a 450µm cutting shape inside. It can be machined by 3D printing



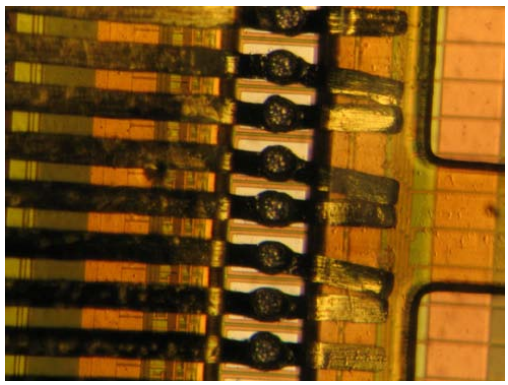
BONDING SENSOR AND KAPTON

Tape Automated Bonding (TAB)



• Ultrasonic bonds are made through opening etched in the polyimide base.
• The bond tool – when pressing the Al towards the bond pad - leaves a specific mark.
• Can be done in a regular bounding machine.

Silicon strip detector (SSD) module assembled using TAB for ALICE ITS SSD layers.



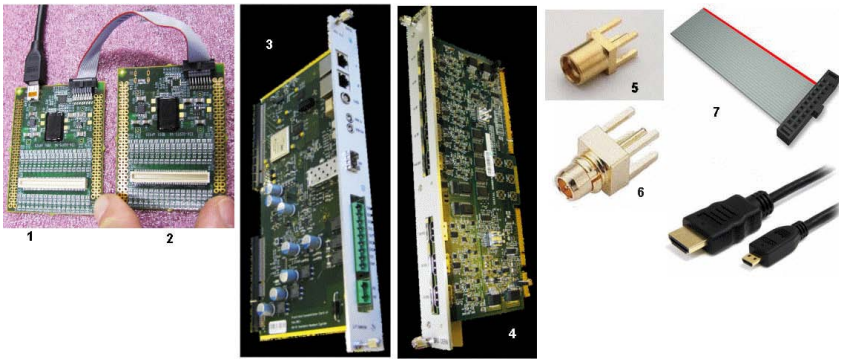
Features:
• Single point bonding;
• No wire loop;
• The bond can be covered by the glue for better protection;
•It is difficult to repair bonding defects.

READ OUT FOR THE TAU LAB BENCH

status

- After sensor assembly this summer, we realized we cant test assembled module in the lab.
- Fcal read-out board, now, is limited & mostly an available.
- LumiCAl read-out chip in new technology (as we hared yesterday) IS under development.
- We need to find something else to equip our sensors in the time being

APV25



- 128 channels chip used by the CMS tracker collaboration (silicon and gas microstrips technology)
- 50 ns shaper and amplifier.
- 3 sampling modes : peak mode, deconvolution mode and multi mode
- Intensively used by the RD51 community
- One full chain exist at Weizmann Institute : possibility to check if it fits our needs.

How to get it ?

CERN Stores Catalogue

SCEM Code: Search Keyword(s): SRS

Group: 07.89

07.89.00 - RD51 SRS PROJECT

For any further technical information additionnal - click here

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General description

LOW CAP DIODE NUP4114UPXV6T1G : 08.51.49.960.0

FEMALE CONNECTOR 130 CONTACTS : 09.55.42.400.3

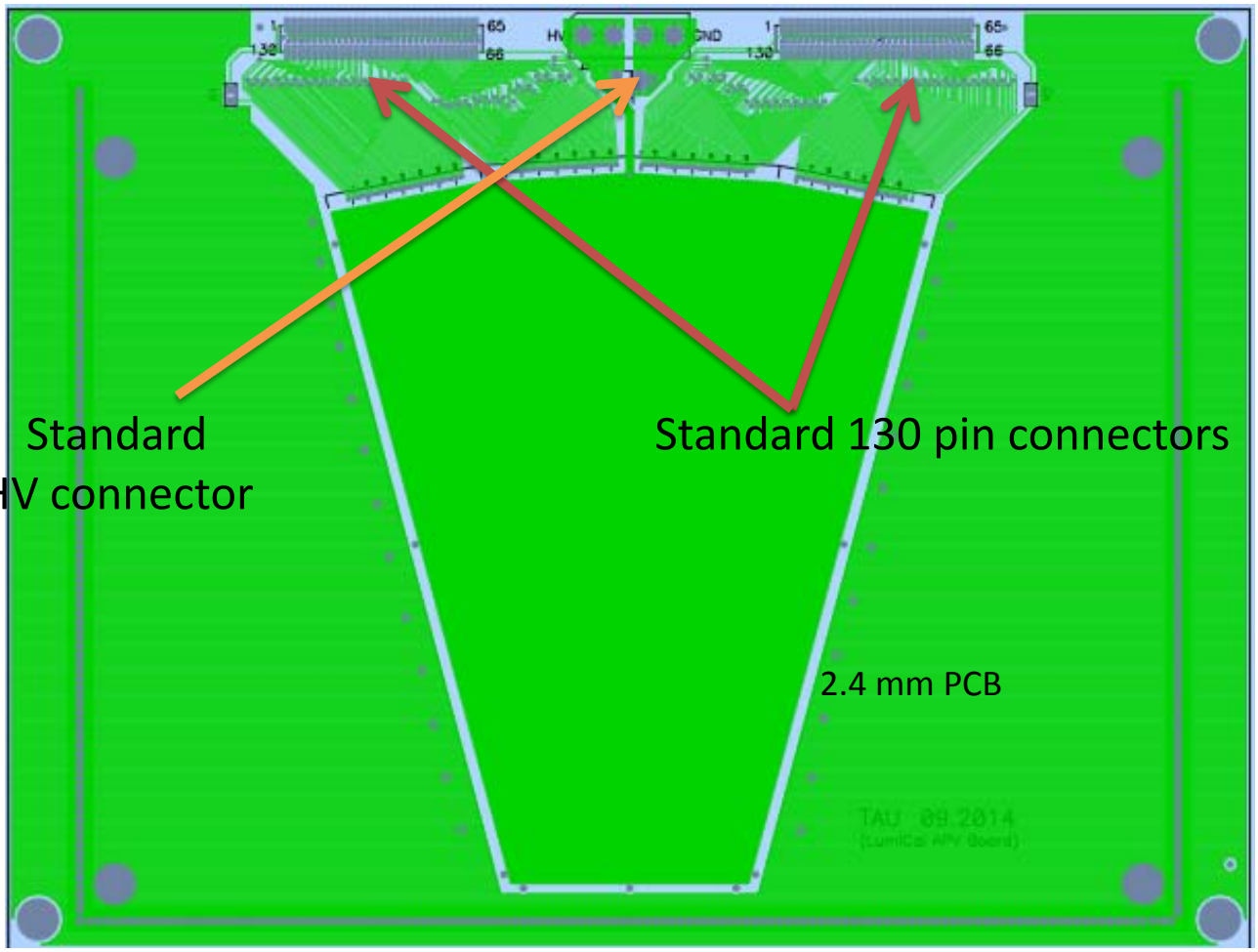
MALE CONNECTOR 130 CONTACTS : 09.55.42.410.6

Buy	SCEM Code	Unit	Unit Price	DESIGNATION	TYPE / REF	FIG.
	07.89.00.005.9	PC	158.4	RD51 APV25 HYBRID MASTER	EDA-02075-V4-0	1
	07.89.00.010.2	PC	140.8	RD51 APV25 HYBRID SLAVE	EDA-02075-V4-0	2
	07.89.00.020.0	PC	794.2	MINICRATE CHASSIS	-	-
	07.89.00.030.8	PC	809.6	EUROCRATE CHASSIS	-	-
	07.89.00.100.1	PC	1595.0	RD51 SRS FEC CARD	-	3

Board for electronic test

- As a first step we need to have a sensor board with right connection.
- We started to design (external designer) a board based on the current LumiCal board.
- Separate standard connector :
  - For HV.
  - For signal (Panasonic 130 pin connector).

Design board



plans

- Test Beam…
- After the test beam:
  - Design the kaptons (already started) and produce it.
  - Create a “fake” 320 μm sensor (started at Tel Aviv University)
  - Design and print the envelop (can be done at CERN)
  - Glue the whole system on a “fake” tungsten at CERN.
- In parallel, design a 2.4 mm PCB with 130 pin connector to check the APV25 (or any available chip). Started at Tel Aviv.
- By the beginning of 2015, we should have a first “fake” prototype of sensor+tungsten and some results of the sensor with the APV25.