



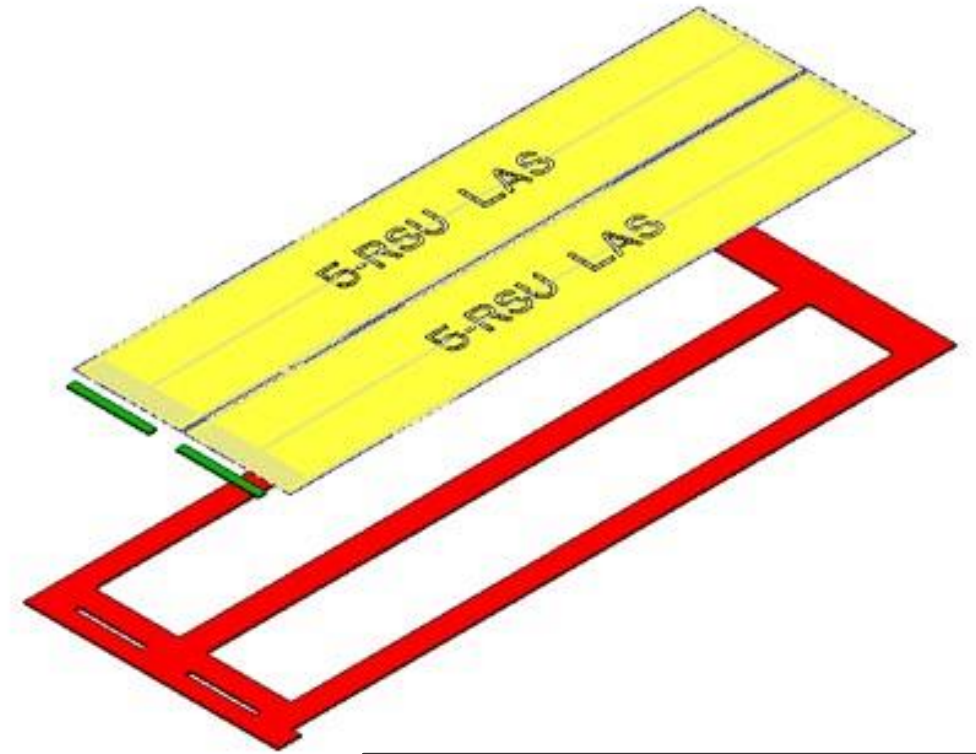
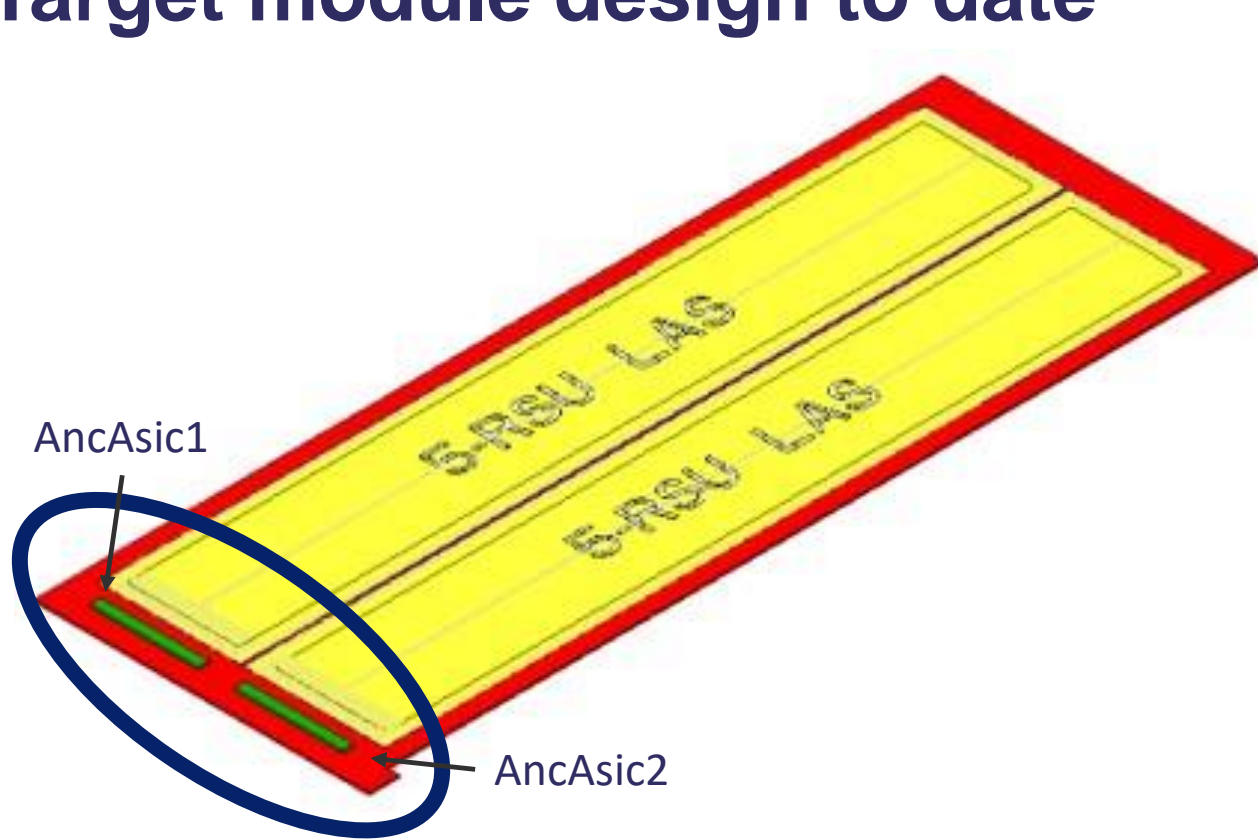
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Biased towards
OB

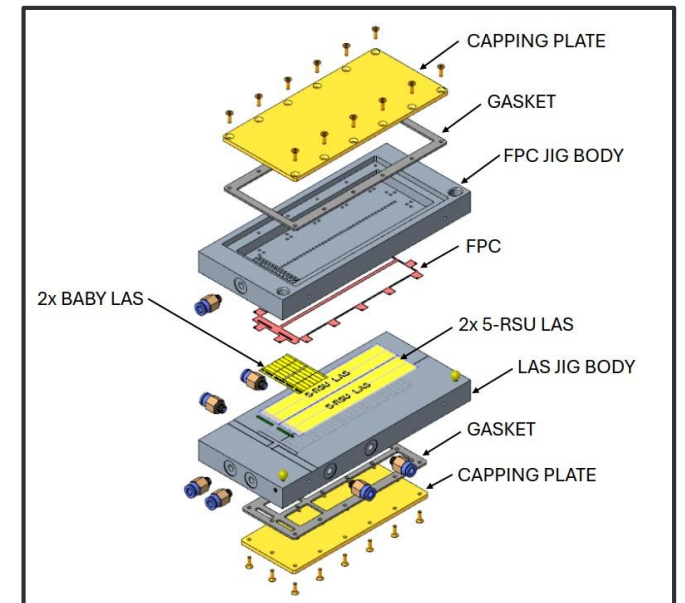
Notes on OB bridge FPC: Towards a new iteration + AncAsic layout

M.Borri

Target module design to date



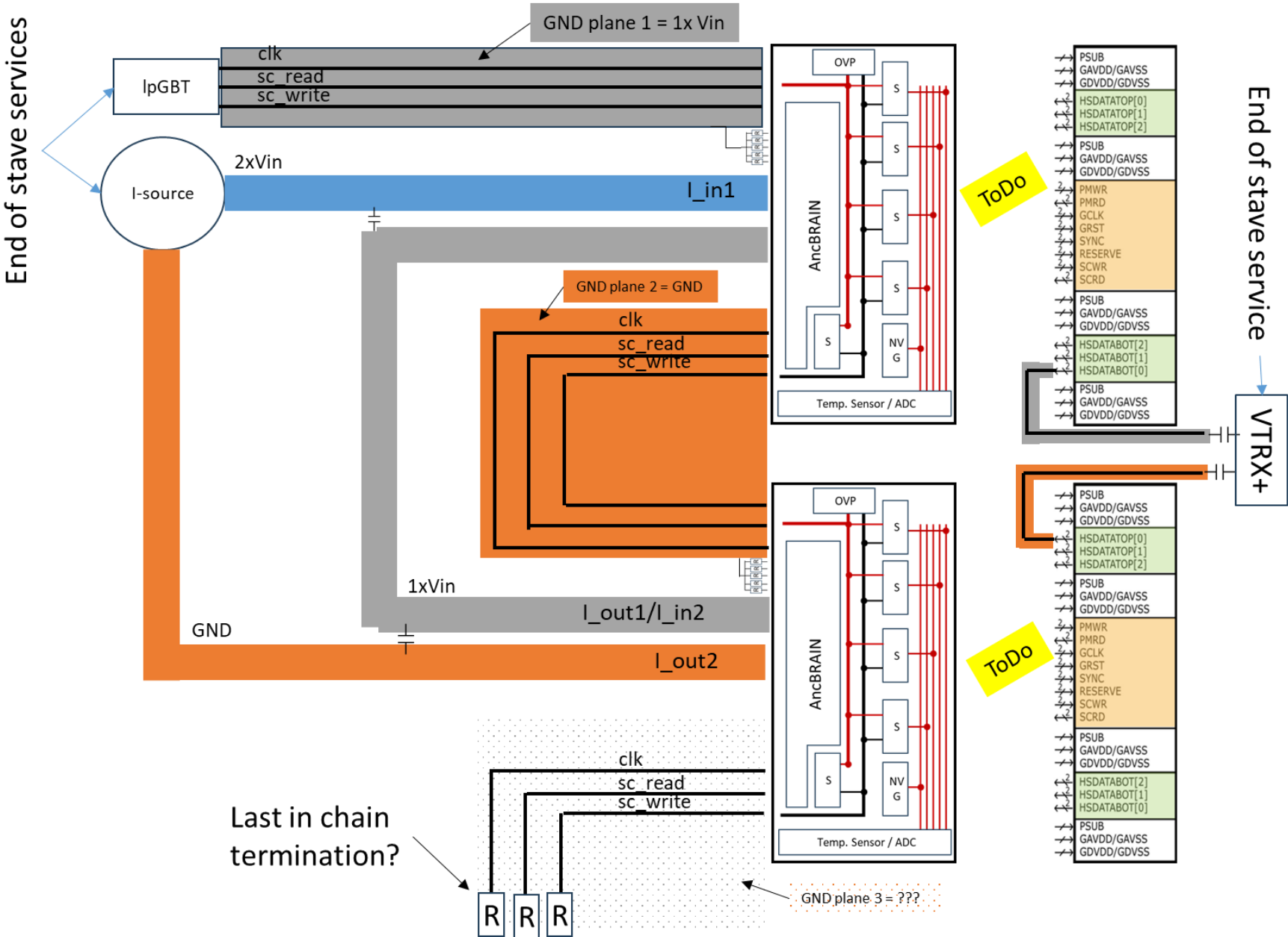
Reference: James' talk on interconnection considerations:
https://indico.bsnl.gov/event/25702/contributions/99824/attachments/58780/100945/24-11--6_FPC_AncAsicPlacement_Bonding_JJG_ET_r3.pdf



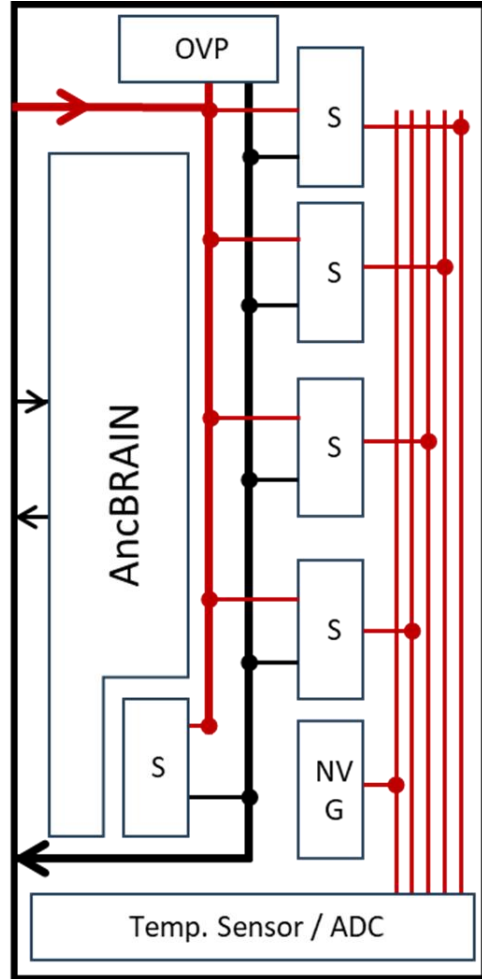
Sanity check on the “end of stave side” of B-FPC

Topological sketch

$I_{in} = \text{const}$
 clk, sc_read, sc_write :
AC or DC coupled?



Sanity check on the “LAS side” of B-FPC



LEC

GSVDD/GSVSS

GAVDD/GAVSS

GDVDD/GDVSS

TXVDD/TXVSS

PSUB

HS DATA

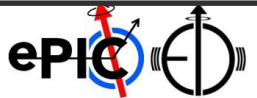
CTRL,CLK, ETC

LEC: 152 pads, size: 144*91 um2;

~ symmetric pad distribution:
1 to 76; 77 to 152;

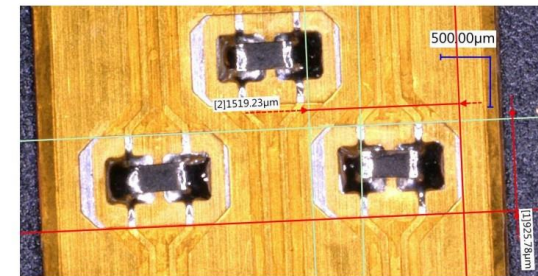
Q: GSVSS, GAVSS, GDSS, TXVSS, PSUB
have common ground?

Caps between AncASIC & LAS

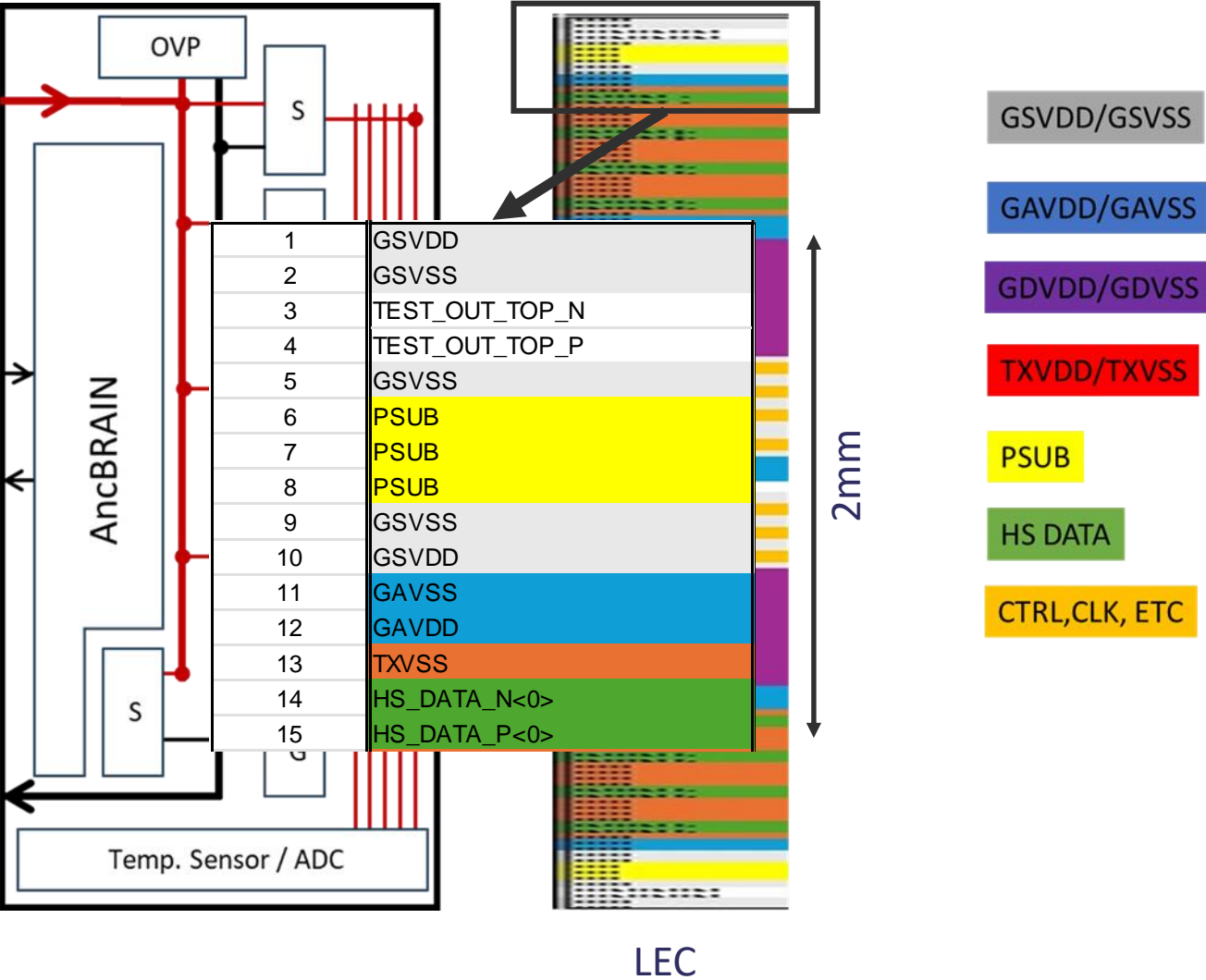


Example from LTU-made prototype FPC.

- On FPC components: 0201 (imperial).
- Sit within a 1 × 1.5 mm window.
- Exact position on b-FPC depends on location of (MOSAIX) pads for the power domains.
 - Number of caps needed is still to be determined.



Sanity check on the “LAS side” of B-FPC



Focus on pads position of HS data closest to LAS top side

Pads are available on top and bottom side of MOSAIX.

Any advantage to retain any of those in LAS?

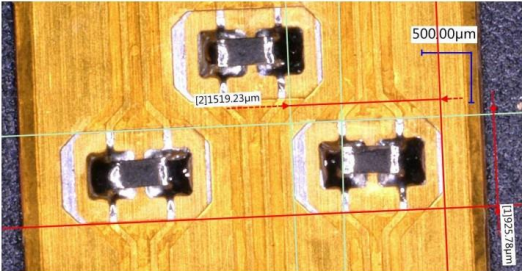


Caps between AncASIC & LAS



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Sanity check on the “LAS side” of B-FPC

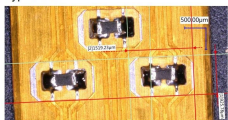
Opt1

AncAsic
aspect ratio

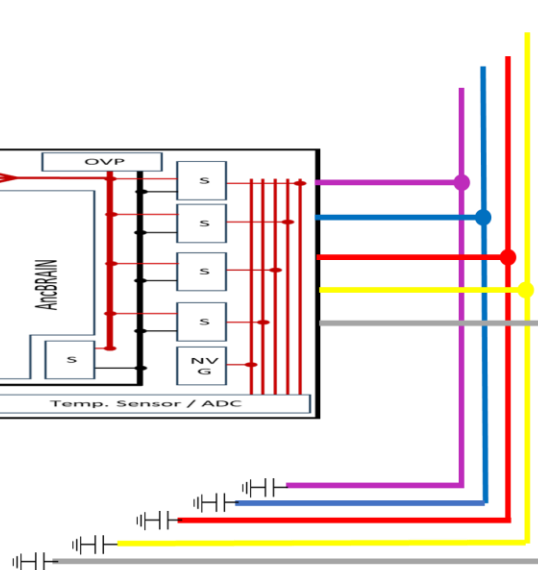
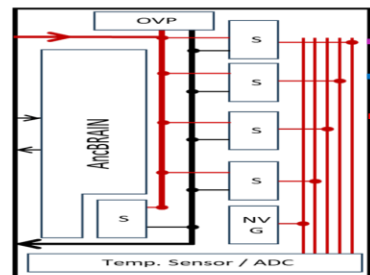
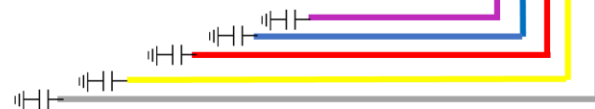
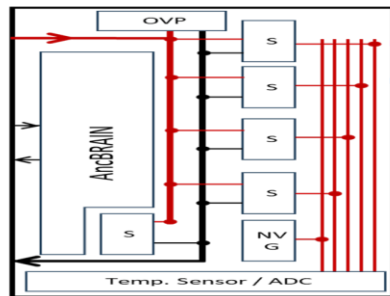
Caps between AncASIC & LAS

Example from LTU-made prototype FPC.

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28 November 2024
ePIC DUT DDC Meeting
5



GSVDD/GSVSS

GAVDD/GAVSS

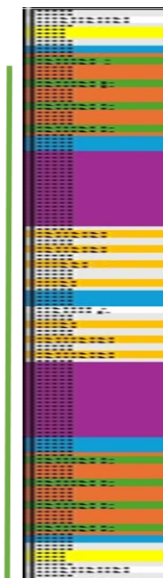
GDVDD/GDVSS

TXVDD/TXVSS

PSUB

HS DATA

CTRL,CLK, ETC



GSVDD/GSVSS

GAVDD/GAVSS

GDVDD/GDVSS

TXVDD/TXVSS

PSUB

HS DATA

CTRL,CLK, ETC

Q1: can we select HS banks depending on sensor location?

Q2: is the cap too far away?

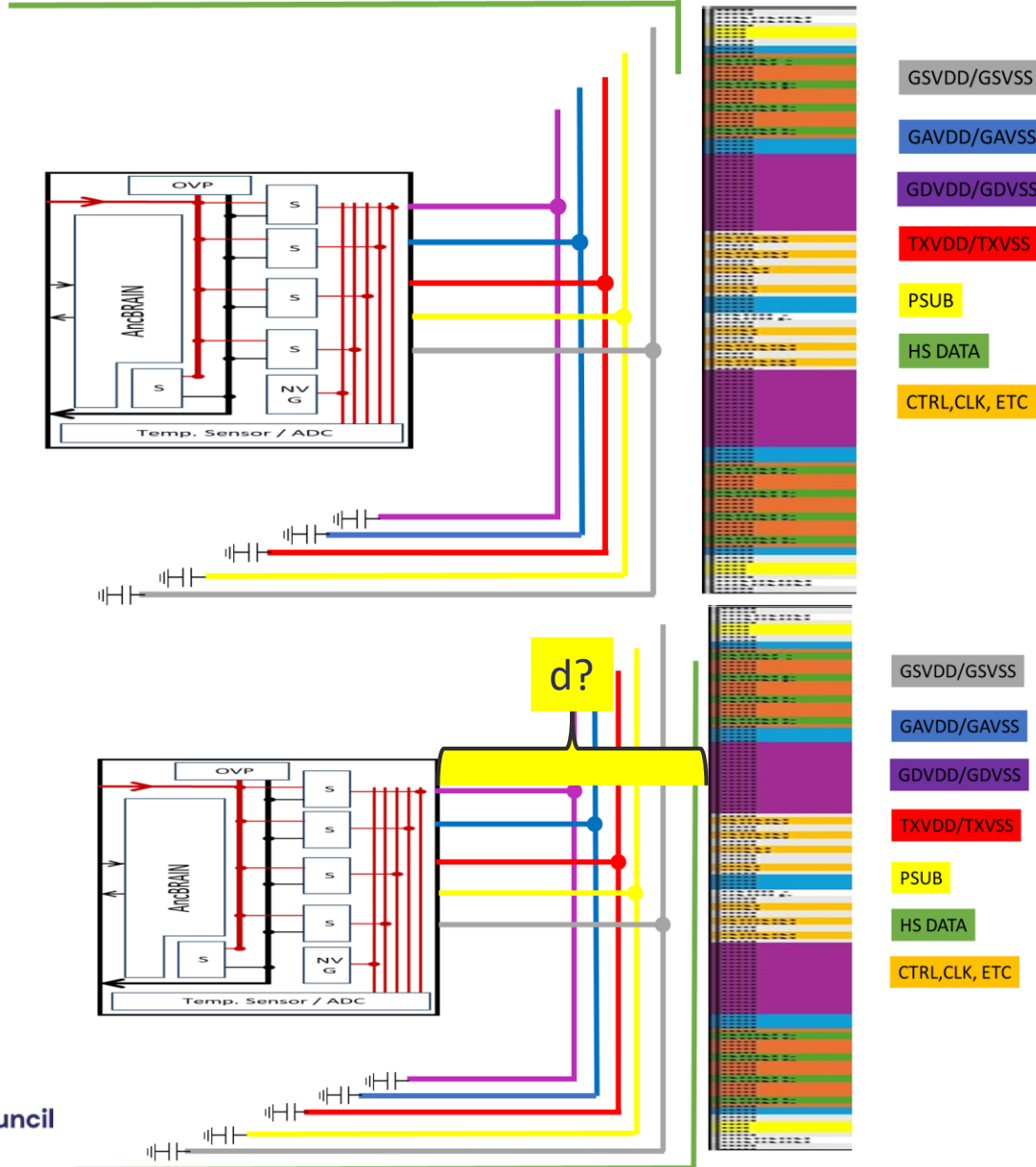
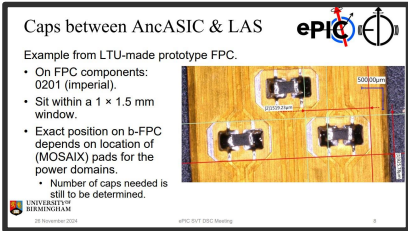
Telescopic wirebonds for “slow control” cluster of pads. (see next slide)



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Sanity check on the “LAS side” of B-FPC

Opt1



5 pwr traces

1 for common gnd (not showed in sketch)

1 diff HS data = 2 traces

Total 8 traces

Trace thickness: 15 μ m Al;

Widths:

Diff HS data:

Pair foot-print:

70 μ m trace, 130 gap= 200 μ m pitch

Spacing to neighbours:

+130 left + 130 right = 260 μ m

Total foot print: ~500 μ m

pwr traces: $2\text{mm}/5 = 0.400$ mm
(100 μ m gap, 300 μ m width)

Common gnd: = 0.400 mm
(100 μ m gap, 300 μ m width)

Clearance for alignment tolerancing:
500 μ m (combined)

Grand Total ~3.5mm

-> length of wirebonds for “ctrl cluster”

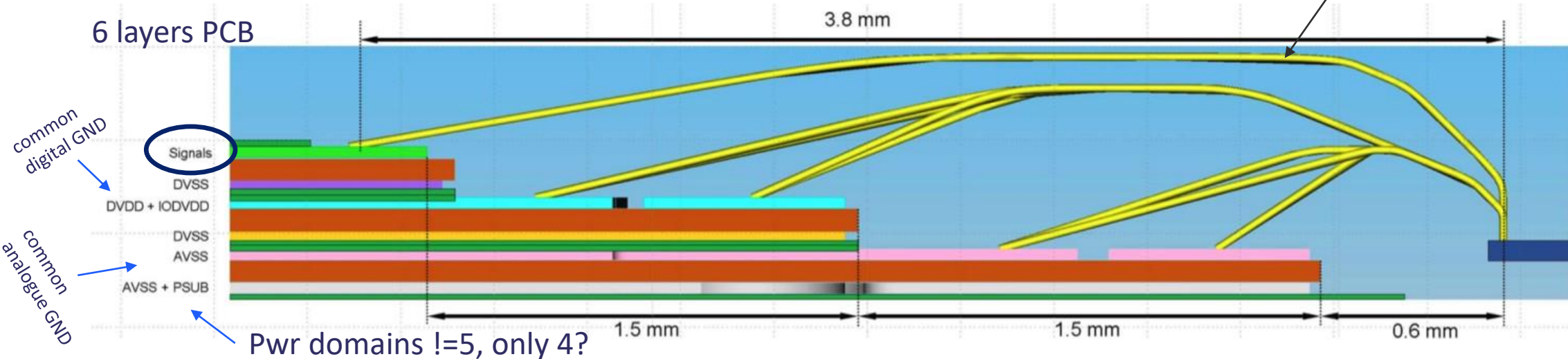
... quite long

...not too elegant

...potentially a pragmatic approach

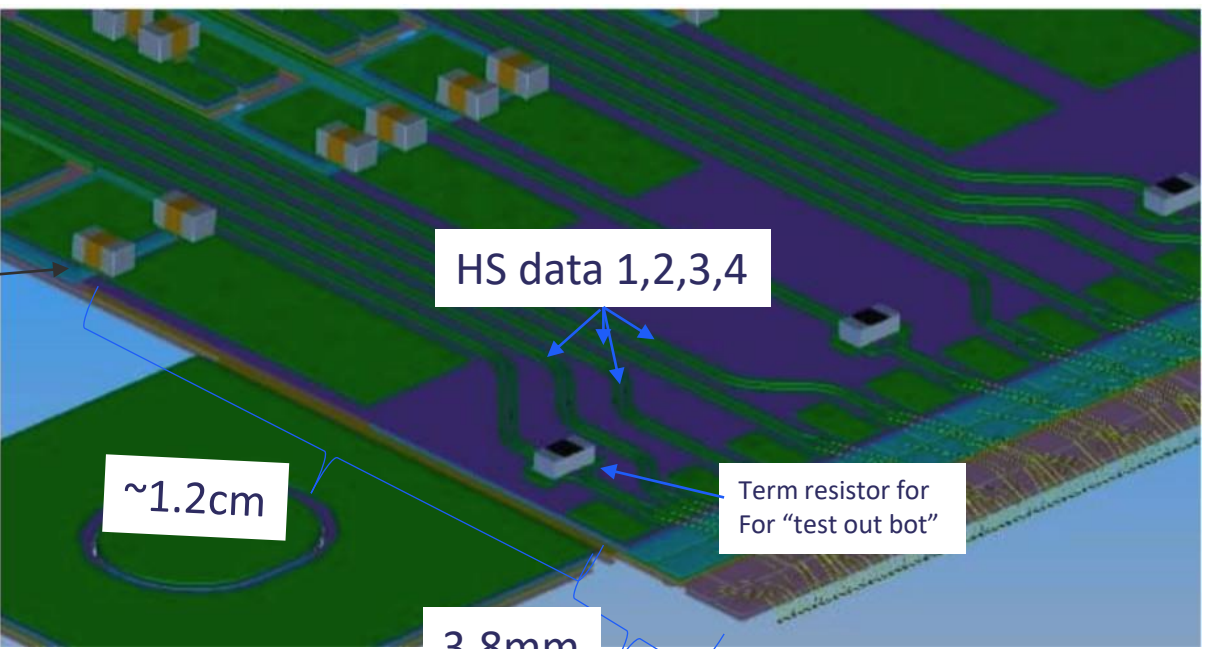
Sanity check on MOSAIX (From ITS3 TDR)

HS data on longest wirebond



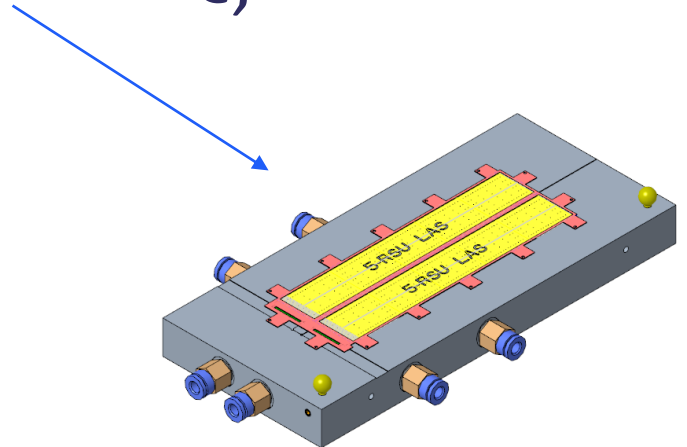
Educated guess

Caps



Conclusion

- To confirm target resistance of power buses from AncAsic to LAS;
 - To confirm distance on decoupling caps;
 - To confirm common ground (D+A);
 - The initial attempt estimates dimensions comparable with images from ITS3 TDR...
 - Low cost prototyping (Layout + interconnection) could be done;
- ... to be continued.





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Thank you

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