

Calorimeter Upgrade Meeting

Analog Electronics
COTS design

11/2/2011

Summary

- COTS solution status
 - Previous problems
 - Solutions
 - Status
- Analog Mezzanine
 - Specifications
 - Enhancements
 - Status

COTS solution status

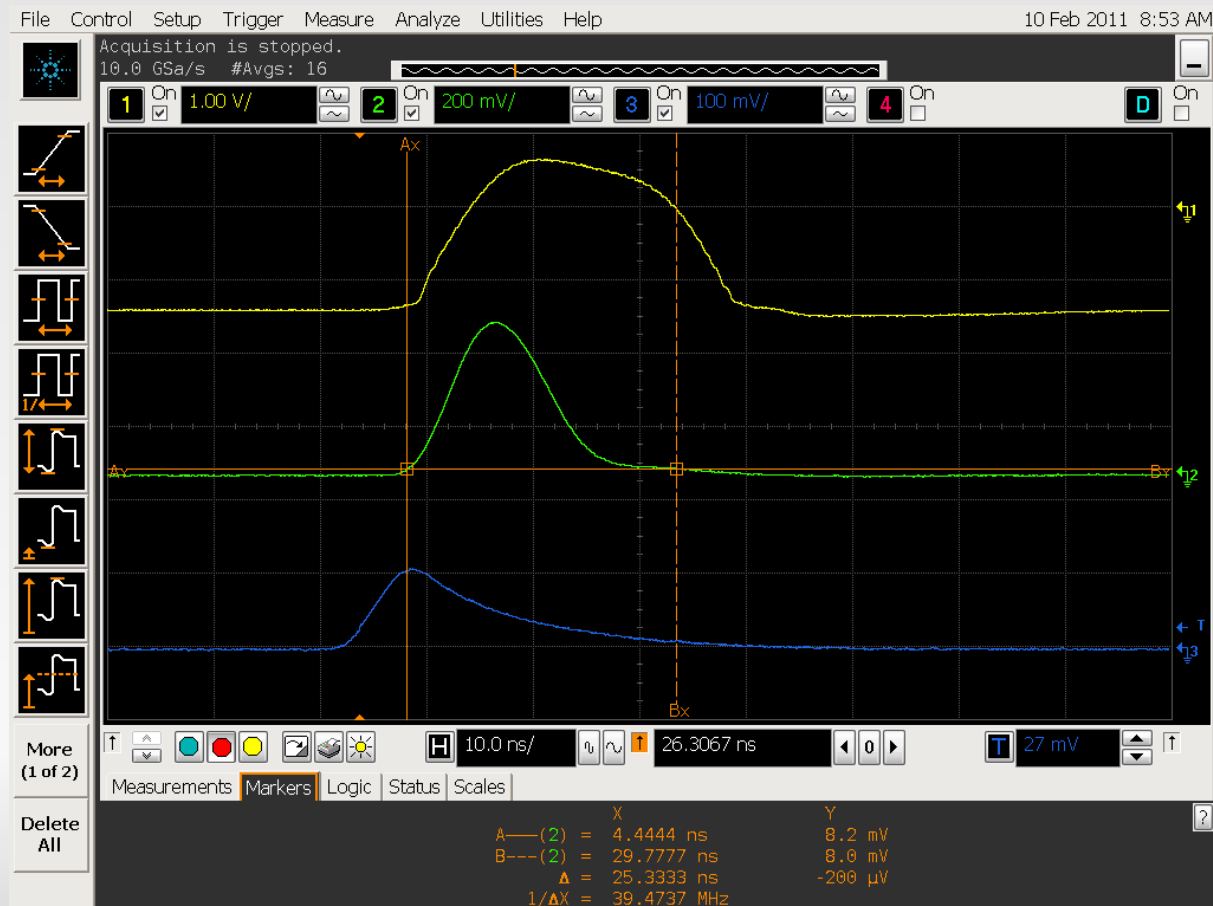
- Previous problems
 - Integrator: OSCILLATES!
 - Phase margin not enough
 - Not easy to solve with COTS amplifier

COTS solution status

- Solutions
 - Change the op-amp
 - Redo the board with different chip
 - FOUND ONE WITH THE SAME FOOTPRINT :D
 - Very similar, less $G \cdot BW$ but stable for $G=1$
 - ADA4939 → ADA4932
 - Also found a substitution with low noise (1.2 nV/sqrt(Hz)) ideal for input amplifier
 - ADA4939 → ADA4930

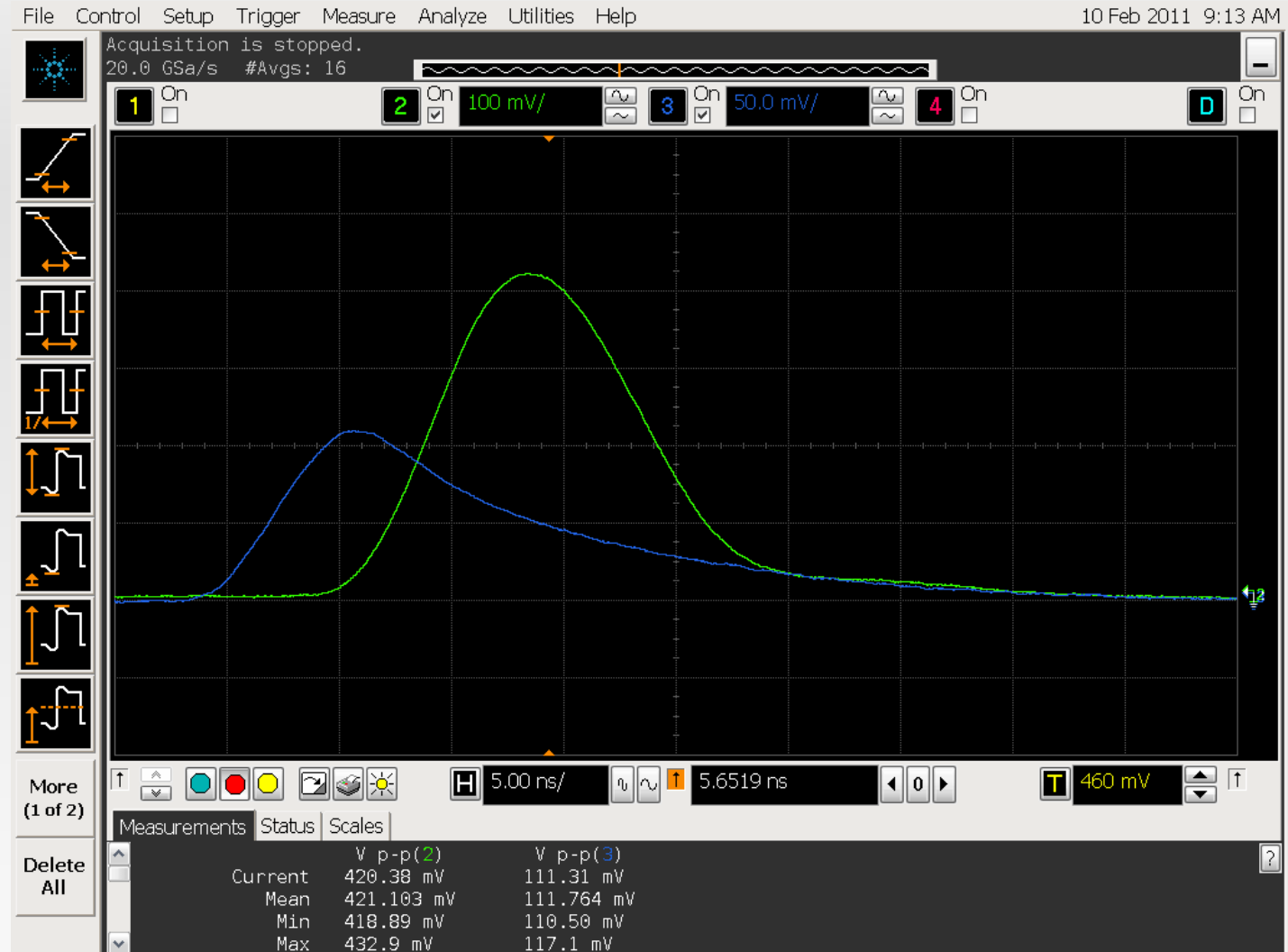
COTS solution status

- Status
 - Chip changed → Oscillation removed



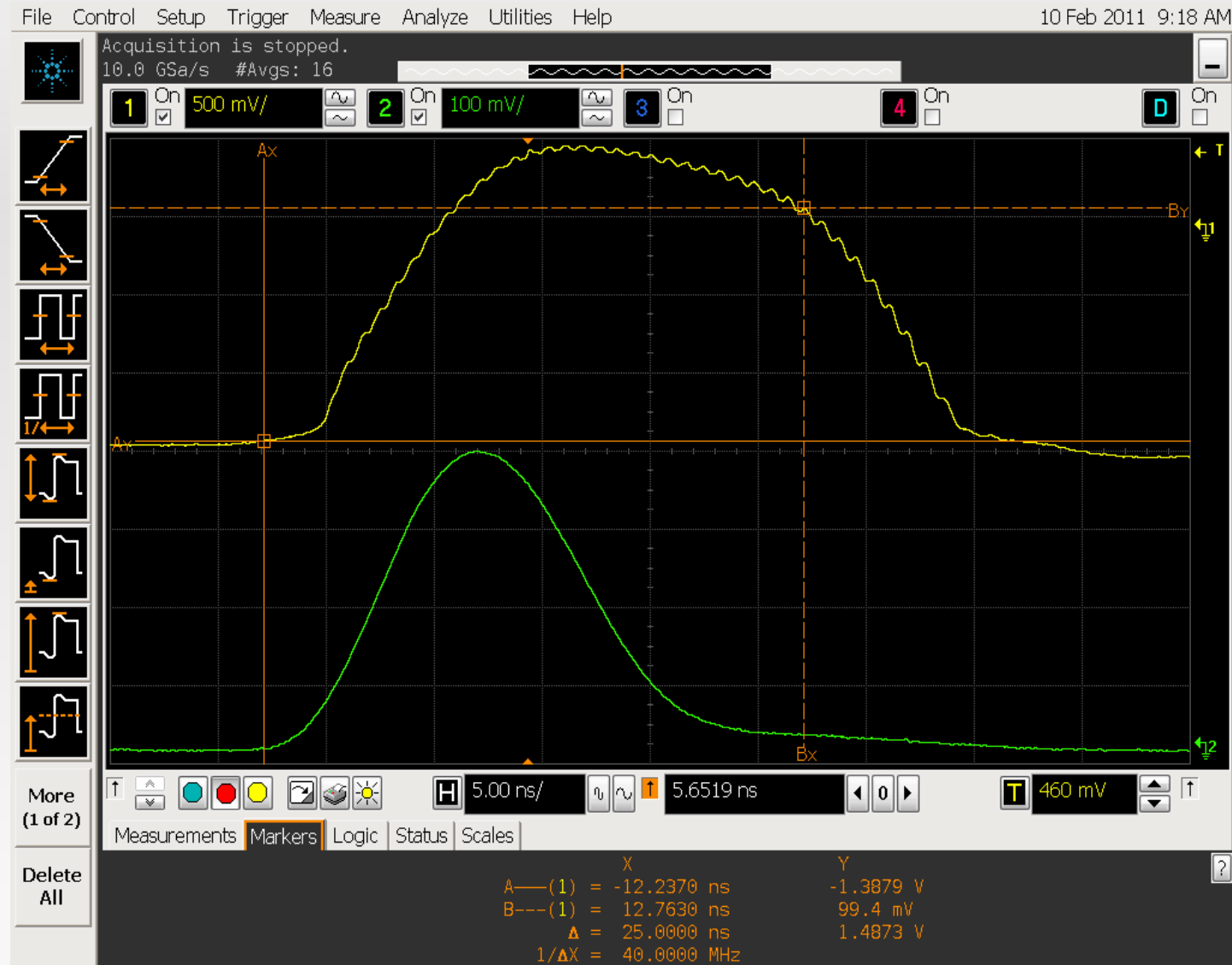
COTS solution status

- Status
 - Snapshots
 - Vi
 - Vclipped



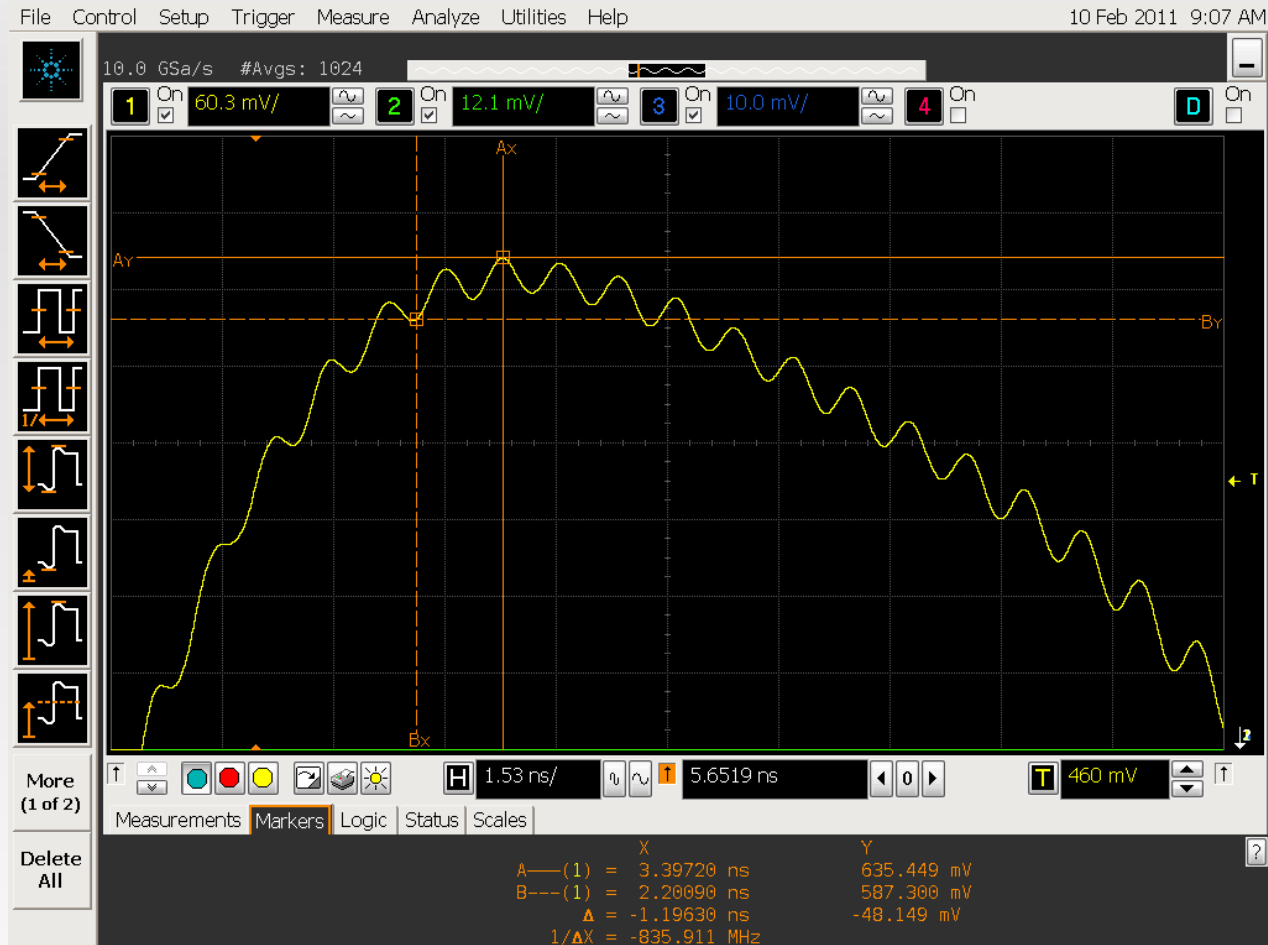
COTS solution status

- Status
 - Snapshots
 - Vclipped
 - Vout
 - Offset?
 - To be understood



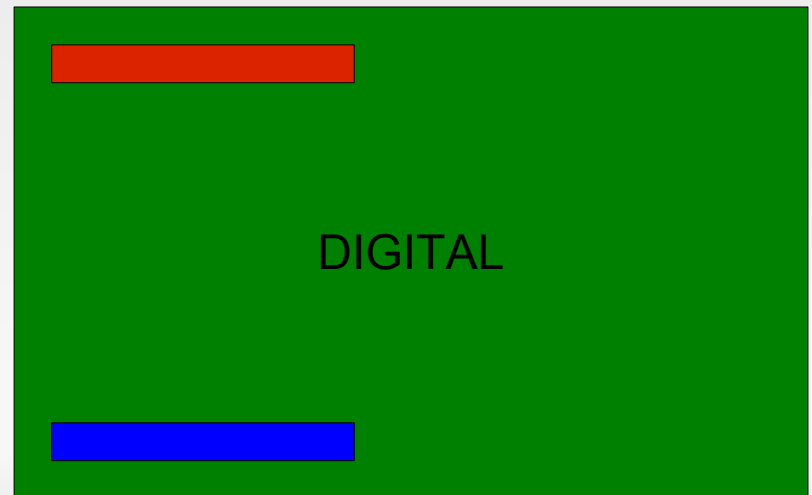
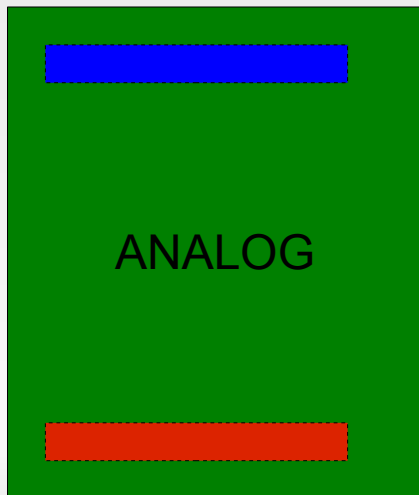
COTS solution status

- Status
 - Some oscillation
 - 3ns \rightarrow 0.3%
- Could be a measurement ghost
- Need to modify to work with single supply



Analog Mezzanine

- Specifications
 - Ground plane mistake
 - Minor changes
 - CONNECTORS SWAPPED

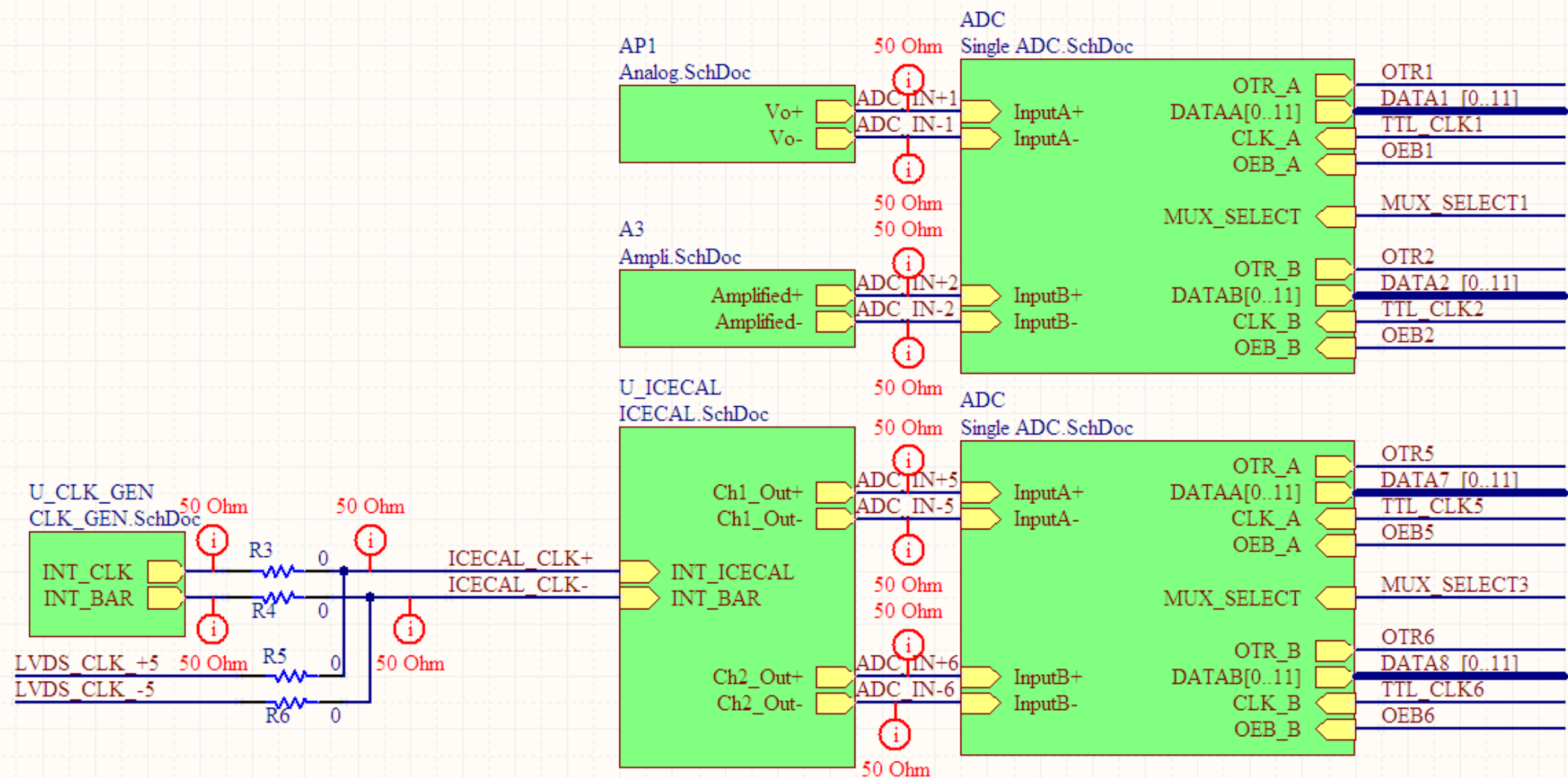


Analog Mezzanine

- Specifications
 - Able to test ICECAL ASIC
 - Correct mistakes
 - Able to test DC-DC converters
 - Test ADC adaptation systems
- Enhancements
 - Controlled impedance routing
 - Controlled skew
 - Test interference in digital signals

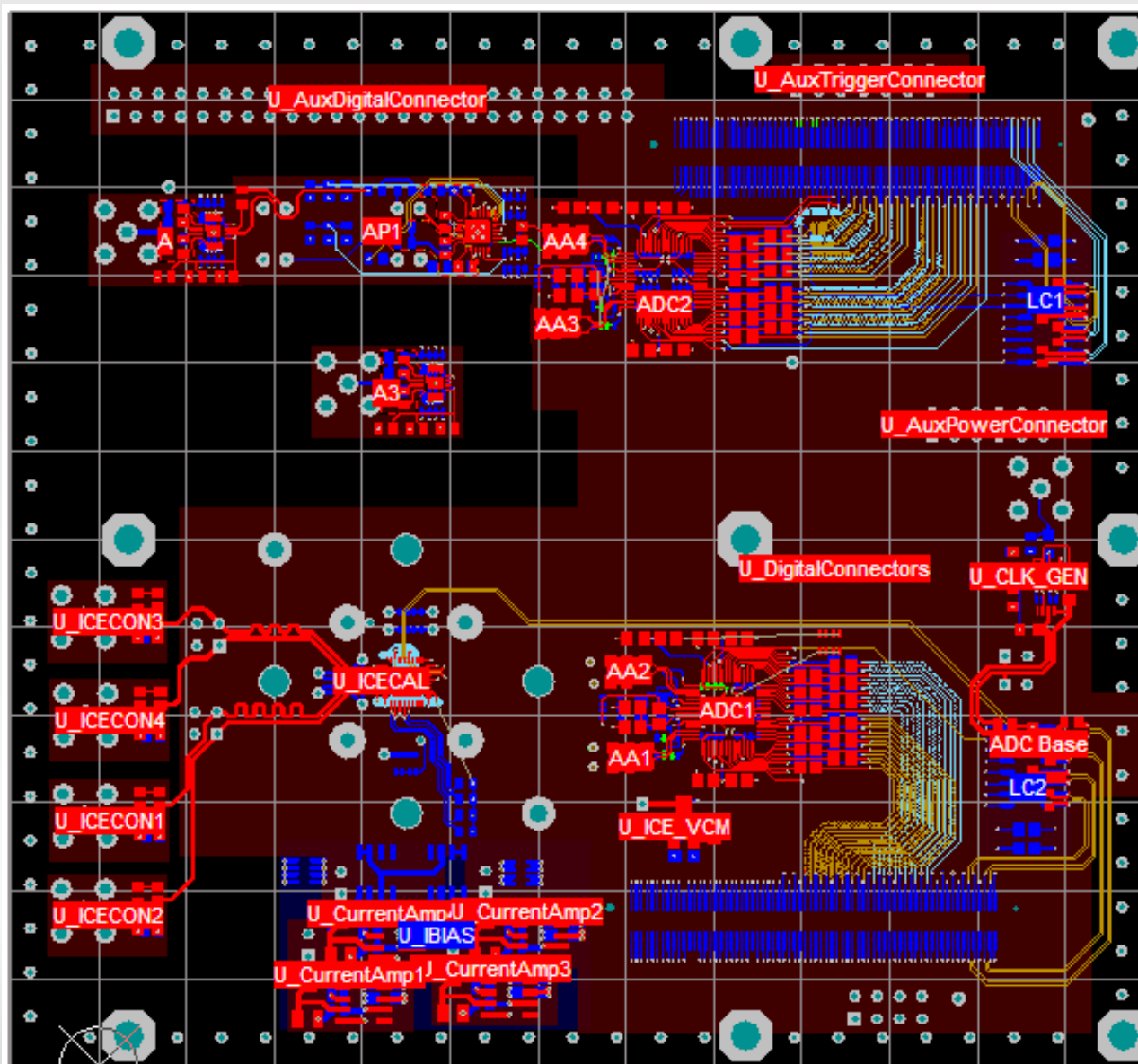
Analog Mezzanine

- Status



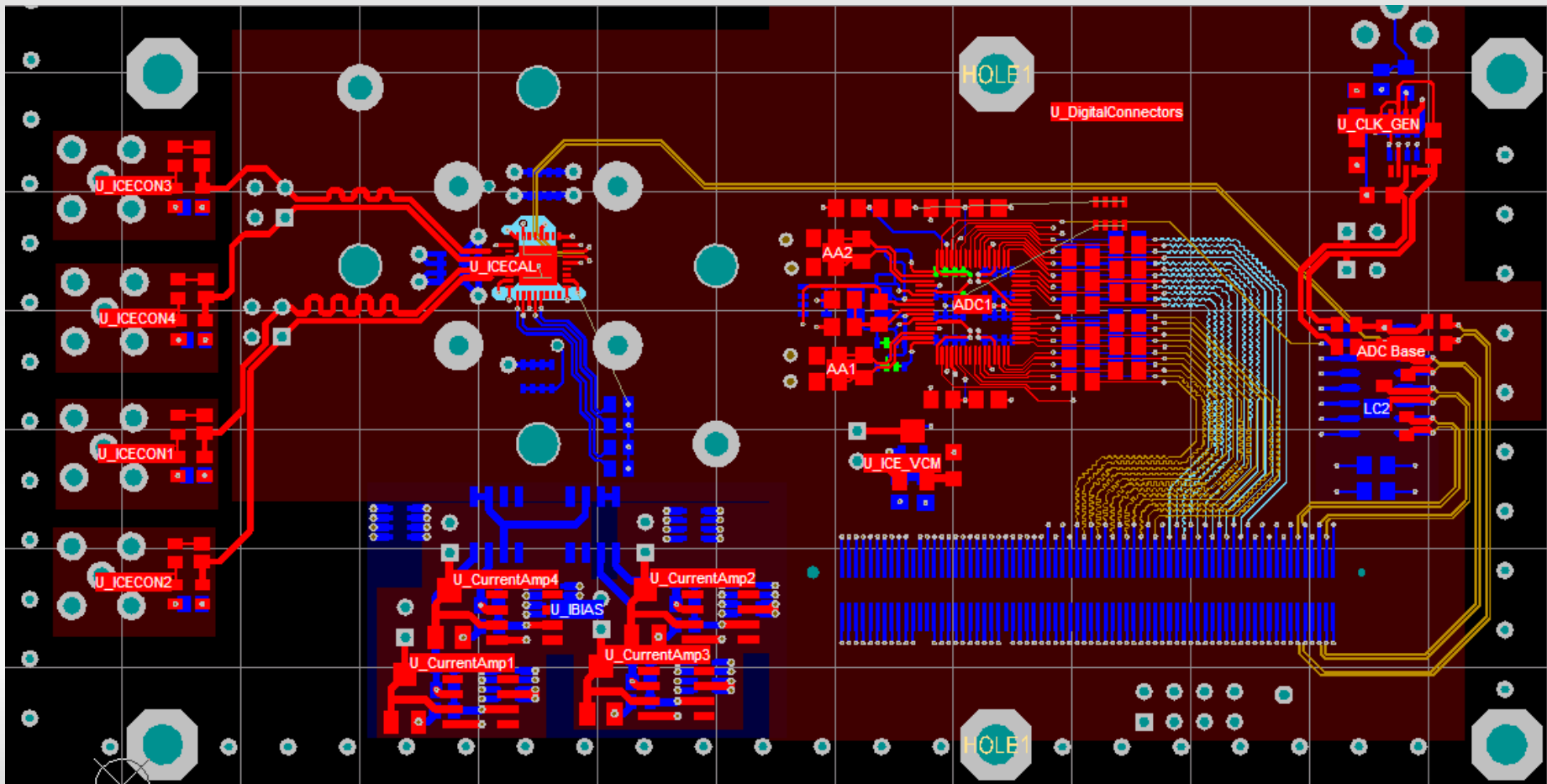
Analog Mezzanine

- Status



Analog Mezzanine

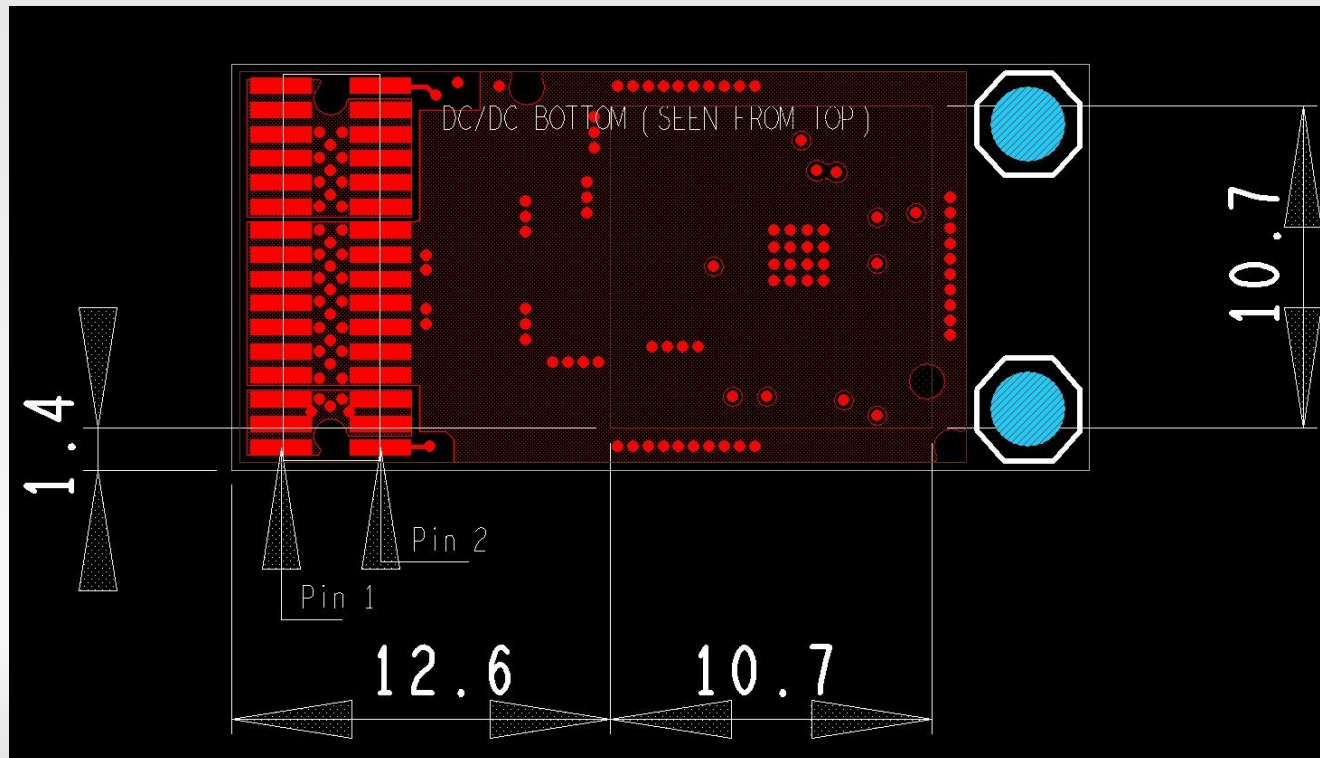
- Status
 - Able to test ICECAL ASIC



Analog Mezzanine

- Status
 - Able to test DC-DC converters

Mating connector: SAMTEC CLE-116-01-G-DV-A (female)



Analog Mezzanine

- Status
- New Connectors

MODIFIED VERSION

TOP CONNECTOR

| Pin | Signal | Notes |
|-----|-------------|-------|
| 1 | DRVCC2 | |
| 2 | RESET | |
| 3 | PAR_OE | |
| 4 | PAR_RD | |
| 5 | PAR_WR | |
| 6 | PAR_OE | |
| 7 | PAR_WR | |
| 8 | PAR_ADD0 | |
| 9 | PAR_ADD1 | |
| 10 | PAR_ADD2 | |
| 11 | PAR_ADD3 | |
| 12 | PAR_ADD4 | |
| 13 | PAR_ADD5 | |
| 14 | PAR_ADD6 | |
| 15 | PAR_ADD7 | |
| 16 | PAR_ADD8 | |
| 17 | PAR_D0 | |
| 18 | PAR_D1 | |
| 19 | PAR_D2 | |
| 20 | PAR_D3 | |
| 21 | PAR_D4 | |
| 22 | PAR_D5 | |
| 23 | PAR_D6 | |
| 24 | PAR_D7 | |
| 25 | PAR_D8 | |
| 26 | PAR_D9 | |
| 27 | PAR_D10 | |
| 28 | PAR_D11 | |
| 29 | PAR_D12 | |
| 30 | PAR_D13 | |
| 31 | PAR_D14 | |
| 32 | PAR_D15 | |
| 33 | DRGND | |
| 34 | MUX_SELECT1 | |
| 35 | OEB1 | |
| 36 | DRGND | |
| 37 | DATA1_11 | |
| 38 | DATA1_10 | |
| 39 | DATA1_9 | |
| 40 | DATA1_8 | |
| 41 | DATA1_7 | |
| 42 | DATA1_6 | |
| 43 | DATA1_5 | |
| 44 | DATA1_4 | |
| 45 | DATA1_3 | |
| 46 | DATA1_2 | |
| 47 | DATA1_1 | |
| 48 | DATA1_0 | |
| 49 | DRGND | |
| 50 | DATA2_11 | |
| 51 | DATA2_10 | |
| 52 | DATA2_9 | |
| 53 | DATA2_8 | |
| 54 | DATA2_7 | |
| 55 | DATA2_6 | |
| 56 | DATA2_5 | |
| 57 | DATA2_4 | |
| 58 | DATA2_3 | |
| 59 | DATA2_2 | |
| 60 | DATA2_1 | |
| 61 | DATA2_0 | |
| 62 | DRGND | |
| 63 | OEB2 | |
| 64 | DRGND | |
| 65 | DRGND | |
| 66 | DRGND | |
| 67 | DRGND | |
| 68 | DRGND | |
| 69 | DRGND | |
| 70 | DRGND | |
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| 139 | DRGND | |
| 140 | DRGND | |

Analog Mezzanine

- Status
- New Connectors

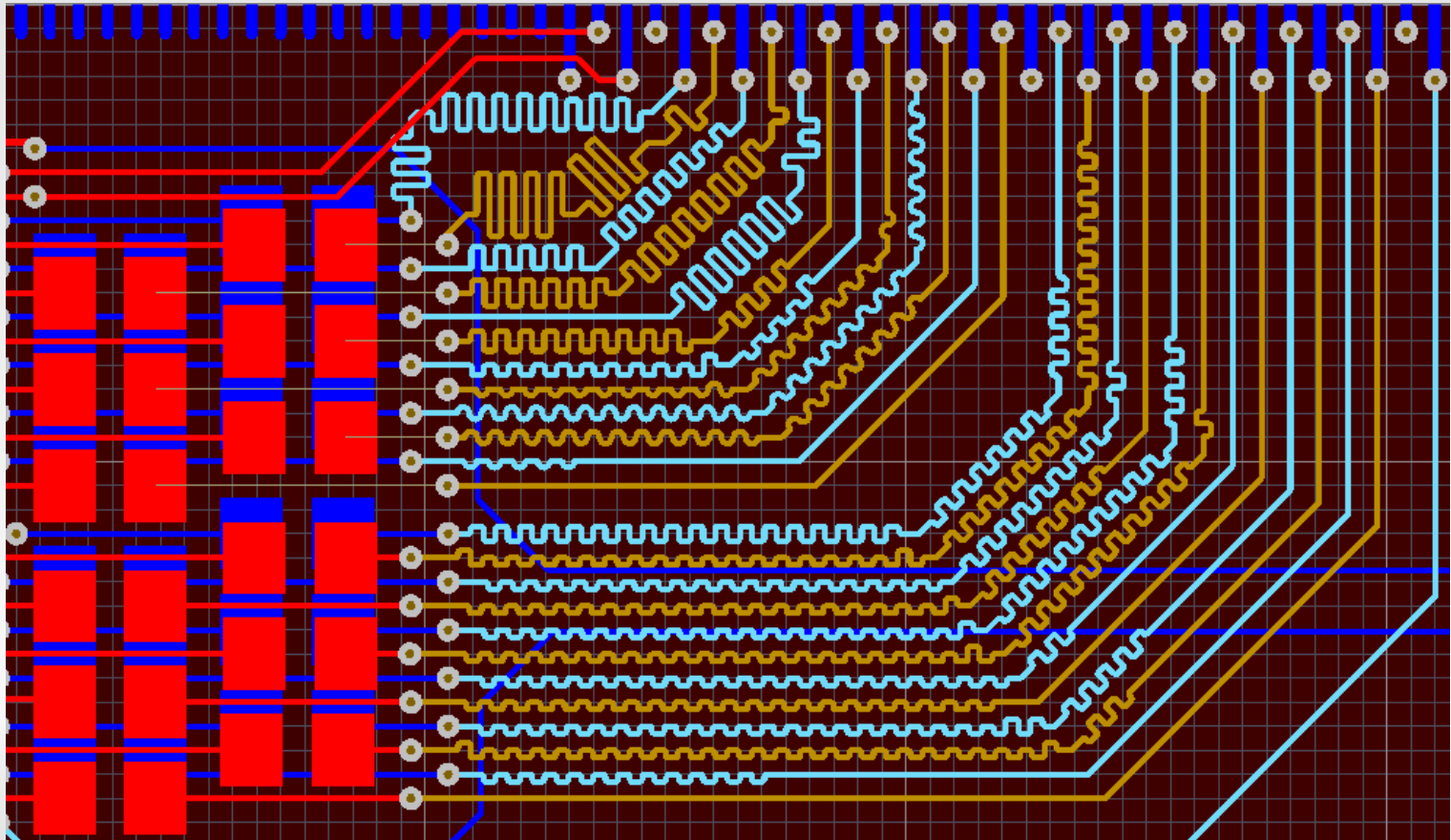
| | | | | |
|-----|-------|-----|------|-------|
| 1 | DRVCC | 1 | AVSS | DRVCC |
| 2 | DRVCC | 2 | AVSS | DRVCC |
| 3 | DRVCC | 4 | AVSS | DRVCC |
| 4 | DRVCC | 5 | AVSS | DRVCC |
| 5 | DRVCC | 6 | AVSS | DRVCC |
| 6 | DRVCC | 7 | AVSS | DRVCC |
| 7 | DRVCC | 8 | AVSS | DRVCC |
| 8 | DRVCC | 9 | AVSS | DRVCC |
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| 16 | DRVCC | 17 | AVSS | DRVCC |
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| 18 | DRVCC | 19 | AVSS | DRVCC |
| 19 | DRVCC | 20 | AVSS | DRVCC |
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| 21 | AGND | 22 | AVSS | DRGNI |
| 22 | AGND | 23 | AVSS | DRGNI |
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BOTTOM CONNECTOR

DIGITAL SIDE
MODIFIED VERSION

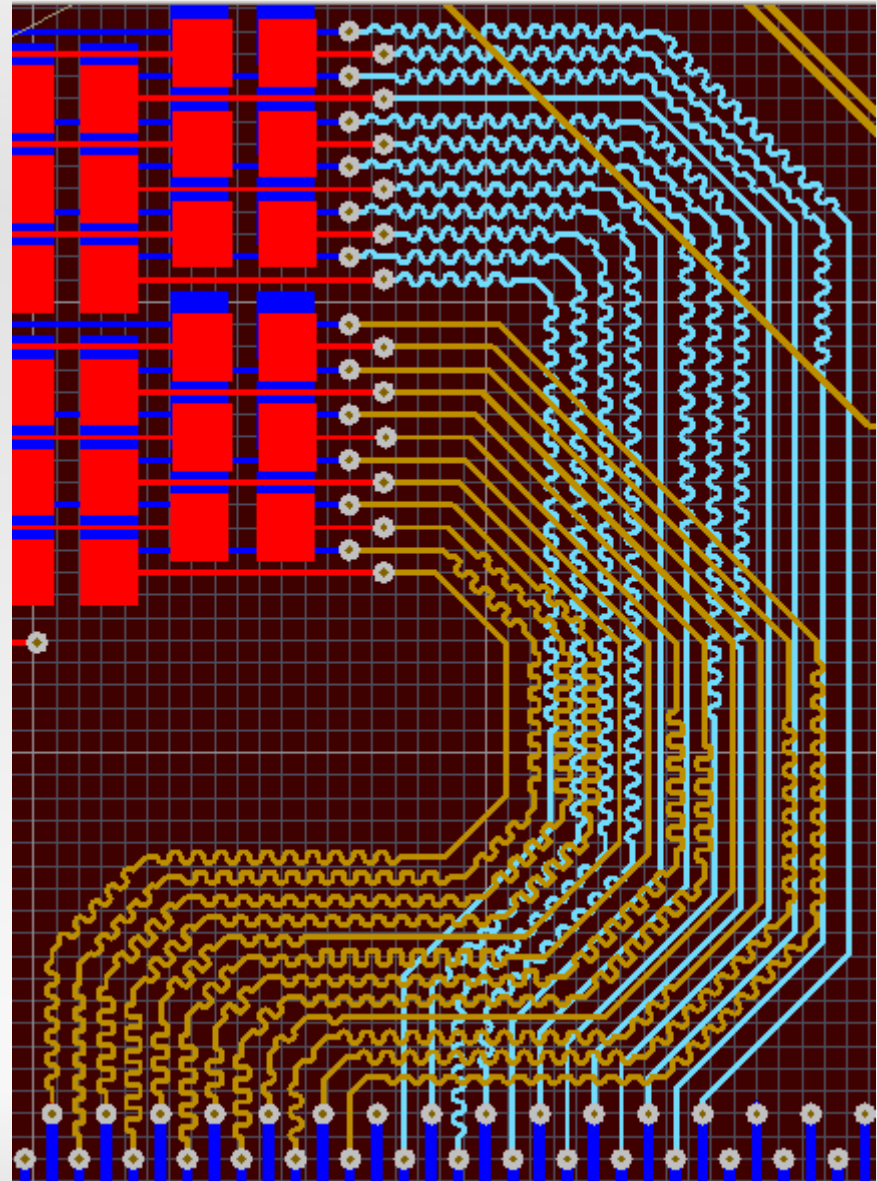
Analog Mezzanine

- Status
 - New digital lines



Analog Mezzanine

- Status
 - New digital lines
 - Test interference
 - Equalized length
 - Better sampling window!
- Test Impedance



Analog Mezzanine

- BACKUP SLIDES

Backup

