LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

LMU München - Excellence Cluster Universe

Services and Grounding

Stefan Rummel

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Overview

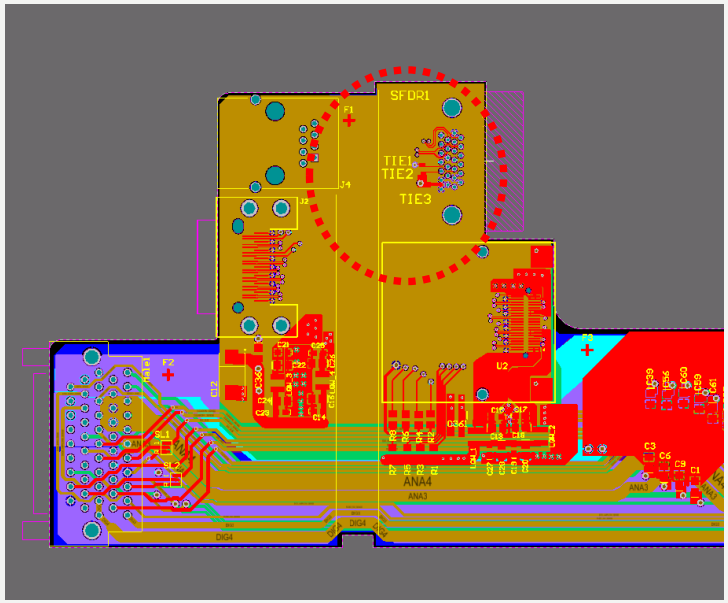
- Dockbox
- PP
- Kapton
- Grounding scheme

Dockbox – current status

- Two independent functionalities:
  - Adapter between power connectors and common mode filter
  - Fan-out of dig. signals and optical transmission
- Prototypes with transmitter and DP cable available
- Mechanics cross-checked with Karlheinz
  - Outline - ok
  - Thickness near 2mm! – next batch fine
- Circuitry around transmitter
  - Similar to the test board from Igor

  → Transmitter is working
- RJ45 connector pin assignment issue in footprint

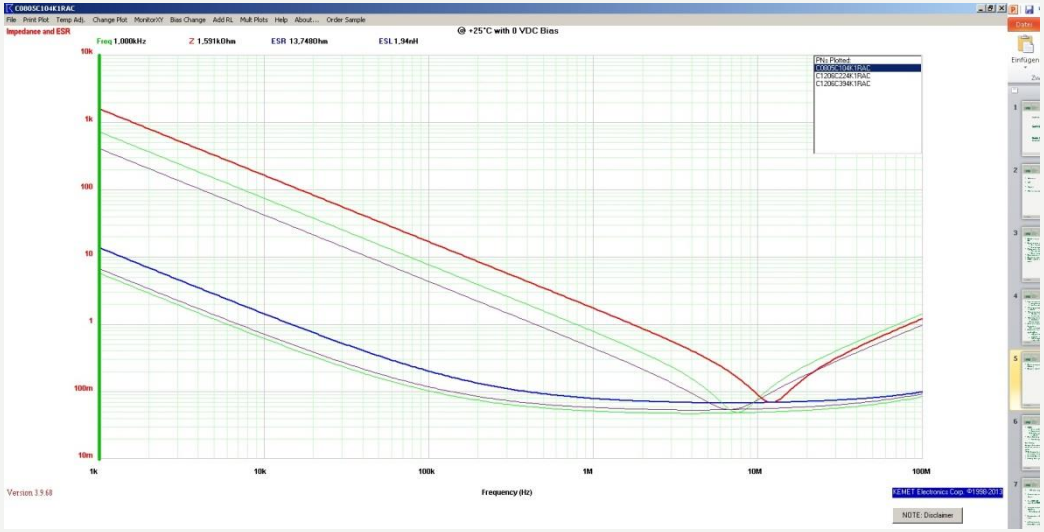
  →to be addressed in next production
- Infiniband connector was apparently tilted while reflow:
  - All pads in the first row (drainwires) were soldered, signal row was elevated limited yield
  - EMS immediately offered to rework them, next batch delivered in 2 weeks



Dockbox – open issues

- Docks incorporate capacitors for common mode filtering
  - Current value 100nF – Z < 1 Ohm: 2MHz-80MHz
  - Going for higher C?
- Transmitter with modules operated for the first time @ DESY
  - One link shows instability, reason unclear

→ Mass production can start after robust module operation is demonstrated



Dockbox – Quality control

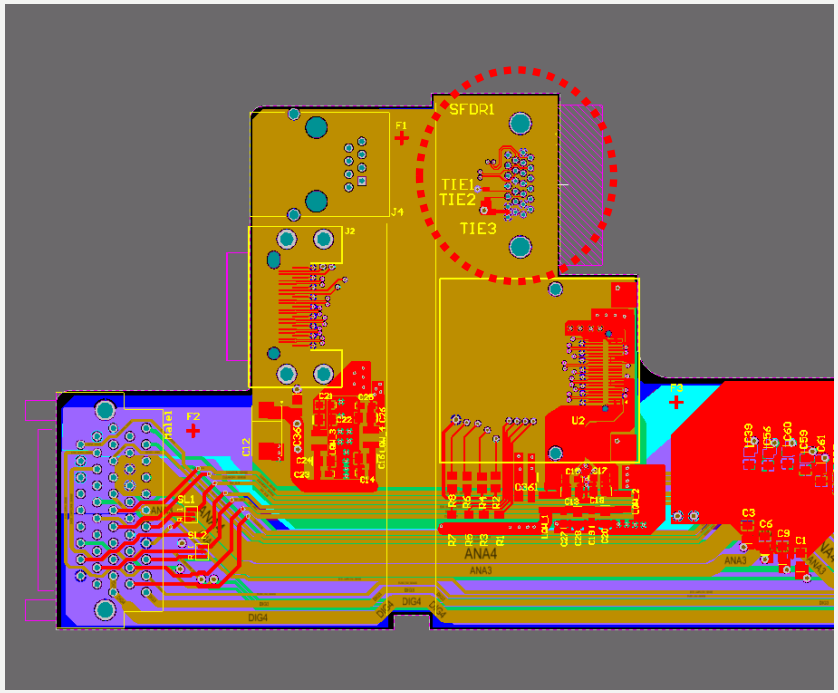
- PCB's:
  - Individual E-Test
  - Impedance control
  - → "Test-coupon" on each batch can be made available
- Manufacturing:
  - Visual inspection, AOI

Lab Testing:

Except of the transmitter the Dockbox is a fan-out which serves as an adapter between different cables

→ Cable tester can be used to check electrical connections between relevant nodes

- Successfully used for the rework of the existing boards
- Testing link quality in some test setup



PP's – current status

- 8 PP prototypes without housing are in use in the collaboration
- Test showed an issue with the assignment of the RJ45 cable
  → Issue was traced back to footprint of connector in Dockbox – exchange of two pairs
- Two links exchanged
  → Fixed on documentation

- Current strain-relief is not sufficient to prevent pairs in the InfiniBand cable from moving
  - Infiniband particular critical since it uses solid wires, stiff bundled pairs
  - Peel off of pads for Inifinibandcable

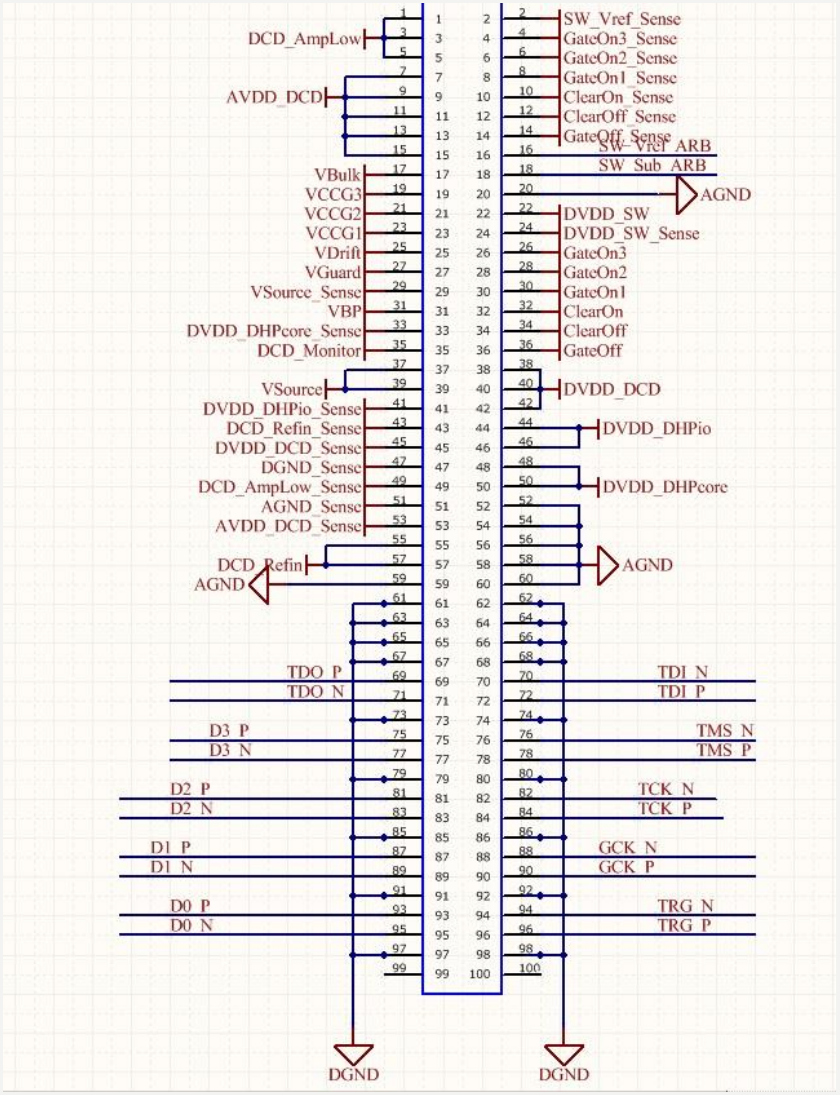
→ Additional measures required:
(1) potting and/or removing cable jacket seem to be most straight forward and compatible with existing mechanics
(2) Thinner wires in Inifiniband cables (AWG 26 or 28) → impact on signal quality?
(2) Through hole contacts for InfiniBand → Implemented in next batch, deeper cutouts on PP base already foreseen

- Locking mechanism, guide posts where in discussion

PP's – signal connections

- DHH – needs a set (4) of analog signals for operation and defining local ground:
  - DCD_Mon
  - Signals to detect DHP power state
- New baseline:
  - DCD_MON comes with DGND_SENSE as reference – Currents in DCD_MON?
  - DHP_IO_SENSE and DGND_SENSE to detect power state (prev. DHP_IO and local PP DGND)
- Both optical transmitter in Docks and DHH are referenced to module DGND using the sense wire

- This scheme is implemented in the PP PCB's currently produced



PP's – next steps

- First hoods and bases made of Aluminum will be available from MPI
  - Appropriate for single connector interface
- PP PCBs with TH – delivery scheduled for next week
- Assembly will take around 3 weeks

→ First PP prototypes with current state of mechanics available

- Main question: Are the TH contacts sufficient, does bending directly after PP harm them?

PP's – quality control

- PCB's standard measures: E-Test, Impedance

- Manufacturing has several manual non standard steps; take care of:
  - Stripping of insulation on data lines
  - Staying within the allowed volume
  - Assignment…

- PP contains no active circuitry
- Full test of assignment, open/shorts, resistance sufficient to check the electric properties
- Test can be done using the cable tester @ LMU

- Link quality to assess signal integrity

Kapton

- Production ongoing
- We have to make a decision on the size of the various capacitors….
  - Input from Gated-mode testing?

Grounding

- **Baseline are the recommendations from Fernando**

- Deviations from this occurred on the PP side where shields of the data cables where connected to PP via the crimp

→ Measures to insulate the braid from the housing must be implemented

- A set of issues came up regarding the referencing of the transmitter circuitry and DHH with respect to the module
  - New baseline is to put DHH and Transmitterground on the same potential as the module DGND using the respective sense wire
  - Flexible handling of Drainwire connection on Dockbox level – capacitor implemented – so can be left open or AC coupled

Backup