DAPHNE modifications for SoF receiver.

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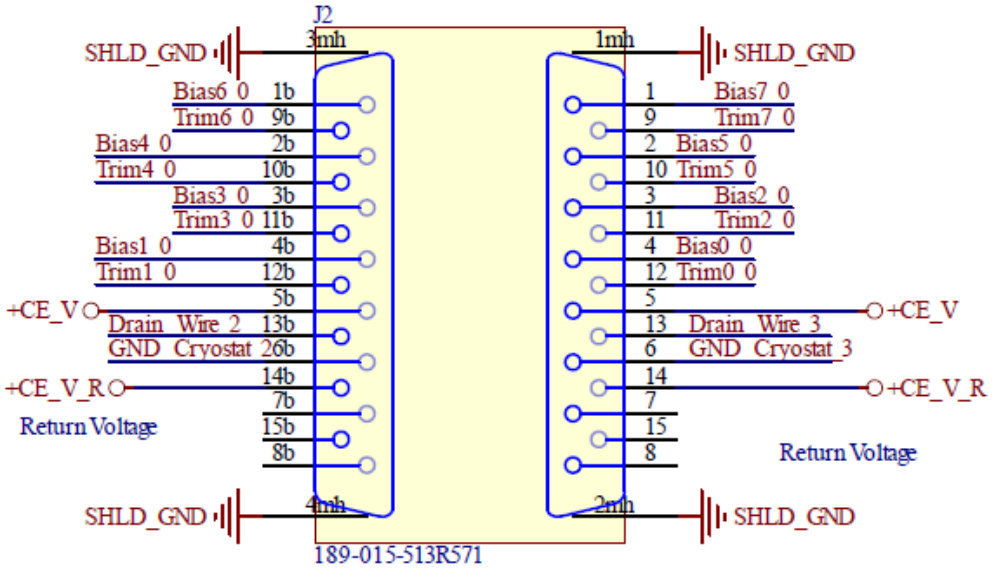
Considerations

- These are the modifications are needed to achieve the best signal response with the SoF receiver.
- Given that DAPHNE is 100Ω terminated in AC coupling, the **main reason to modify DAPHNE is to bypass the transformer in order to have the least undershoot possible in the signal**.
- **The SoF receiver should be compatible with DAPHNE without any modification** at the expense of having extra undershoot in the signal. (from ~8% to ~30%).
- If the extra undershoot is tolerated, the related modification to signal conditioning are not required.
- A small modification is required to deliver power to the SoF receiver, but it can be also powered externally.

SoF Receiver – pinout
1st inmediate batch



Questions:

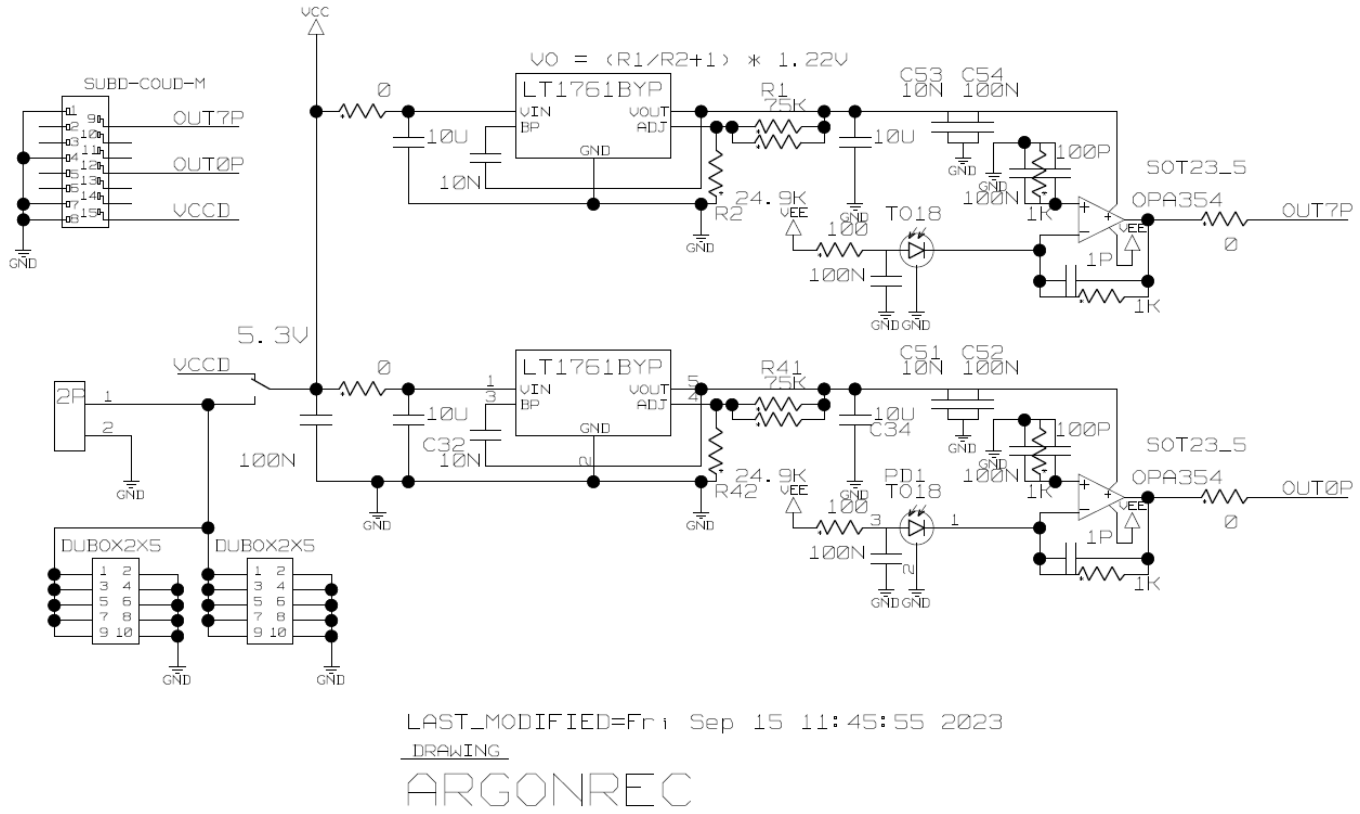
1) Gnd connection?
2) Signal: trim pins ?
3) Signal: Bias pins ?

Answers:

1. GND (AGND): Pins 7 (7b*) and 8 (8b*) ; Pin 1 (Bias7_0) and Pin 4 (Bia
2. Signals: S1 → Pin 9 (Trim7_0) ; S2 → Pin 12 (Trim0_0).
3. VCC: Pin 15 (pin 15b*).
4. All other pins must be left OPEN.
5. IMPORTANT: Only one (1) (bottom) DB15 connector is necessary, pins must be left OPEN in the top DB15 connector if a double DB15 male connector is used.

*An exception can be made for (unused) pins 7b, 8b and 15b which can be tied with their corresponding analogues pins 7,8,15.

SoF Receiver - Power



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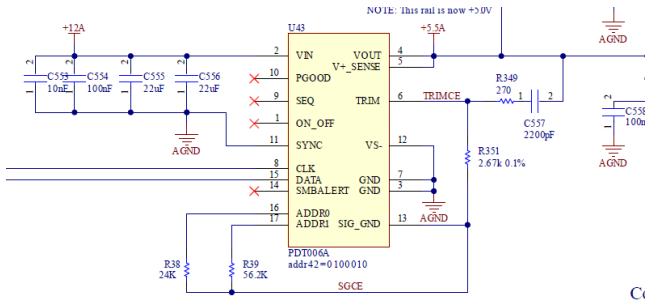
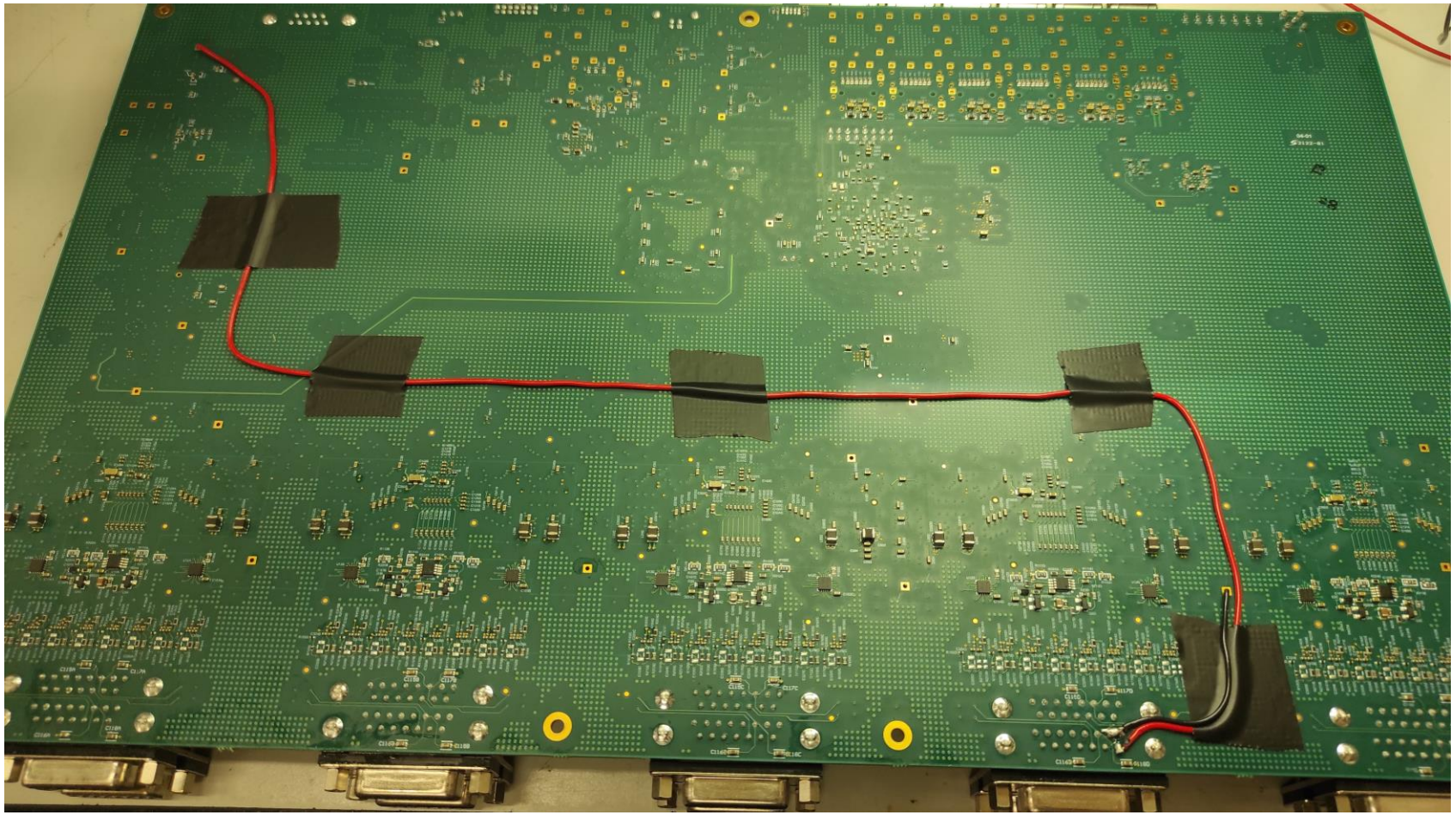
DRAWING

ARGONREC

- SoF receiver is single ended output.
- 0 Ohm output resistor can be maintained or changed to 50Ohms.
- Required supply voltage is 5.3V.
- Power will be supplied by U43.
- Modification 1:
  - Change R351 to 2.55kΩ
  - Bypass power to pin 15.

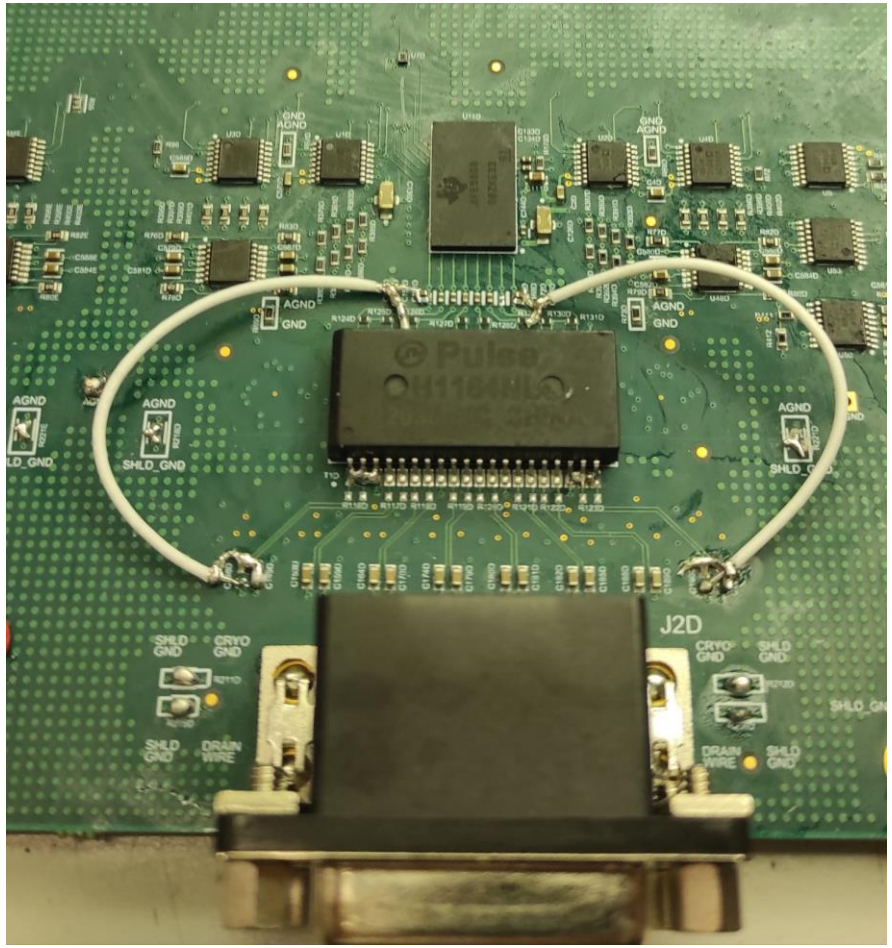


SoF Receiver - Power



- Red wire jumper bypasses +5.5A test point to pin 15.
- Black jumpers bypass AGND to pin 7 and 8 to provide reference to the SoF Receiver Board.
- **The SoF has also has the possibility to be powered externally.**

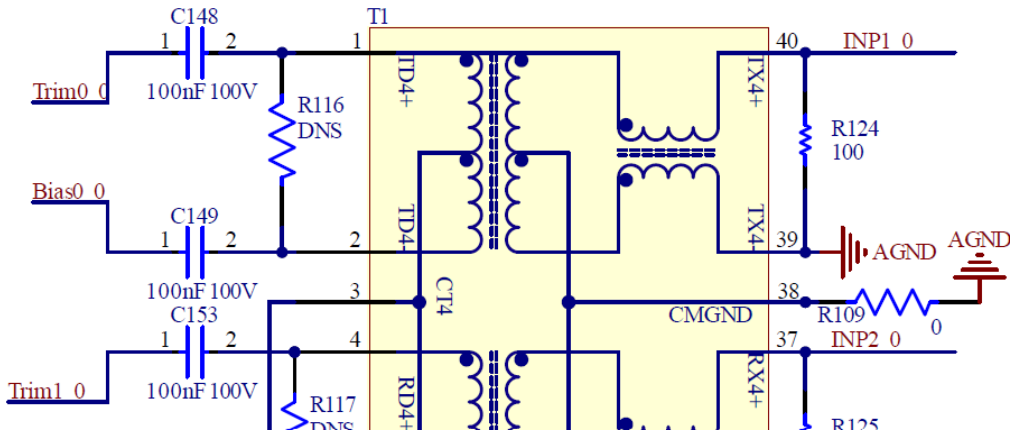
SoF Receiver – Signal-Power modifications Nº1 @ Milano-Bicocca



1. Removal of capacitors C148 (Trim0_0), C149 (Bias0_0), C190 (Trim7_0), C191 (Bias7_0).
2. Bias0_0 and Bias7_0 nodes connect to ground. Signals are injected through the Trim0_0 and Trim7_0 nodes.
3. Removal of resistors R184,R192 (Connection from Trim0_0 to current monitor) and R203,R210 (Connection from Trim7_0 to current monitor).
4. Disconnect C150 and C176, rotate 90 degrees and reconnect only pin2 of the capacitors, leaving pin1 floating.
5. Connect a 50 ohms resistor to pin1 of the capacitors in (4), ground the other pin of the resistor.
6. Bypass the transformer by shorting pad 1 of Trim0_0, Trim7_0 to the referred pin1 in (4)(5).
7. Change resistor R351 to 2.55K ohms to increase output of U43 from 5V to 5.3V.
8. Short rail name +5.5A (now 5.3V) to pin 15 of the DB15 connector.
9. Ground pin 7,8 of the DB15 connector.

Important: these modifications were done in this way in order to not damage the transformer in our daphne at Milano-Bicocca. I Do not recommend this modification for more than 2 channels per AFE

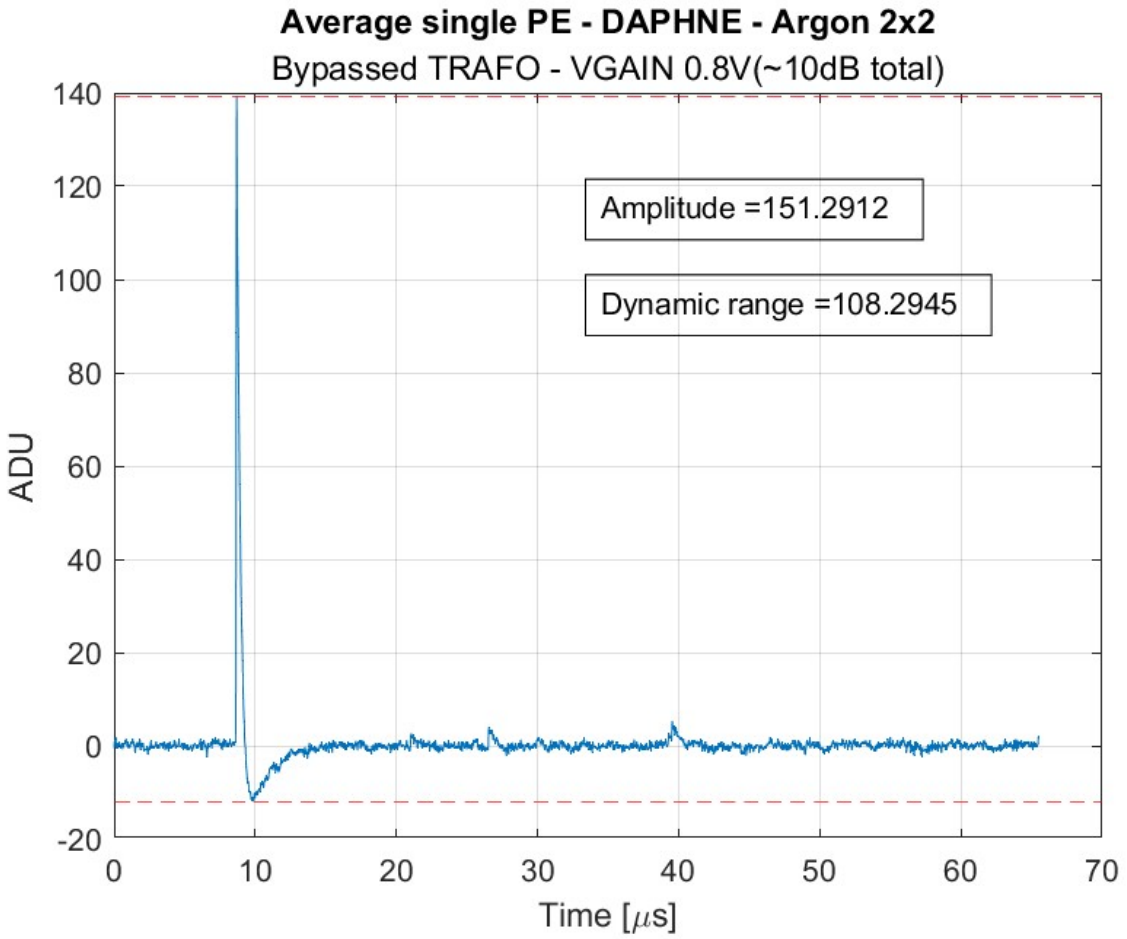
SoF Receiver – Signal-Power modifications Nº2



- From the previous slide list replace (4)(5)(6) with:
  - Remove transformer T1.
  - Short C148 pad1 and pad2; Short pin1 of T1 to pin 40. Short C190 pad1 and pad2. Short pin19 of T1 to pin 22.
  - Change R124,131 to 50 ohms (optional: leave the 100 ohms?).

Important: these modifications allows all AFE input to be terminated directly. Removal of transformer must be done carefully to prevent damaging pads. The transformer may have to be destroyed. Each DB15 could support 4 SoF channels, with 40 per DAPHNE in total.

SoF Receiver – Koheron test @ coldbox



- IMPORTANT: modifications Nº 1 where already tested.
- Although the trasnformer was bypassed, a undershoot is still present.
- Reminder: **the SoF should be compatible with DAPHNE without any modifications at the cost of larger signal undershoot.**