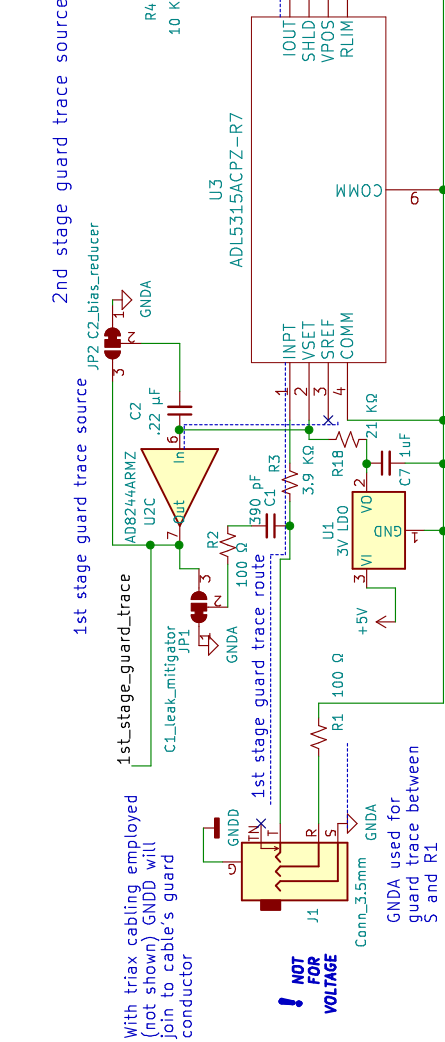


- FID1 Front Fiducial
- FID2 Back Fiducial
- FID3 Front Fiducial
- FID4 Back Fiducial
- FID5 Front Fiducial
- FID6 Back Fiducial

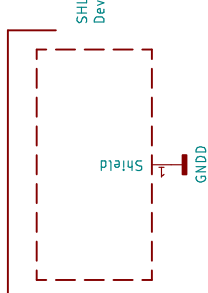
Sheet: Sheet05/57/BB6
File: Coax Cable and Diagnostic DUT.sch

Blue dashes indicate traces that ought to be guarded using similar voltage guard trace. Remove solder mask from the guard traces to guard signal source. Reagents used must contain guard trace isolation to guard signal traces from the other side of the board as well.



NOTE CHEMISTRY TERMS OF SOLUTE, SOLVENT, AND SOLUTION

Stock shield symbol below slightly incorrect: it is the top that connects to GND while the bottom is not used



When used as designed (body not soldered, and not hermetically sealed), the height of the shield is 10mm and not hermetically sealed.

Instead, hermetic sealing is suggested to provide you with the ultimate in long term sensitivity stability in scientific applications. The height of the shield will also benefit from J1 being a triax connector instead of the phone connector shown.

Hermetic sealing is achieved by:

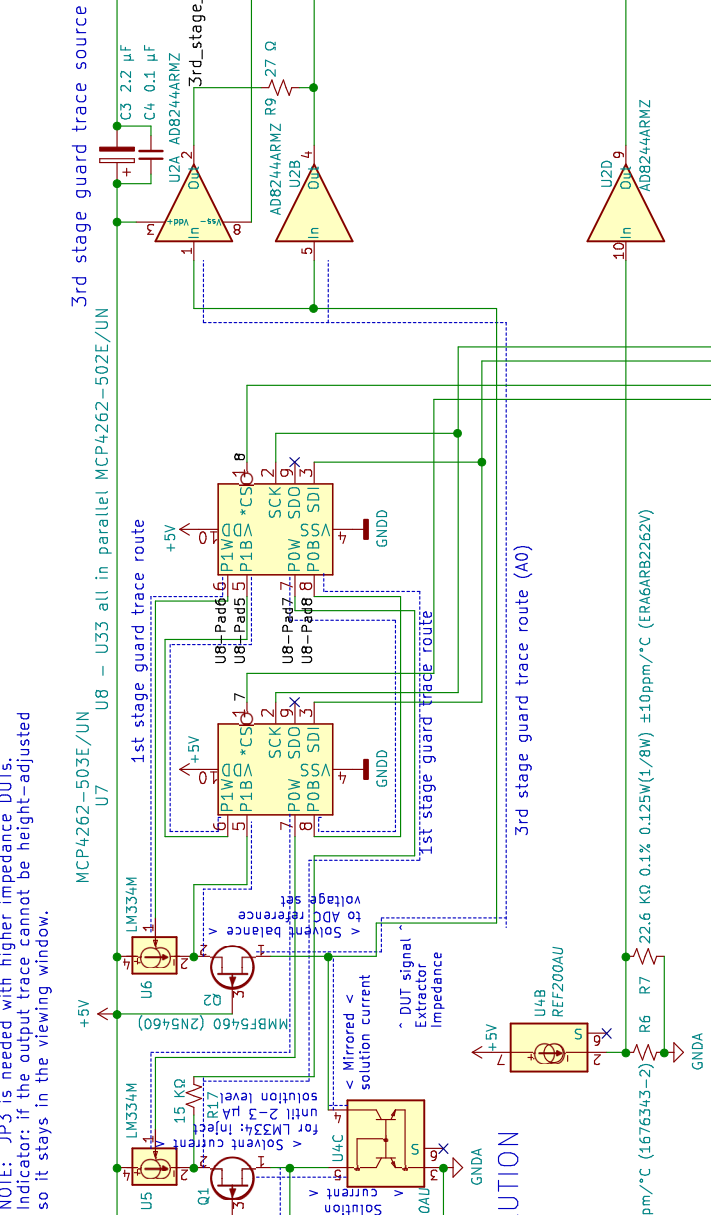
- #1) Solder sealing all micro-vias of the PCB under the shield, and the PCB under the shield, and the PCB under the shield.
- #2) not using the shield body, only the shield body, and the shield body, and the shield body.

NOTE: Vcc net will remain labeled +5V until +3.3V operation is fully validated. Operation currently at +3.3V is a little sickly, likely due to the following.

NOTE FOR 3.3V OPERATION – In 3.3V operation, the voltage drop that Q2 adds for the sake of the highest output impedance of U4C may not allow for the use of the 3.3V operation. The 3.3V operation that JET may be shorted across D to S with the expected result to be reduced signal sensitivity.

MBRFS460 (2N5460) Notes: SMD Source & Drain MUST BE interchangeable due to starting off this project with a backwards SMD footprint. This restriction should not be a problem b/c the manufacturer states that specific interchangeability is not required for this device. Also note: Q1 contributes nothing to functionality except to permit using the same voltage guard trace for both U7 and U8 since they are co-located, distant from the board sides leaving no room for another.

NOTE: J23 is needed with higher impedance DUTs. The DUT must be height-adjusted so it stays in the viewing window.



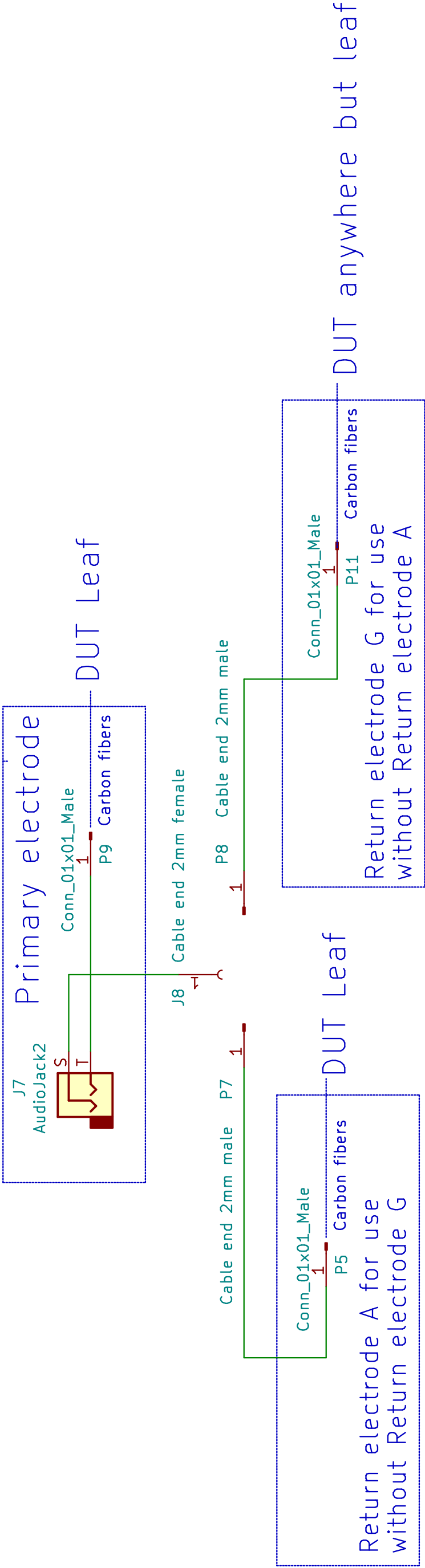
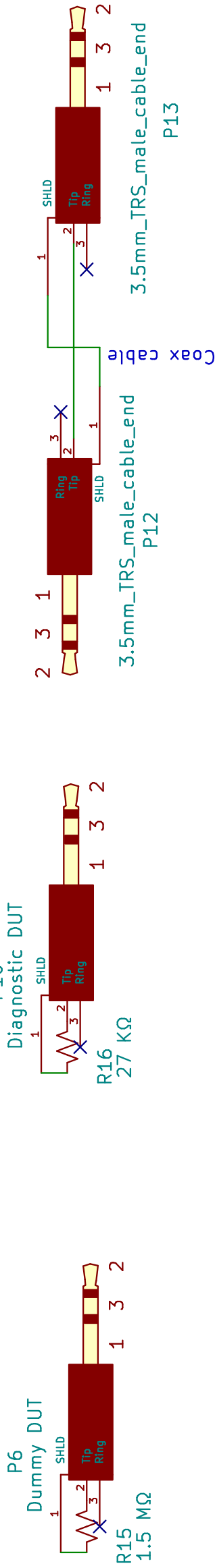
NOTE – These resistors are valued for 5V operation to the the advanced high-precision amplifier. Future research is apt to be done for 3.3V operation of the HX711 to determine if this value will need to be changed. It is not expected to be different, based simply on the reasoning that this reference voltage is about half of 3.3V already.

NOTE – These resistors are spec'd tightly to mitigate temperature drift. It is a different tempo is found to be different, but the temps of these resistors would be the solution.

NOTE – Due to this current mirror being referenced low, the signal gets inverted (higher current=lower voltage). No stage following is also inverting, so unfortunately it is not inverted. I haven't done that due to it being unessential to the lay operator – for now, the operator may just things considered. For now, the operator may just or electrical resistance instead of conductance.

Q1,2 pinch-off testing: Q1,2 need to place enough voltage across IM334 to permit full current capability of 1 mA to 5 mA (equi-spaced steps at 68K, 100K, 150K, 200K, 250K, 300K, 350K, 400K, 450K, 500K, 550K, 600K, 650K, 700K, 750K, 800K, 850K, 900K, 950K, 1000K, 1050K, 1100K, 1150K, 1200K, 1250K, 1300K, 1350K, 1400K, 1450K, 1500K, 1550K, 1600K, 1650K, 1700K, 1750K, 1800K, 1850K, 1900K, 1950K, 2000K, 2050K, 2100K, 2150K, 2200K, 2250K, 2300K, 2350K, 2400K, 2450K, 2500K, 2550K, 2600K, 2650K, 2700K, 2750K, 2800K, 2850K, 2900K, 2950K, 3000K, 3050K, 3100K, 3150K, 3200K, 3250K, 3300K, 3350K, 3400K, 3450K, 3500K, 3550K, 3600K, 3650K, 3700K, 3750K, 3800K, 3850K, 3900K, 3950K, 4000K, 4050K, 4100K, 4150K, 4200K, 4250K, 4300K, 4350K, 4400K, 4450K, 4500K, 4550K, 4600K, 4650K, 4700K, 4750K, 4800K, 4850K, 4900K, 4950K, 5000K, 5050K, 5100K, 5150K, 5200K, 5250K, 5300K, 5350K, 5400K, 5450K, 5500K, 5550K, 5600K, 5650K, 5700K, 5750K, 5800K, 5850K, 5900K, 5950K, 6000K, 6050K, 6100K, 6150K, 6200K, 6250K, 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NOTE: These symbols are required to generate an accurate BOM. To use them in that way, copy them and paste them anywhere into the main page. They do not have to show within any sheet boundary. Generate the new BOM and delete the symbol copies from the main page, and main page only, when finished, always leaving the original symbols in this sheet. If the copies are left in the main page when later updating the PCB, they will interfere with the generation of the PCB Gerber files because these have no residencies on the PCB.



The pins inside the electrodes are to enable gold compatible finish electrical contact in the electrode assemblies for the carbon fiber. One pin belongs in each electrode assembly.