

- FID1

Front Fiducial

FID4

Back Fiducial

FID3

Front Fiducial

FID6

Back Fiducial

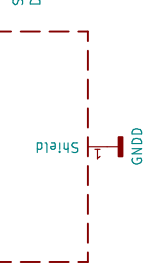
Sheet: Sheet05/57B86
File: Coax Cable and Diagnostic DUT.sch

Blue dashes indicate traces that ought to be guarded using similar voltage guard ring. Remove solder mask from the guard rings to guard signal traces on the underside of the board as well.

With triax cabling employed (not shown) GNDd will be a shieldable guard conductor

I NOT VOLTAGE

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 soldered to the shield and removed), the height of this 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. This is achieved by which 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

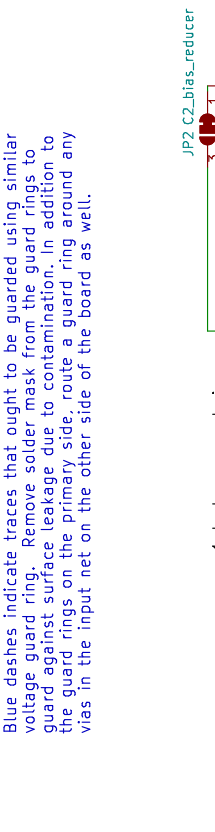
#2) not using the shield body as a triax connector. Instead, the triax connector is soldered to the shield and the shield is then soldered to the PCB using the shield body as a triax connector. This is achieved by using a triax connector with a central pin and a shield ring. The central pin is soldered to the shield body and the shield ring is soldered to the PCB using the shield body as a triax connector.

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

NOTE FOR 3.3V OPERATION — In 3.3V operation, the voltage drop that Q2 adds for the sake of the 3.3V operation will be significant. It will not allow 3.3V operation with an outboard ADC. If that is found to be the case, that JFET may be shorted across D to S with the expected result to be reduced signal limitation.

MMBF5460 (2N5460) NOTE: SMD Source & Drain MUST BE interchangeable due to starting off this project with a SMD package. Since the manufacturer should not be prohibited by the manufacturer states that specific interchangeability is present in the MMBF5460 SMD package anyway. Also note: Q1 contributes nothing to functionality for both U7 and U8 since they are co-located, distant from other guard traces, and their guard trace weaves between board sides leaving no room for another.

2nd stage guard ring source



2nd-stage ring

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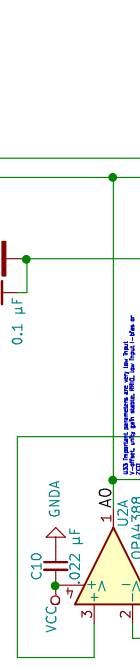
2nd-stage ring

Only a single jumper to be used at a time.

Adapter, though only one of the modules can be chosen from that lineup. If ESP-01 is needed to be used, the JPA shunt but also solder-jumper on board front to surrounding copper. If it is needed for connect to Rx, pad jumpering is available connects to Rx of the other & vice versa. That is why you'll notice Tx printed on the wireless module goes to MCU Rx.

Conn_01x09_Female

Notes: U33, U36, and U35 need not be OPA320. It is shown this way for simplicity of BOM.



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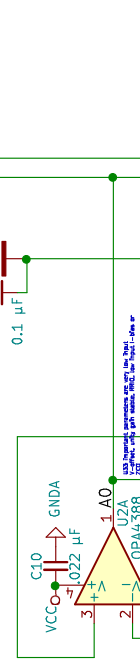
1st stage guard ring route

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6.9 STATELED
8 X
7 Tx
6 Rx
5 VCC
4 GND
3 JPA
2 JPA
1 JPA
0 JPA

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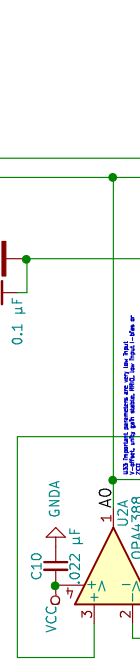
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Not included — not enough board space

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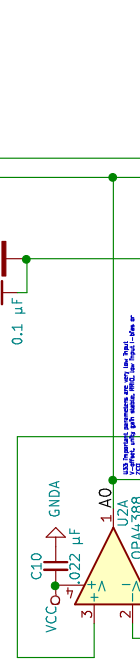
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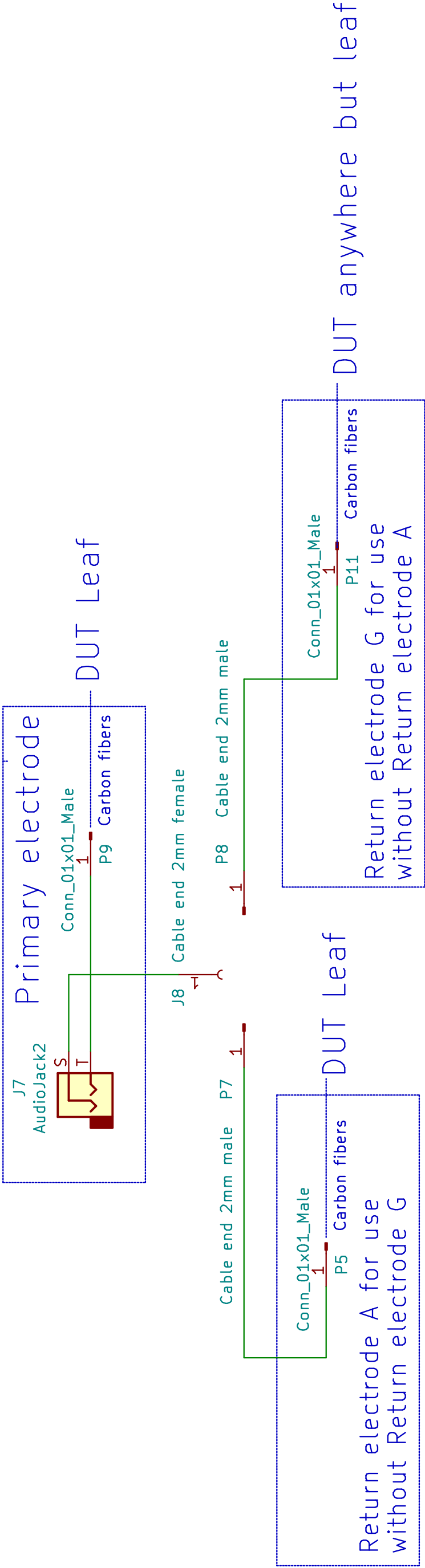
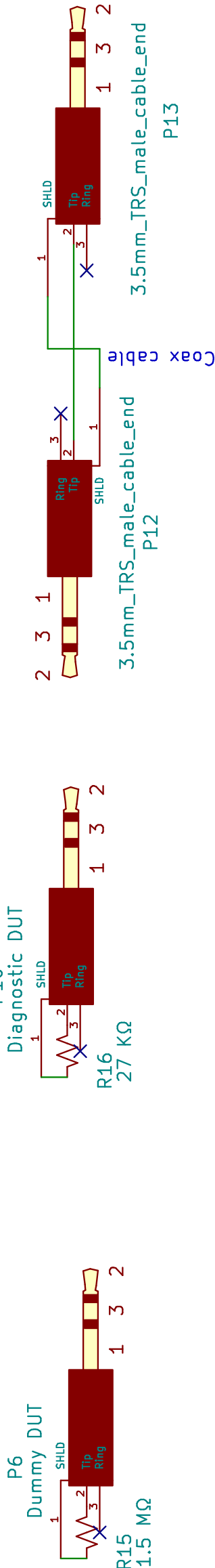
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NOTE: These symbols are required to generate an accurate BOM. To use them in that way, copy them and paste them anywhere into the main page. They do not have to show within any sheet boundary. Generate the new BOM and delete the symbol copies from 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.