

T1100119-v1

FSS Modifications

"from eLIGO to aLIGO"

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1 TTFSS

eLIGO is using a TTFSS equipped according to D040105-B. We have to modify the following points, see Fig. 1 for an overview.

1. Replace R96 and R104 by 00hm
2. Replace R97 by 4kOhm
3. Connect J15 (SLOW) with J6 (RAMP IN) using an external BNC cable
4. Replace C29 with daughter board (D1100371) (Fig. 2). Connect ttfssdghtr.X1 to the pad of C29 which has a connection to TP7, connect ttfssdghtr.X2 to the other pad. Connect ttfssdghtr.X5 to TP22 (ground), ttfssdghtr.X3 to TP15 (+5V), ttfssdghtr.X4 to TP16 (-5V).
5. Add PA85 protection circuit according to datasheet (Fig. 4). Solder the diodes to the PA85 socket dangling below the PCB.

Measure the transfer function from TEST2 (J4) to TP9 to verify the correct installation of the daughter board. Use high impedance inputs at the analyzer, disconnect the RF PD, make sure the loop is closed via EPICS and TEST2 is activated. A reference measurement is shown in Fig. 3, proportional gain might be different.

2 RFPD

Reduce the Q-factor of the photodiode by adjusting R24 (D000455) from 1k to 420Ohm (?). The bandwidth should increase from 700kHz to 1.35MHz.

3 VCO

No modifications necessary.

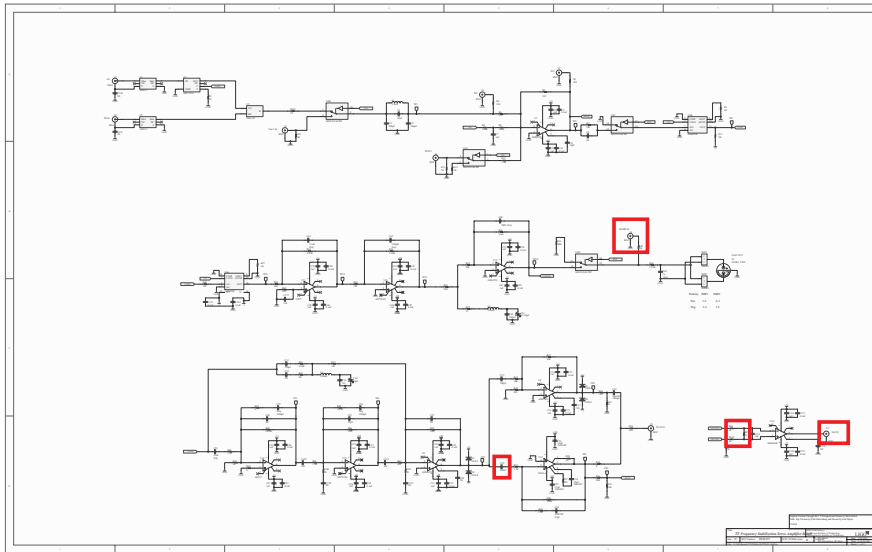


Figure 1: Overview of TTFSS schematics with highlighted modifications.

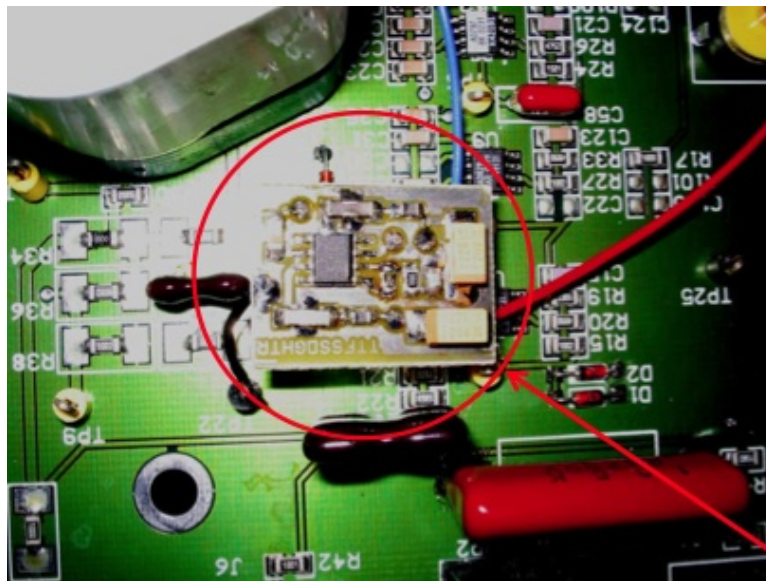


Figure 2: Photo of installed daughter board.

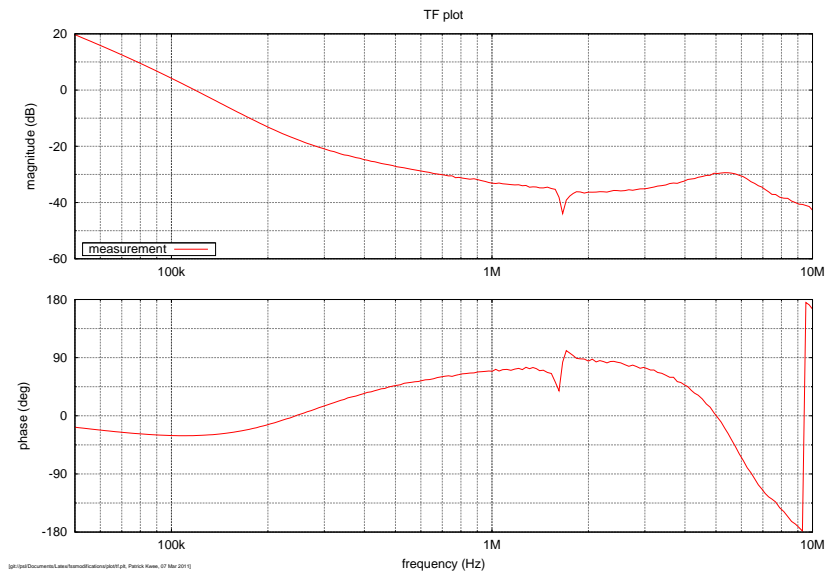


Figure 3: Measured transfer function of the TTFSS.

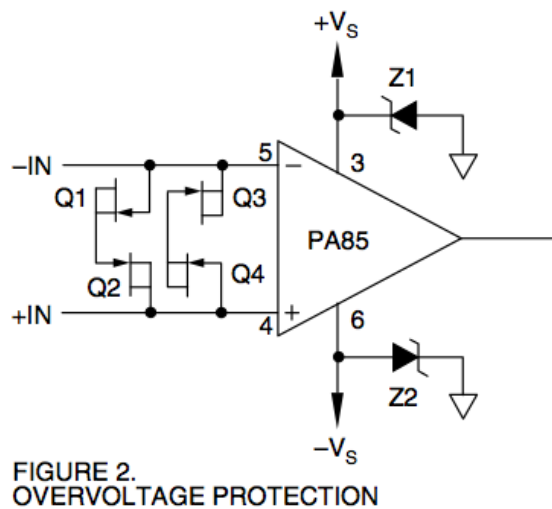


FIGURE 2.
OVERVOLTAGE PROTECTION

Figure 4: PA85 protection according to datasheet. Q1-Q4 are 2N4416, Z1-Z2 are unidirectional zener diode transient suppressors.

4 TPD

Replace PD in transmission of reference cavity with the new one (D1002164).

5 Fieldboxes

Use fieldboxes D1100367 and D1100369.