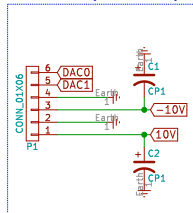
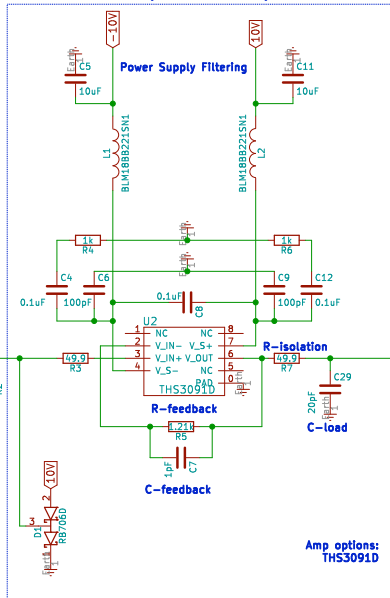


Precision power input

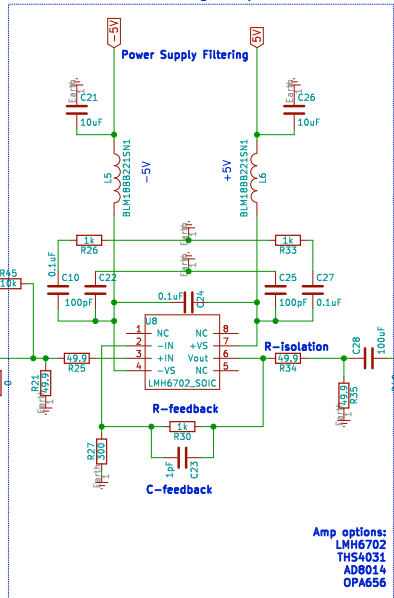


Transimpedance Amplifier



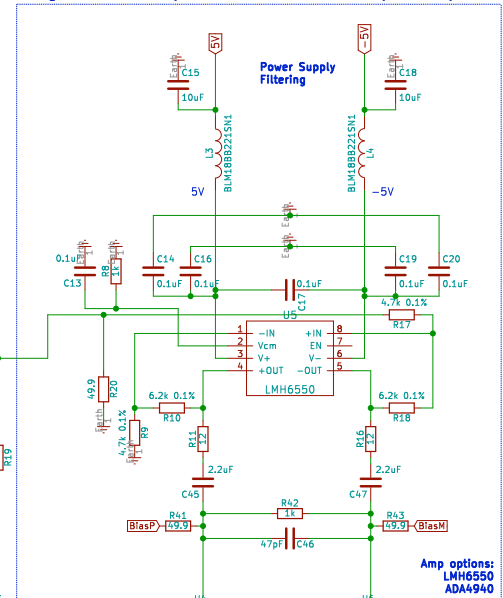
Amp options:
THS3091D

Non-inverting Amplifier



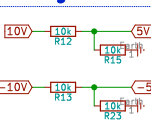
Amp options:
LMH6702
THS4031
AD8014
OPA656

Single-ended input to differential output amplifier

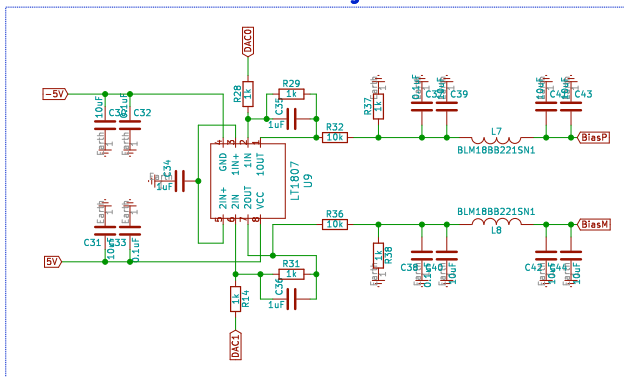


Amp options:
LMH6550
ADA4940

Voltage divider



Differential ADC Range Offset



NOTES

In-line

500hm signal trace. Thick trace.
No vias on signal.
All signal on top layer.

C-load

RC filter. 50 and 20pF, $F_c = 160\text{MHz}$

R-isolation

R isolation very close to V_{out} .
Minimizes capacitive loading.
Use 0603, non-handsoldering pads.
Same resistance as track impedance

R-feedback

Close to input and output pins as possible.
Large values add JN noise.
Small values make instabilities.
Check values in datasheet.

Power Supply Filtering

Wide traces on power lines.
100pF decoupling cap as close as possible to V_{SS} and V_{DD}
100pF on IC side

C-feedback

Helps with stray capacitance.
*Likely remove for final design, or sub 1pF values.

MIT -- KamLAND

Sheet:

Files: FEA.sch

Title: Mainboard Analog Front End

Size: B

Date: 2020-03-18

Rev: v1

KiCad E.D.A. eeschema (5.1.5-0-10-14)

Id: 1/1

EMF Shield
SMA preferred over BNC
Keep components small, 0603 all smt
MULTIPLE Vias Everywhere
Short fat traces to reduce I
Round traces. No 90s.
GND and V pour removed near IC IO
Symetric power supply filtering

<http://www.ti.com/lit/ml/slyp173/slyp173.pdf>

Low pass filter: <https://rf-tools.com/lc-filter/>