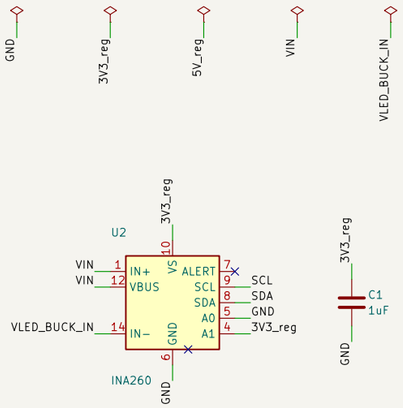
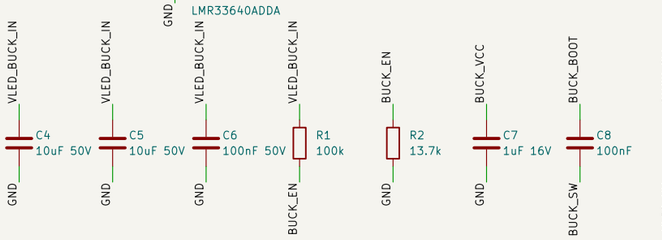
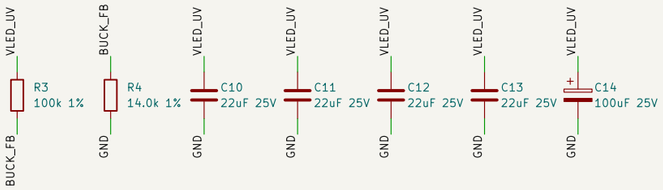
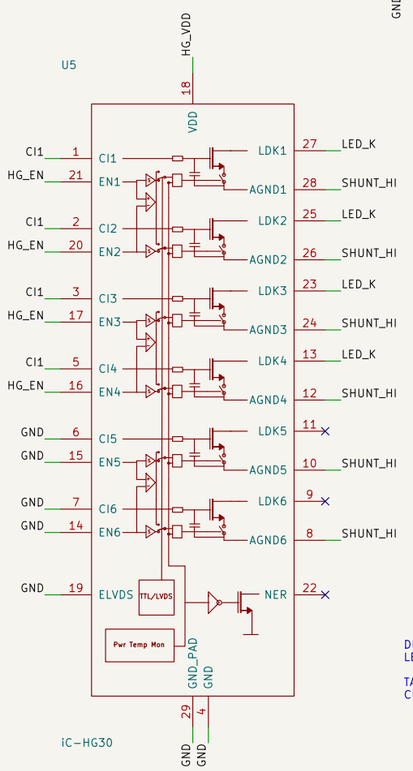
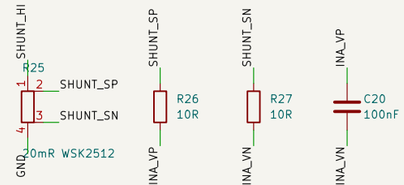




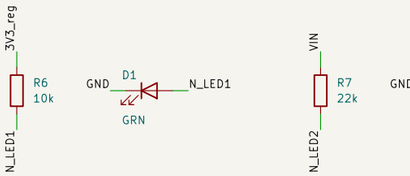


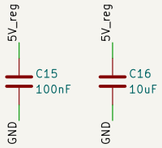


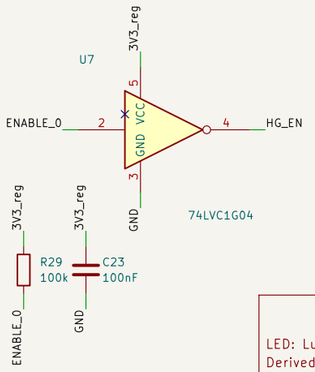














DESIGN NOTES
LED: Luminus XFM-5050-UV-D130 (275 nm UV-C). Vf 5.0-7.75 V at 2 A, If max 3.2 A, Tj max 95 C. UV-C is hazardous to eyes and skin.
TARGET: 2.0 A continuous (LED Vf 6.75 V typ at 2 A).
CURRENT: iC-HG30 channels 1-4 in parallel, 0.5 A each at 2 A (1 A CW max per channel). Channels 5-6 unused: CI/EN to GND, LDK open (iC-HG30 Rev B4 p.8).
CI = DAC A x 4.7k/(11.3k+4.7k) = 0.29 x Vdac -> -1.43 V at 5 V FS (1.37-1.45 V incl. CI internal pull-downs).
Fig. 4 at 1.45 V: ~0.8 A/ch max part (3.2 A total, LED limit), ~0.5 A/ch typ (~2.0 A), ~0.3 A/ch min part (~1.2 A).
Set 2.00 A in firmware by trimming the DAC code to the INA209.
Needs a 5 V DAC span: U4 must be AD5669RBRUZ-2 (-1 = 2.5 V span).
RAIL: VLED_UV = 1.0 V x (1 + R3/R4) = 8.14 V (R4 14.0k), ~1 V of headroom over a 6.75 V LED. iC-HG30 dissipates ~2.5 W at 2 A.
Match R4 to the LED's Vf bin (Vbin max + ~1.2 V):
V3 17.4k V4 16.0k V5 14.7k V6 14.0k V7 13.0k V8 12.1k
Single buck fed from VIN (stack pins 34/36, protected system input); the power board's Vled buck/boost (pins 7/9) is not used.
VIN must be 11-36 V (UVLO ~10 V via R1/R2; LMR33640 max 36 V).
Buck runs whenever VIN is present; HG_EN alone gates the LED.
STROBE: HG_EN = NOT ENABLE_0 (U7). ENABLE_0 low = LED on.
D6 free-wheels the cable inductance at turn-off (iC-HG30 Fig. 6); place it next to U5 and J2.
I2C: INA260 0x44 (VIN to buck), INA209 0x41 (LED current), AD5669R A0=GND (same strap as original U24). ~LDAC=GND, ~CLR=5V_reg (clear unused; original U24 had ~CLR on GND).
SUPPLY: AD5669R and iC-HG30 VDD run from 5V_reg (fixed).

LED: Luminus XFM-5050-UV-D130, 275 nm UV-C, 2 A typ / 3.2 A max
Derived from SWIRSystemController LED driver board (J34 stack pinout)

MBARI

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Title: XFM-5050-UV Single-Channel Stack Driver

Size: A3	Date: 2026-11-03	**Rev: A**
KiCad E.D.A. 10.0.6		Id: 1/1