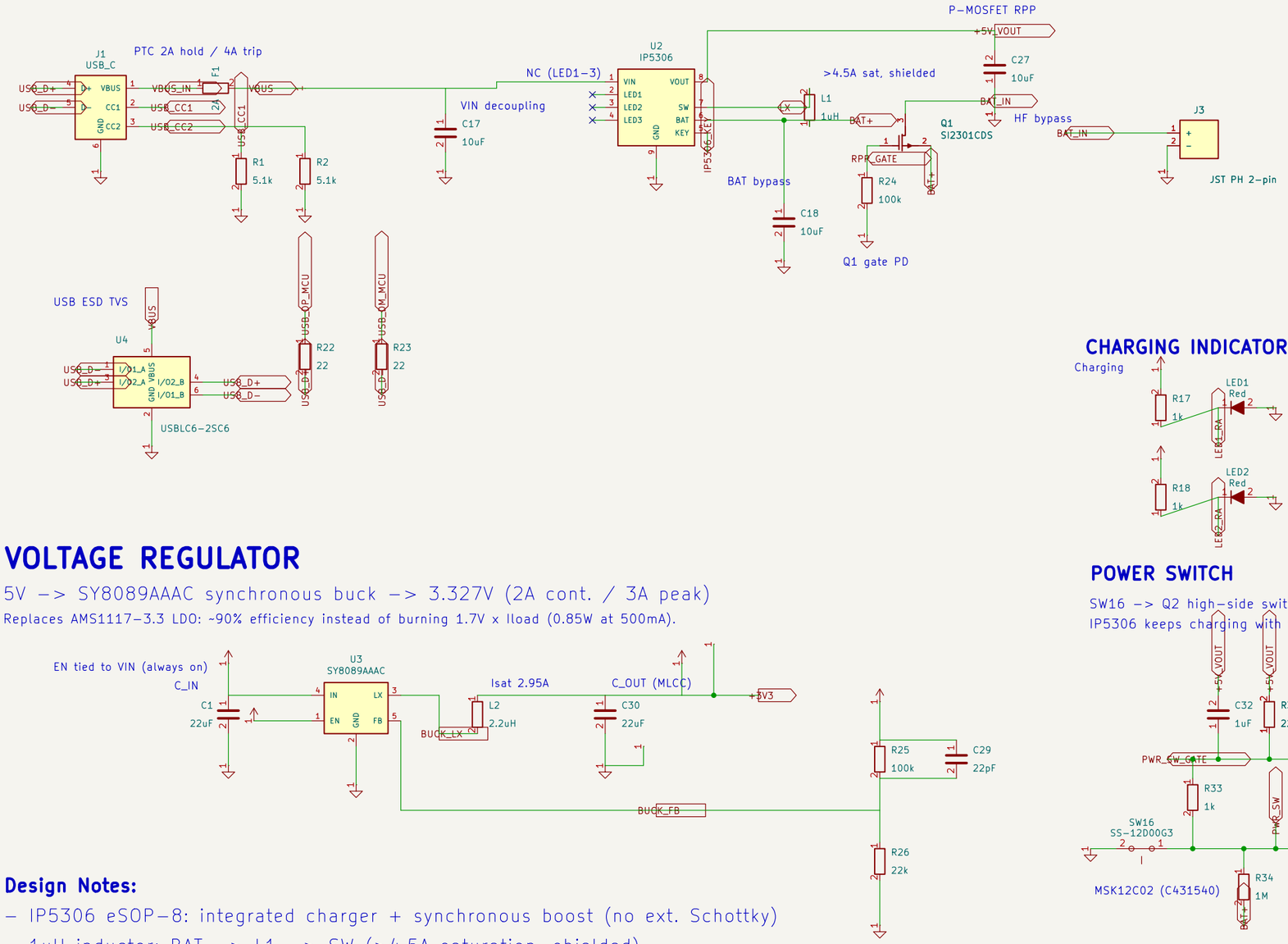
POWER SUPPLY

USB-C -> IP5306 SOP-8 (charge + boost) -> SY8089AAAC buck -> 3.3V rail



VOLTAGE REGULATOR

5V -> SY8089AAAC synchronous buck -> 3.327V (2A cont. / 3A peak)

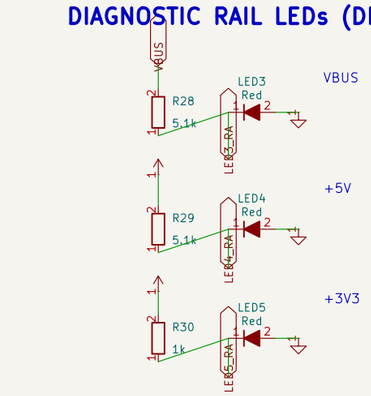
Replaces AMS1117-3.3 LDO: ~90% efficiency instead of burning 1.7V x Iload (0.85W at 500mA).

Design Notes:

- IP5306 eSOP-8: integrated charger + synchronous boost (no ext. Schottky)
- 1uH inductor: BAT -> L1 -> SW (>4.5A saturation, shielded)
- GND via exposed pad only (must solder to ground plane)
- KEY driven by C33 wake pulse (R16 100k pull-up DELETED)
- SY8089AAAC buck: 3.327V for ESP32-S3 and peripherals (2A cont., 3A peak)
- C2 (22uF tantalum) DELETED: reversed assembly destroyed prototype #1; C30 is a non-polarized MLCC
- 5.1k CC pull-downs identify USB-C UFP (5V sink)
- Battery: LiPo 3.7V 5000mAh via JST PH connector

CHARGING INDICATOR LEDs

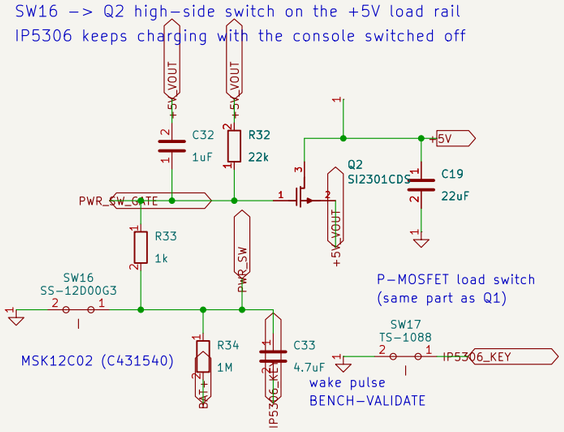
DIAGNOSTIC RAIL LEDs (DNP in production)



POWER SWITCH

SW16 -> Q2 high-side switch on the +5V load rail

IP5306 keeps charging with the console switched off



FEEDBACK DIVIDER

Vout = 0.6 x (1 + 100k/22k) = 3.327V

C29 = datasheet feed-forward cap (load transient)

manual KEY wake (DO NOT PLACE)
fit only if the C33 pulse is short

Generated by scripts/generate_schematics
ESP32 Emu Turbo — Handheld Retro Console

Sheet: /
File: 01-power-supply.kicad_sch

Title: Power Supply

Size: A3	Date:	Rev:
KiCad E.D.A. 10.0.5		Id: 1/1