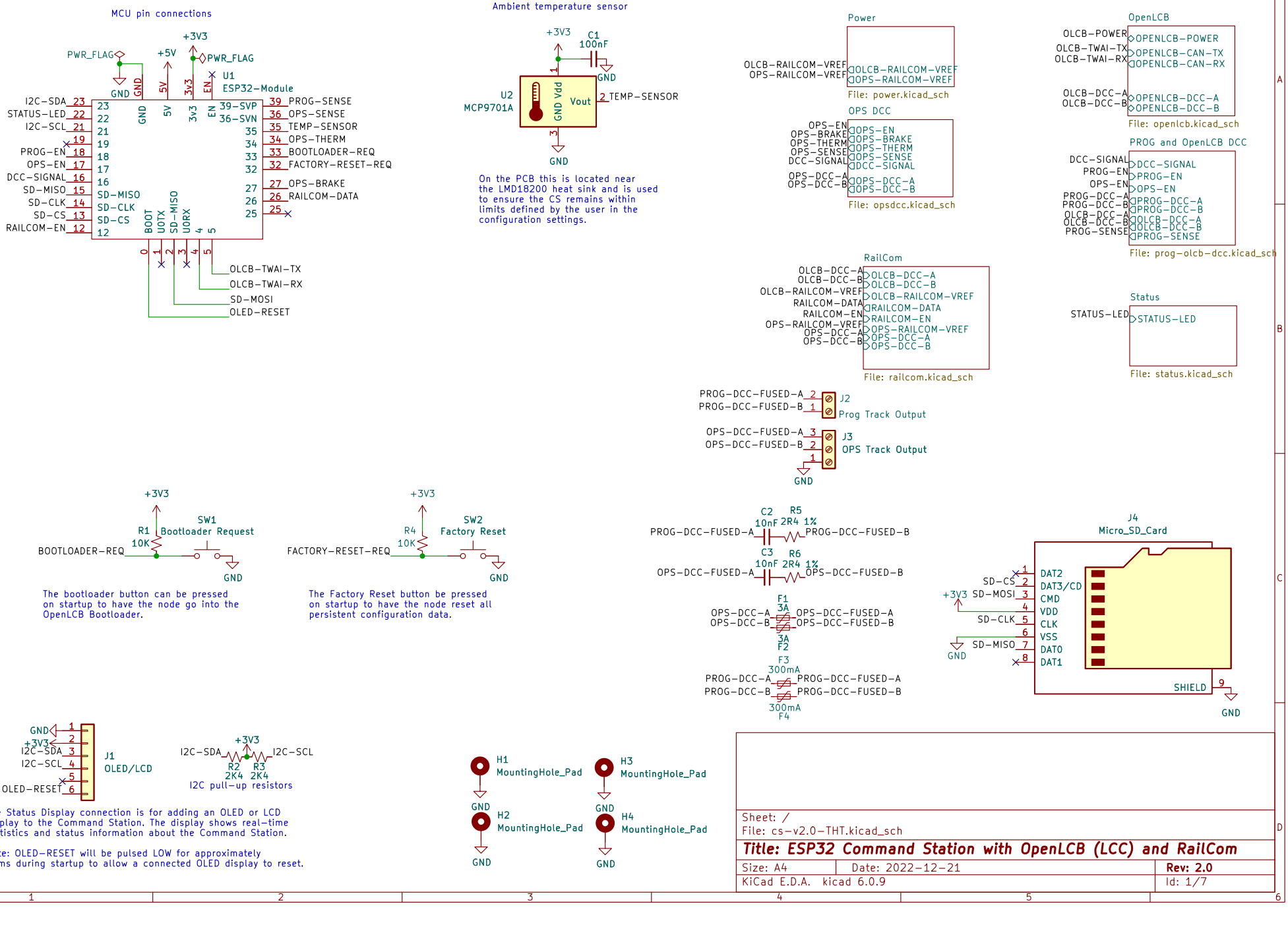
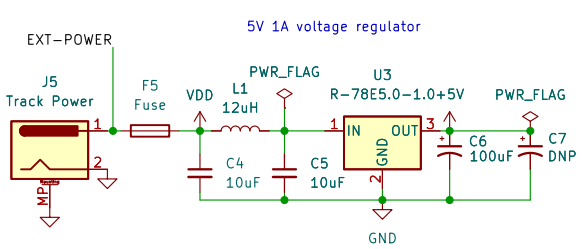
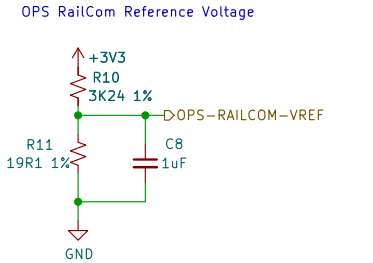


Sheet: /
File: cs-v2.0-THT.kicad_sch

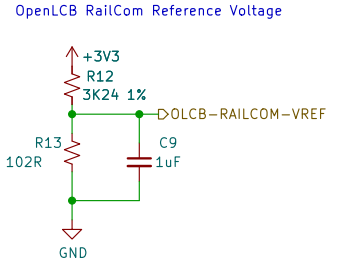
Title: ESP32 Command Station with OpenLCB (LCC) and RailCom

Size: A4	Date: 2022-12-21	**Rev: 2.0**
KiCad E.D.A. kicad 6.0.9		Id: 1/7

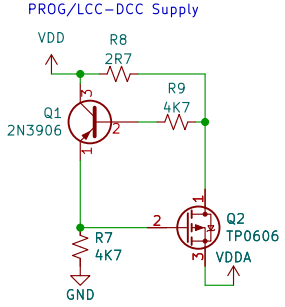




RAILCOM-VREF = (3v3 + R12) / (R11 + R12)
RAILCOM-VREF = (3v3 + 16) / (2700 + 16)
RAILCOM-VREF = 19mA



RAILCOM-VREF = (3v3 + R12) / (R11 + R12)
RAILCOM-VREF = (3v3 + 16) / (2700 + 16)
RAILCOM-VREF = 19mA

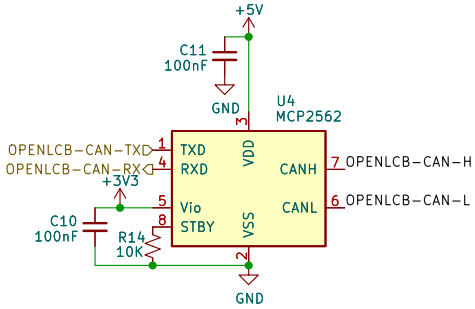


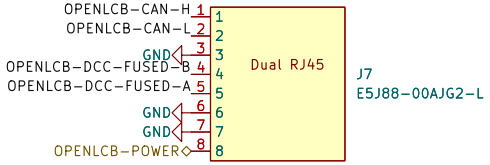
Note: This limits the current to ~250mA.
To increase the current 2R7 can be adjusted.
Or a jumper can be added between the 2N3906
pin 3 to TP0606 pin 3 and all five components
can be omitted to disable current limiting.

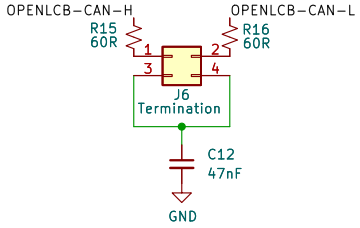
Sheet: /Power/
File: power.kicad_sch

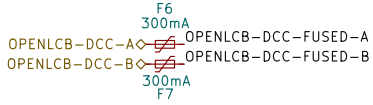
Title: ESP32 Command Station with OpenLCB (LCC) and RailCom

Size: A4	Date: 2022-12-21	**Rev: 2.0**
KiCad E.D.A. kicad 6.0.9		Id: 2/7







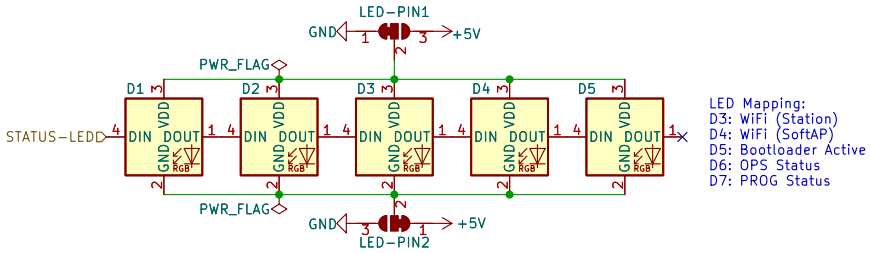


Sheet: /OpenLCB/
File: openlcb.kicad_sch

Title: ESP32 Command Station with OpenLCB (LCC) and RailCom

Size: A4	Date: 2022-12-21	**Rev: 2.0**
KiCad E.D.A. kicad 6.0.9		Id: 3/7

Command Station status output RGB LEDs

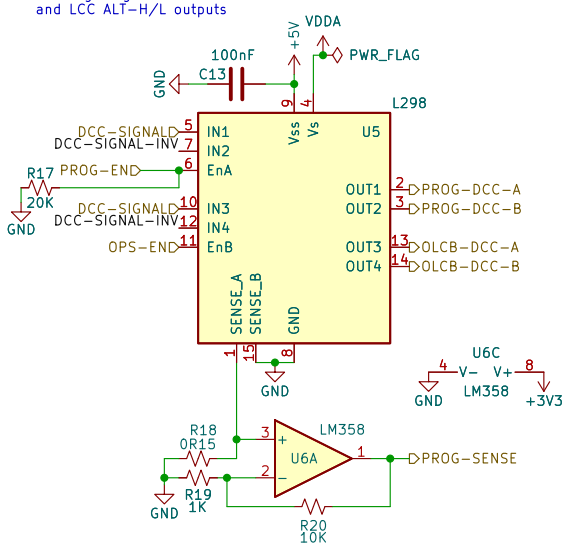


LED Mapping:
D3: WiFi (Station)
D4: WiFi (SoftAP)
D5: Bootloader Active
D6: OPS Status
D7: PROG Status

Note: LED-PIN1 and LED-PIN2 set to the APA106 (included in PCB kit).
For WS2812B LEDs cut the traces and add a solder bridge to the opposite pad.

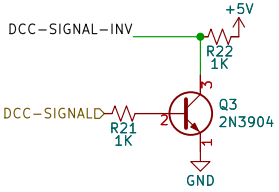
Sheet: /Status/		
File: status.kicad_sch		
Title: ESP32 Command Station with OpenLCB (LCC) and RailCom		
Size: A4	Date: 2022-12-21	**Rev: 2.0**
KiCad E.D.A. kicad 6.0.9		Id: 4/7

DCC signal generator for PROG track
and LCC ALT-H/L outputs



Note: LOW side current sense is being used for the PROG track output.
OLCB-DCC output is not monitored. PROG-EN has a PD to force the output
to OFF when not actively used.

OPS track signal split for L298 h-bridge



Sheet: /PROG and OpenLCB DCC/
File: prog-olcb-dcc.kicad_sch

Title: ESP32 Command Station with OpenLCB (LCC) and RailCom

Size: A4	Date: 2022-12-21	**Rev: 2.0**
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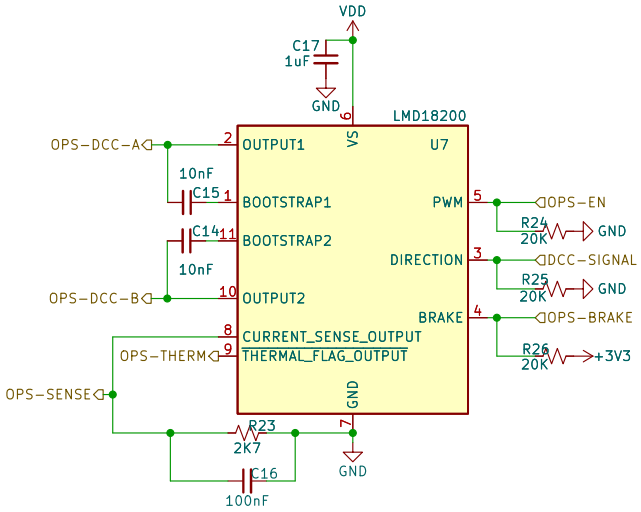
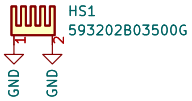
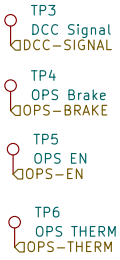
DCC Signal generation for OPS track



Note: The CURRENT_SENSE_OUTPUT is an INLINE output from the h-bridge. The PWM and DIR have a PULL-DOWN and BRAKE has a PULL-UP to force the LMD18200 into a known state on startup (IE: OFF)

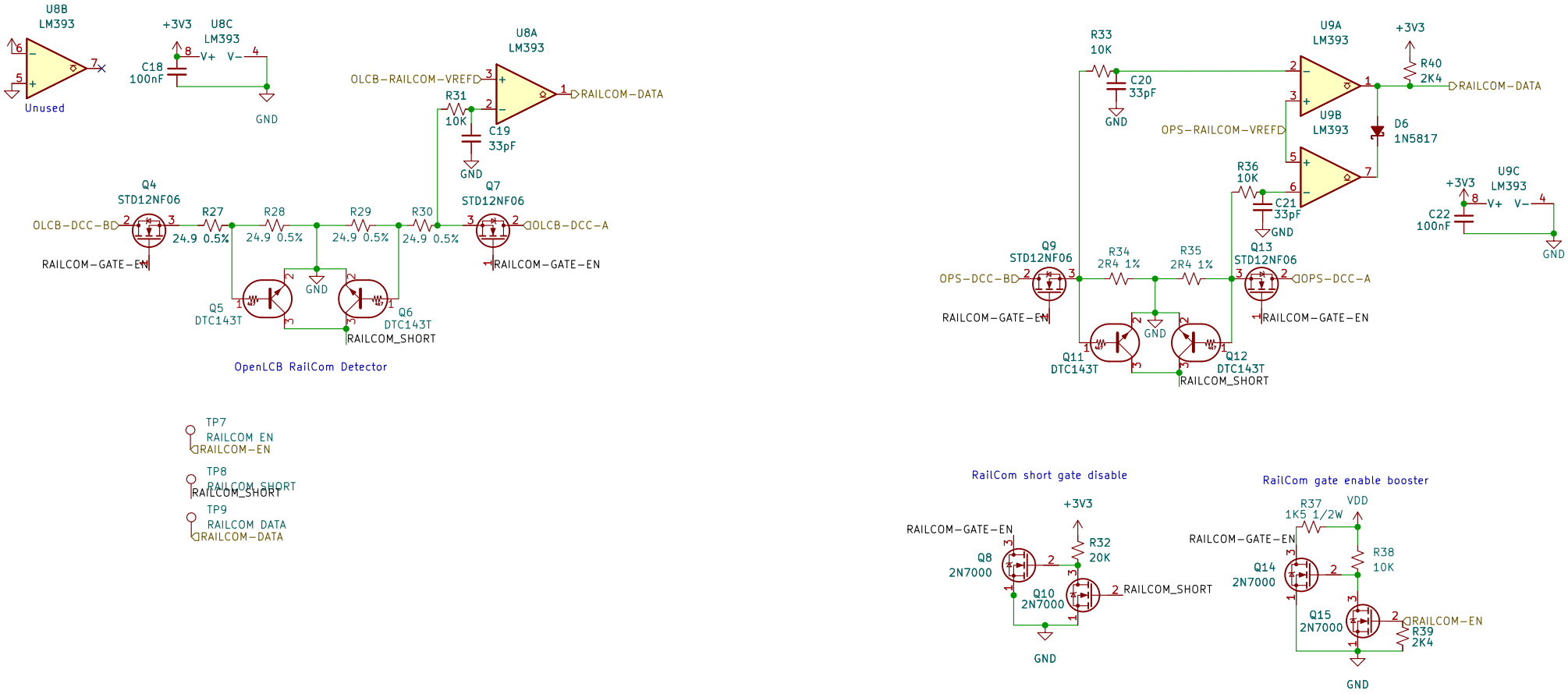




Sheet: /OPS DCC/
File: opsdcc.kicad_sch

Title: ESP32 Command Station with OpenLCB (LCC) and RailCom

Size: A4	Date: 2022-12-21	**Rev: 2.0**
KiCad E.D.A. kicad 6.0.9		Id: 6/7



Sheet: /RailCom/		
File: railcom.kicad_sch		
Title: ESP32 Command Station with OpenLCB (LCC) and RailCom		
Size: A4	Date: 2022-12-21	**Rev: 2.0**
KiCad E.D.A. kicad 6.0.9		Id: 7/7