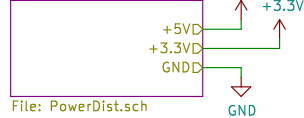


Sheet: Power Distribution



Isolated +5V and +3.3V.
Use GND as local gnd for all board electronic components.
Connect GNDPWR when using +12V.

Sheet: CAN



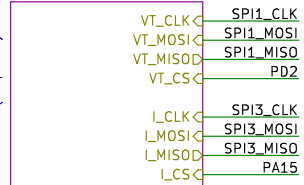
Sheet: Contactor Driver



Sheet: EEPROM



Sheet: Sensor Boards Interface



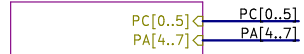
Sheet: Error Light



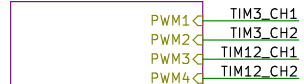
Sheet: USB



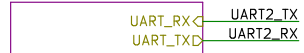
Sheet: LEDs



Sheet: Fan Board Interface

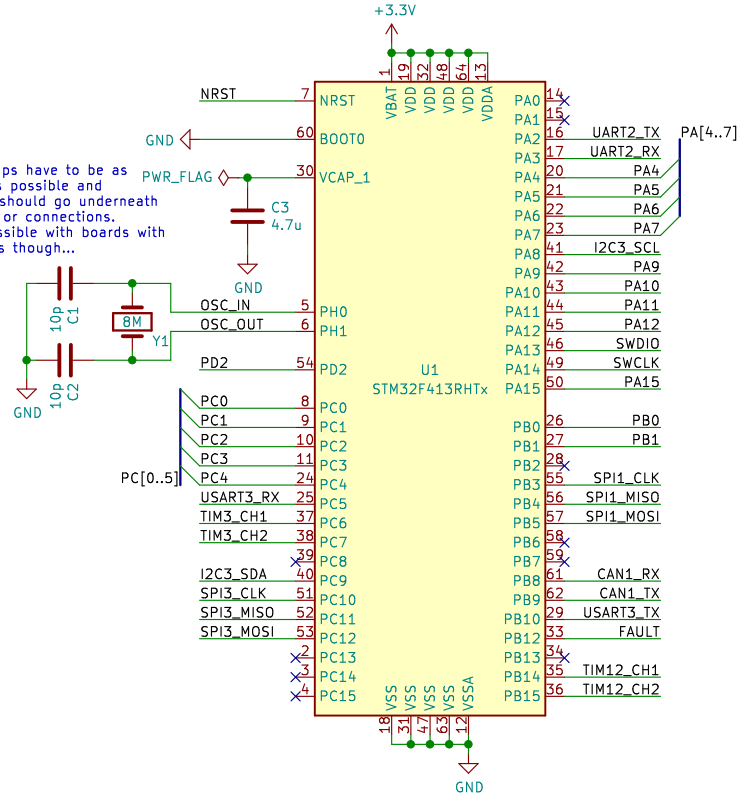


Sheet: Bluetooth



Important note, UART must have these connections:
STM RX to IC TX
STM TX to IC RX

The crystal and caps have to be as close to the uC as possible and usually no traces should go underneath these components or connections. Exceptions are possible with boards with more than 2 layers though...

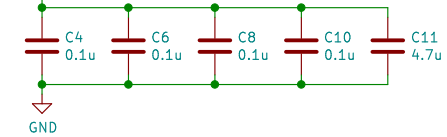


Graphics/Logos

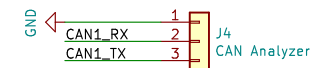
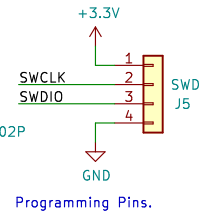
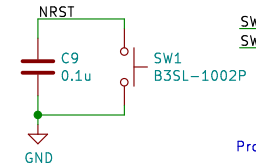
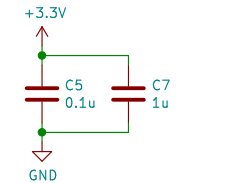


Bypass Capacitors

Place these capacitors as close to mcu as possible for correct operation.
VDD/VSS



VDDA/VSSA (VREF+/VREF-)



Sheet: /
File: BPSLeader.sch

Title:

Size: A4

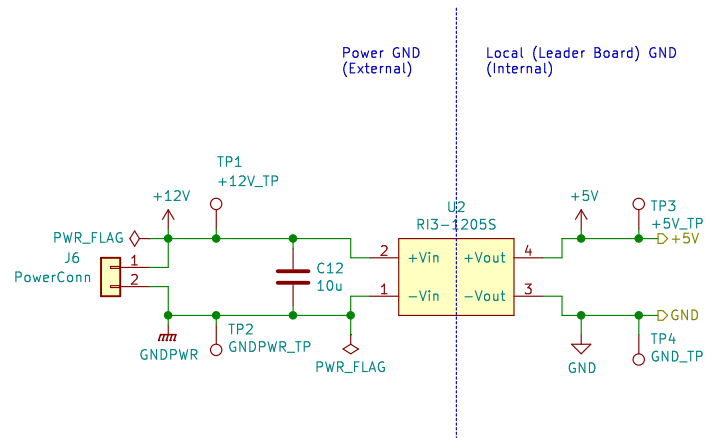
Date:

KiCad E.D.A. kicad (5.1.6)-1

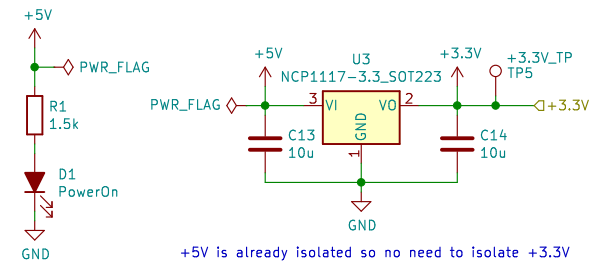
Rev:

Id: 1/11

ISOLATED



Isolated DC-DC Converter to step down +12V power to an isolated +5V. The input gnd (Power GND) is different from the output gnd (Local GND)



+5V is already isolated so no need to isolate +3.3V

Linear Regulator to step down +5V to +3.3V. An isolated converter was not used for the +3.3V line because of price and space. May need to change this to DC-DC converter if we really want to make the BPS more energy efficient.

Sheet: /Power Distribution/
File: PowerDist.sch

Title:

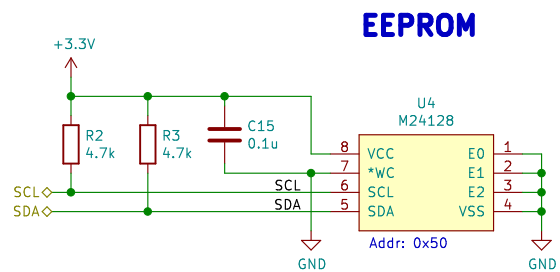
Size: A4

Date:

KiCad E.D.A. kicad (5.1.6)-1

Rev:

Id: 2/11



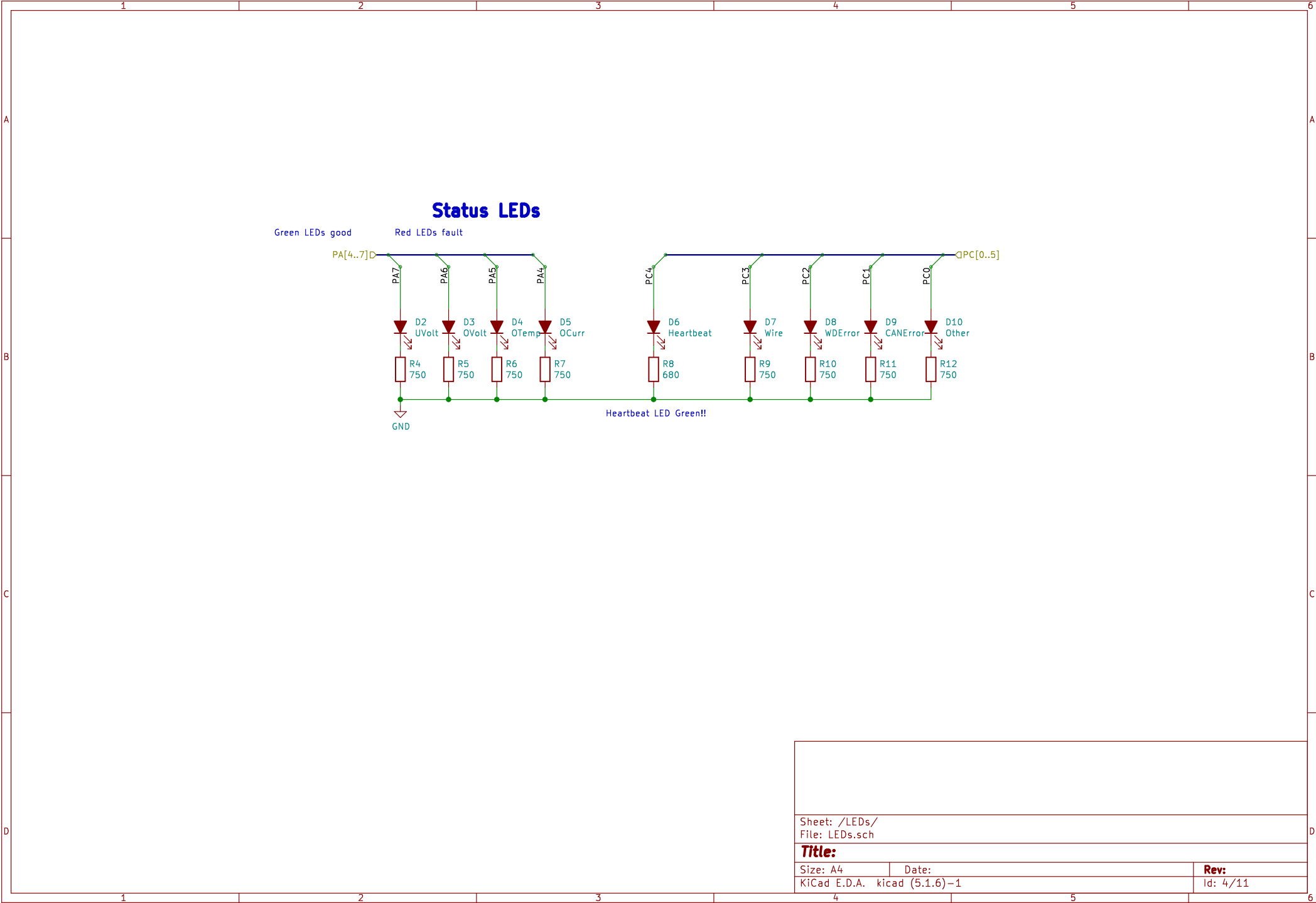
Sheet: /EEPROM/
File: EEPROM.sch

Title:

Size: A4
KiCad E.D.A. kicad (5.1.6)-1

Date:

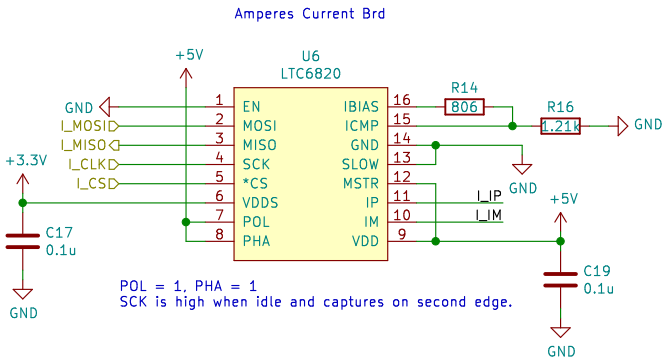
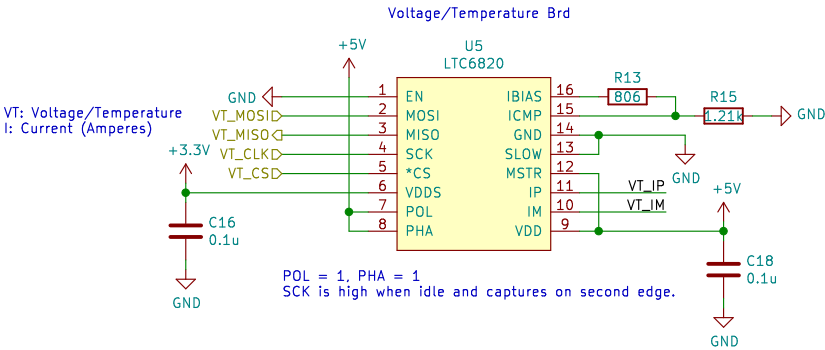
Rev:
Id: 3/11



Isolated SPI

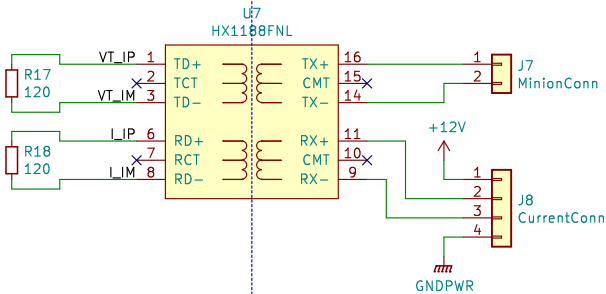
If the wires lengths are short and you want to save more power, change IBIAS resistor to be 2.8k. Look in LTC6820 datasheet for more information on calculating these BIAS resistors.

4-wire SPI to 2-wire Isolated SPI Converter ICs



ISOLATED

Connectors



Sheet: /Sensor Boards Interface/
File: SensorBrdInterface.sch

Title:

Size: A4

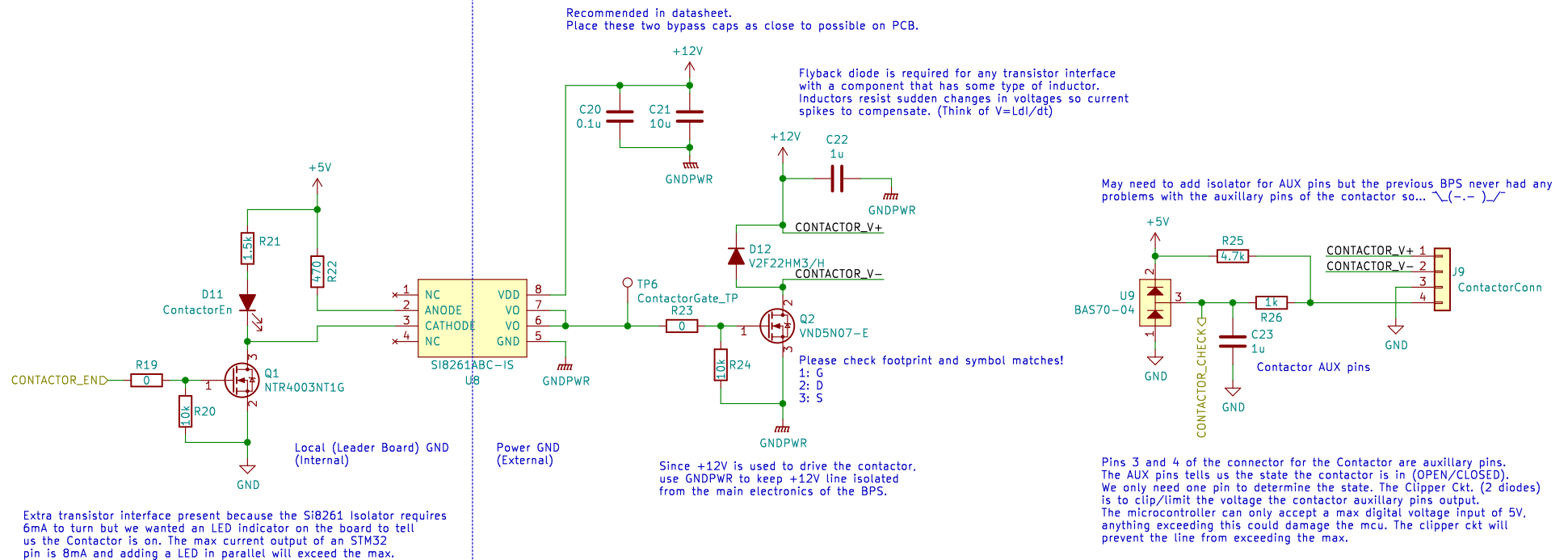
Date:

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Rev:

Id: 5/11

ISOLATED



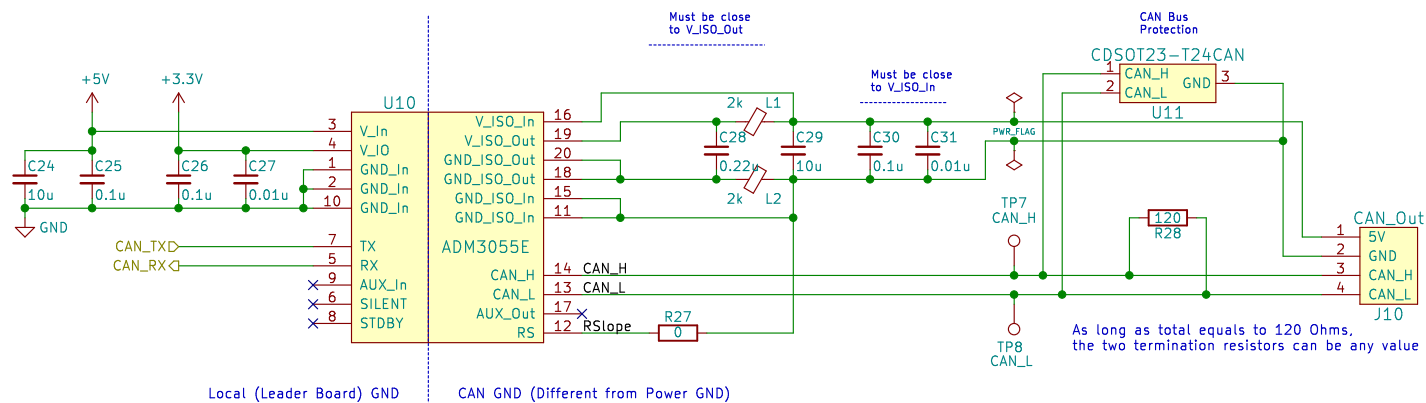
Sheet: /Contactor Driver/
File: Contactor.sch

Title:

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|------------------------------|-------|
| Size: A4 | Date: |
| KiCad E.D.A. kicad (5.1.6)–1 | |

Rev:
Id: 6/11

ISOLATED



Isolated CAN transceiver. This connects to the main electrical system's CAN bus. Look in datasheet for more information about this page.

Sheet: /CAN/
File: CAN.sch

Title:

Size: A4
KiCad E.D.A. kicad (5.1.6)-1

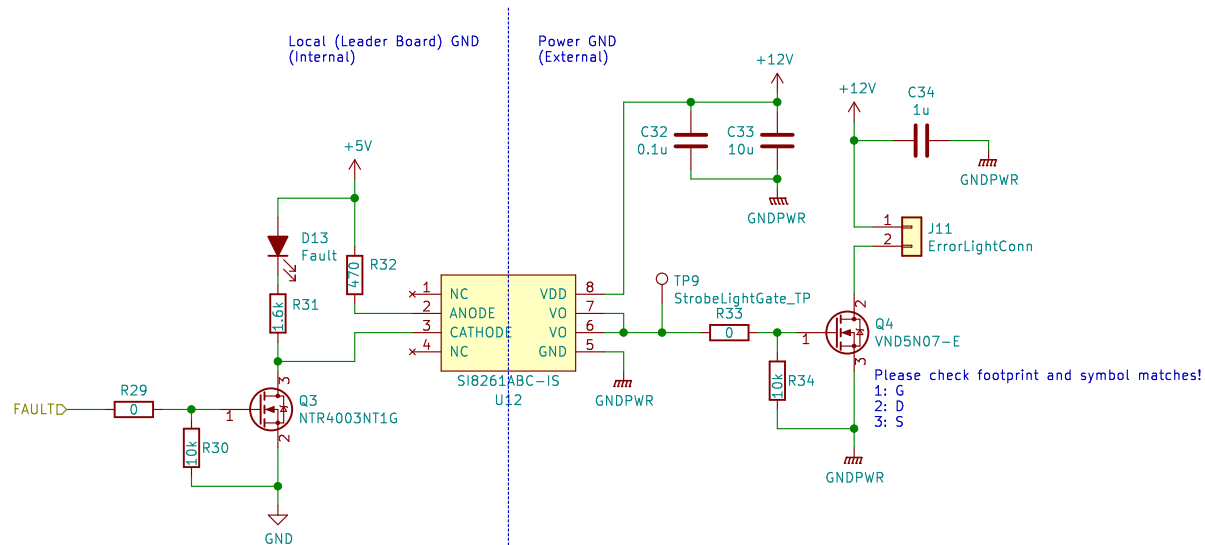
Date:

Rev:

Id: 7/11

Error Light

ISOLATED



Extra transistor interface present because the Si8261 Isolator requires 6mA to turn but we wanted an LED indicator on the board to tell us the Contactor is on. The max current output of an STM32 pin is 8mA and adding a LED in parallel will exceed the max.

Sheet: /Error Light/
File: ErrorLight.sch

Title:

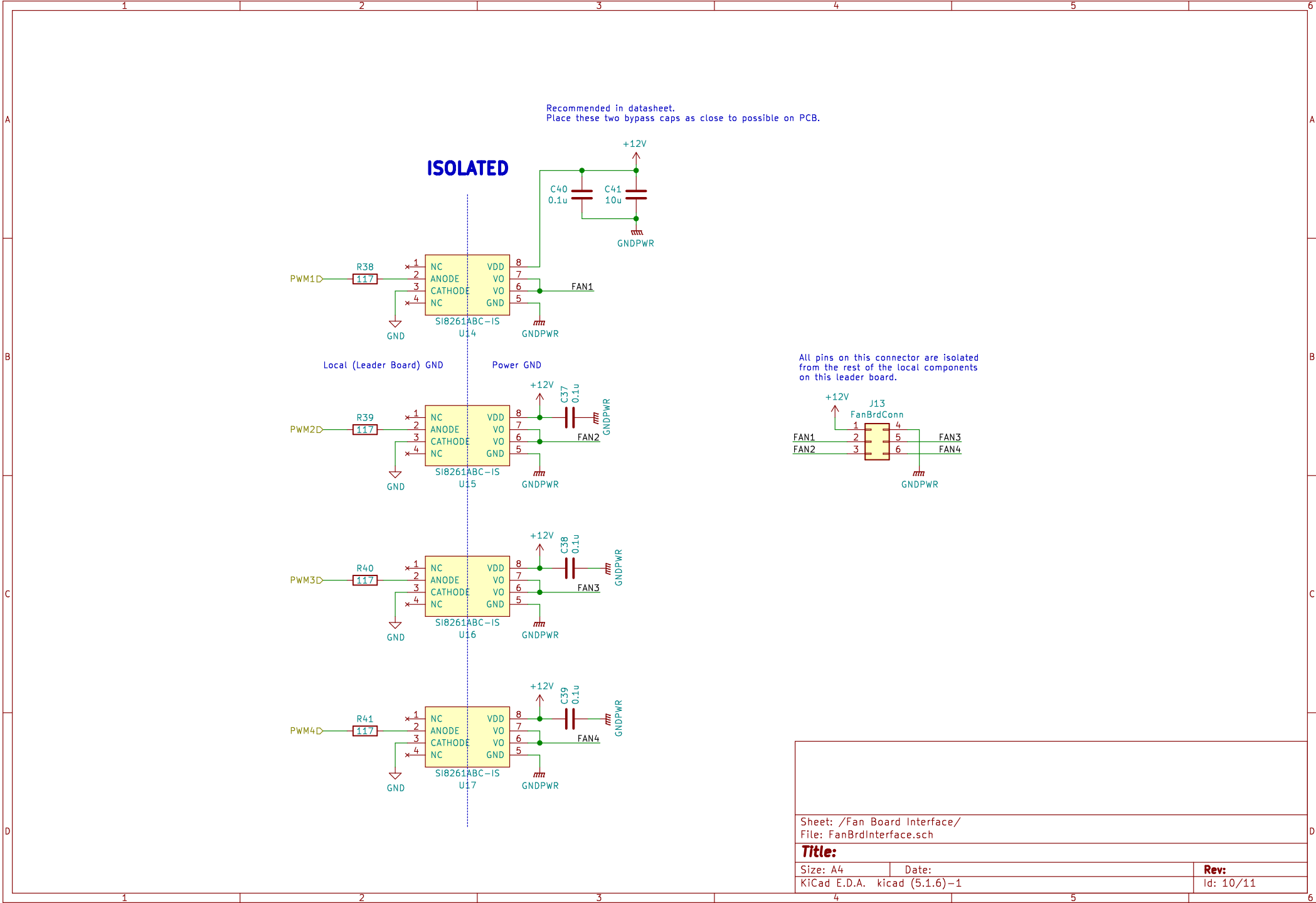
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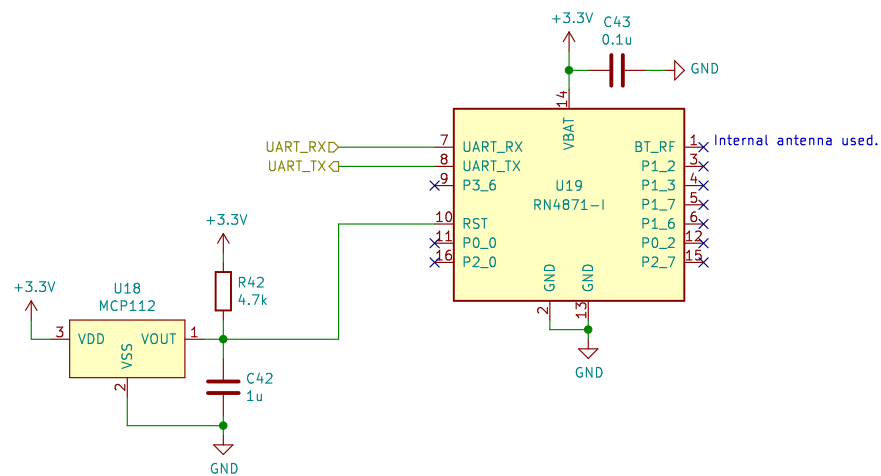
Date:

Rev:

Id: 8/11







Sheet: /Bluetooth/
File: Bluetooth.sch

Title:

Size: A4

Date:

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Rev:

Id: 11/11