

Bias power supply with SMPS pre-regulator

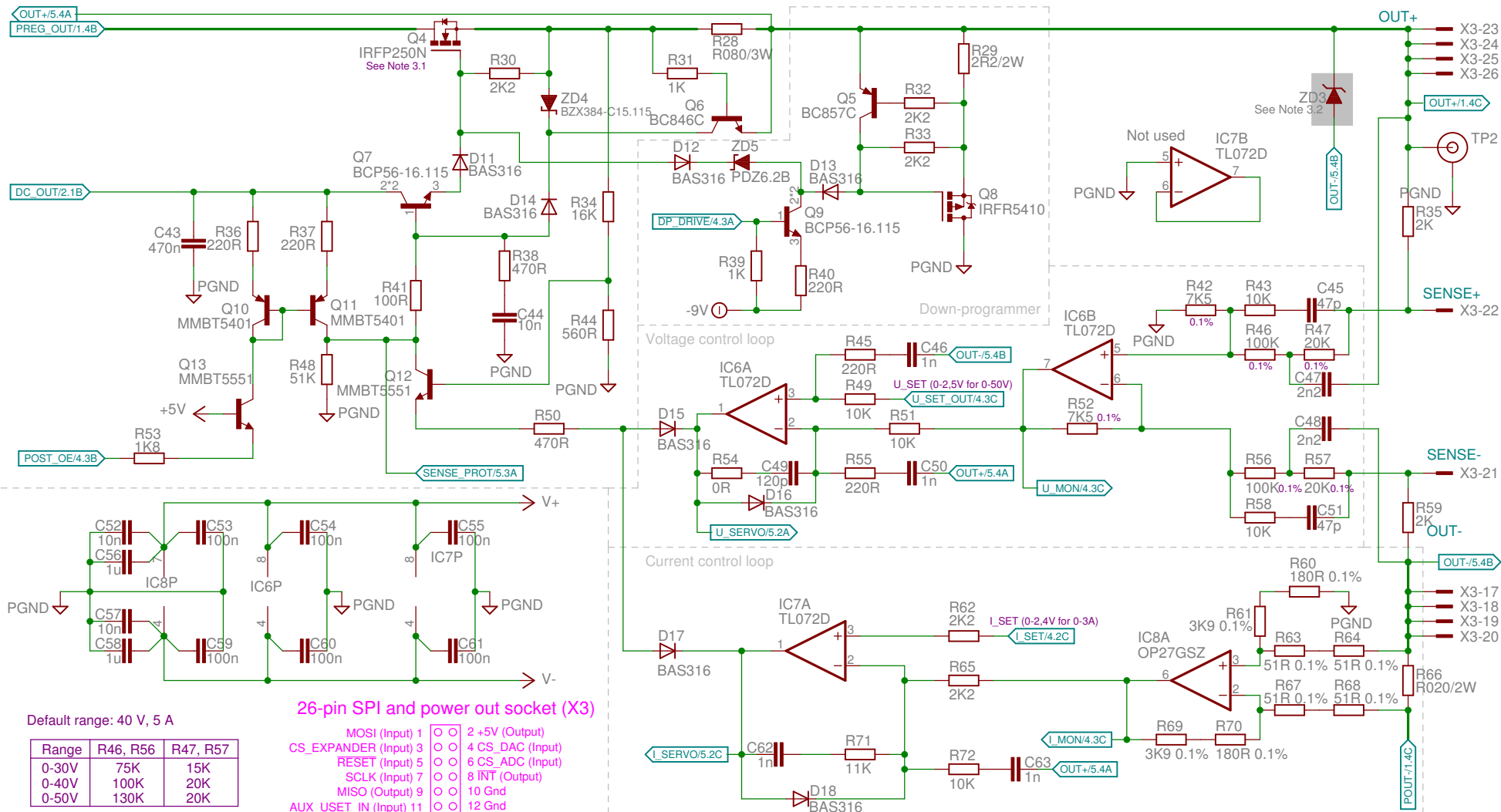
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Default range: 40 V, 5 A

| Range | R46, R56 | R47, R57 |
|-------|----------|----------|
| 0-30V | 75K | 15K |
| 0-40V | 100K | 20K |
| 0-50V | 130K | 20K |

| Range | R61, R69 | Q4 |
|---------|----------|----------|
| 0-3.12A | 3K9 | IRFP250N |
| 0-4.16A | 3K24 | IRFP250N |
| 0-5A | 2K37 | IRFP260N |

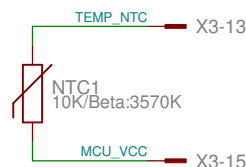
26-pin SPI and power out socket (X3)

| | |
|------------------------|-------------------|
| MOSI (Input) 1 | 2 +5V (Output) |
| CS_EXPANDER (Input) 3 | 4 CS_DAC (Input) |
| RESET (Input) 5 | 6 CS_ADC (Input) |
| SCLK (Input) 7 | 8 INT (Output) |
| MISO (Output) 9 | 10 Gnd |
| AUX_USET_IN (Input) 11 | 12 Gnd |
| TEMP_NTC (Output) 13 | 14 Gnd |
| MCU_VCC (Input) 15 | 16 Sync (Input) |
| -Vout 17 | 18 -Vout |
| -Vout 19 | 20 -Vout |
| Sense- (Input) 21 | 22 Sense+ (Input) |
| +Vout (Output) 23 | 24 +Vout (Output) |
| +Vout (Output) 25 | 26 +Vout (Output) |

Note 3.1: Q4 is mounted on the external heatsink (e.g. RAD-A4463/120)
Note 3.2: Place for optional TVS (primary place is the Arduino shield board)

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Repository: <https://github.com/eez-open>

Temperature sensor



CV/CC linear post-regulator
Output enable and "down-programmer"

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Digital control (SPI)

SSW-113-02-T-D-RA

X3-9 PS_MISO

X3-5 PS_RESET

X3-1 PS_MOSI

X3-7 PS_SCLK

X3-3 CS_EXPANDER

+5V

X3-2

X3-10

X3-12

X3-14

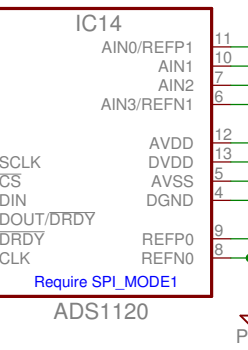
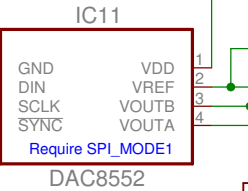
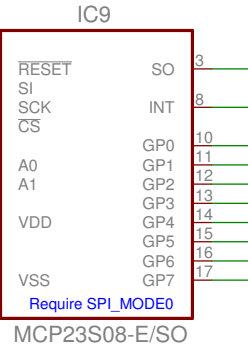
PGND

X3-8 INT

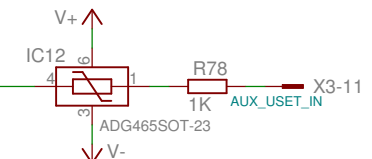
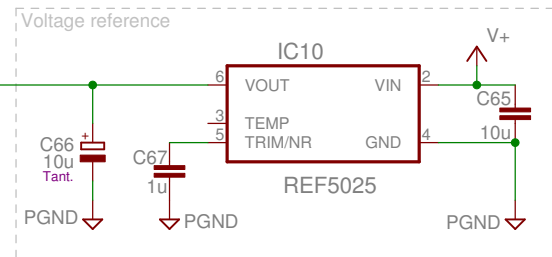
JP2-0R

X3-4 CS_DAC

X3-6 CS_ADC



| I/O Expander | | |
|--------------|-------------------------|-----------|
| Bit | Function | Direction |
| 0 | Sense error | Output |
| 1 | Down programmer disable | Output |
| 2 | CC | Input |
| 3 | Set 100% duty cycle | Output |
| 4 | Remote programming | Output |
| 5 | CV | Input |
| 6 | Power good | Input |
| 7 | Output enable | Output |



SPI I/O expander, DAC, ADC, Voltage reference
Remote programming

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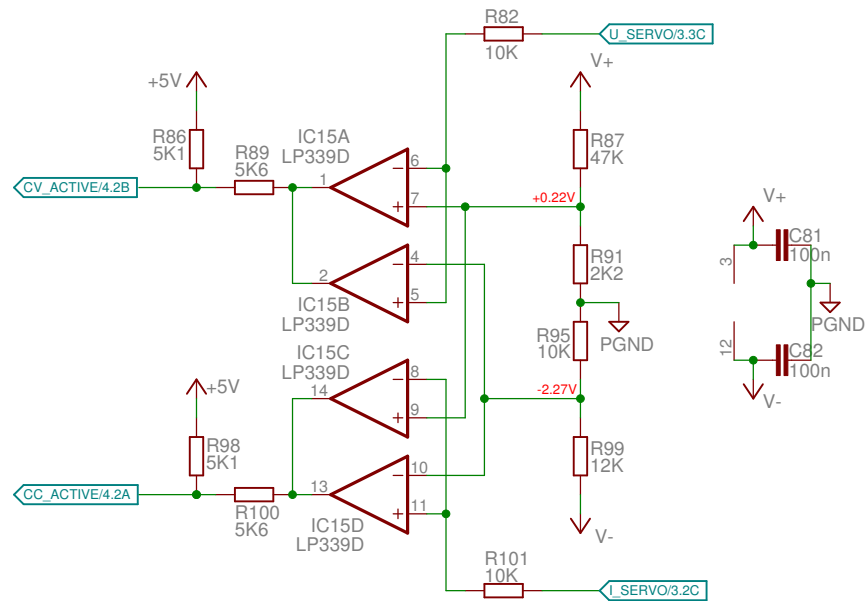
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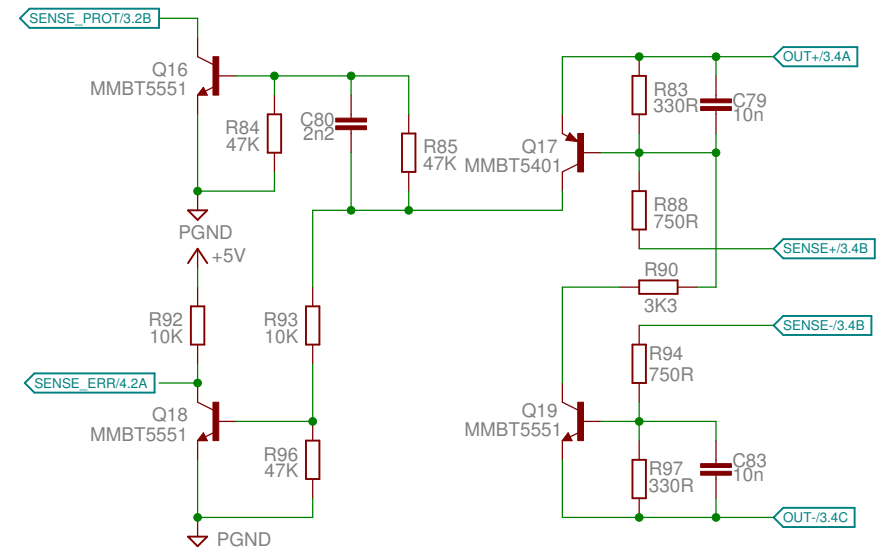
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Constant Voltage (CV) and Constant Current (CC) mode indicator



Remote sense reverse polarity detection



CC/CV indicators, Sense error detection

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The schematic diagram illustrates the internal components and connections of the LMJ2138812S0LOT6C LED driver module. The module is powered by an AC source (AC_EARTH/6.2B) and grounded (GND). It features a transformer with multiple windings, a feedback network consisting of a 60R@100MHz resistor (FB5) and a 1 nF capacitor, and two LEDs (Right LED Yellow and Left LED Green). The module is labeled IC18 and TPD4E002DRLR. The connections are as follows:

- Power Input:** AC_EARTH/6.2B (Green line) connects to pin 8*3. GND (Green line) connects to pin 1 and the bottom of the feedback network.
- Feedback Network:** A 1 nF capacitor connects pin 8*3 to a node between two 75R resistors. This node connects to pin 4. Another 75R resistor connects pin 4 to pin 5. A third 75R resistor connects pin 5 to pin 7. A fourth 75R resistor connects pin 7 to pin 8.
- LEDs:** The Right LED (Yellow) is connected between pin 1 and pin 2. The Left LED (Green) is connected between pin 3 and pin 4.
- Other Connections:**
 - Pin 1 is connected to GND.
 - Pin 2 is connected to GND.
 - Pin 3 is connected to GND.
 - Pin 4 is connected to GND.
 - Pin 5 is connected to GND.
 - Pin 6 is connected to GND.
 - Pin 7 is connected to GND.
 - Pin 8 is connected to GND.

| | |
|--------------------|-----------------------|
| LED Link (Input) 1 | <input type="radio"/> |
| LED Act (Input) 2 | <input type="radio"/> |
| Shield 3 | <input type="radio"/> |
| RX+ (Output) 4 | <input type="radio"/> |
| RX- (Output) 5 | <input type="radio"/> |
| TX+ (Input) 6 | <input type="radio"/> |
| TX- (Input) 7 | <input type="radio"/> |
| +3.3V (Input) 8 | <input type="radio"/> |

[illegible]

Fan+ (Red) 1 ☐

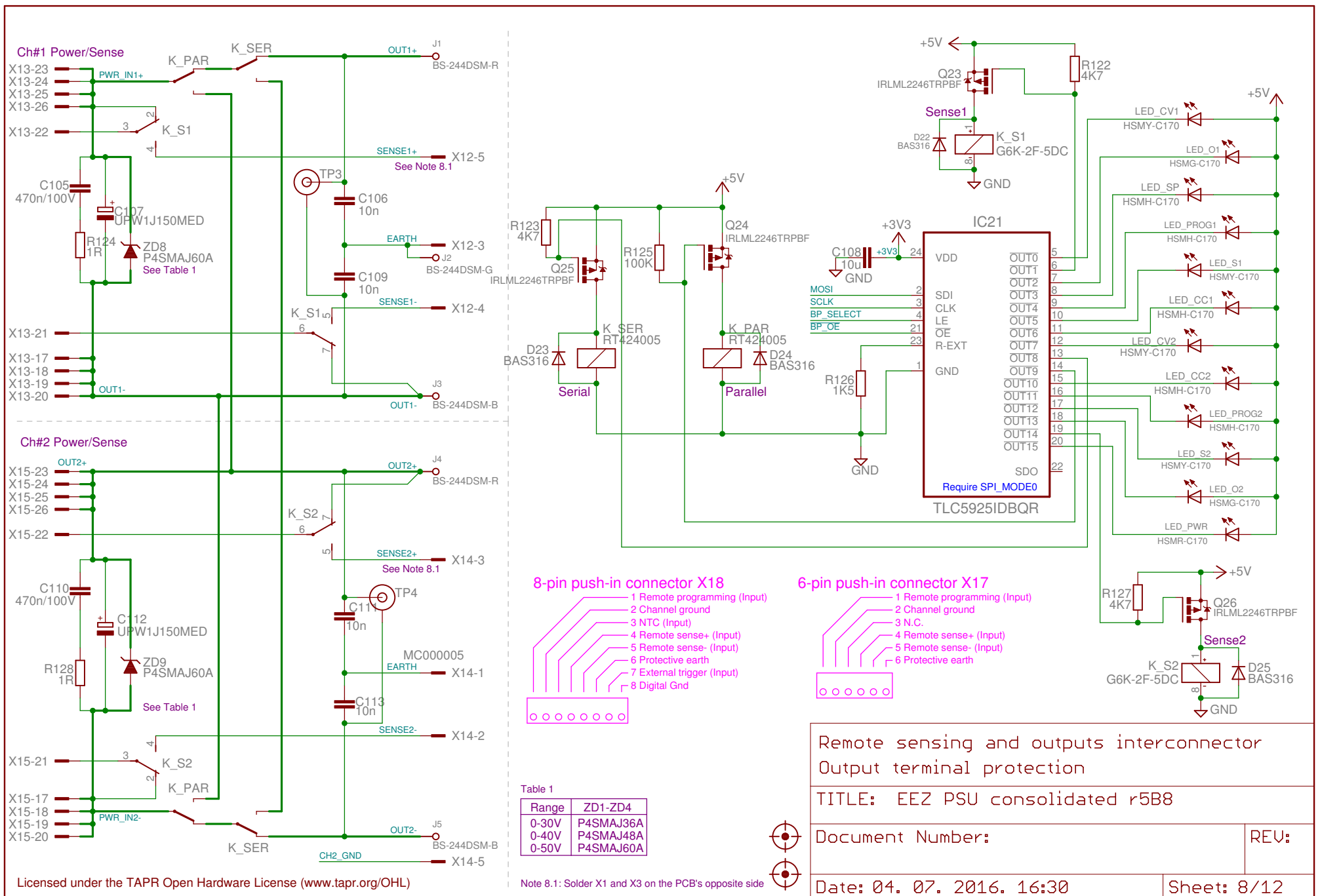
Fan- (Black) 2 ☐

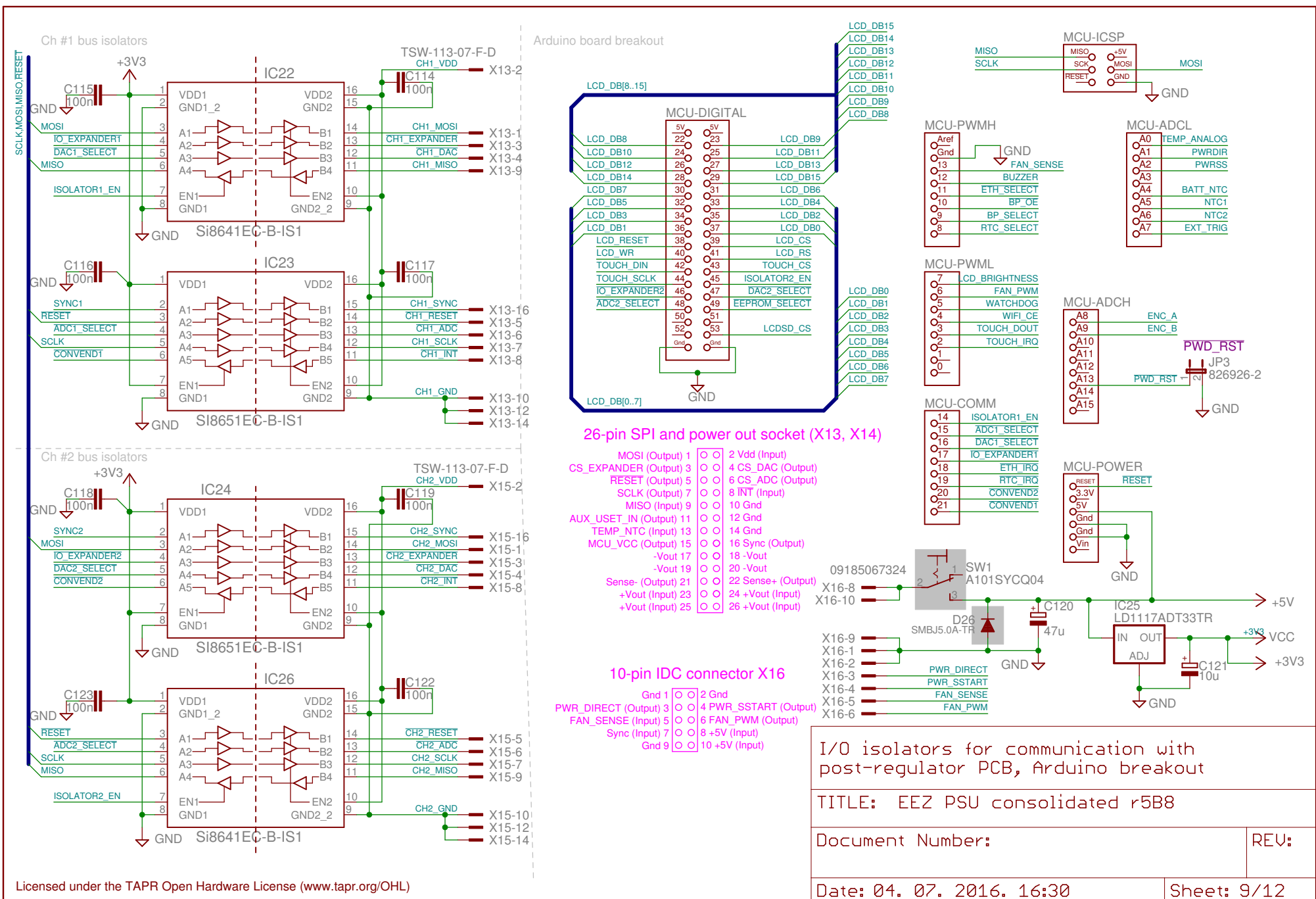
Fan sense (Yellow) 3 ☐

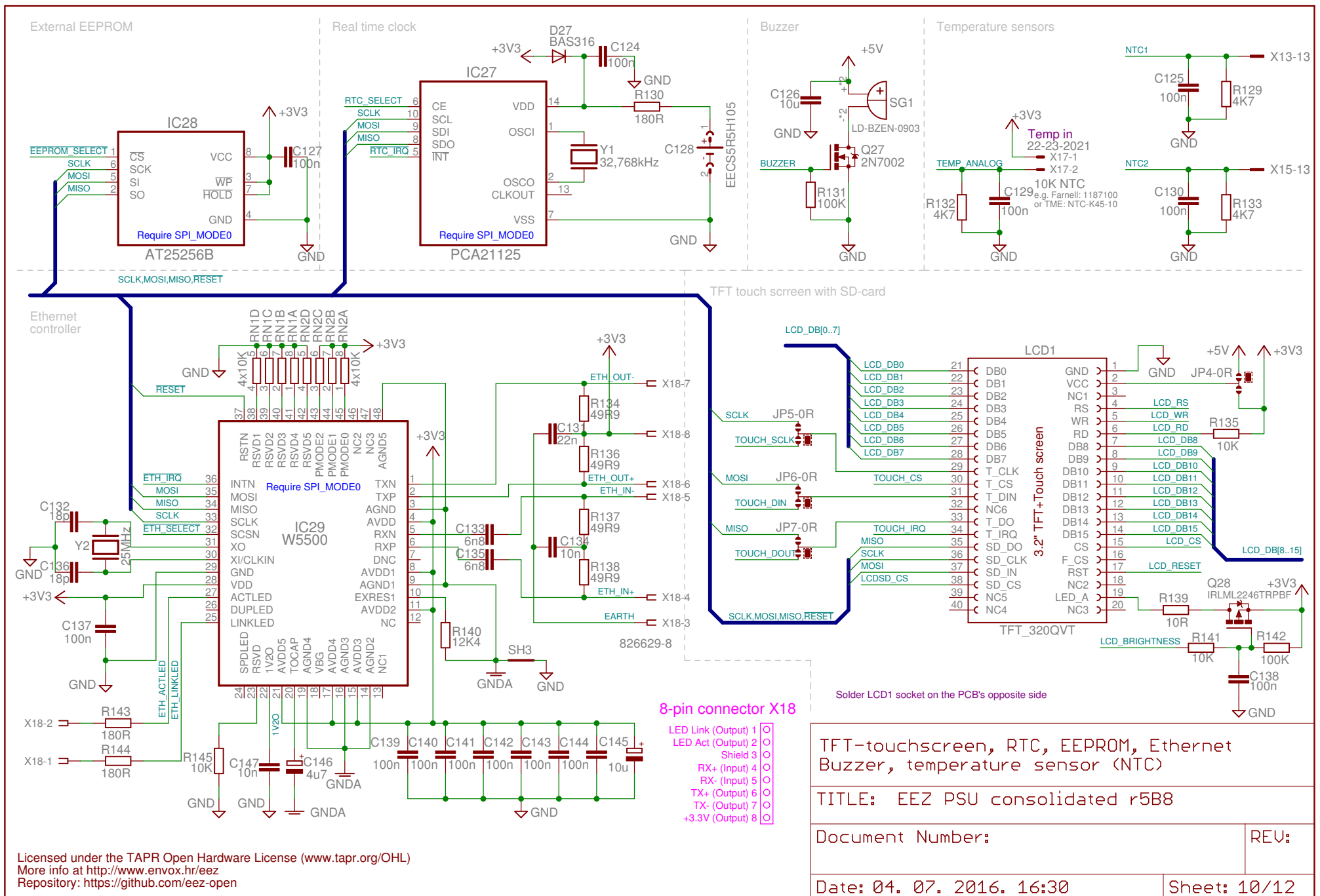
| | | |
|--------|---|-----------------------|
| Vcc | 1 | <input type="radio"/> |
| Data- | 2 | <input type="radio"/> |
| Data+ | 3 | <input type="radio"/> |
| Gnd | 4 | <input type="radio"/> |
| Shield | 5 | <input type="radio"/> |

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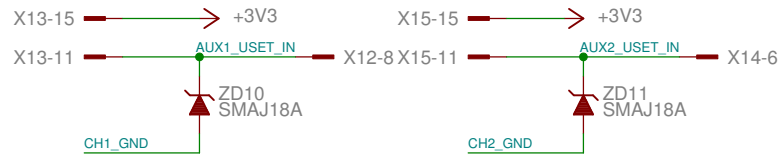
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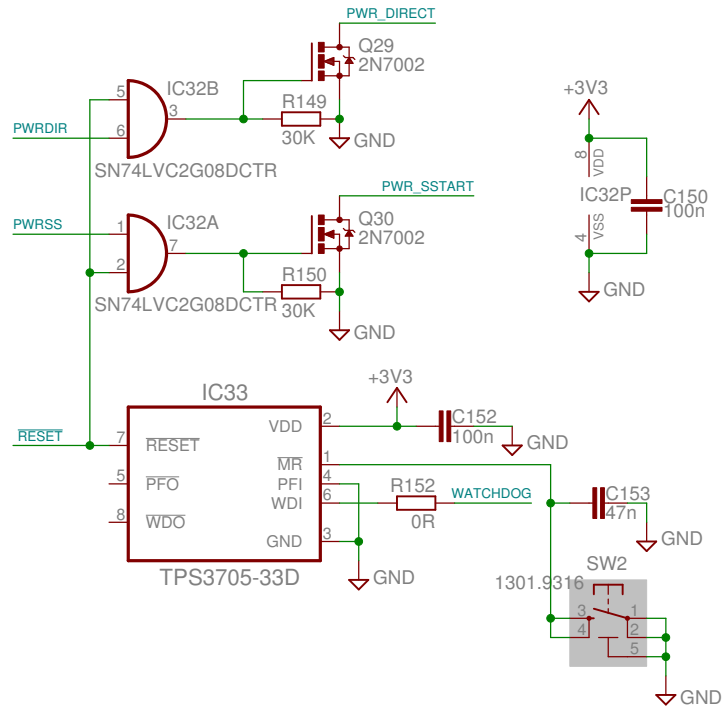




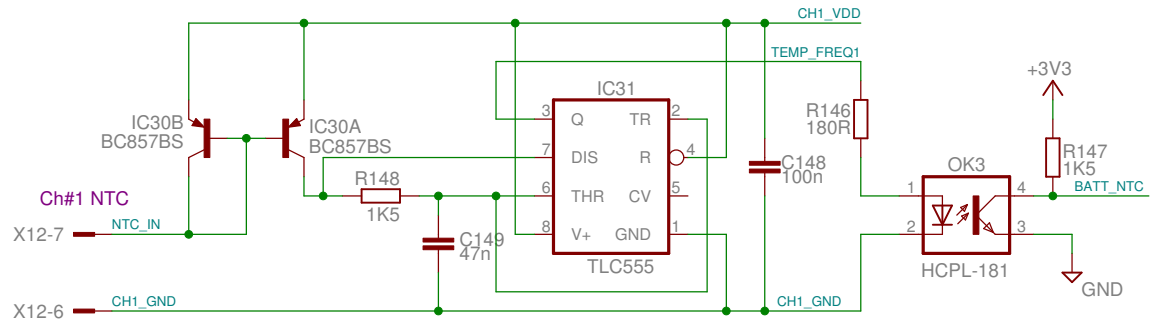
Remote programming inputs



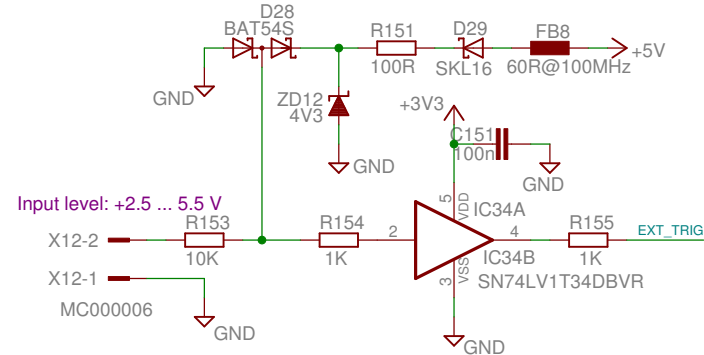
Power-on reset generator and power control



Channel 1 V/F converter for battery NTC (optional)



External trigger protection and level shifter/buffer



LED CC/CV indicators, Reset control,
Optional Ethernet module connector, External trigger,
V/F converter for battery NTC (optional), Encoder (optional)

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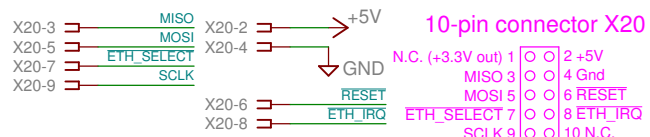
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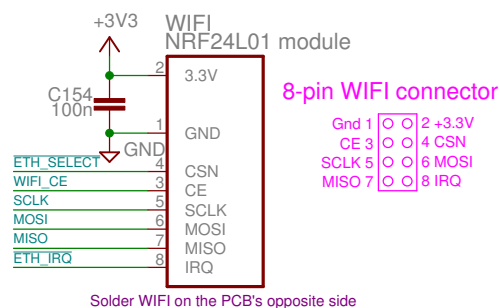
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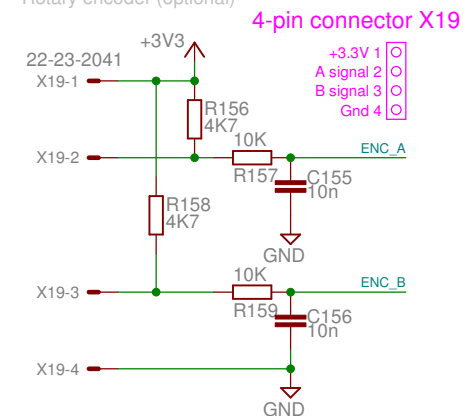
Optional Ethernet module connector



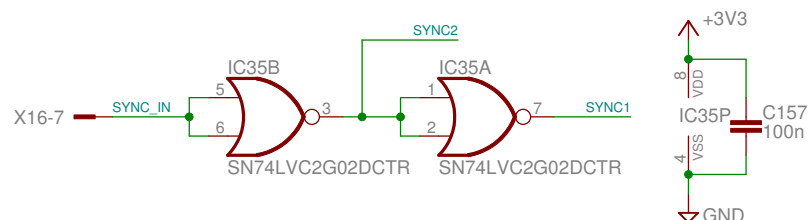
Optional Wifi module connector



Rotary encoder (optional)



Master sync signal phase shifting



Optional ethernet, Wifi and encoder
Power boards SMPS sync

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