

Alternate stacking BeagleBone Headers:  
 MajorLeague SSHQ-123-D-08-GT-LF  
 Samtec SSQ-123-03-T-D (Tin)  
 Samtec SSQ-123-03-G-D (Gold)

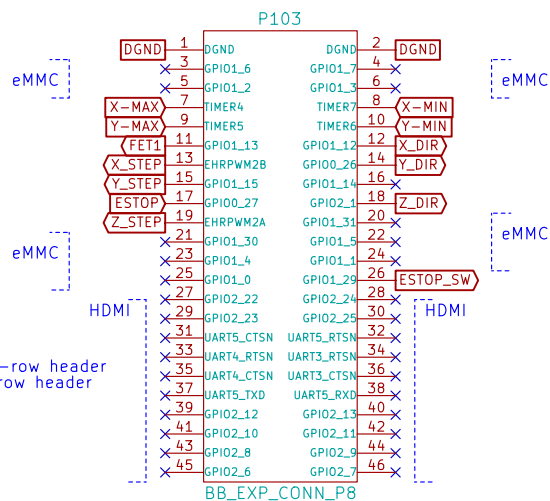
Or use plain pin headers if you do not require additional expansion capes

To save money on all the pin headers when buying parts for a few boards, you can get large breakaway headers instead of the individual parts. You will need a total of:

57 pins of single-row header  
 74 pins of dual-row header

Which you can get using

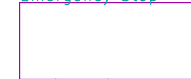
- (2) Harwin M20-9993645 36-pin single-row header
- (2) Harwin M20-9983645 72-pin dual-row header



## Stepper Drivers



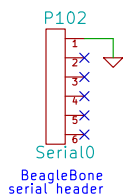
## Emergency Stop



## Inputs

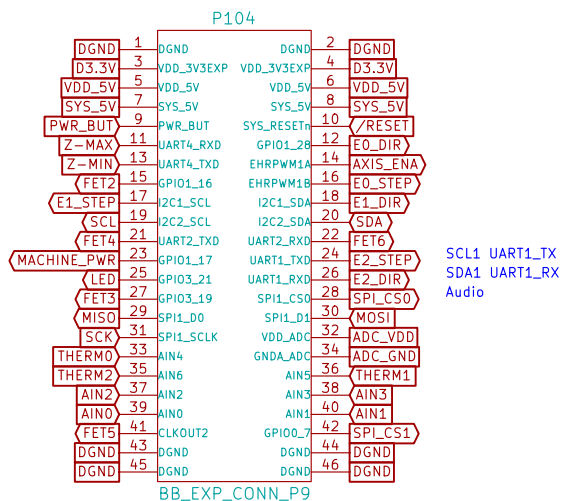


## Mosfet Outputs

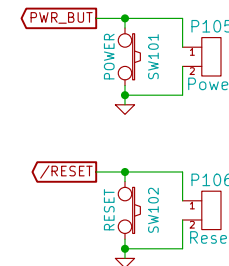
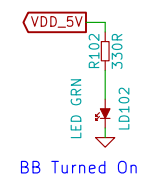
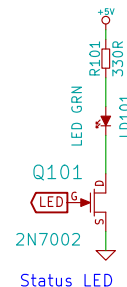


24.576MHz Audio

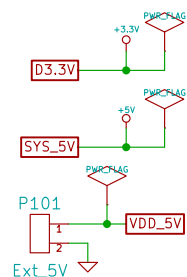
Audio  
Audio



SCL1 UART1\_TX  
 SDA1 UART1\_RX  
 Audio

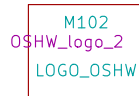
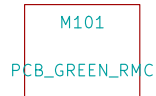


BeagleBone Logic supply is always 3.3V



SYS\_5V: Low-current supply

VDD\_5V: DC Input Jack



CRAMPS by Charles Steinkuehler  
 Copyright 2014 GPL v3  
 Derived from RAMPS-FD by Bob Cousins  
 Derived from RAMPS 1.4 rewrap.org/wiki/RAMPS1.4

File: CRAMPS.sch

Sheet: /

Title: CRAMPS (Cape-RAMPS for BeagleBone)

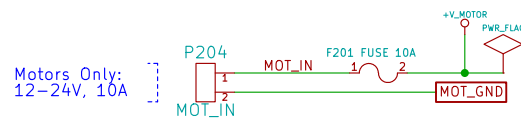
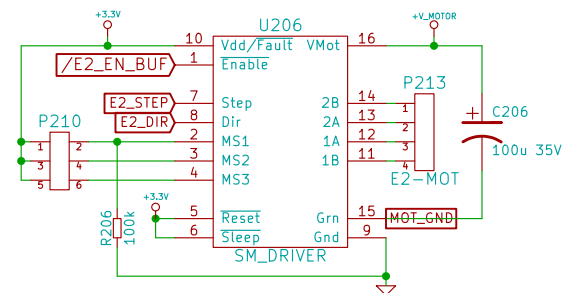
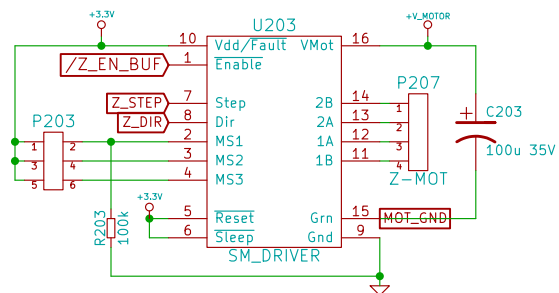
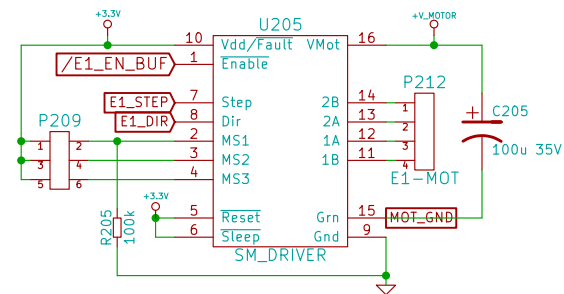
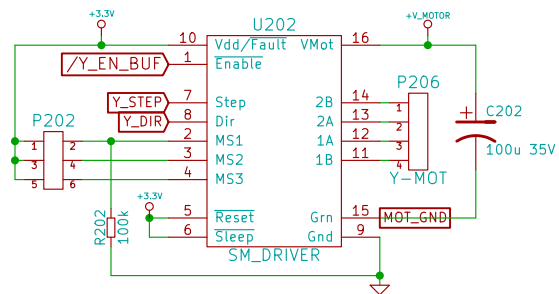
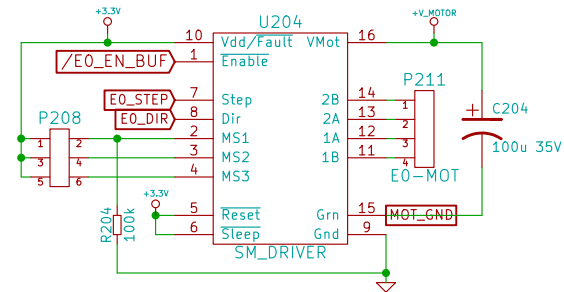
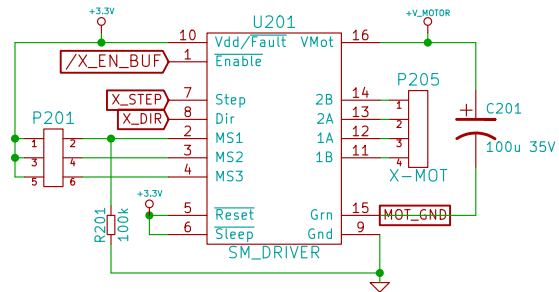
Size: A

Date: 25 mar 2014

Rev: v1.0

KiCad E.D.A.

Id: 1/5

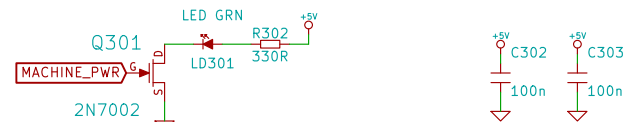


CRAMPS by Charles Steinkuehler  
 Copyright 2014 GPL v3  
 Derived from RAMPS-FD by Bob Cousins  
 Derived from RAMPS 1.4 [reprap.org/wiki/RAMPS1.4](http://reprap.org/wiki/RAMPS1.4)

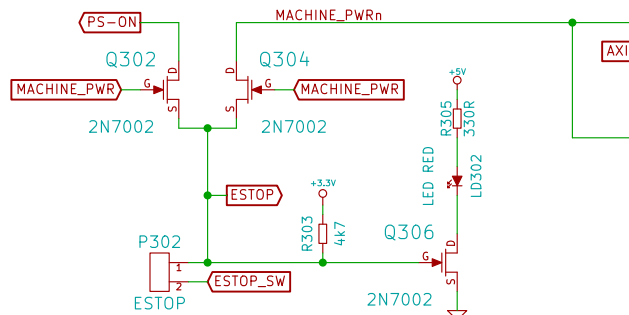
File: steppers.sch  
 Sheet: /Stepper Drivers/  
 Title: CRAMPS (Cape-RAMPS for BeagleBone)

Size: A Date: 25 mar 2014  
 KiCad E.D.A.

Rev: v1.0  
 Id: 2/5

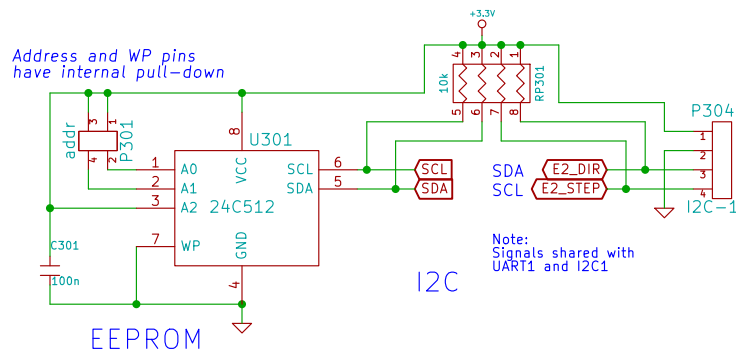


Machine Power Status

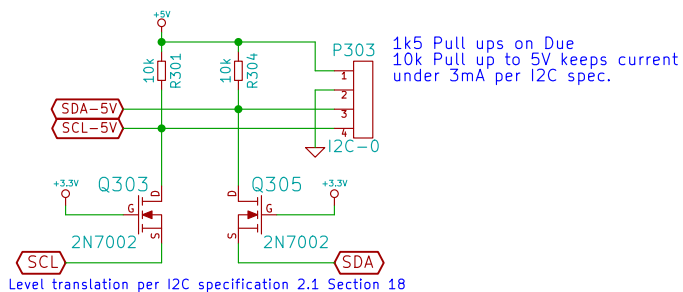


Emergency Stop switch  
(Normally Closed type)  
use jumper if not present

ESTOP Active (high) unless:  
\* ESTOP chain is unbroken  
\* Software is driving ESTOP\_SW low

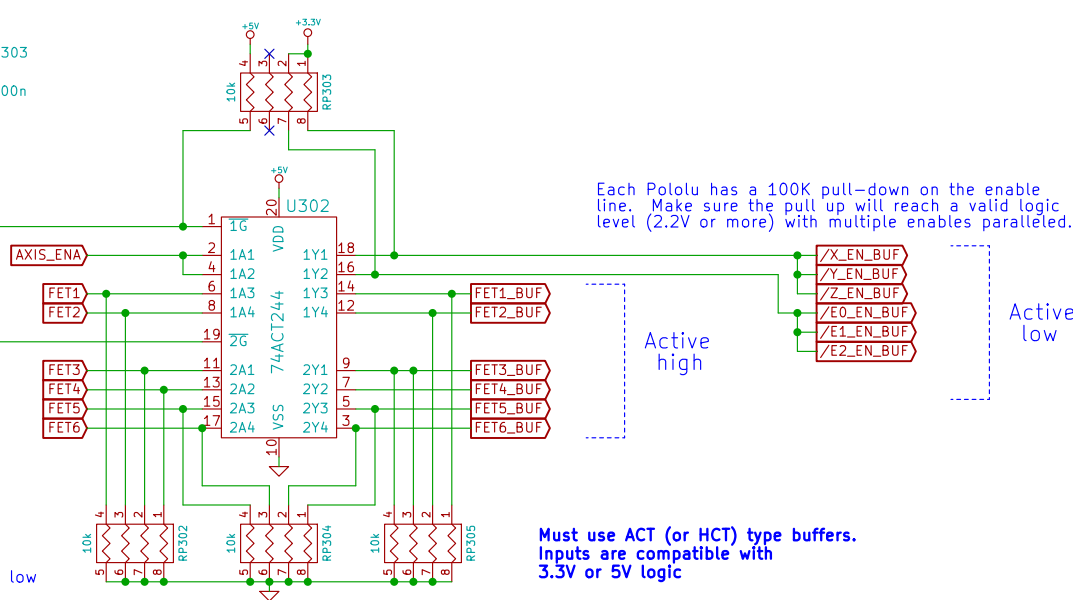


EEPROM



Level translation per I2C specification 2.1 Section 18

1k5 Pull ups on Due  
10k Pull up to 5V keeps current  
under 3mA per I2C spec.



Each Pololu has a 100K pull-down on the enable line. Make sure the pull up will reach a valid logic level (2.2V or more) with multiple enables paralleled.

Active high

Active low

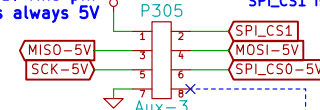
Must use ACT (or HCT) type buffers.  
Inputs are compatible with  
3.3V or 5V logic

Aux connectors

Aux3 - SPI

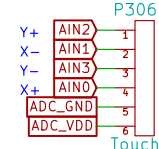
NB: This pin  
is always 5V

WARNING:  
SPLCS1 is NOT 5V Tolerant!



Note: Some addon boards  
connect this pin to GND.

Aux2 - Analog  
Resistive Touch Screen



CRAMPS by Charles Steinkuehler  
Copyright 2014 GPL v3  
Derived from RAMPS-FD by Bob Cousins  
Derived from RAMPS 1.4 [reprap.org/wiki/RAMPS1.4](http://reprap.org/wiki/RAMPS1.4)

File: e-stop.sch  
Sheet: /Emergency Stop/  
Title: CRAMPS (Cape-RAMPS for BeagleBone)

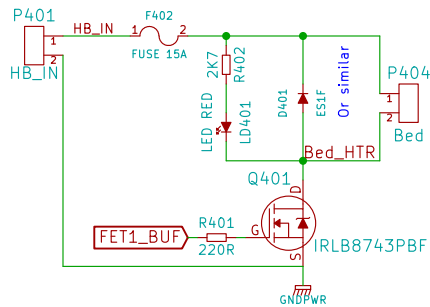
Size: A Date: 25 mar 2014  
KiCad E.D.A.

Rev: v1.0  
Id: 3/5

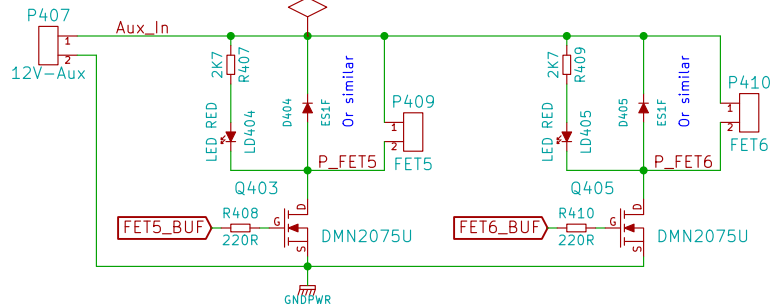
# MOSFET Outputs

Non-inverting drivers

Heatbed Only:  
12-24V, 15A

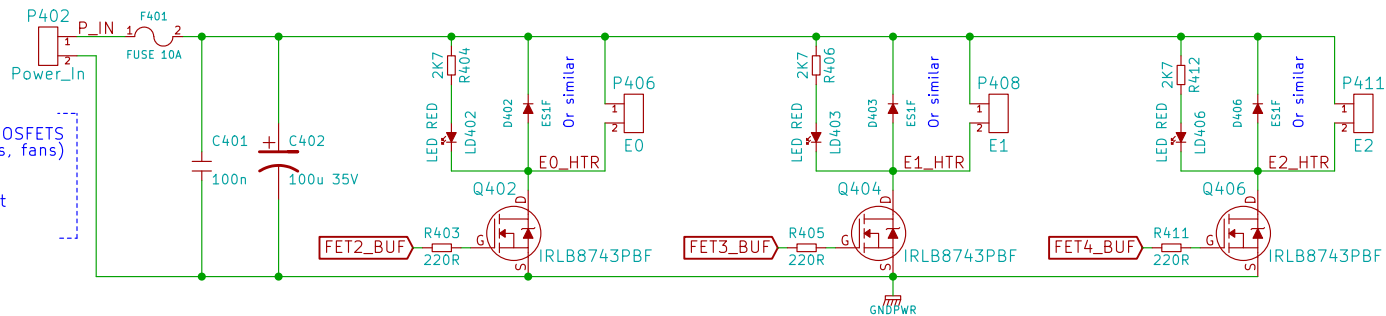


Aux Power Input

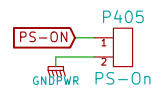


Medium power MOSFETS  
(extruder heaters, fans)

12V to 24V input



ATX Power On



CRAMPS by Charles Steinkuehler  
Copyright 2014 GPL v3  
Derived from RAMPS-FD by Bob Cousins  
Derived from RAMPS 1.4 [reprap.org/wiki/RAMPS1.4](http://reprap.org/wiki/RAMPS1.4)

File: con\_outputs.sch  
Sheet: /Mosfet Outputs/  
Title: CRAMPS (Cape-RAMPS for BeagleBone)

Size: A Date: 25 mar 2014  
KiCad E.D.A.

Rev: v1.0  
Id: 4/5

**Endstops**

Endstop inputs are 5V tolerant

JP701 should be used to enable pullups for switch type endstops; remove for active types (e.g. opto)

The endstop circuit includes a 5V supply, a 100nF capacitor (C501), and a 74CBTLV3861 buffer. The buffer's inputs are connected to the endstop pins (A1-A10) and its outputs are connected to the BeagleBone Black pins (B1-B10). The BeagleBone Black pins are labeled: B1 (Z-MAX), B2 (Z-MIN), B3 (Y-MAX), B4 (Y-MIN), B5 (X-MAX), B6 (X-MIN), B7 (MISO-5V), B8 (SCK-5V), B9 (MOSI-5V), B10 (SPI\_CS0-5V).

**Thermistor Inputs**

The thermistor circuit includes a 5V supply, a 100nF capacitor (C501), and a 74CBTLV3861 buffer. The buffer's inputs are connected to the thermistor pins (THERM0-THERM3) and its outputs are connected to the BeagleBone Black pins (B1-B10). The BeagleBone Black pins are labeled: B1 (Z-MAX), B2 (Z-MIN), B3 (Y-MAX), B4 (Y-MIN), B5 (X-MAX), B6 (X-MIN), B7 (MISO-5V), B8 (SCK-5V), B9 (MOSI-5V), B10 (SPI\_CS0-5V).

**CRAMPS by Charles Steinkuehler**  
 Copyright 2014 GPL v3  
 Derived from RAMPS-FD by Bob Cousins  
 Derived from RAMPS 1.4 reprap.org/wiki/RAMPS1.4

**File: con\_inputs.sch**  
**Sheet: /Inputs/**  
**Title: CRAMPS (Cape-RAMPS for BeagleBone)**

Size: A	Date: 25 mar 2014	Rev: v1.0
KICad E.D.A.		Id: 5/5

**Endstops**

Endstop inputs are 5V tolerant

JP701 should be used to enable pullups for switch type endstops; remove for active types (e.g. opto)

**Thermistor Inputs**

Remove jumper to support 4-wire touch-screen

CRAMPS by Charles Steinkuehler  
 Copyright 2014 GPL v3  
 Derived from RAMPS-FD by Bob Cousins  
 Derived from RAMPS 1.4 [reprap.org/wiki/RAMPS1.4](http://reprap.org/wiki/RAMPS1.4)

File: con\_inputs.sch  
 Sheet: /Inputs/  
 Title: CRAMPS (Cape-RAMPS for BeagleBone)

Size: A	Date: 25 mar 2014	Rev: v1.0
KICad E.D.A.		Id: 5/5

**Endstops**

Endstop inputs are 5V tolerant

JP701 should be used to enable pullups for switch type endstops; remove for active types (e.g. opto)

The endstop circuit uses two 5V tolerant pullup resistors (RP501, RP502) connected to a 5V supply. The endstop inputs (A1-A10) are connected to the pullup resistors. The endstop inputs are also connected to the BeagleBone Black pins (A1-A10) via a 74CBTLV3861 buffer. The BeagleBone Black pins are also connected to the endstop inputs via a 74CBTLV3861 buffer.

**Thermistor Inputs**

The thermistor circuit uses four 5V tolerant pullup resistors (R501-R504) connected to a 5V supply. The thermistor inputs (THERM0-THERM3) are connected to the pullup resistors. The thermistor inputs are also connected to the BeagleBone Black pins (A1-A4) via a 74CBTLV3861 buffer. The BeagleBone Black pins are also connected to the thermistor inputs via a 74CBTLV3861 buffer.

**CRAMPS by Charles Steinkuehler**  
 Copyright 2014 GPL v3  
 Derived from RAMPS-FD by Bob Cousins  
 Derived from RAMPS 1.4 reppap.org/wiki/RAMPS1.4

**File: con\_inputs.sch**  
**Sheet: /Inputs/**  
**Title: CRAMPS (Cape-RAMPS for BeagleBone)**

Size: A	Date: 25 mar 2014	Rev: v1.0
KICad E.D.A.		Id: 5/5

**Endstops**

Endstop inputs are 5V tolerant

JP701 should be used to enable pullups for switch type endstops; remove for active types (e.g. opto)

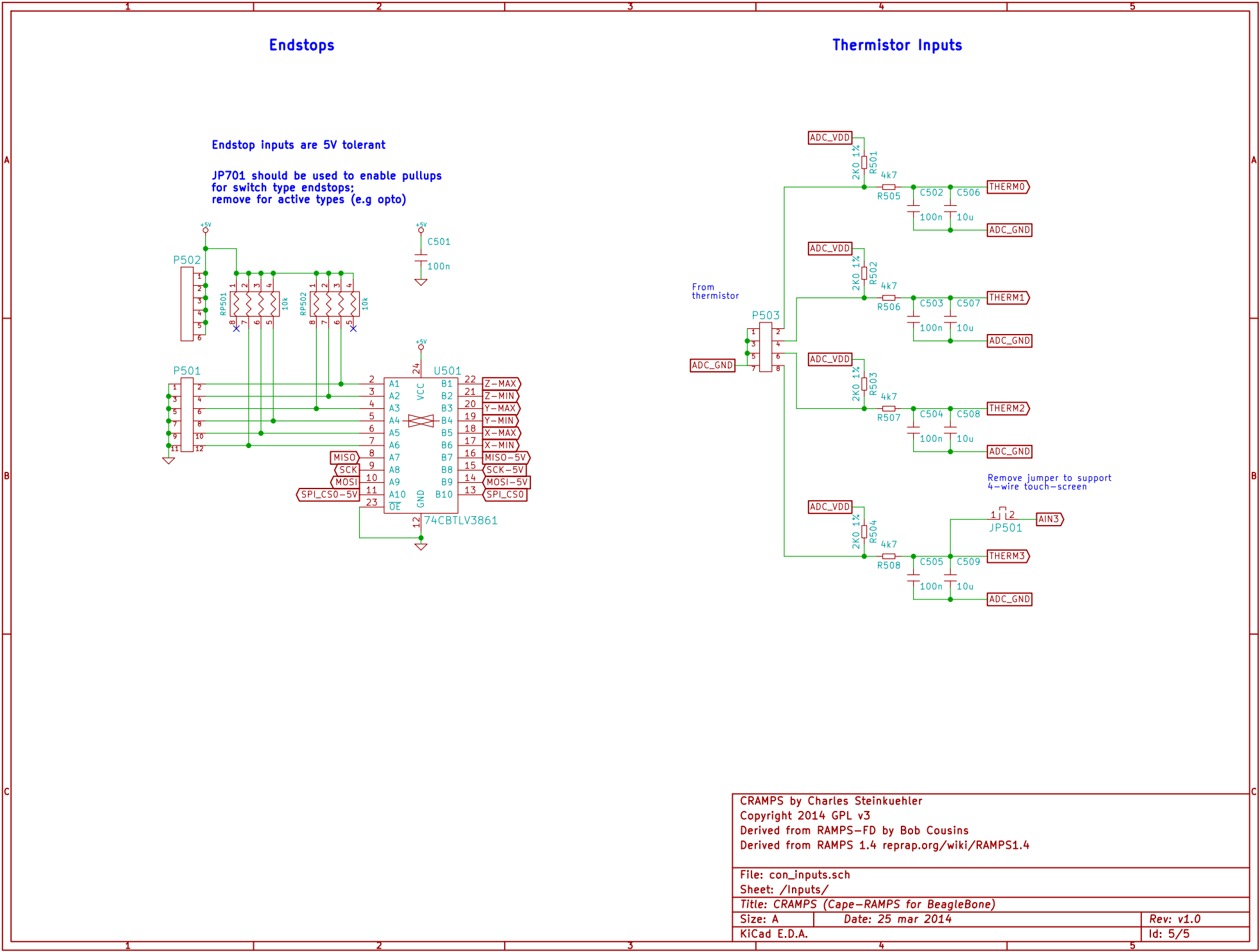
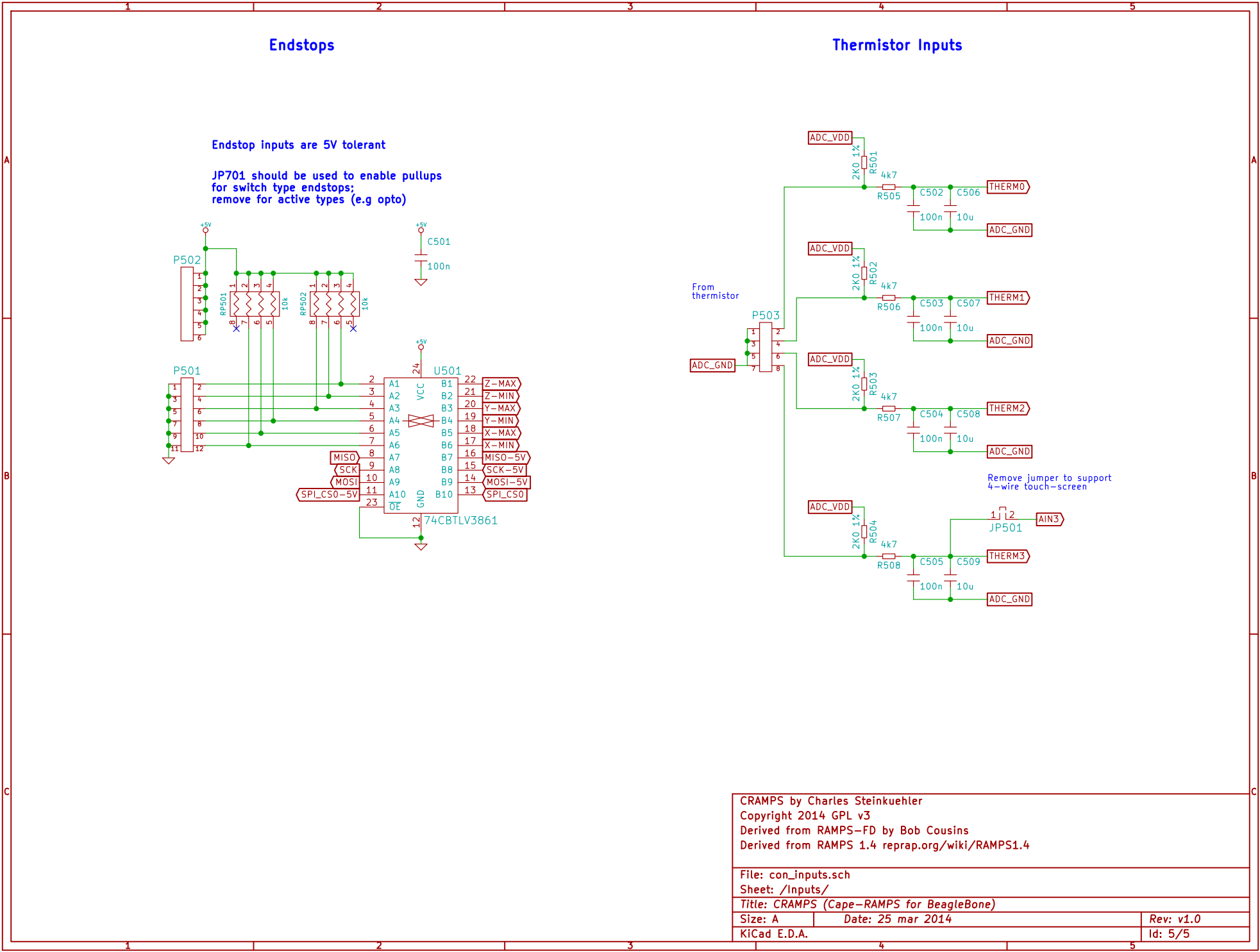
**Thermistor Inputs**

Remove jumper to support 4-wire touch-screen

CRAMPS by Charles Steinkuehler  
 Copyright 2014 GPL v3  
 Derived from RAMPS-FD by Bob Cousins  
 Derived from RAMPS 1.4 [reprap.org/wiki/RAMPS1.4](http://reprap.org/wiki/RAMPS1.4)

File: con\_inputs.sch  
 Sheet: /Inputs/  
 Title: CRAMPS (Cape-RAMPS for BeagleBone)

Size: A	Date: 25 mar 2014	Rev: v1.0
KICad E.D.A.		Id: 5/5



**Endstops**

Endstop inputs are 5V tolerant

JP701 should be used to enable pullups for switch type endstops; remove for active types (e.g. opto)

**Thermistor Inputs**

Remove jumper to support 4-wire touch-screen

CRAMPS by Charles Steinkuehler  
 Copyright 2014 GPL v3  
 Derived from RAMPS-FD by Bob Cousins  
 Derived from RAMPS 1.4 [reprap.org/wiki/RAMPS1.4](http://reprap.org/wiki/RAMPS1.4)

File: con\_inputs.sch  
 Sheet: /Inputs/  
 Title: CRAMPS (Cape-RAMPS for BeagleBone)

Size: A	Date: 25 mar 2014	Rev: v1.0
KICad E.D.A.		Id: 5/5

**Endstops**

Endstop inputs are 5V tolerant

JP701 should be used to enable pullups for switch type endstops; remove for active types (e.g. opto)

**Thermistor Inputs**

Remove jumper to support 4-wire touch-screen

CRAMPS by Charles Steinkuehler Copyright 2014 GPL v3 Derived from RAMPS-FD by Bob Cousins Derived from RAMPS 1.4 reprap.org/wiki/RAMPS1.4		
File: con_inputs.sch		
Sheet: /Inputs/		
Title: CRAMPS (Cape-RAMPS for BeagleBone)		
Size: A	Date: 25 mar 2014	Rev: v1.0
KICad E.D.A.		Id: 5/5

**Endstops**

Endstop inputs are 5V tolerant

JP701 should be used to enable pullups for switch type endstops; remove for active types (e.g. opto)

**Thermistor Inputs**

Remove jumper to support 4-wire touch-screen

CRAMPS by Charles Steinkuehler Copyright 2014 GPL v3 Derived from RAMPS-FD by Bob Cousins Derived from RAMPS 1.4 reprap.org/wiki/RAMPS1.4		
File: con_inputs.sch		
Sheet: /Inputs/		
Title: CRAMPS (Cape-RAMPS for BeagleBone)		
Size: A	Date: 25 mar 2014	Rev: v1.0
KICad E.D.A.		Id: 5/5

**Endstops**

Endstop inputs are 5V tolerant

JP701 should be used to enable pullups for switch type endstops; remove for active types (e.g. opto)

**Thermistor Inputs**

Remove jumper to support 4-wire touch-screen

CRAMPS by Charles Steinkuehler Copyright 2014 GPL v3 Derived from RAMPS-FD by Bob Cousins Derived from RAMPS 1.4 reprap.org/wiki/RAMPS1.4		
File: con_inputs.sch		
Sheet: /Inputs/		
Title: CRAMPS (Cape-RAMPS for BeagleBone)		
Size: A	Date: 25 mar 2014	Rev: v1.0
KICad E.D.A.		Id: 5/5

**Endstops**

Endstop inputs are 5V tolerant

JP701 should be used to enable pullups for switch type endstops; remove for active types (e.g. opto)

**Thermistor Inputs**

Remove jumper to support 4-wire touch-screen

CRAMPS by Charles Steinkuehler  
 Copyright 2014 GPL v3  
 Derived from RAMPS-FD by Bob Cousins  
 Derived from RAMPS 1.4 reprap.org/wiki/RAMPS1.4

File: con\_inputs.sch  
 Sheet: /Inputs/  
 Title: CRAMPS (Cape-RAMPS for BeagleBone)

Size: A	Date: 25 mar 2014	Rev: v1.0
KICad E.D.A.		Id: 5/5