

Einsy Rambo 0.4a  
UltiMachine  
6/14/2017

0.3a Revision Summary (for detailed infomation goto: <https://github.com/ultimachine/Einsy-Rambo/tree/0.3a>)

- Added TVS and over-voltage protection to select nets
- Added and corrected testpoints
- Added "XTRA0" net between 32U2 and 2560
- Removed via tenting underneath QFNs and other flat solder lug/heatsink primitives
- Added teardrops to vias
- Standardized via sizes to 10/22 and 15/30 (mils)
- New footprint for 5V SMPS inductor (fits two inductors now)
- Added I2C pullup footprints (resistors are "DNI")
- Fan connectors now have a 3rd pin for reading the TACH signal
- Added 100R to the gate of each FET
- Adjusted the stackup to better reflect a standard 4-layer stack

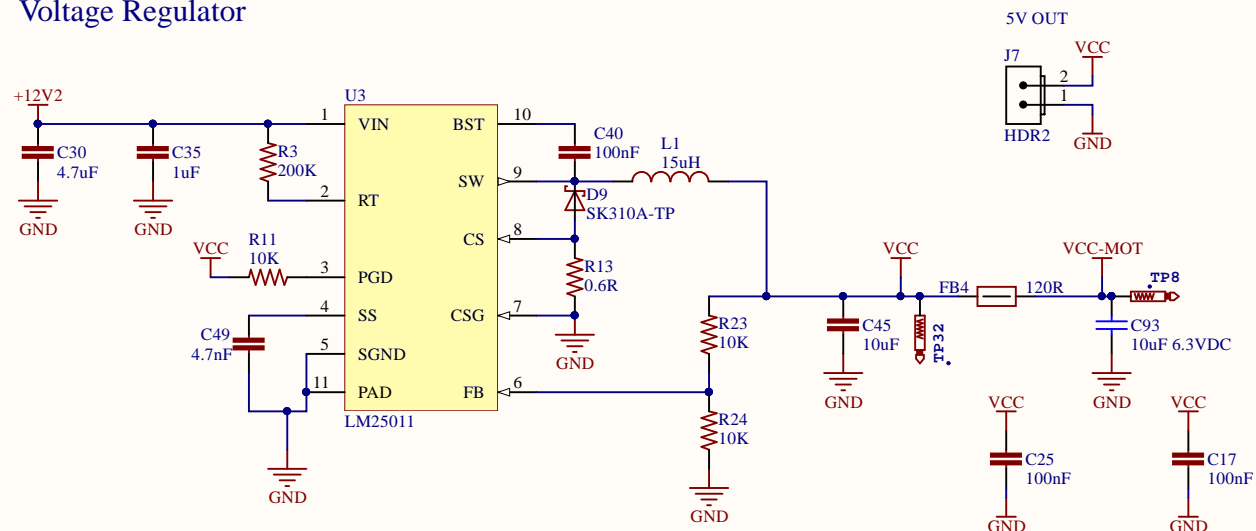
0.4a Revision Summary

- Touchup diode polarity markings in silkscreen
- New footprint for P3
- Moved thermistor TPs to connector pin
- Increased GND stitching
- Increased copper pour coverage
- Updated paste mask apertures on QFNs
- Added nAC\_FAULT to pin\_6 of Atmega2560
- Added J7, power failure relay input.
- Added R73
- Removed RN4
- Stole RX1 and TX1 from P1, moved to J19
- Combined 2560 ICSP (X18) with pins\_9-14 of J19
- Removed J16-J18, X\_MAX, Y\_MAX, Z\_MAX
- Changed X\_MIN and Y\_MIN endstops to 2-pin headers
- Changed Z\_MIN endstop to Z\_PROBE, 4-pin header
- Combined DIAG\_0 and DIAG\_1 on TMC2130 drivers
- TP40 moved 0.1" to the left
- TP32 moved 0.1" to the left

Notes:  
DNI = Do Not Include = No Populate

Title Einsy Rambo Title Page		
Size A	Number 0.4	Revision a
Date:	6/20/2017	Sheet 1 of 11
File:	C:\Users\...\Title.SchDoc	Drawn By: AWS

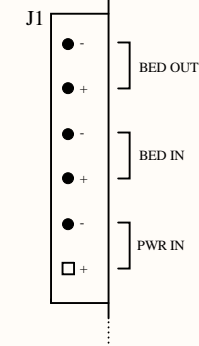
## Voltage Regulator



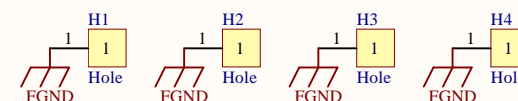
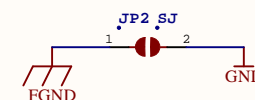
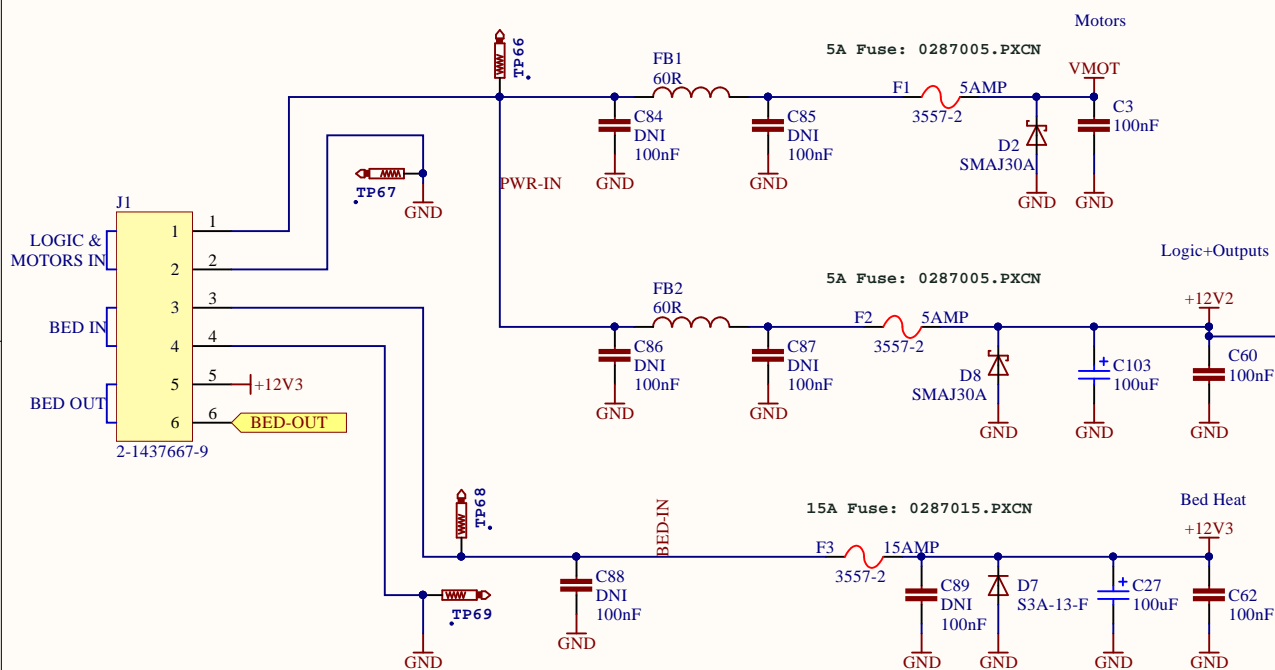
## TOP BOARD EDGE



Connector  
Layout



## Power Input

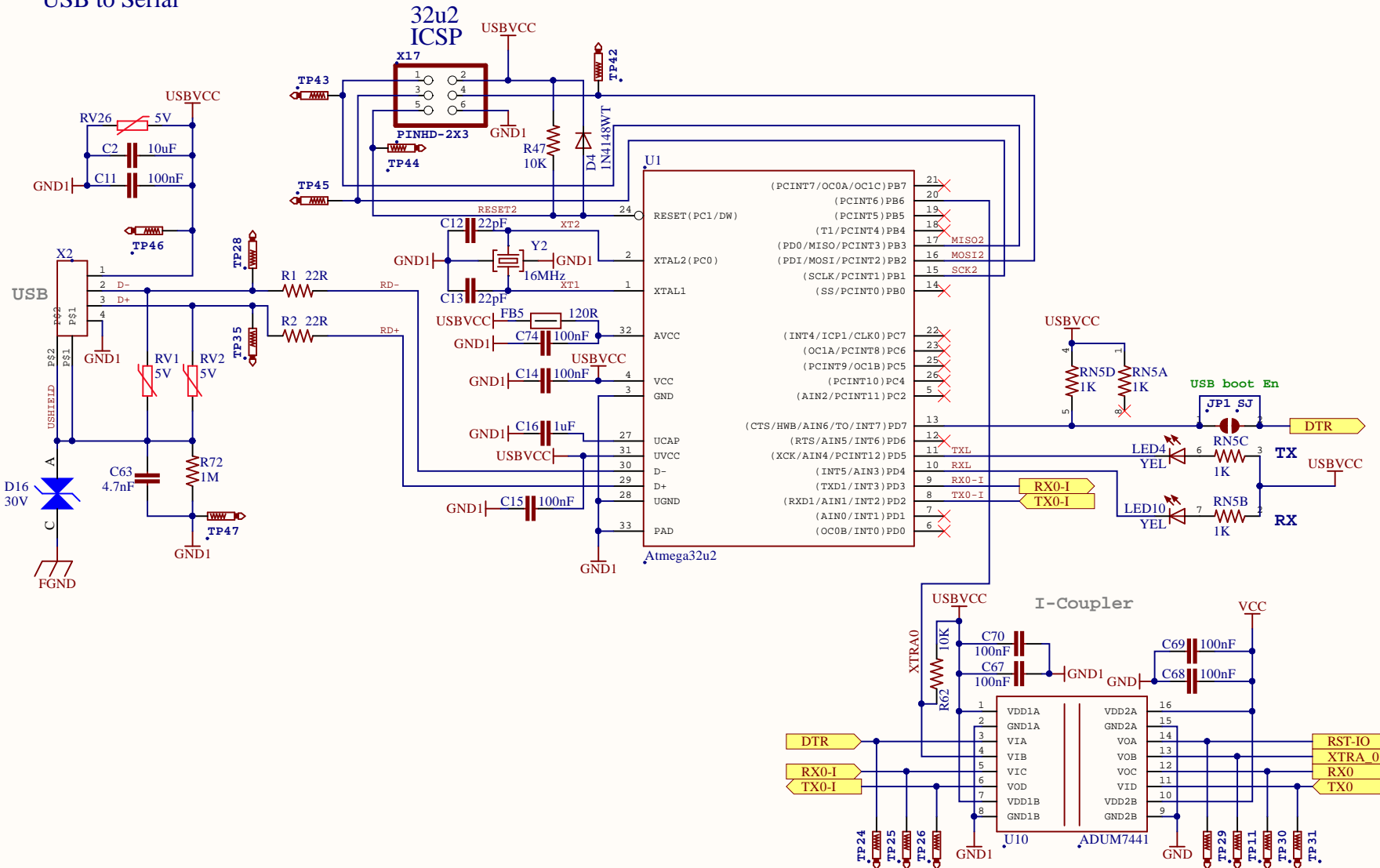


Title Einsy Rambo Power-SMPS		
Size Letter	Number 0.4	Revision a
Date:	6/20/2017	Sheet 2 of 11
File:	C:\Users\...Power-SMPS.SchDoc	Drawn By: AWS



# Atmega 32u2 USB

## USB to Serial



Reference Designs ARE PROVIDED "AS IS" AND "WITH ALL FAULTS". We DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, REGARDING PRODUCTS, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

We may make changes to specifications and product descriptions at any time, without notice. The Customer

must not rely on the absence or characteristics of any features or instructions marked "reserved" or

"undefined." We reserve these for future definition and shall have no responsibility whatsoever for conflicts or

incompatibilities arising from future changes to them. The product information on the Web Site or Materials is

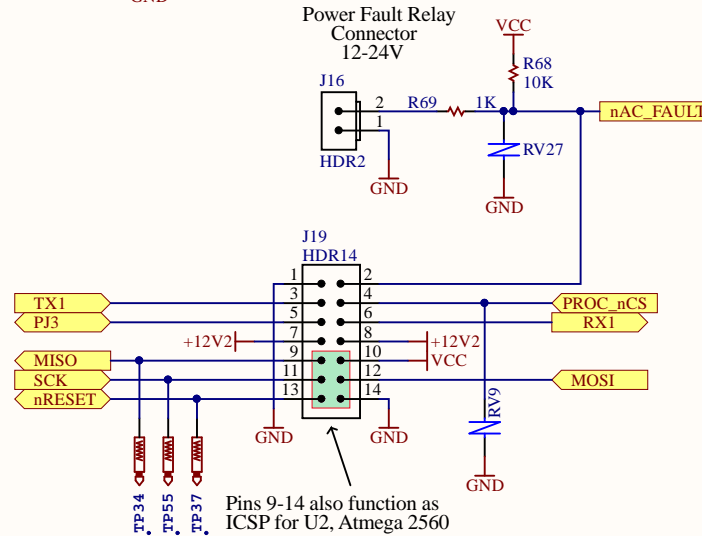
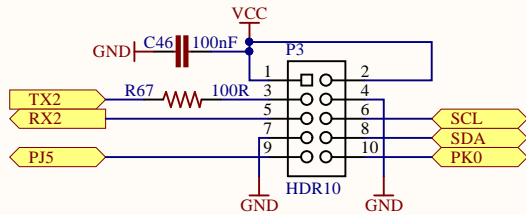
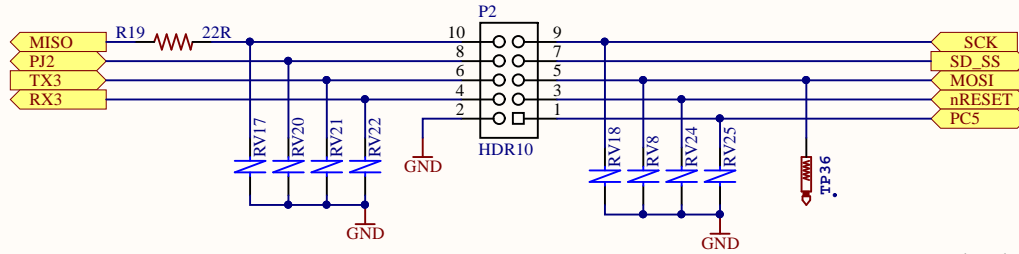
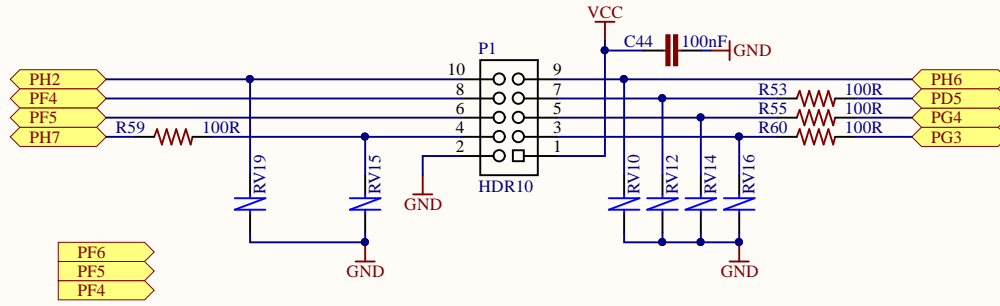
subject to change without notice. Do not finalize a design with this information.



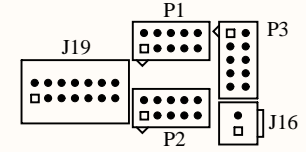
Open Source Hardware  
Copyright 2017 - UltiMachine

Title Einsy Rambo USB-Serial		
Size Letter	Number 0.4	Revision a
Date:	6/20/2017	Sheet 4 of 11
File:	C:\Users\...\USB-Serial.SchDoc	Drawn By: AWS

# Expansion Connectors



## TOP BOARD EDGE

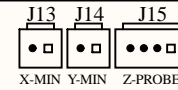


Connector Layout

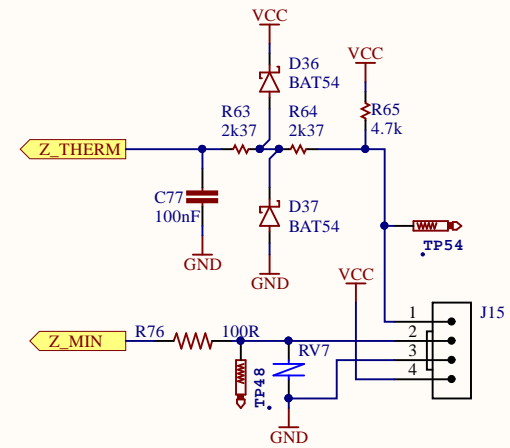
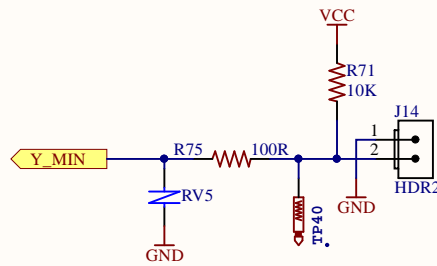
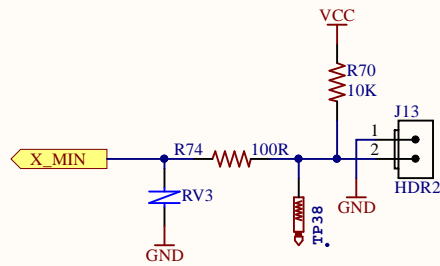
TP27  
Depicted SCLK TP

Title Einsy Rambo Connectors		
Size A	Number 0.4	Revision a
Date:	6/20/2017	Sheet 5 of 11
File:	C:\Users\...\Connectors.SchDoc	Drawn By: AWS

## TOP BOARD EDGE

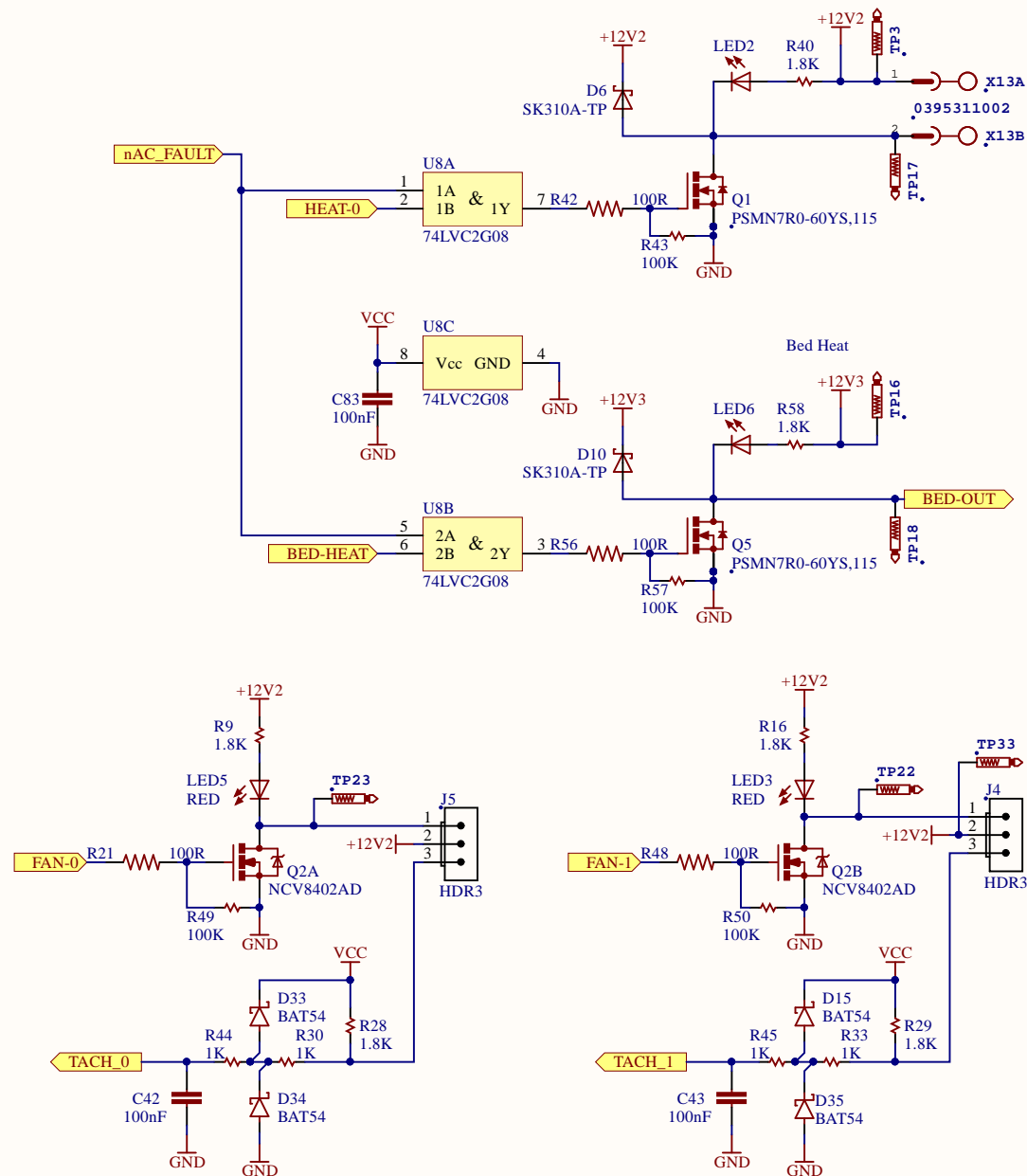
Connector  
Layout

## End Stops



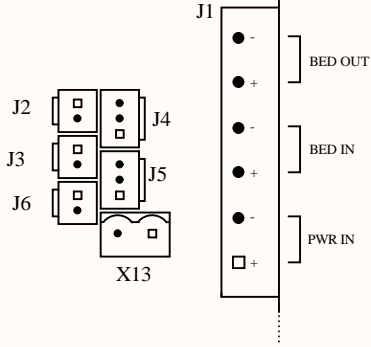
Title Einsy Rambo Endstops		
Size A	Number 0.4	Revision a
Date:	6/20/2017	Sheet 6 of 11
File:	C:\Users\...\Endstops.SchDoc	Drawn By: AWS

Heater Outputs

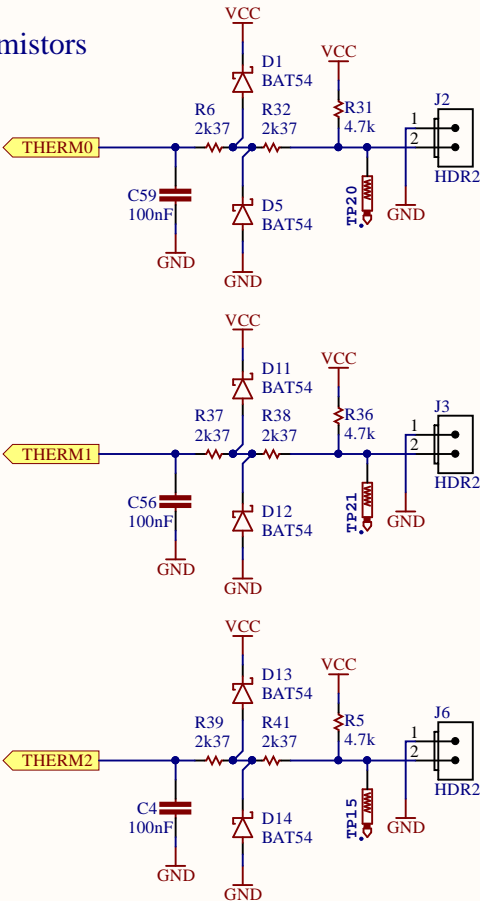


TOP BOARD EDGE

Connector Layout



Thermistors



Title Einsy Rambo Heaters		
Size Letter	Number 0.4	Revision a
Date:	6/20/2017	Sheet 7 of 11
File:	C:\Users\...\Heaters.SchDoc	Drawn By: AWS

A

B

C

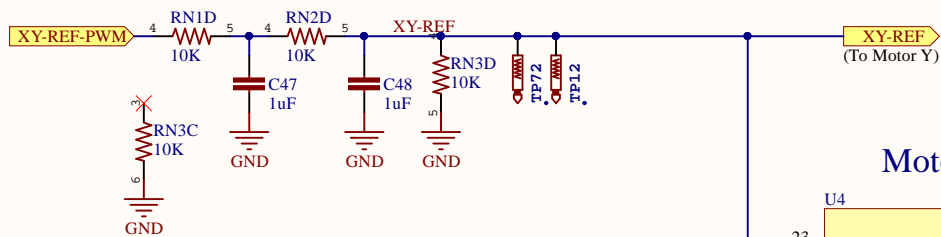
D

A

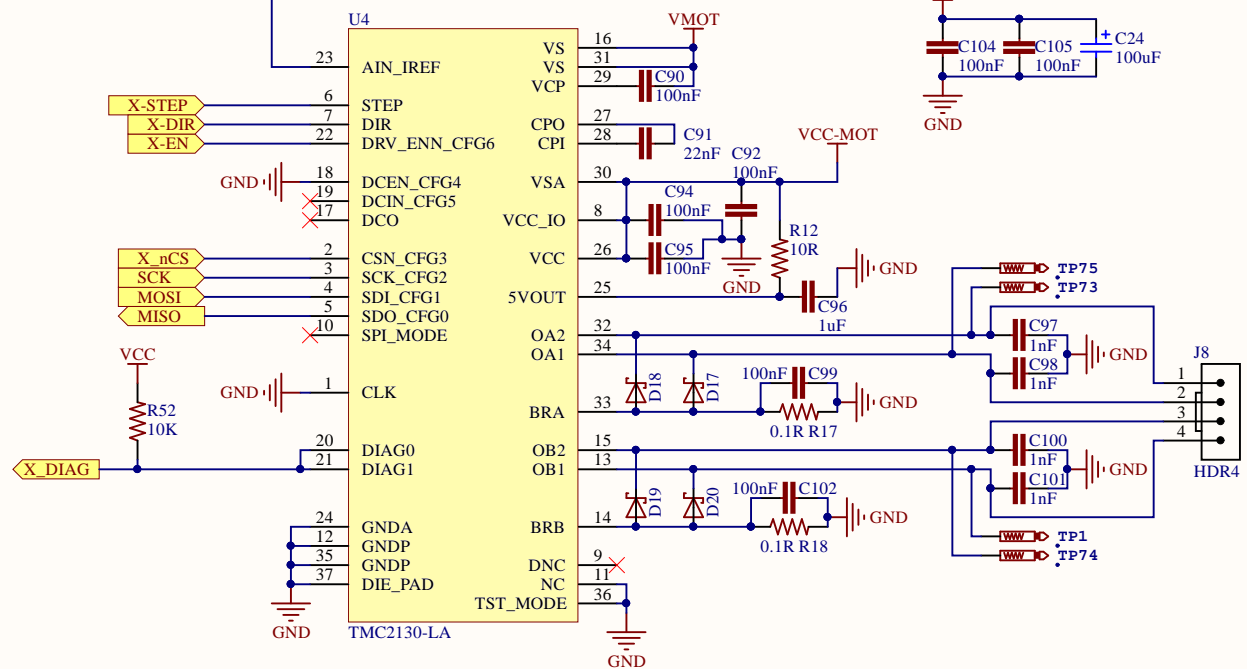
B

C

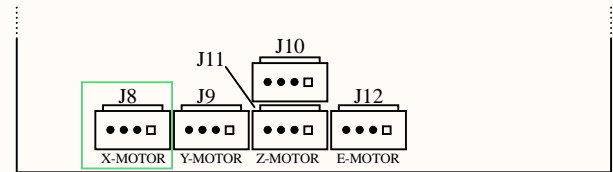
D



### Motor X



### Connector Layout

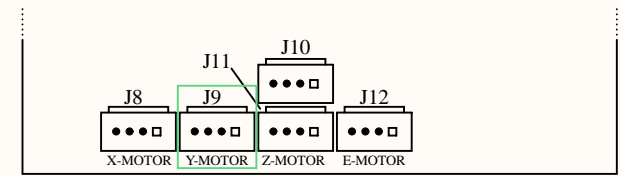


BOTTOM BOARD EDGE

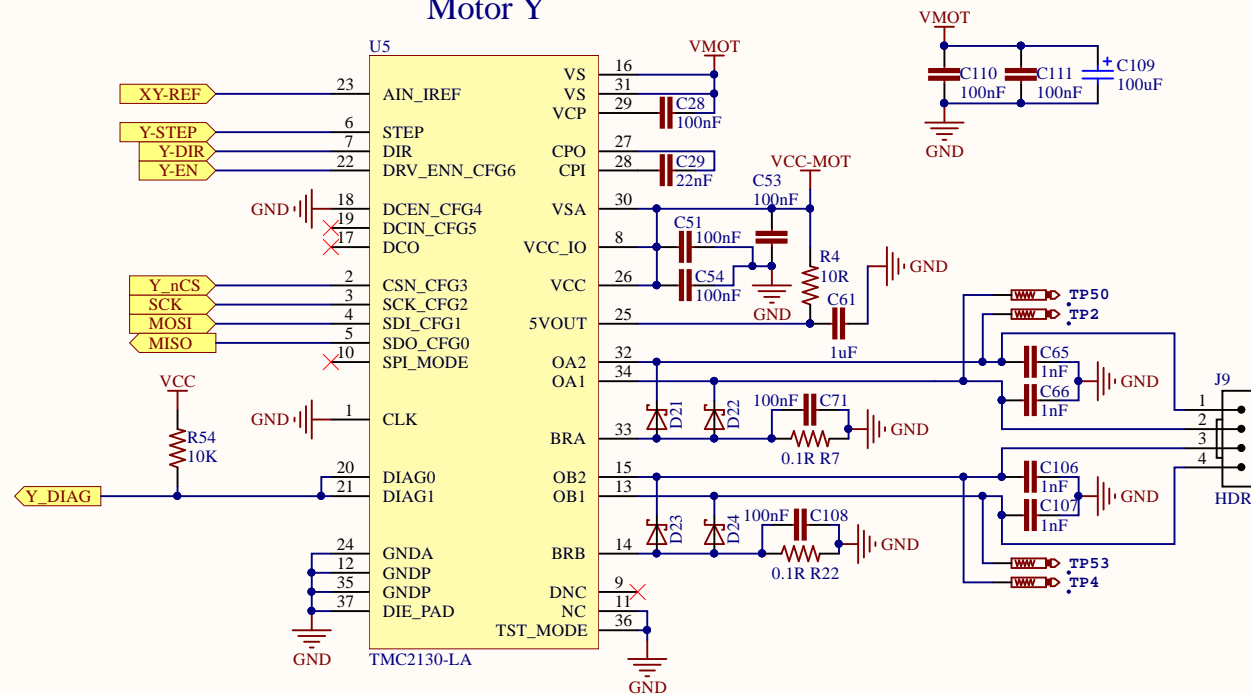
Title Einsy Rambo Motor-X		
Size Letter	Number 0.4	Revision a
Date:	6/20/2017	Sheet 8 of 11
File:	C:\Users\...\Motor-X.SchDoc	Drawn By: AWS



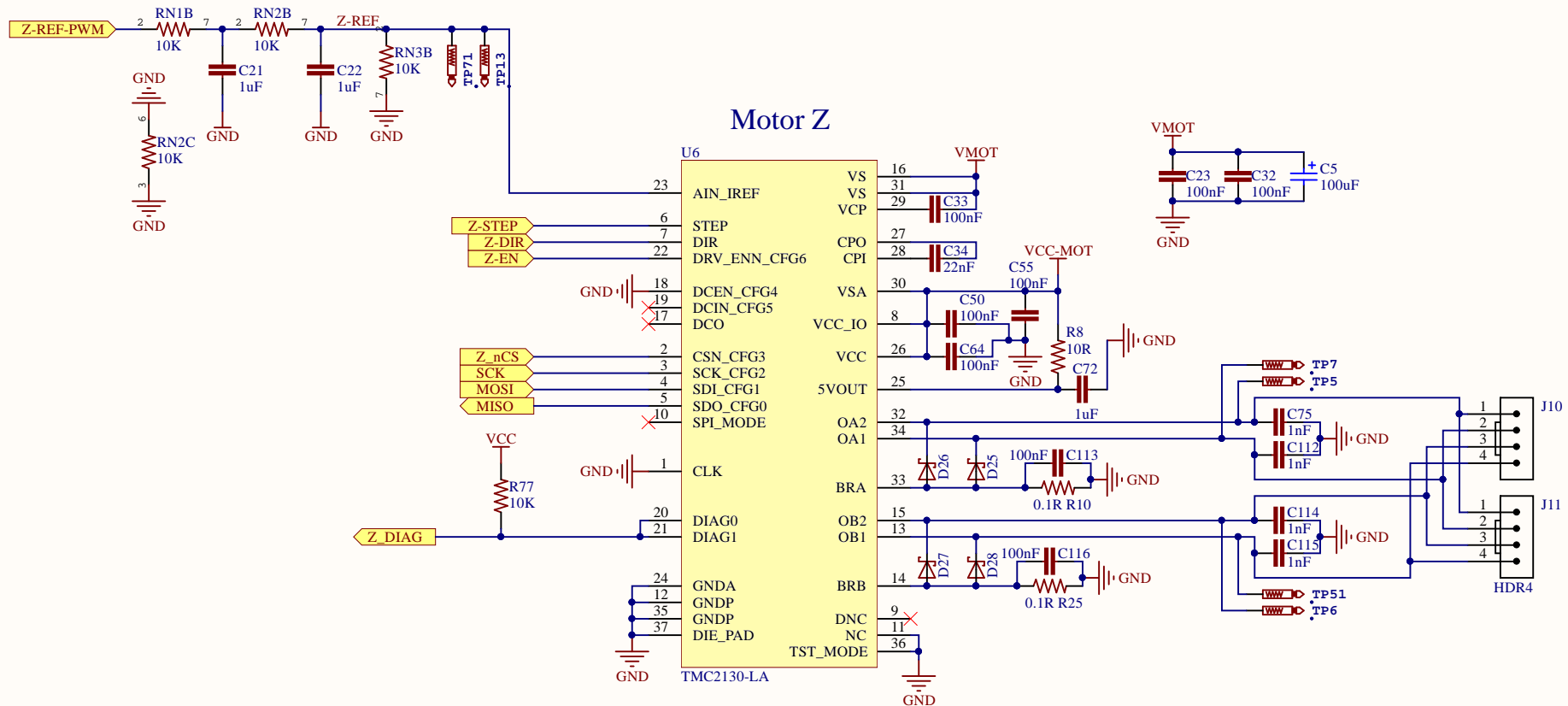
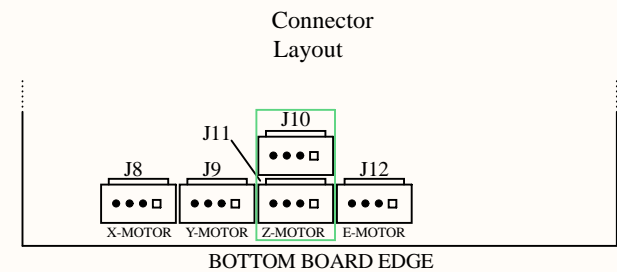
# Connector Layout



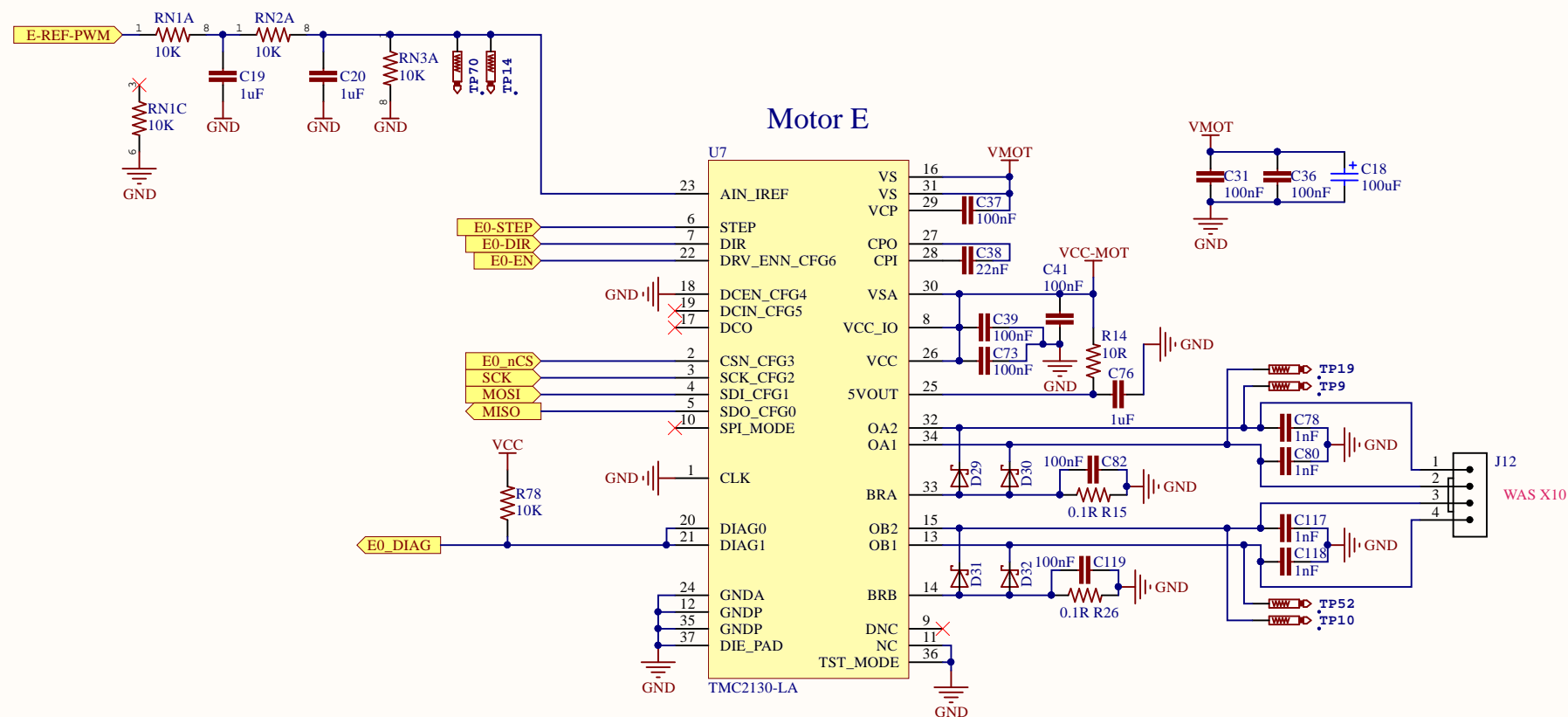
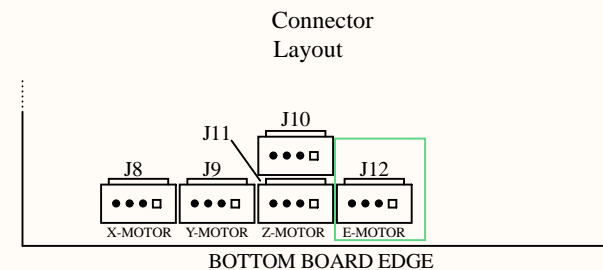
## Motor Y



Title Einsy Rambo Motor-Y		
Size Letter	Number 0.4	Revision a
Date:	6/20/2017	Sheet 9 of 11
File:	C:\Users\...\\Motor-Y.SchDoc	Drawn By: AWS



Title Einsy Rambo Motor-Z		
Size Letter	Number 0.4	Revision a
Date:	6/20/2017	Sheet 10 of 11
File:	C:\Users\...\\Motor-Z.SchDoc	Drawn By: AWS



Title Einsy Rambo Motor-E		
Size Letter	Number 0.4	Revision a
Date:	6/20/2017	Sheet 1 of 11
File:	C:\Users\...\\Motor-E.SchDoc	Drawn By: AWS