

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

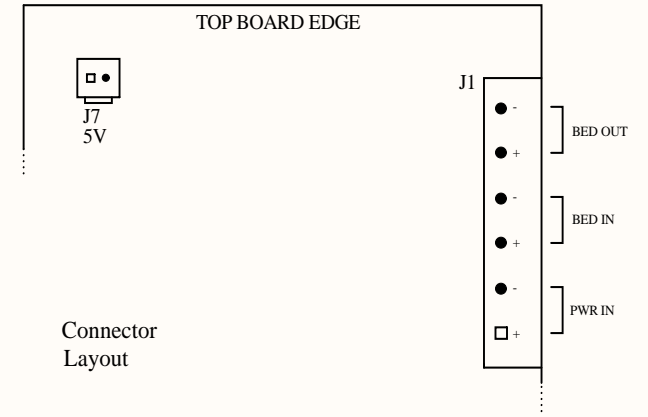
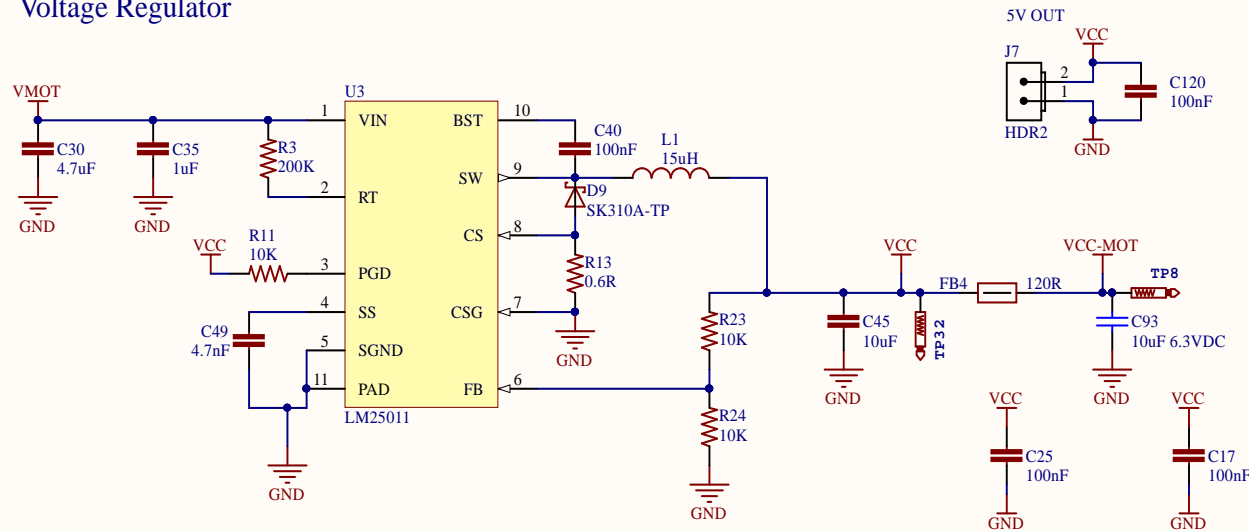
0.5a Revision Summary

- Added ferrites to motor controller outputs.
- Removed fuse and input filter for VMOT
- Move MOSFET pulldown resistors to input side of AND gates
- Added ferrites to all P1 and P2 signals.
- Changed RN1 and RN2 from 10k to 5.6k (increases voltage on motor controller Vref pins)
- Changed motor controller low-side I-sense resistors from 0.1 to 0.22Ohm
- Voltage regulator U3 is now sourced from VMOT (was +12V2)
- Added power bypass capacitors to J7 and J15
- +12V2(Logic) and +12V3(Bed) now have micro-controller ADC based voltage monitoring.
- Added 2 internal layers (now 6 layers total)
- Added filtered internal island for micro-controller Vcc
- Most bottom layer routing (Layer 6) was moved to the new adjacent internal layer (Layer 5)
- Moved MOSFET pulldowns R43 and R57 upstream from FETs and placed at input of AND gate.
- New pinout for J19 header.
- Motor connectors are now flush with the bottom edge of the board.

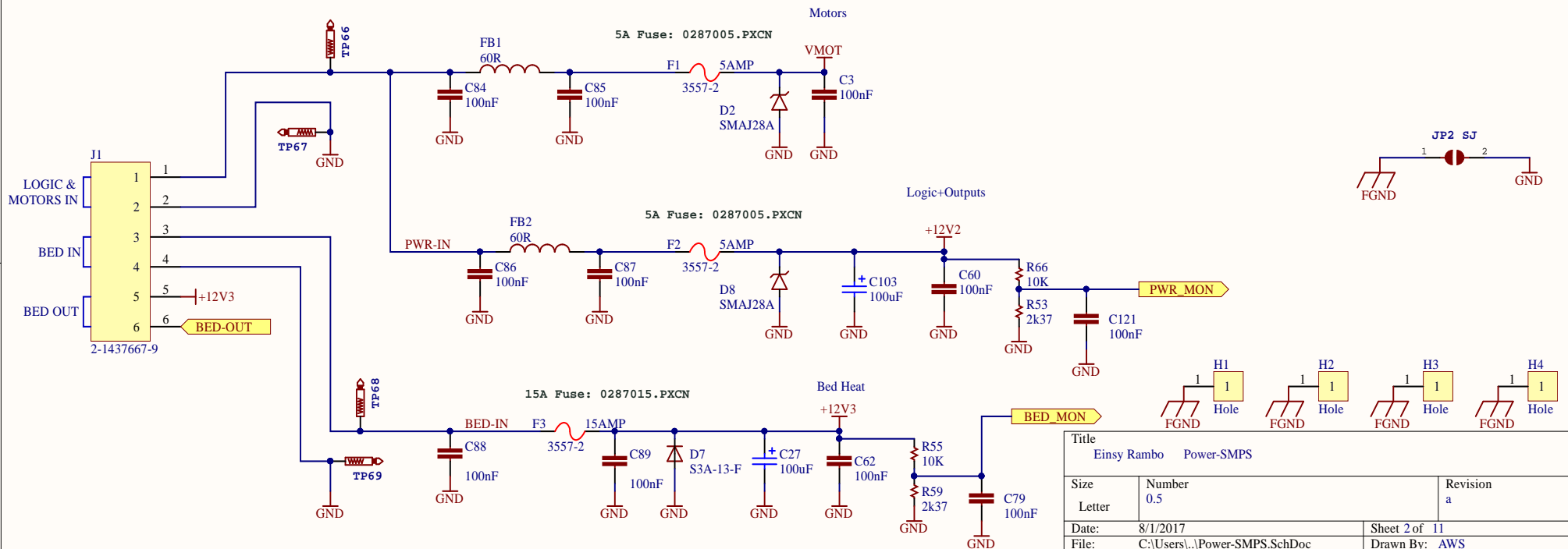
Notes:
DNI = Do Not Include = No Populate

Title			
Einsy Rambo Title Page			
Size	Number		Revision
A	0.5		a
Date:	8/1/2017		Sheet 1 of 11
File:	C:\Users\...\Title.SchDoc		Drawn By: AWS

Voltage Regulator



Power Input



Title		
Einsy Rambo Power-SMPS		
Size	Number	Revision
Letter	0.5	a
Date:	8/1/2017	Sheet 2 of 11
File:	C:\Users\...\Power-SMPS.SchDoc	Drawn By: AWS

A

A

B

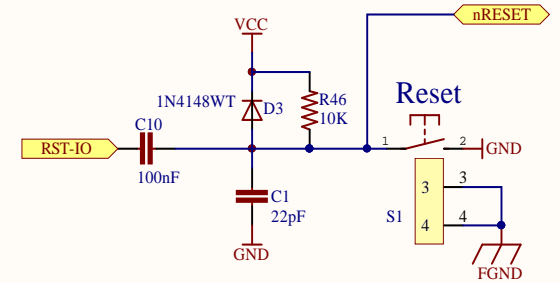
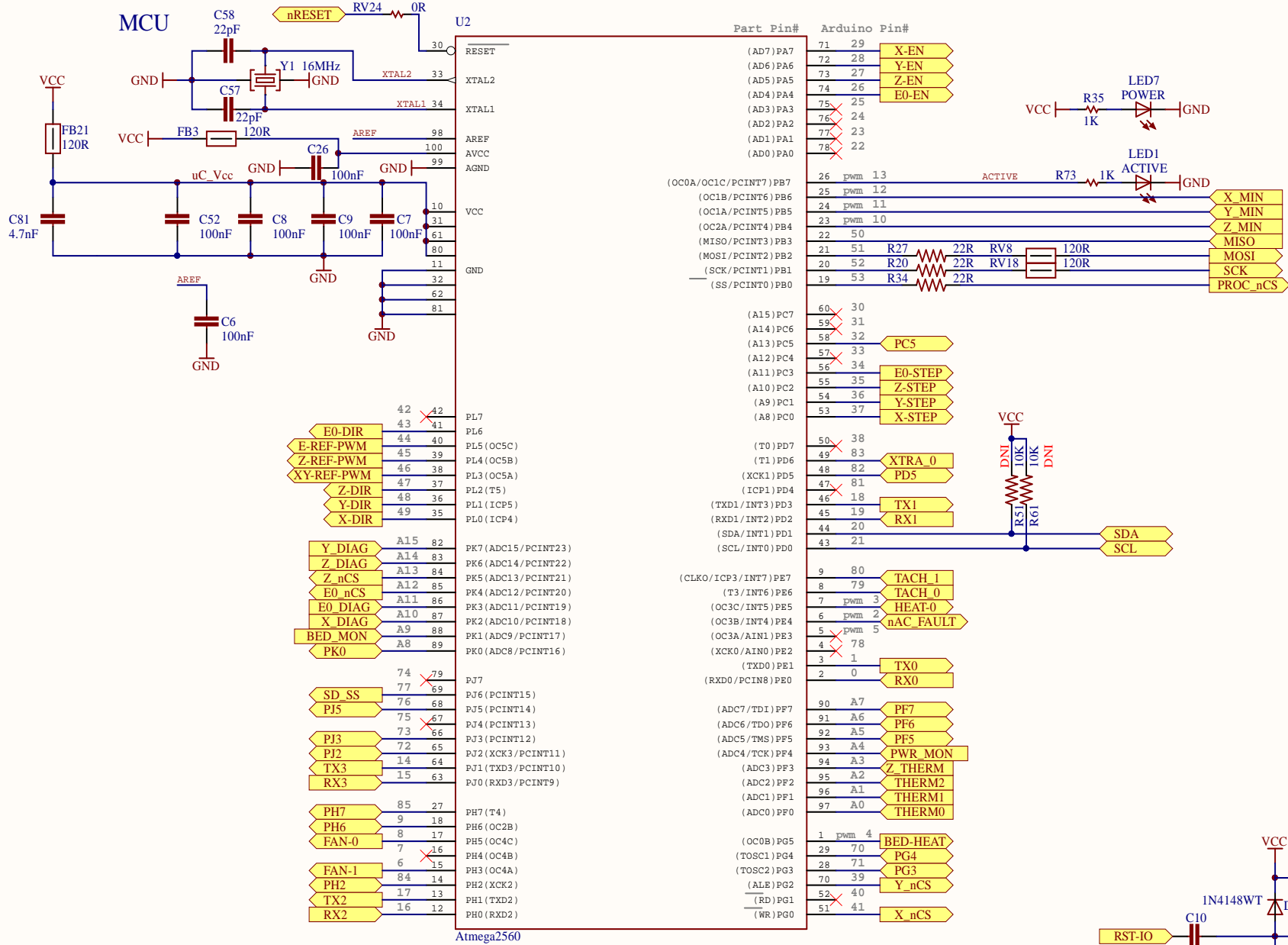
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D

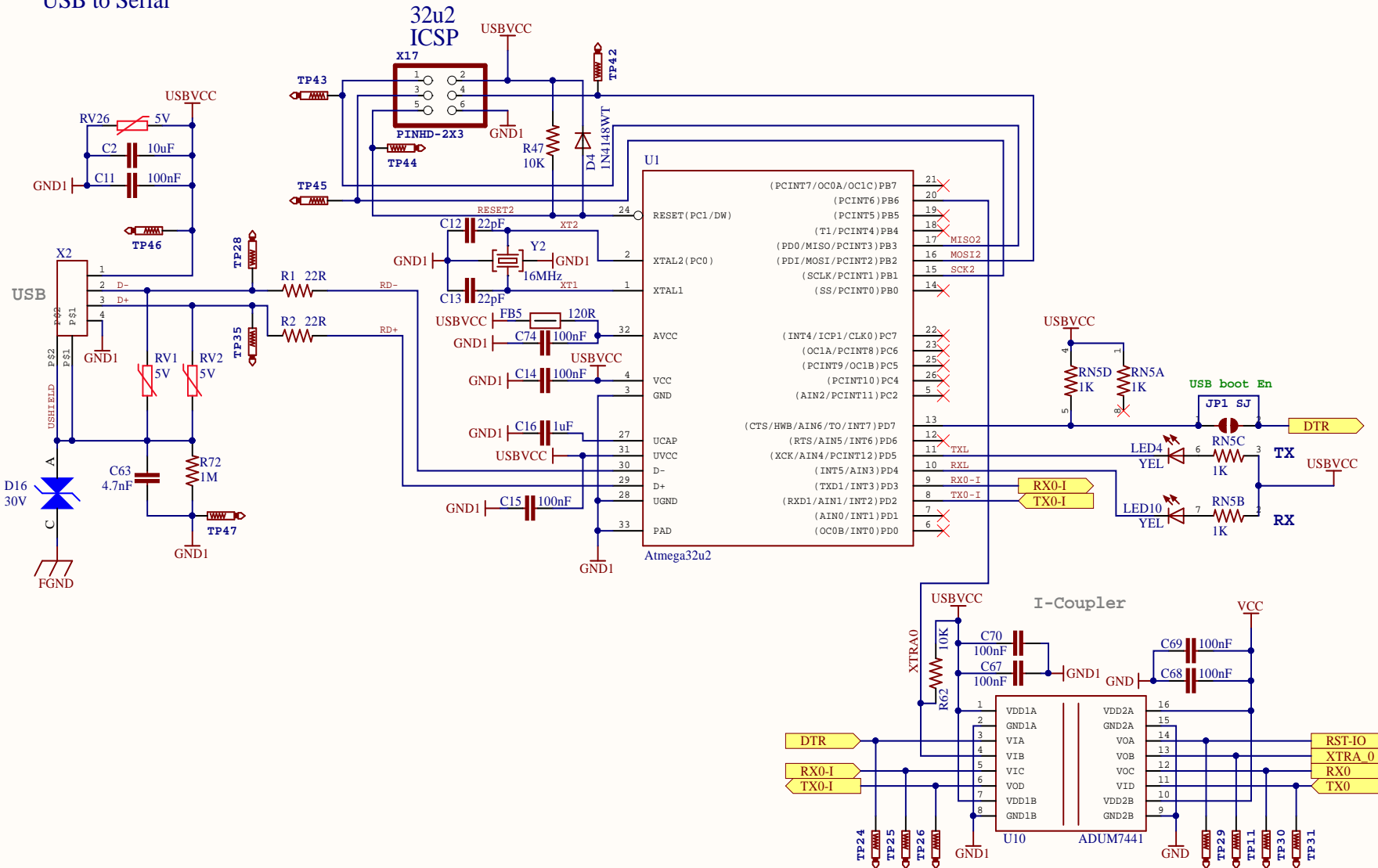
D



Title Einsy Rambo MCU		
Size Letter	Number 0.5	Revision a
Date:	8/1/2017	Sheet 3 of 11
File:	C:\Users\...\MCU.SchDoc	Drawn By: AWS

Atmega 32u2 USB

USB to Serial



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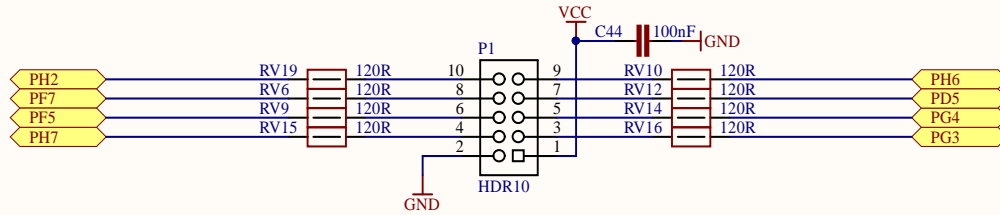
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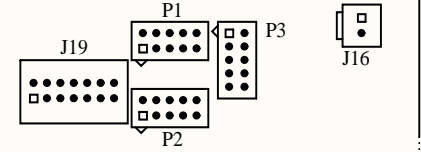
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Title Einsy Rambo USB-Serial		
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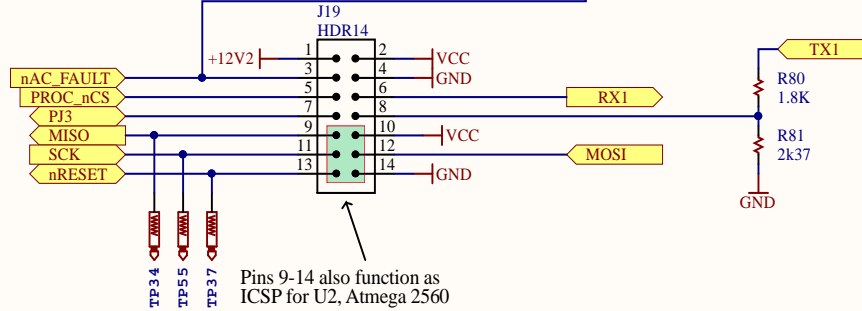
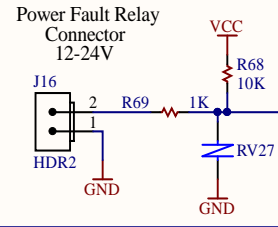
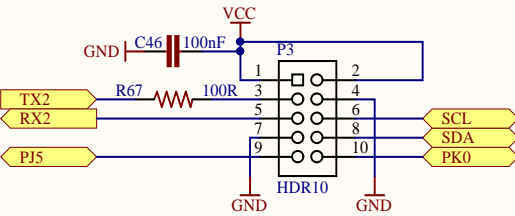
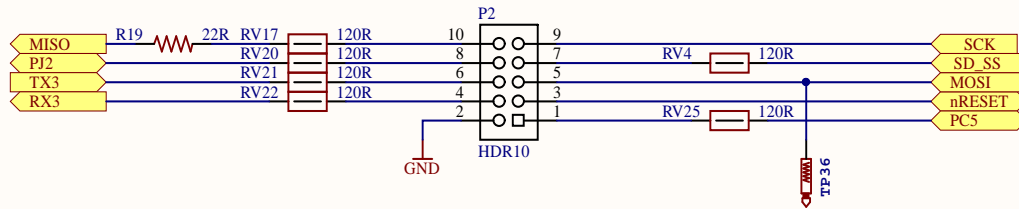
Expansion Connectors



TOP BOARD EDGE

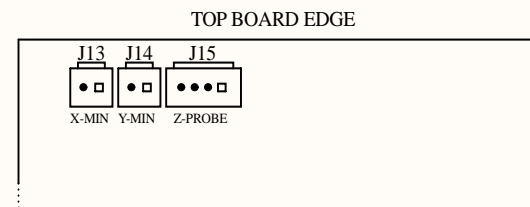


Connector Layout



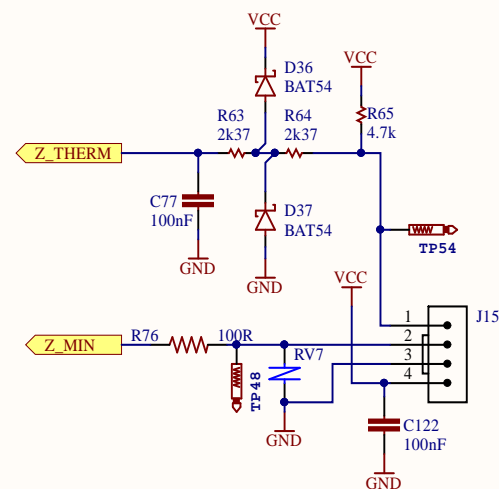
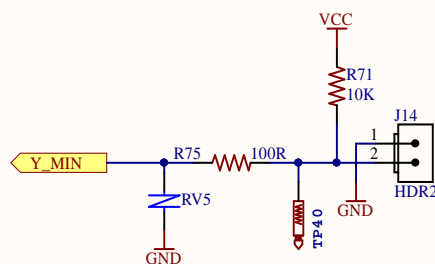
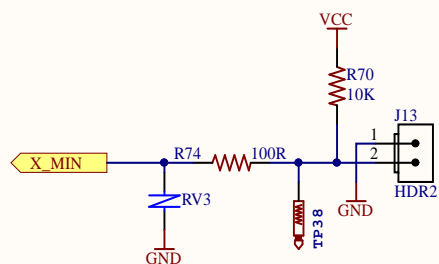
Pins 9-14 also function as ICSP for U2, Atmega 2560

Title Einsy Rambo Connectors		
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Date:	8/1/2017	Sheet 5 of 11
File:	C:\Users\...\Connectors.SchDoc	Drawn By: AWS



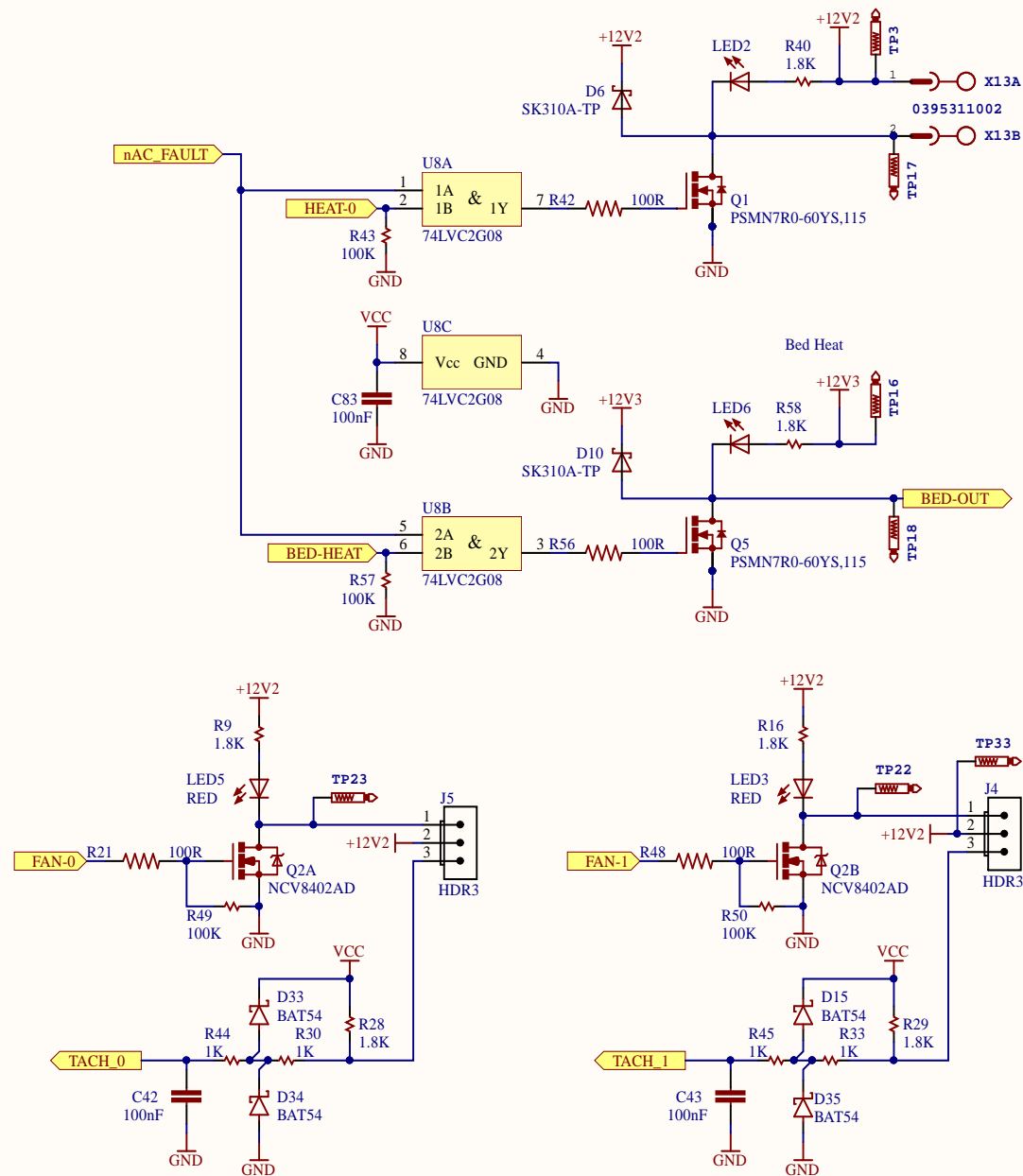
Connector
Layout

End Stops



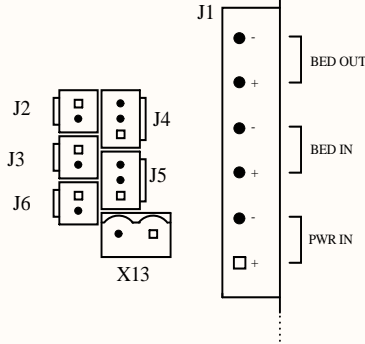
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Size A	Number 0.5		Revision a
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Heater Outputs

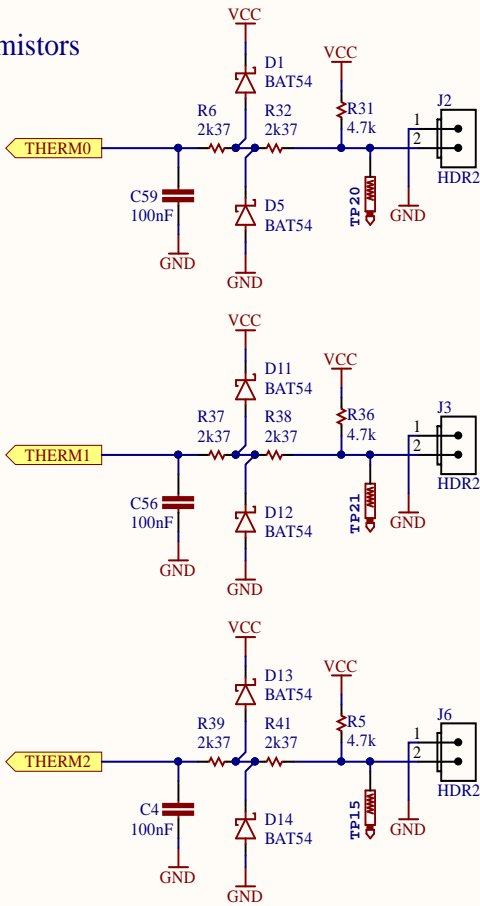


TOP BOARD EDGE

Connector
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Thermistors



Title Einsy Rambo Heaters		
Size Letter	Number 0.5	Revision a
Date:	8/1/2017	Sheet 7 of 11
File:	C:\Users\...\Heaters.SchDoc	Drawn By: AWS

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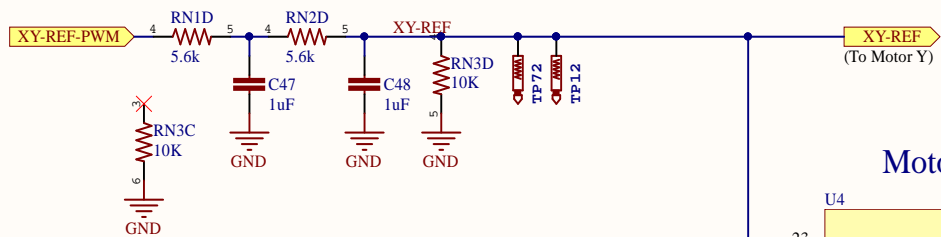
D

A

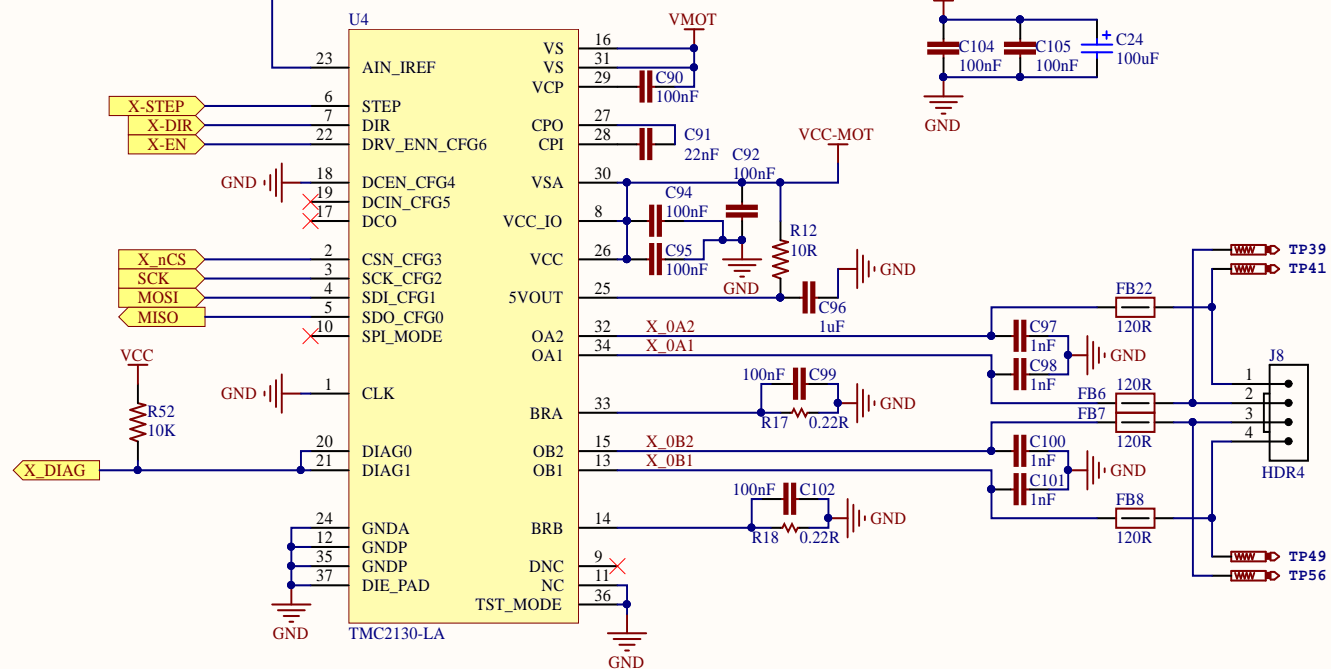
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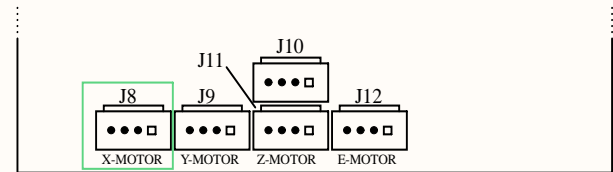
D



Motor X



Connector Layout

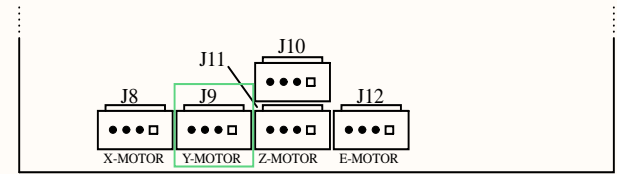


BOTTOM BOARD EDGE

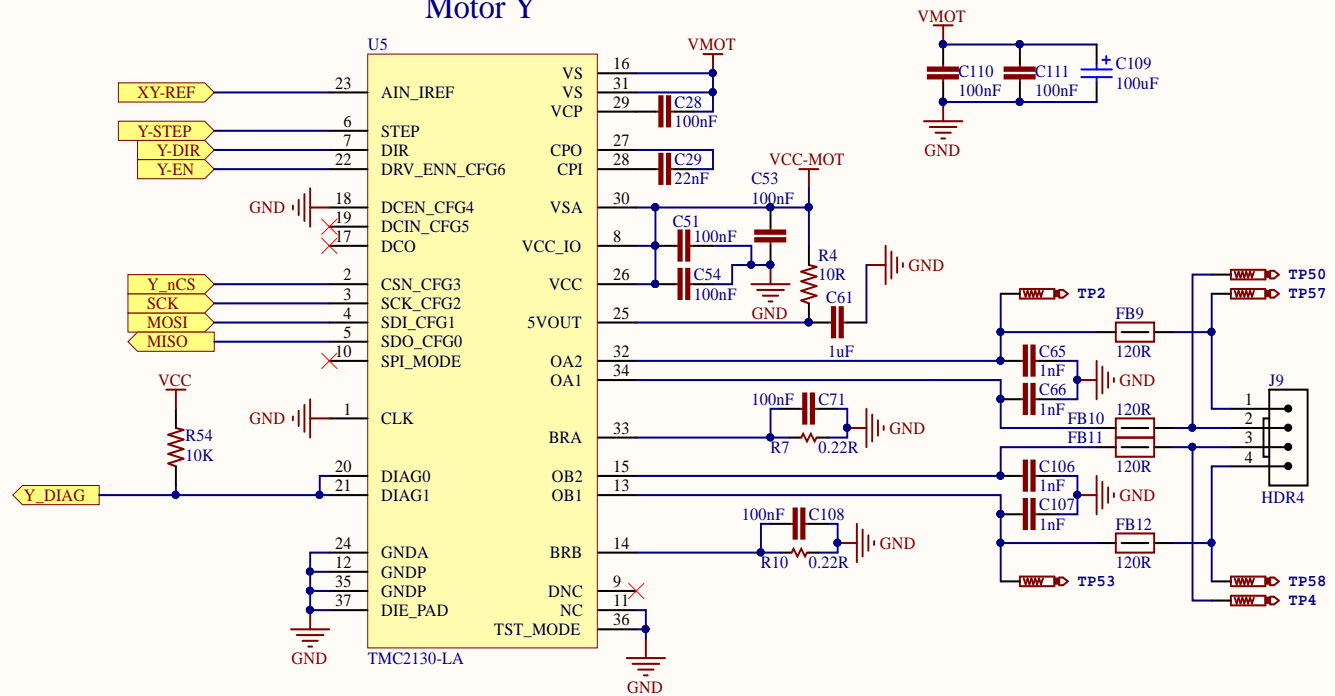
Deprecated Test Points	
X_0A1	TP75
X_0A2	TP73
X_0B1	TP1
X_0B2	TP74

Title		Einsy Rambo Motor-X	
Size	Number	Revision	
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File:	C:\Users\...\Motor-X.SchDoc	Drawn By:	AWS

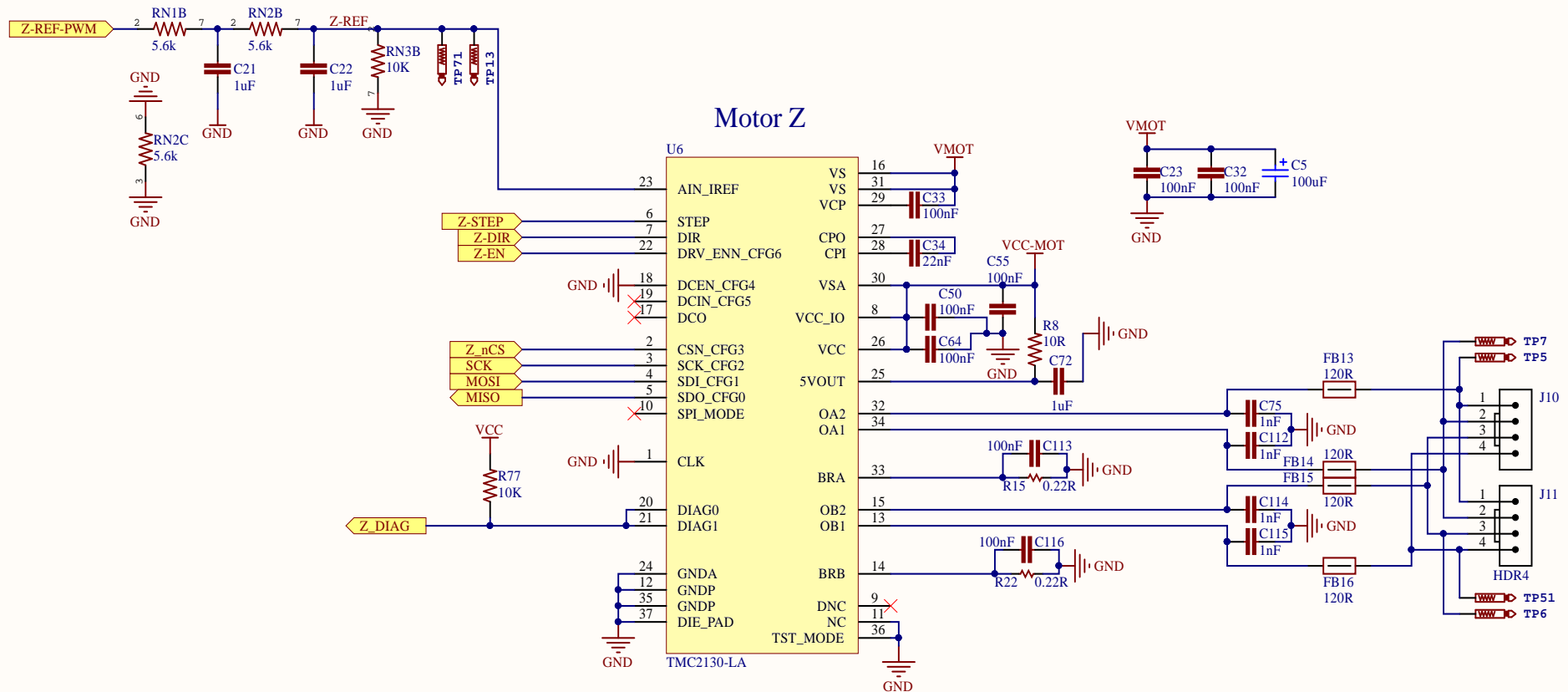
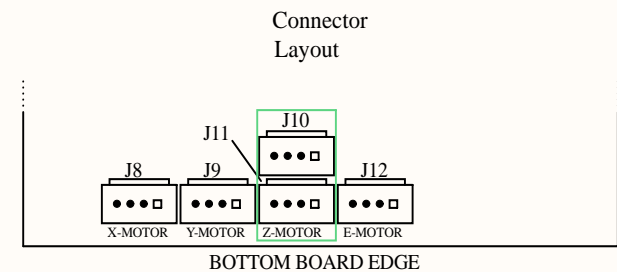
Connector
Layout



Motor Y



Title Einsy Rambo Motor-Y			
Size Letter	Number 0.5		Revision a
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Title		
Einsy Rambo Motor-Z		
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