

	1	2	3	4	
A					A
B					B
C					C
D					D

Einsy Rambo 0.3a  
UltiMachine  
3/8/2017

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

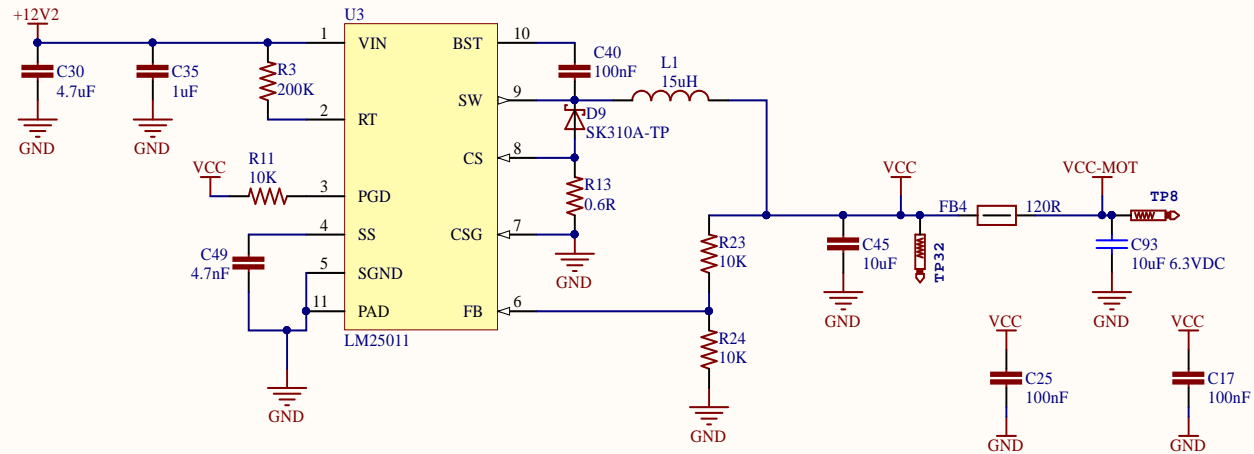
- Added TVS and over-voltage protection to select nets
- Added and corrected testpoints
- Added "XTRA0" net between 32U2 and 2560
- Removed via tenting underneath QFNs and other flat solder lug/heatsink primitives
- Added teardrops to vias
- Standardized via sizes to 10/22 and 15/30 (mils)
- New footprint 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

Notes:  
DNI = Do Not Include = No Populate

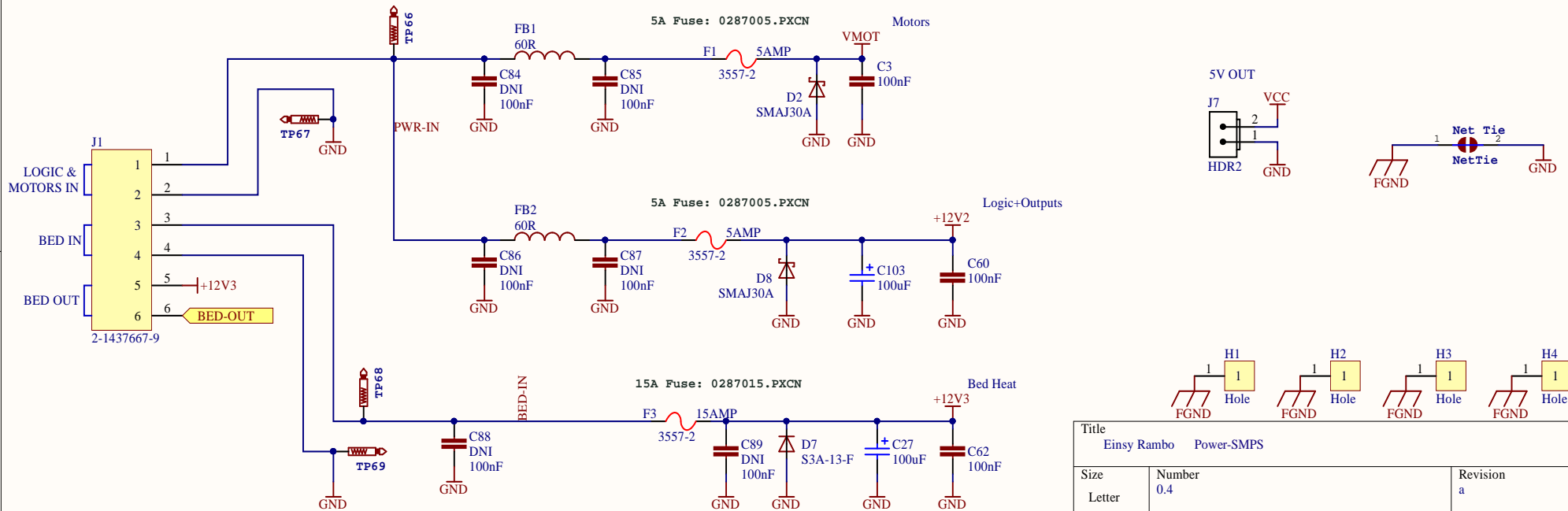
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Size A	Number 0.4	Revision a
Date:	6/6/2017	Sheet 1 of 11
File:	C:\Users\...\Title.SchDoc	Drawn By: AWS

1	2	3	4
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## Voltage Regulator

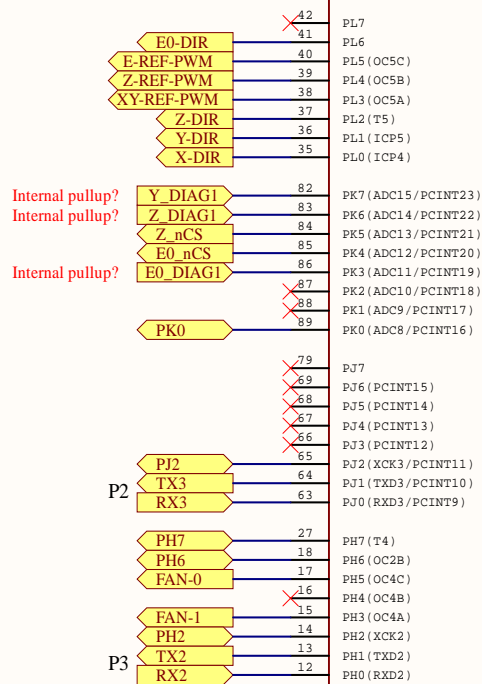
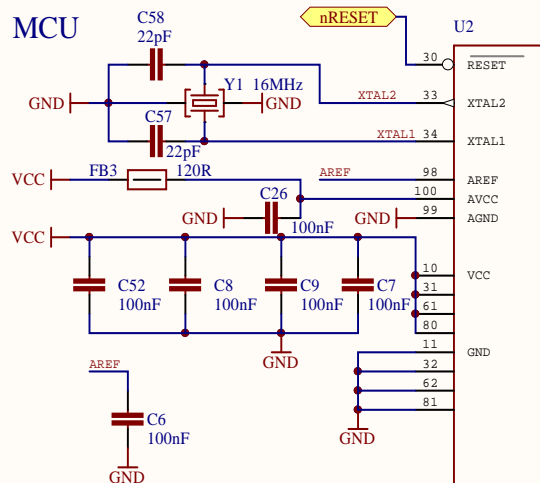


## Power Input

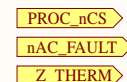
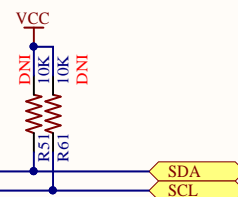
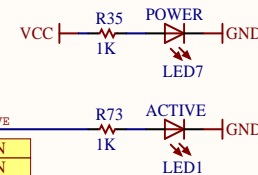
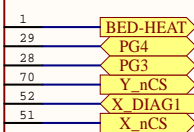
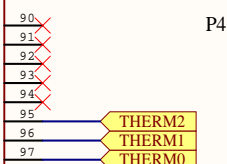
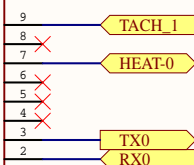
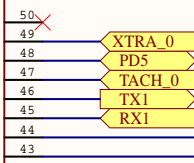
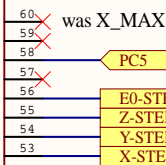
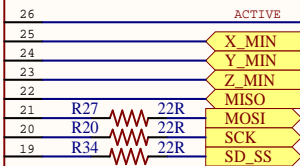
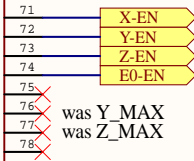
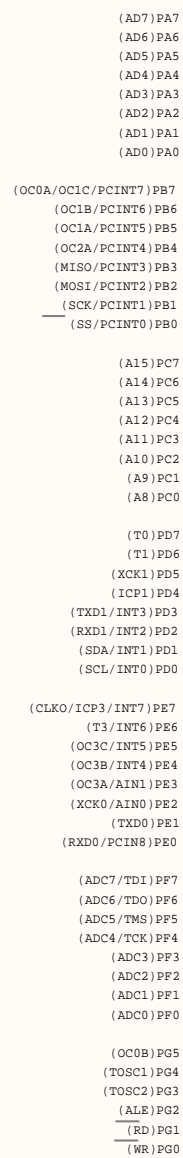


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Einsy Rambo Power-SMPS		
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Date:	6/6/2017	Sheet 2 of 11
File:	C:\Users\...\Power-SMPS.SchDoc	Drawn By: AWS

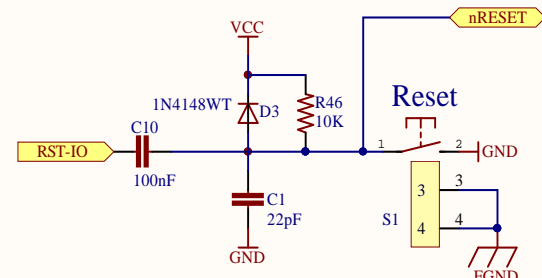
MCU



Atmega2560



Not assigned yet

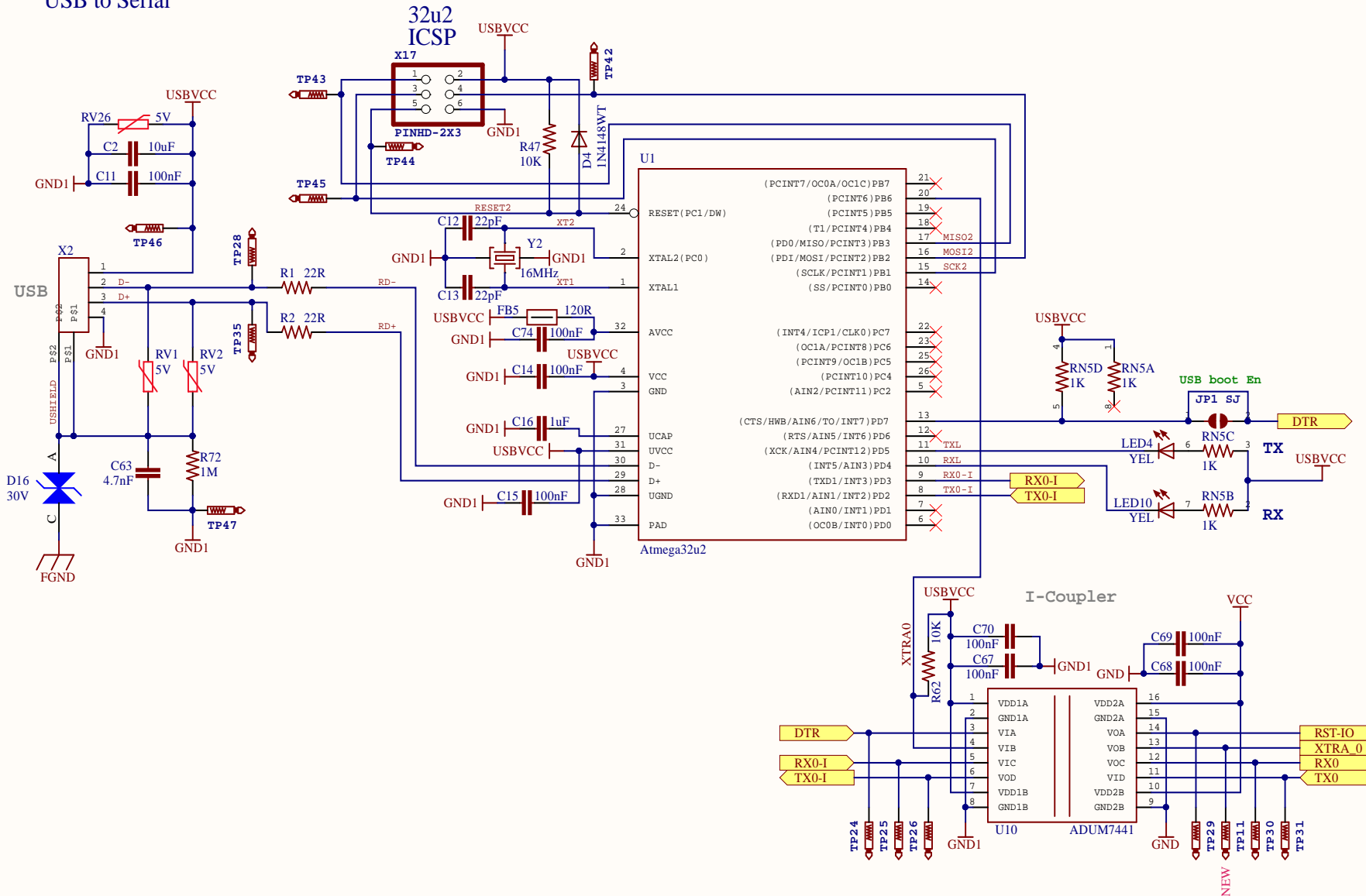


- Added R73  
- Removed RN4

Title Einsy Rambo MCU		
Size Letter	Number 0.4	Revision a
Date:	6/6/2017	Sheet 3 of 11
File:	C:\Users\...\MCU.SchDoc	Drawn By: AWS

# USB to Serial

## Atmega 32u2 USB



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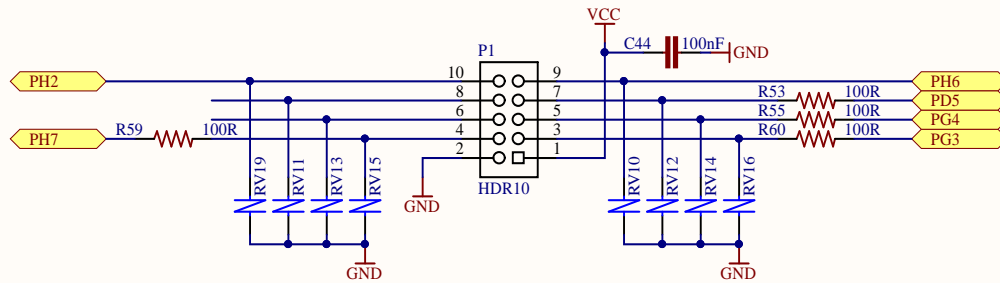
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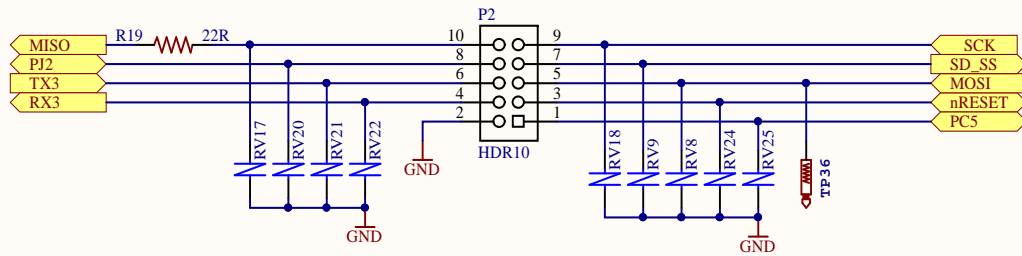
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Title Einsy Rambo USB-Serial		
Size Letter	Number 0.4	Revision a
Date:	6/6/2017	Sheet 4of 11
File:	C:\Users\...\USB-Serial.SchDoc	Drawn By: AWS

## Expansion Connectors

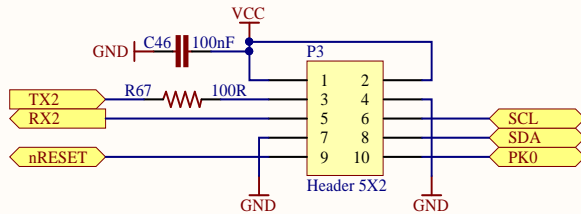


Add connector diagram

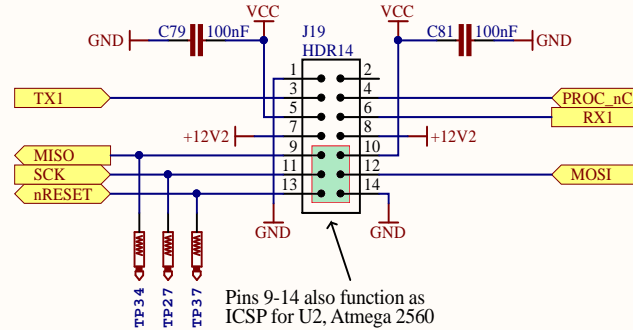
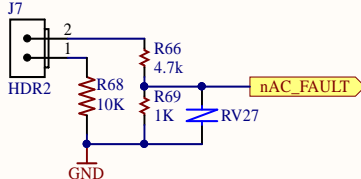


Hardware Chip Select

Swap these??



Power Fault Relay  
Connector  
12-24V

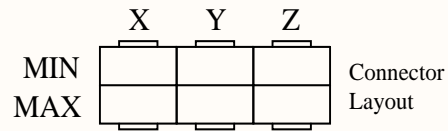


Pins 9-14 also function as  
ICSP for U2, Atmega 2560

Software (GPIO) Chip Select

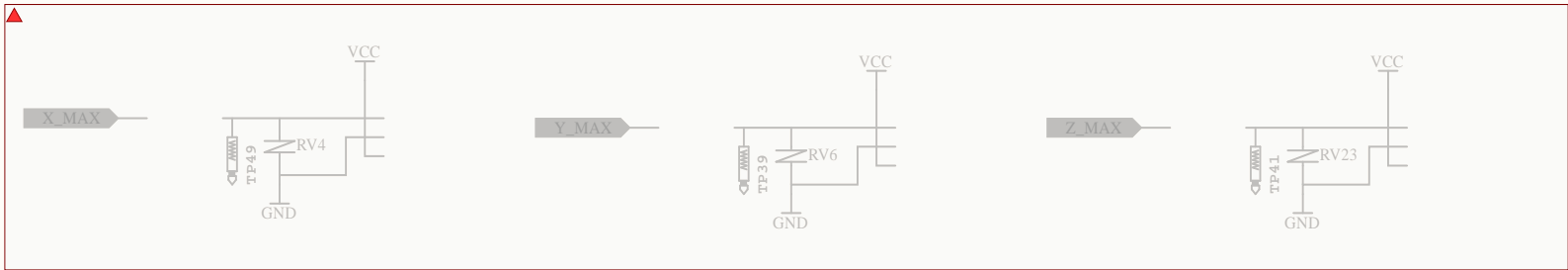
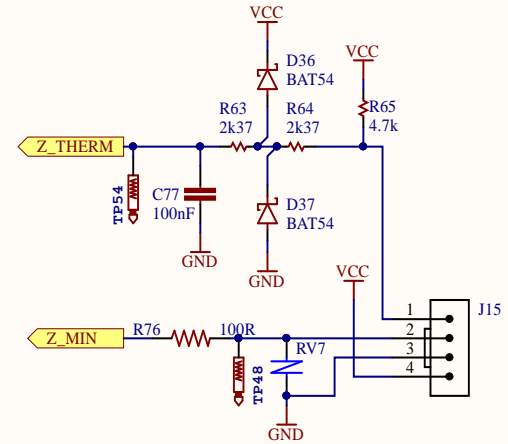
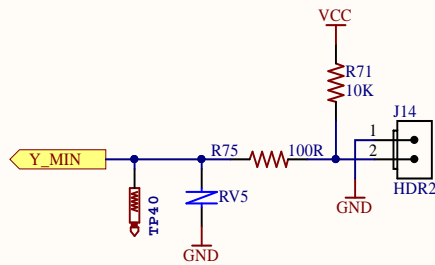
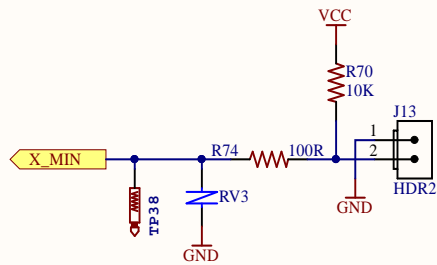
Title Einsy Rambo Connectors		
Size A	Number 0.4	Revision a
Date:	6/6/2017	Sheet 5 of 11
File:	C:\Users\...\Connectors.SchDoc	Drawn By: AWS

- Added J7, power failure relay input.  
- Stole RX1 and TX1 from P1, moved to J19  
- Combined 2560 ICSP (X18) with pins\_9-14 of J19



Redo connector diagram

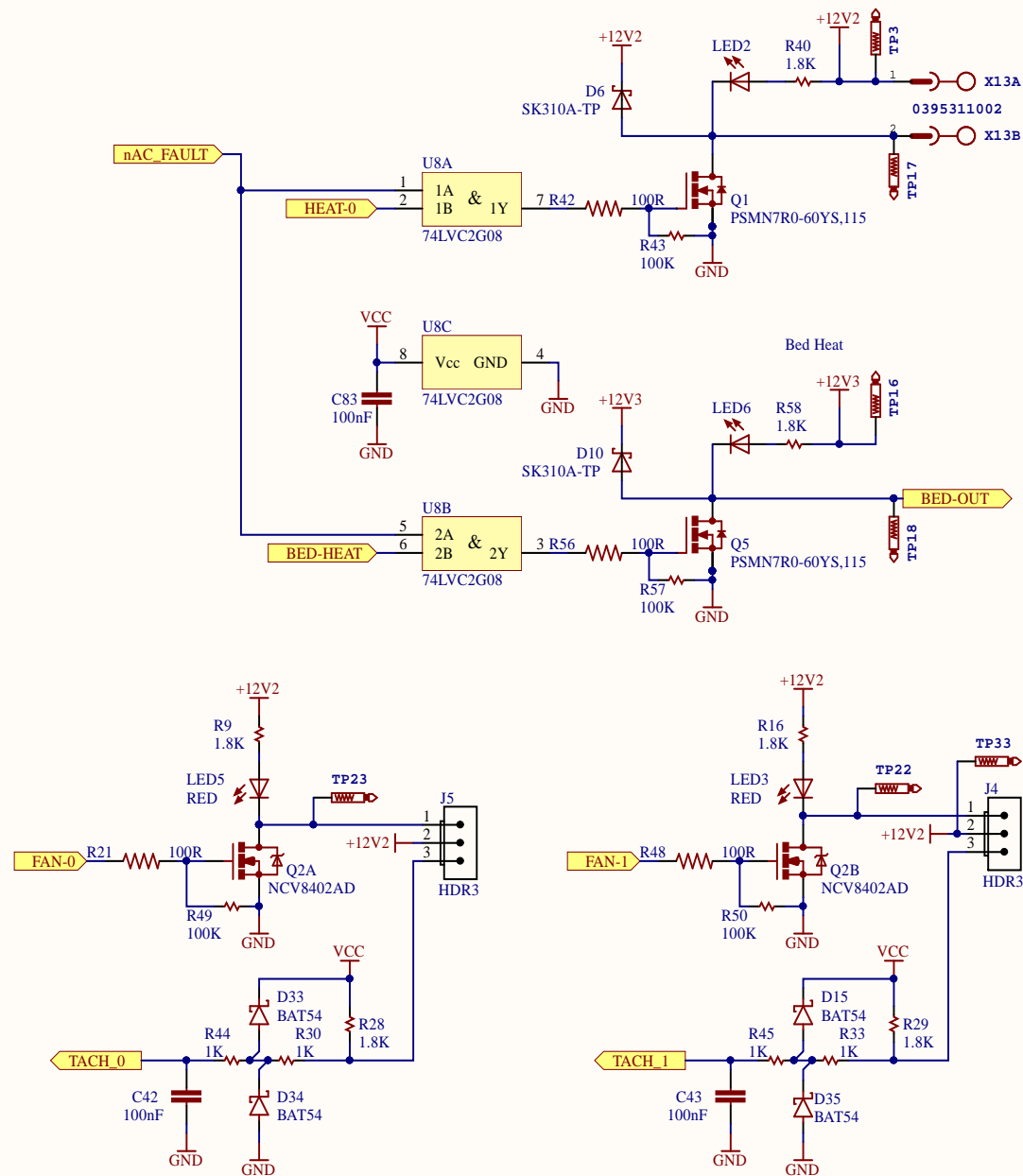
End Stops



Title Einsy Rambo Endstops		
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Date:	6/6/2017	Sheet 6 of 11
File:	C:\Users\...\Endstops.SchDoc	Drawn By: AWS

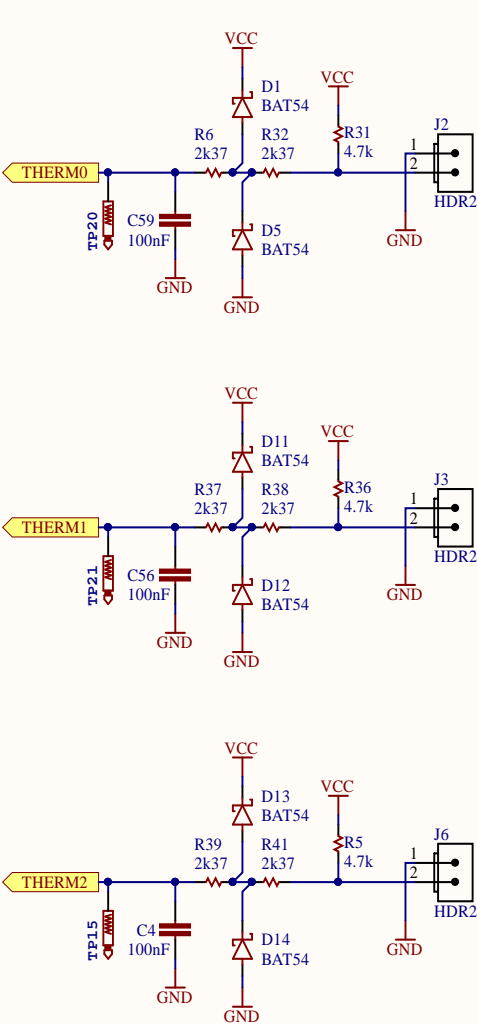
- Removed J16-J18, X\_MAX, Y\_MAX, Z\_MAX (respectively)

Heater Outputs



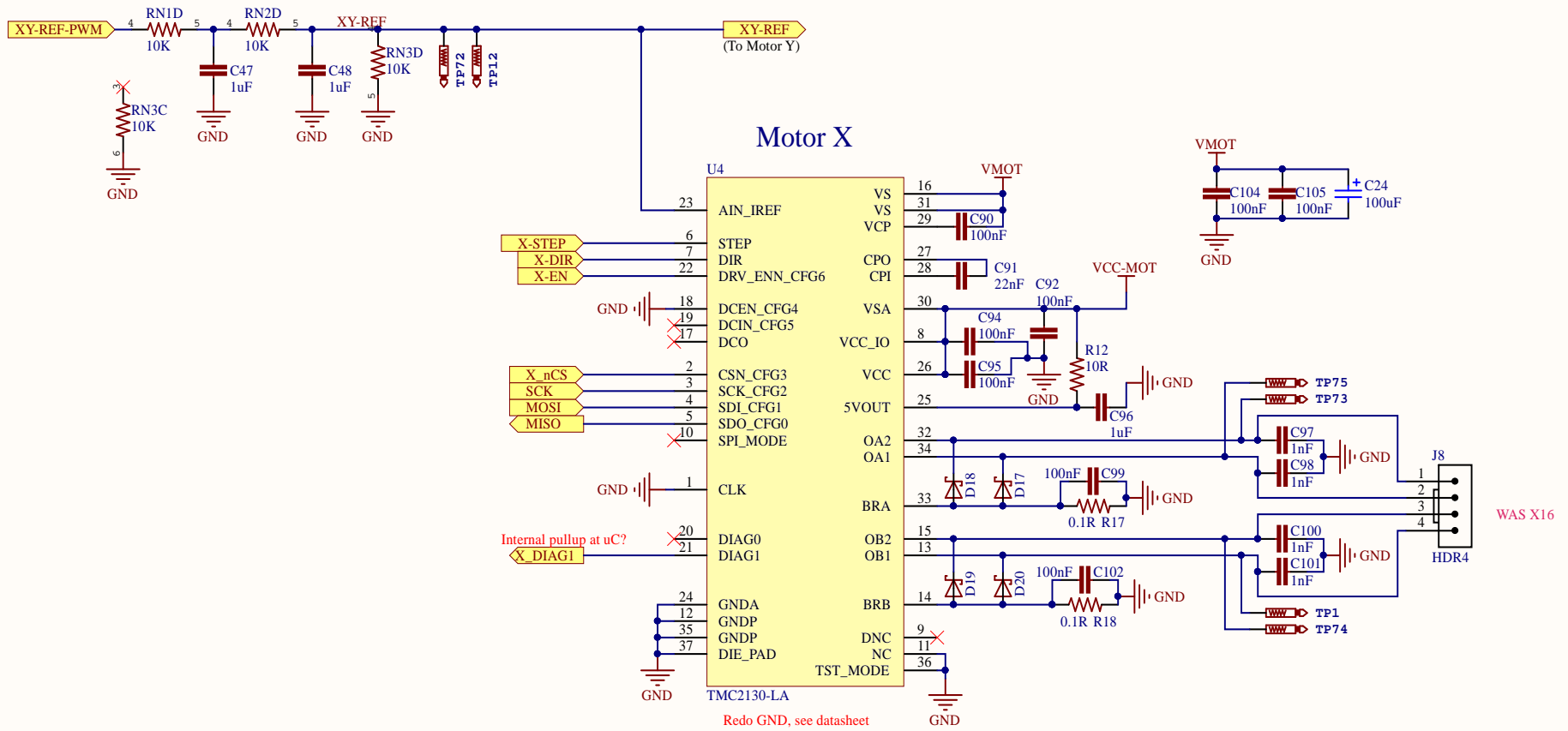
Add connector diagram

Thermistors



Title Einsy Rambo Heaters		
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Date:	6/6/2017	Sheet 7 of 11
File:	C:\Users\...\Heaters.SchDoc	Drawn By: AWS

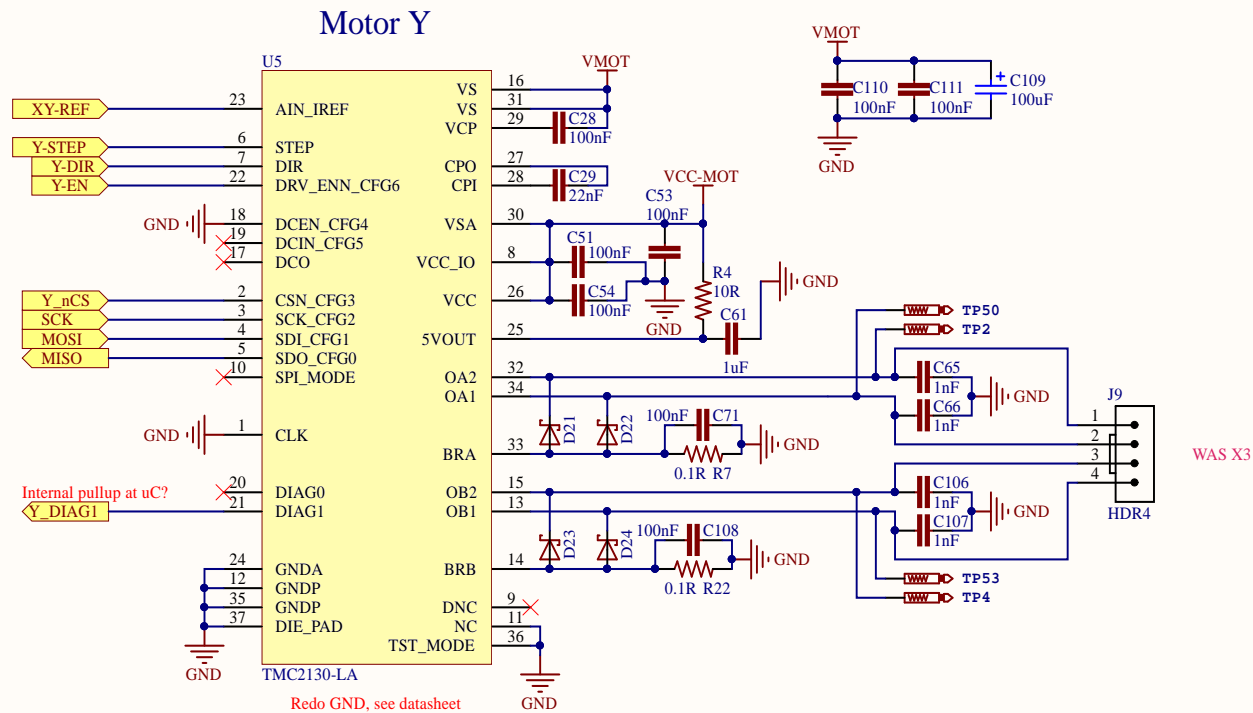
### Add connector diagram



Title Einsy Rambo Motor-X		
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Date:	6/6/2017	Sheet 8 of 11
File:	C:\Users\...\Motor-X.SchDoc	Drawn By: AWS

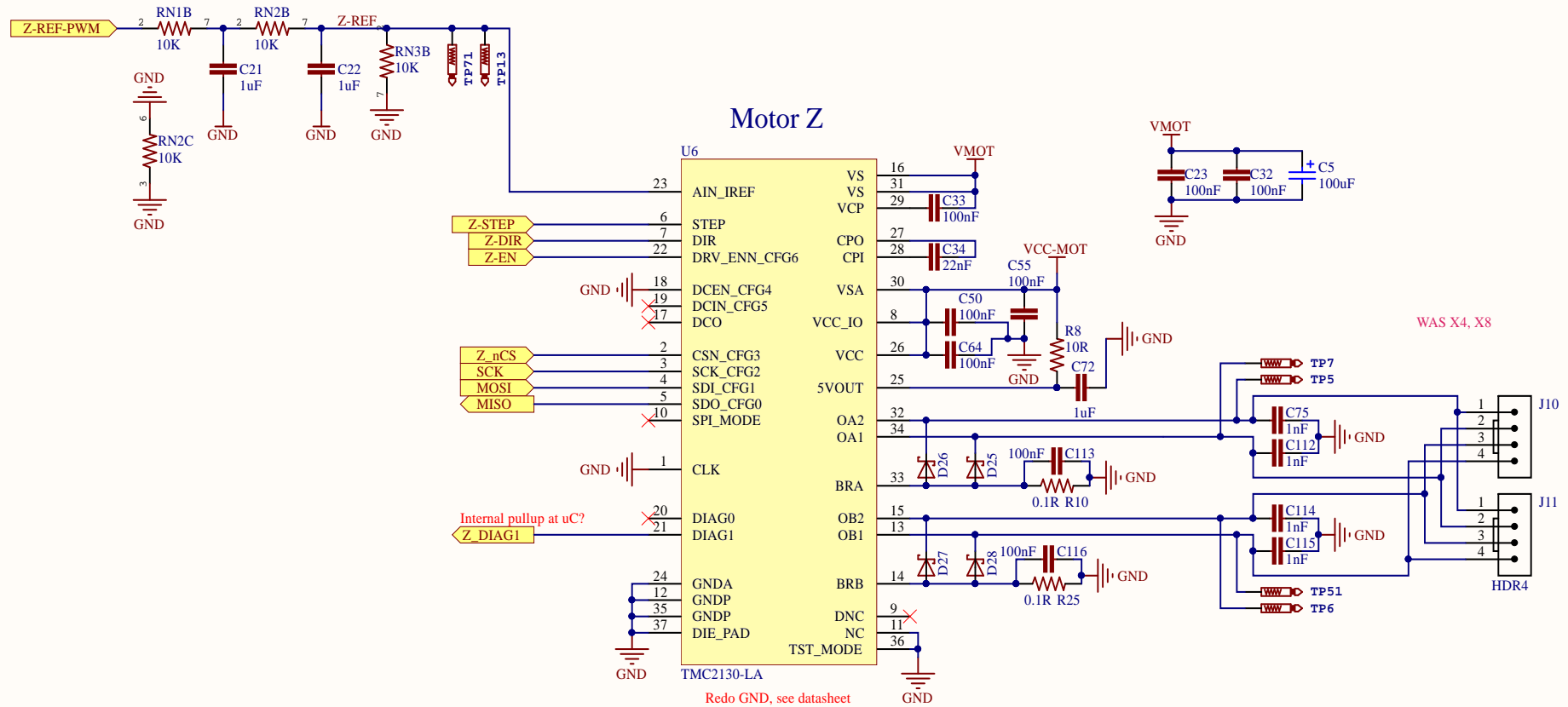


Add connector diagram



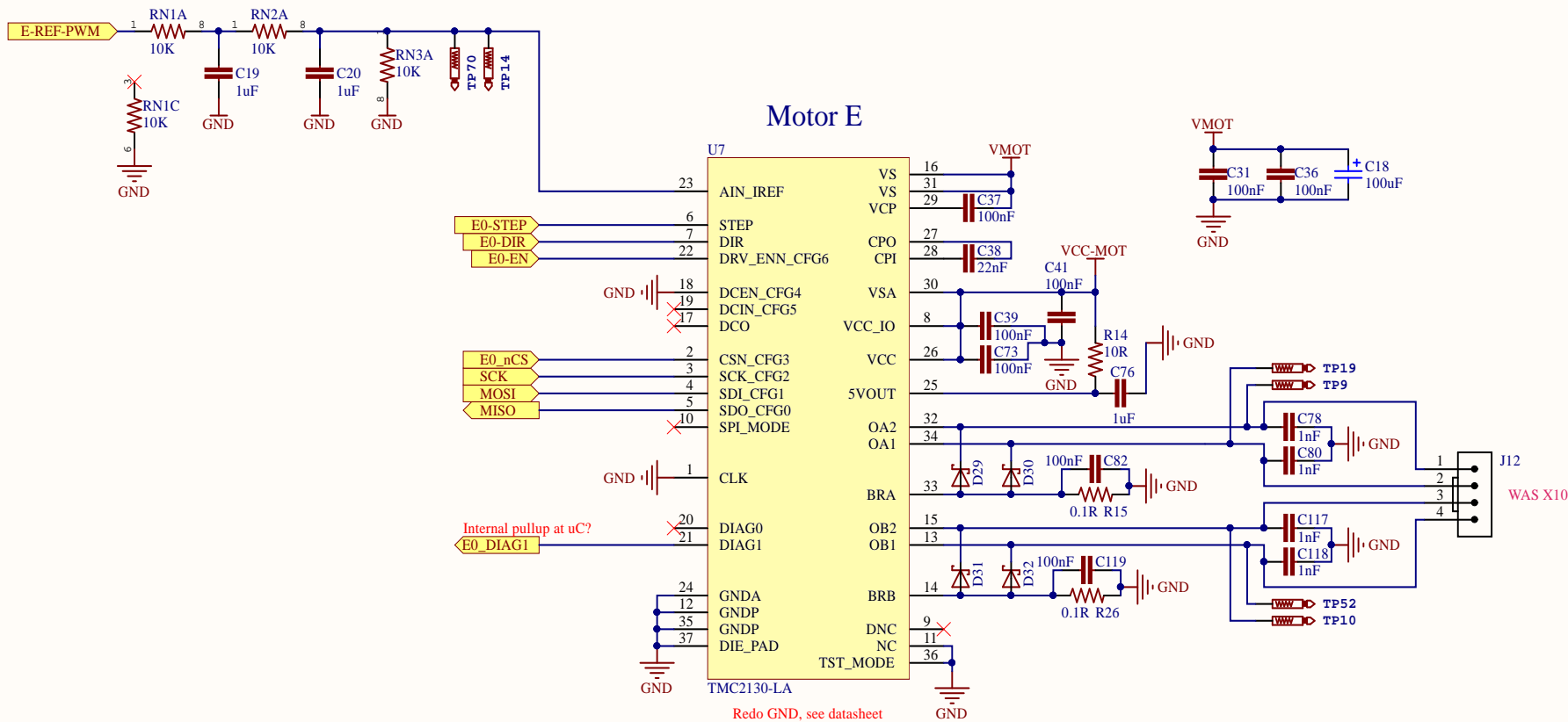
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Einsy Rambo Motor-Y		
Size	Number	Revision
Letter	0.4	a
Date:	6/6/2017	Sheet 9 of 11
File:	C:\Users\...\Motor-Y.SchDoc	Drawn By: AWS

Add connector diagram



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

Add connector diagram



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