

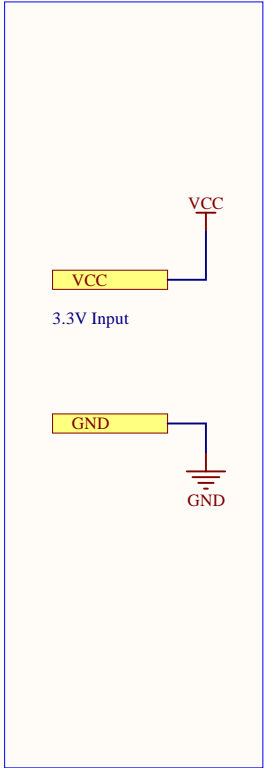
A

B

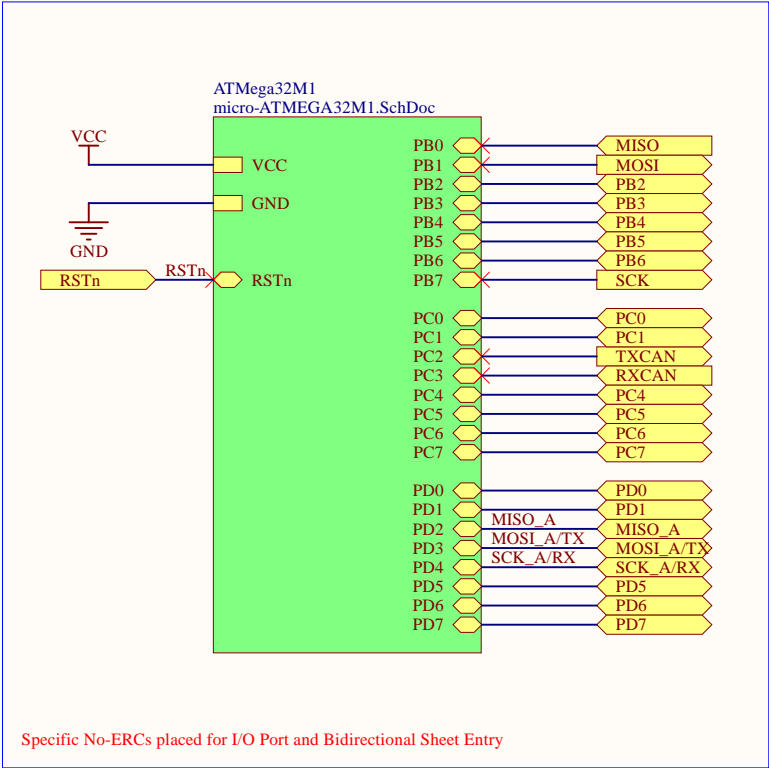
C

D

POWER INPUTS

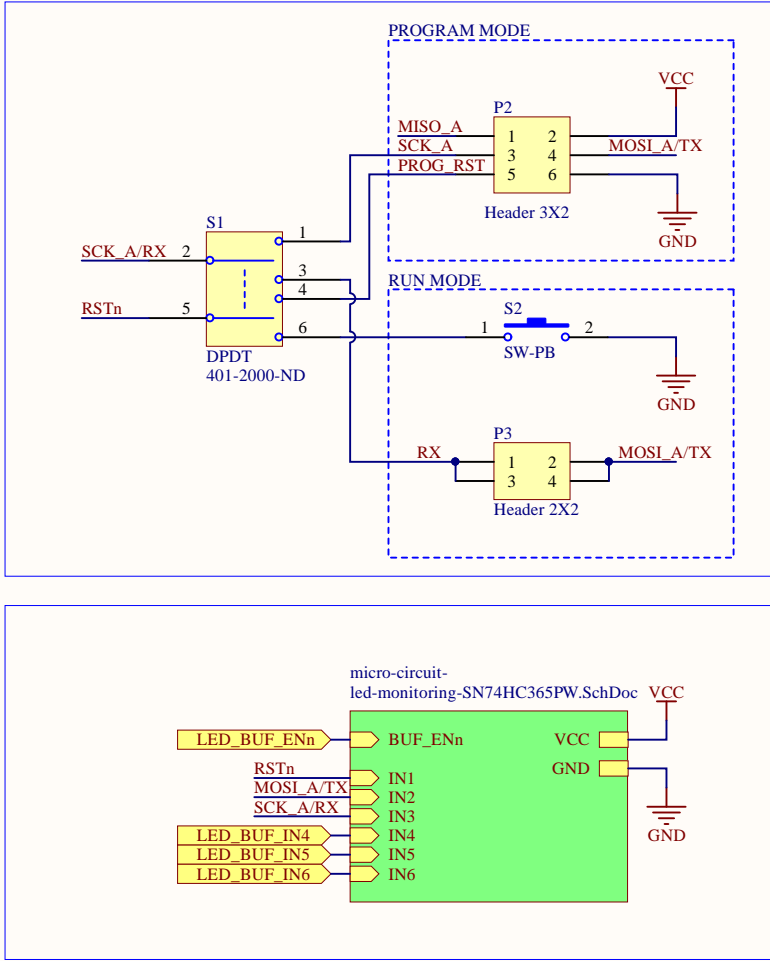


ATMEGA32M1



Specific No-ERCs placed for I/O Port and Bidirectional Sheet Entry

MODE SELECT CIRCUITRY

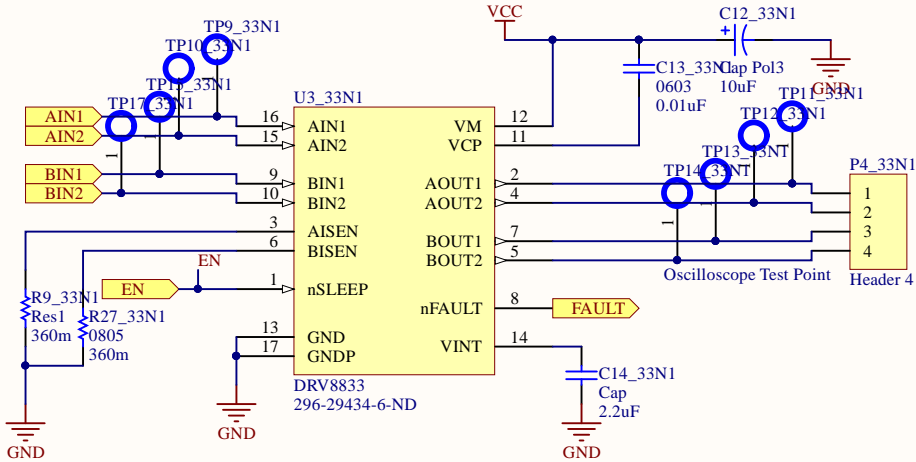
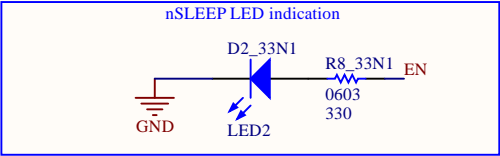
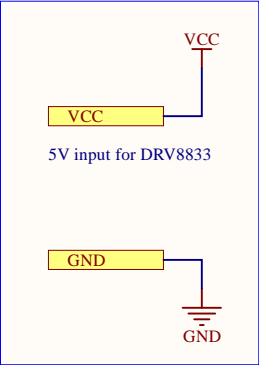


This schematic extends the functionality already included in the micro-ATMEGA32M1 schematic, adding a mode select switch, programming header, reset button and LED indication for TX, RX and RSTn.

- IN[4:6] of the LED buffer have been left unconnected, but are broken out on ports LED\_BUF\_IN[4:6]. They can be connected in the schematic which includes this sheet to monitor up to an additional 3 lines. Highly recommend more blinking lights.

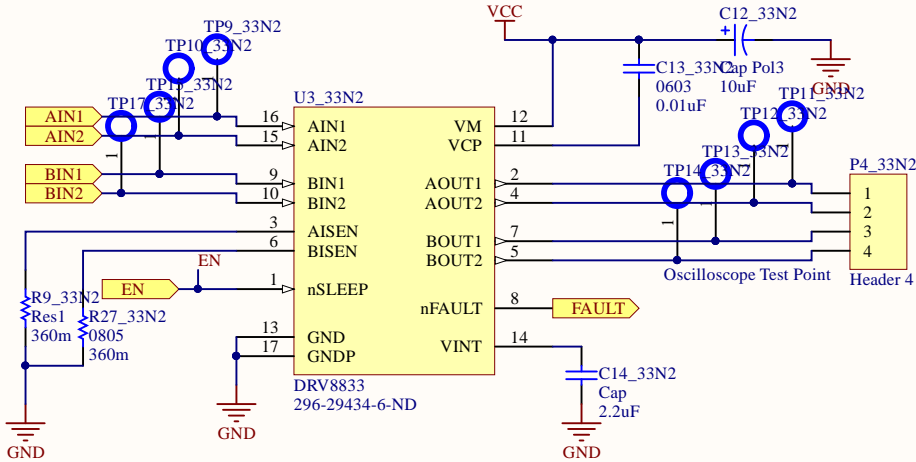
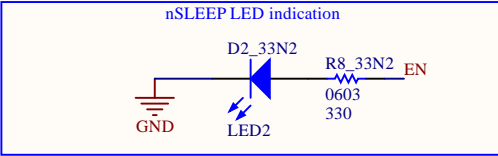
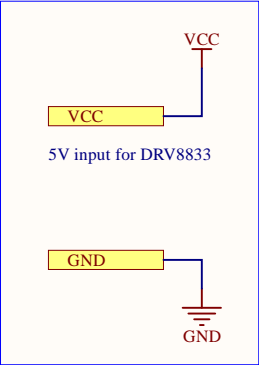
Title		UTAT SS	
ATMEGA32M1 Circuit			
Size	Number	Revision	
A4	2	1.0	
Date:	5/25/2019	Sheet	2 of 7
File:	C:\Users\...\micro-circuit-ATMEGA32M1.SchDoc	By:	Dylan Vogel

POWER INPUTS



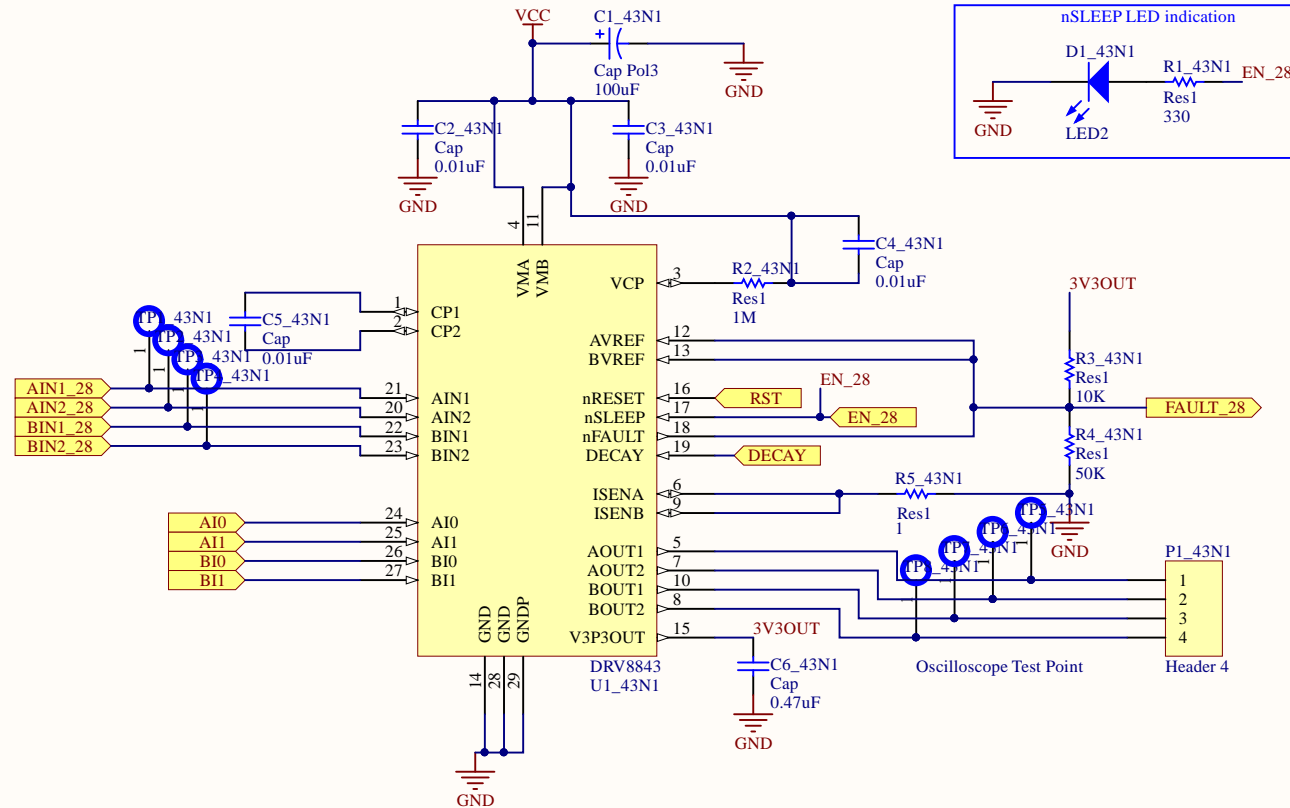
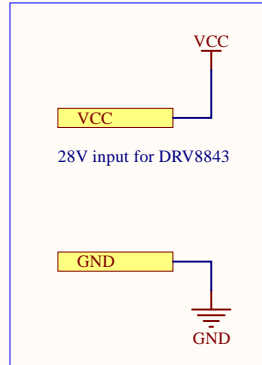
Title		
Size	Number	Revision
A4		
Date:	5/25/2019	Sheet of
File:	C:\Users\...\motor-driver.SchDoc	Drawn By:

POWER INPUTS



Title		
Size	Number	Revision
A4		
Date:	5/25/2019	Sheet of
File:	C:\Users\...\motor-driver.SchDoc	Drawn By:

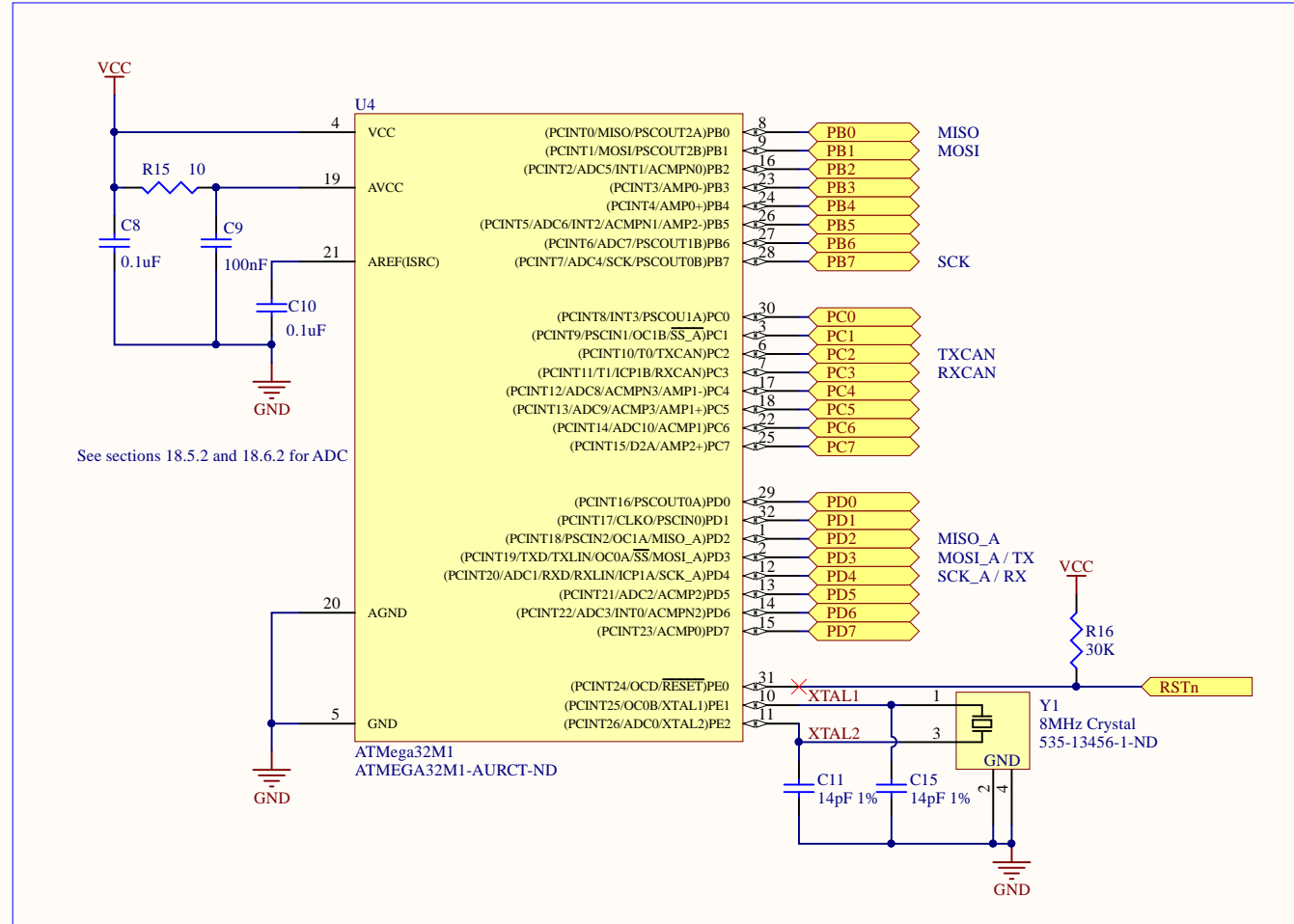
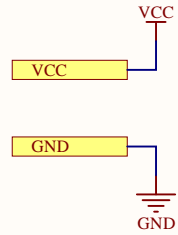
## POWER INPUTS



Title		
Size A4	Number	Revision
Date:	5/25/2019	Sheet of
File:	C:\Users\...\28V-motor-driver.SchDoc	Drawn By:



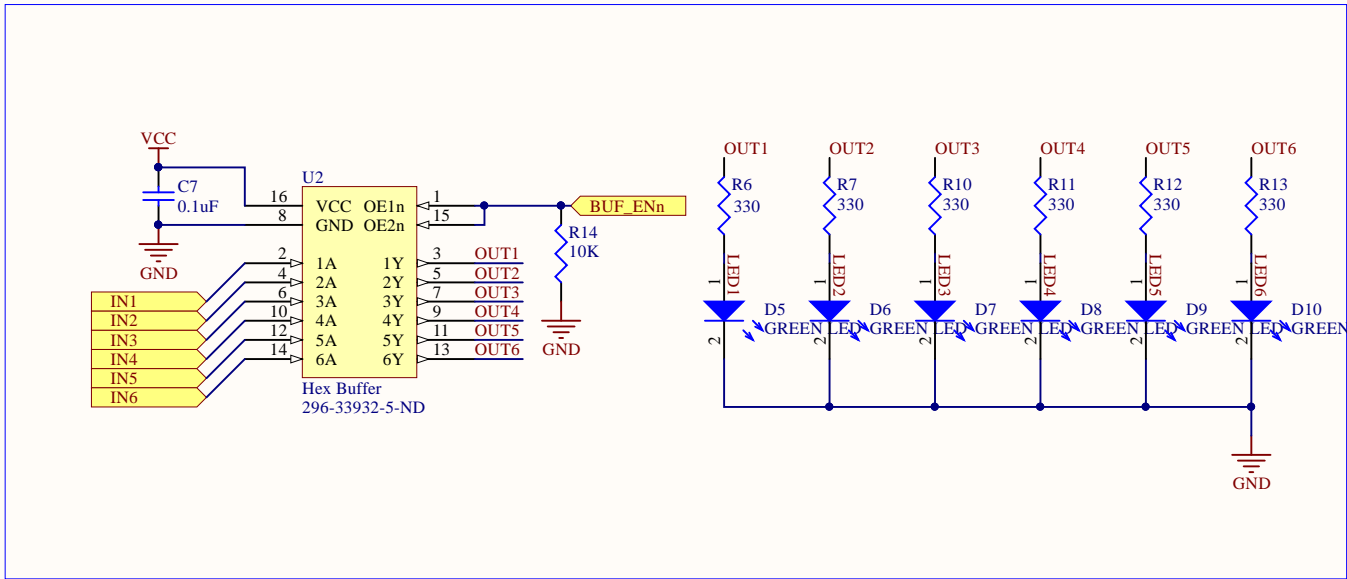
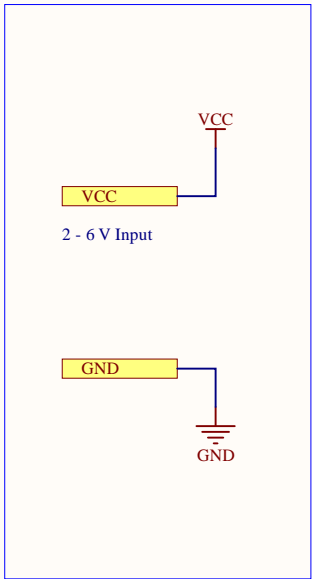
# POWER INPUT



This schematic implements the ATmega32M1 microcontroller with a 8 MHz external crystal and necessary power connections.

- Crystal is connected in a Pierce configuration, values of the capacitors were calculated based on the capacitance of the crystal and ESR.
- I would read through 18.5.2 and 18.6.2 of the complete 32M1 datasheet if you're interested in the motivation behind the ADC input connections. They recommend connecting AVCC through a RC lowpass network to minimize noise.
- If the ADC functionality of the device is used, either AVCC or the internal 2.56 V source can be selected in software as the reference voltage.

Title		UTAT SS	
ATmega32M1			
Size	Number	Revision	
A4	5	1.0	
Date:	5/25/2019	Sheet 5	of 7
File:	C:\Users\...\micro-ATMEGA32M1.SchDoc	Drawn By:	Dylan Vogel



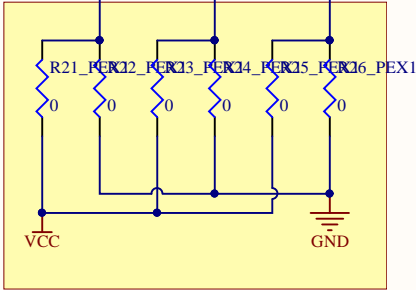
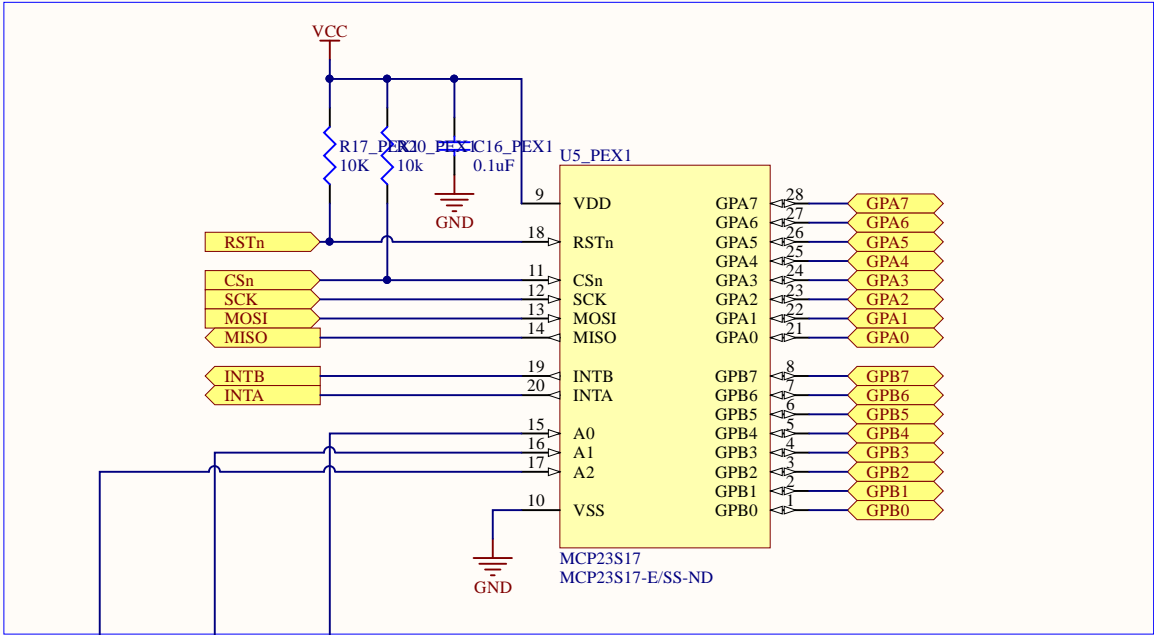
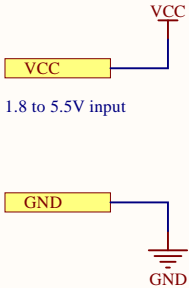
This schematic implements the SN74HC365PW non-inverting, tri-state hex buffer as an LED monitoring circuit. Connecting a signal to IN[1:6] will light up the corresponding LED on OUT[1:6].

- The BUF\_ENn input can be connected to a microcontroller to control the buffer. An input HIGH will set the outputs to high-impedance and disable the LEDs.
- In the schematic symbol which references this schematic sheet, parameters LED[1:6] can be added to specify the colour of each LED. See the micro-circuit common sheet for an example of this.
- Unconnected inputs should be grounded if you don't want random flickering of the LEDs.

Title		UTAT SS	
SN74HC365PW LED Monitoring			
Size	Number	Revision	
A4	6	1.0	
Date:	5/25/2019	Sheet 6	of 7
File:	C:\Users\...\led-monitoring-SN74HC365PW.SchDoc	By:	Dylan Vogel



POWER INPUTS



CHANNEL SELECTION

ONLY SOLDER ONE 0 OHM FROM EACH PAIR  
PEX ADDRESS = A2 A1 A0  
VCC == 1 GND == 0

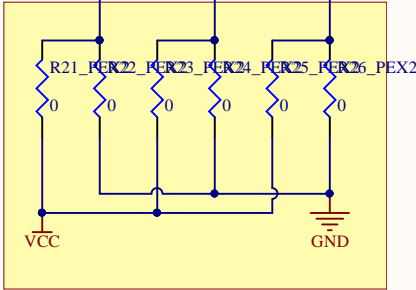
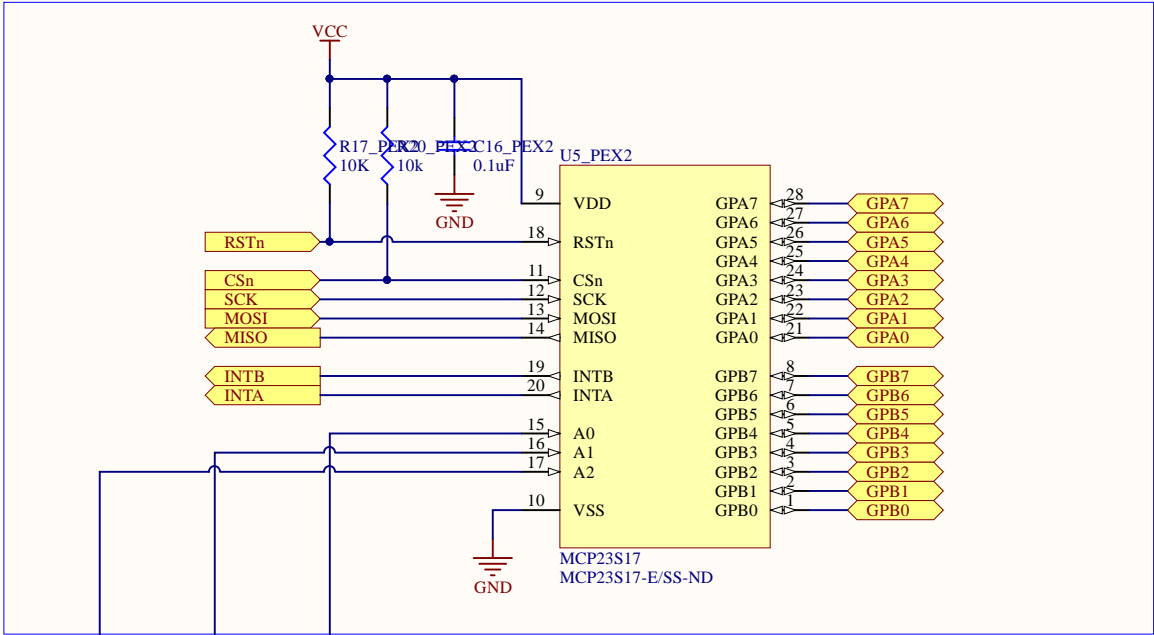
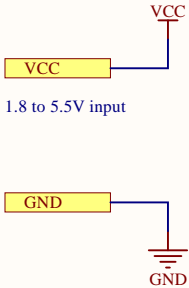
This schematic implements the MCP23S17 SPI port expander, and does some common-sense things like adding a bypass capacitor to the power supply and pull-up resistors to RSTn and CSn.

Multiple port expanders can be connected to the same CSn line, and accessed via a device address that is used during software communication. This address is set in hardware via the A2, A1 and A0 pins. Soldering a 0 ohm resistor to VCC will set that bit to 1, and soldering to GND will set that bit to 0.

In the schematic which includes this file, you should make some note of the relevant hardware address that should be soldered during manufacturing.

Title		UTAT SS	
MCP23S17			
Size	Number	Revision	
A4	7	1.0	
Date:	5/25/2019	Sheet	7 of 7
File:	C:\Users\...\pex-MCP23S17.SchDoc	Drawn By:	Dylan Vogel

POWER INPUTS



CHANNEL SELECTION

ONLY SOLDER ONE 0 OHM FROM EACH PAIR  
PEX ADDRESS = A2 A1 A0  
VCC == 1 GND == 0

This schematic implements the MCP23S17 SPI port expander, and does some common-sense things like adding a bypass capacitor to the power supply and pull-up resistors to RSTn and CSn.

Multiple port expanders can be connected to the same CSn line, and accessed via a device address that is used during software communication. This address is set in hardware via the A2, A1 and A0 pins. Soldering a 0 ohm resistor to VCC will set that bit to 1, and soldering to GND will set that bit to 0.

In the schematic which includes this file, you should make some note of the relevant hardware address that should be soldered during manufacturing.

Title		UTAT SS	
MCP23S17			
Size	Number	Revision	
A4	7	1.0	
Date:	5/25/2019	Sheet	7 of 7
File:	C:\Users\...\pex-MCP23S17.SchDoc	Drawn By:	Dylan Vogel

