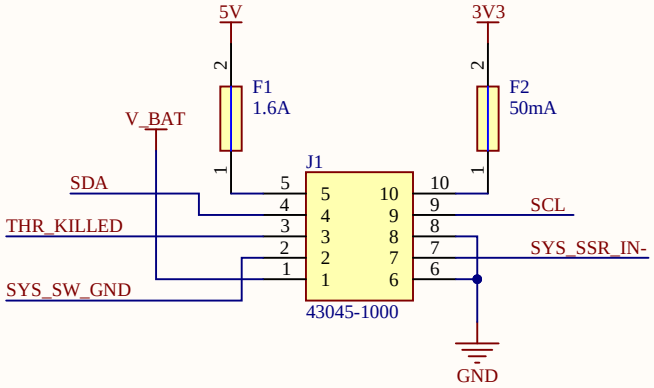
5V and 3V3 from MEB power regulation
5V out fused to 2.8A, holds at 1.6A. DO NOT EXCEDE HOLD CURRENT.
3V3 out fused to 150mA, holds at 50mA. DO NOT EXCEDE HOLD CURRENT.



Connector Guide

i2c:
- 5: MEB 5V
- 10: MEB 3V3
- 4: SDA
- 9: SCL
- 8: GND (2 wires)

Thruster SSR:
- 3: Killed Status Signal
- 6: GND wire (shared)

System SSR:
- 2: Switched System GND
- 7: SSR Input (-)
- 6: GND wire (shared)

Power:
- 1: Battery Voltage
- 6: Battery GND (shared)

Current Consumption

MEBv1:
- D1-D3: 10mA x 3 = 30mA

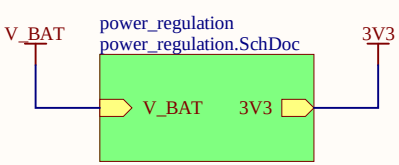
system_SSR_control:
- insignificant

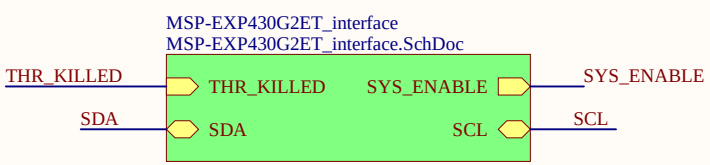
power_regulation:
- 15mA @ 60% efficiency (estimated)

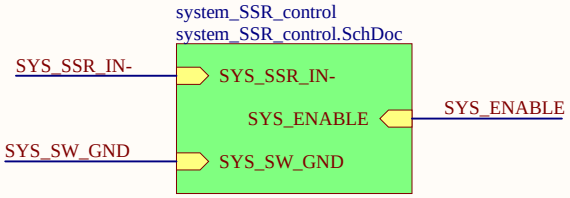
MSP430:
- MSP430 Launchpad: 5mA (estimated)

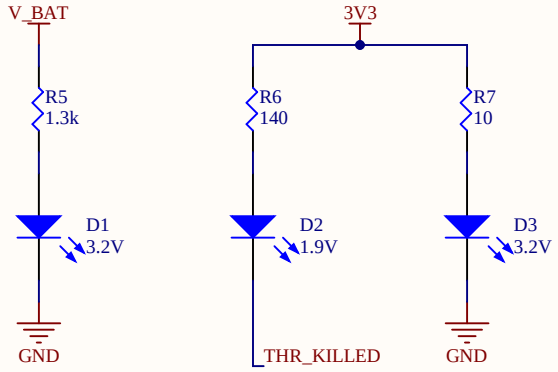
TOTAL = 50mA (estimated)

Verify with measurements and update



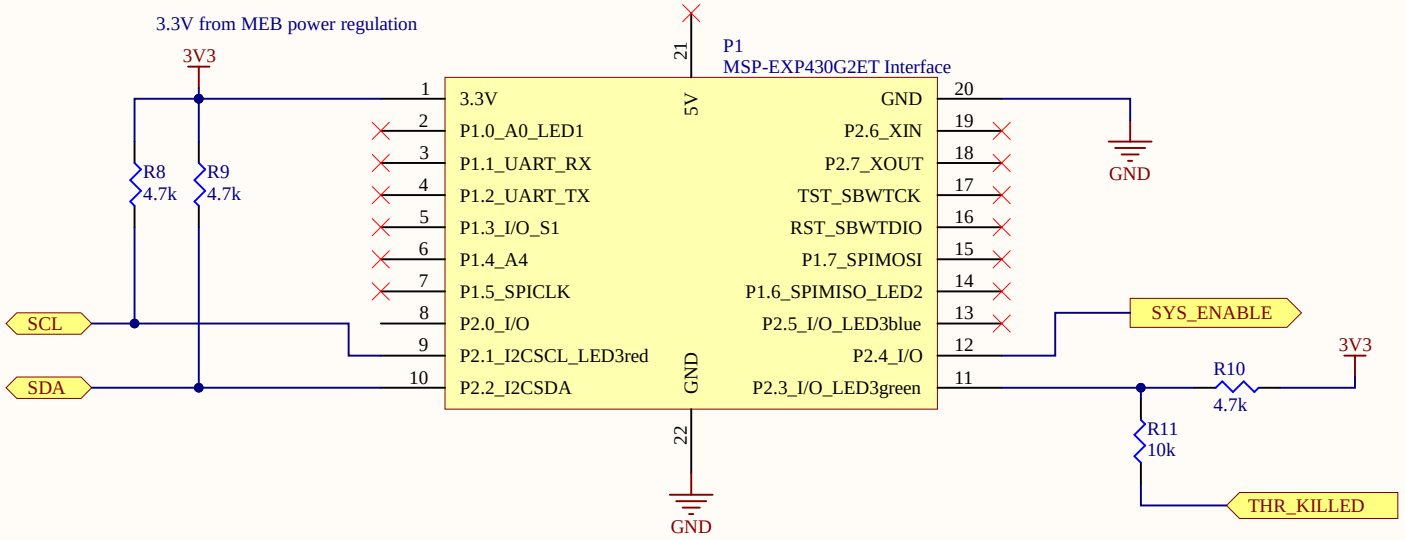






to-do:
- initial DFM

- design review w/ team members
- final DFM and ordering
- update description document



REQUIRED: Remove 3V3 Jumper to prevent powering via eZ-FET as per the MSP-EXP430G2ET User's Guide

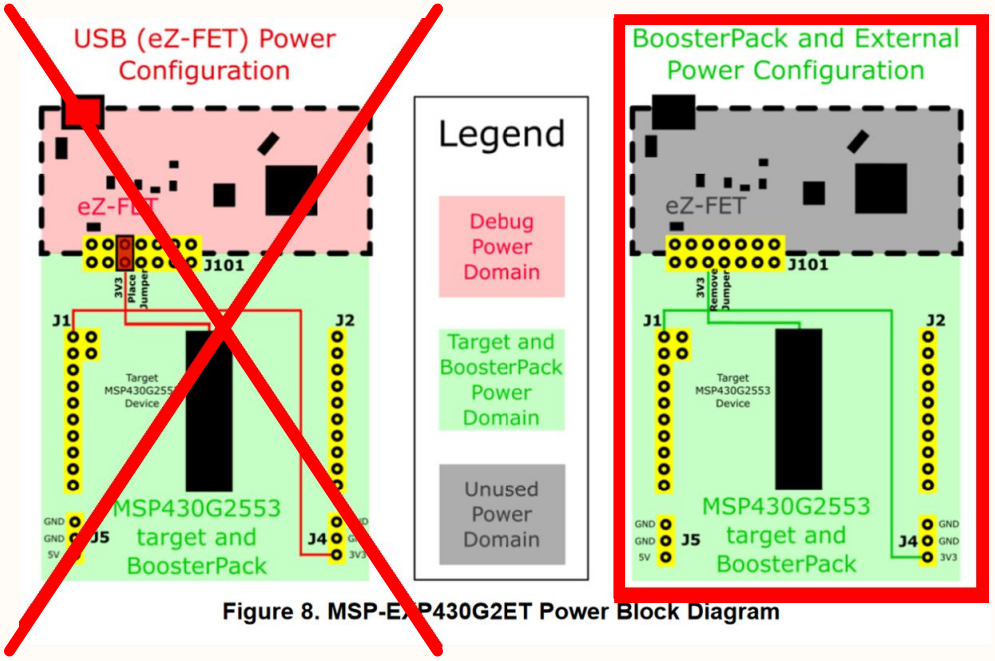
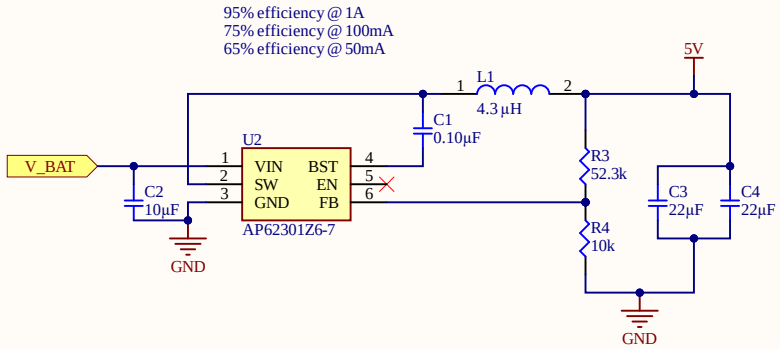
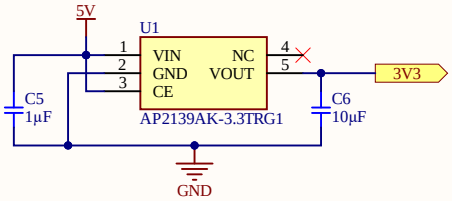


Figure 8. MSP-EXP430G2ET Power Block Diagram

Title		
Size A	Number	Revision
Date: 1/22/2022	Sheet of	
File: C:\Users\..\MSP-EXP430G2ET_interface_3.SchDoc	Drawn By:	





PCB Layout

1. The AP62300/AP62301/AP62300T works at 3A load current so heat dissipation is a major concern in the layout of the PCB. 2oz copper for both the top and bottom layers is recommended.
2. Place the input capacitors as closely across VIN and GND as possible.
3. Place the inductor as close to SW as possible.
4. Place the output capacitors as close to GND as possible.
5. Place the feedback components as close to FB as possible.
6. If using four or more layers, use at least the 2nd and 3rd layers as GND to maximize thermal performance.
7. Add as many vias as possible around both the GND pin and under the GND plane for heat dissipation to all the GND layers.
8. Add as many vias as possible around both the VIN pin and under the VIN plane for heat dissipation to all the VIN layers.
9. See Figure 42 and Figure 43 for more details.

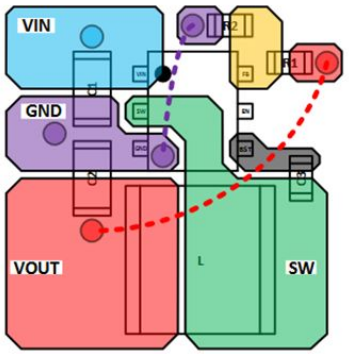


Figure 42. Recommended PCB Layout, SOT563 (Standard)

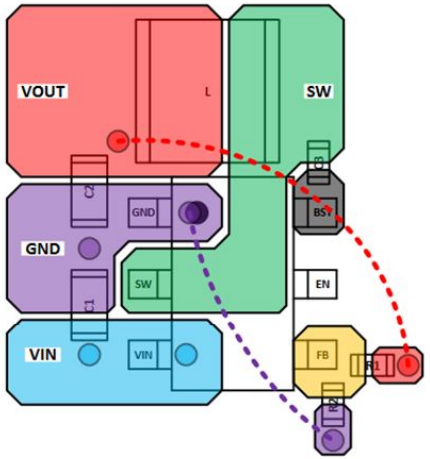


Figure 43. Recommended PCB Layout, TSOT26 (Standard)

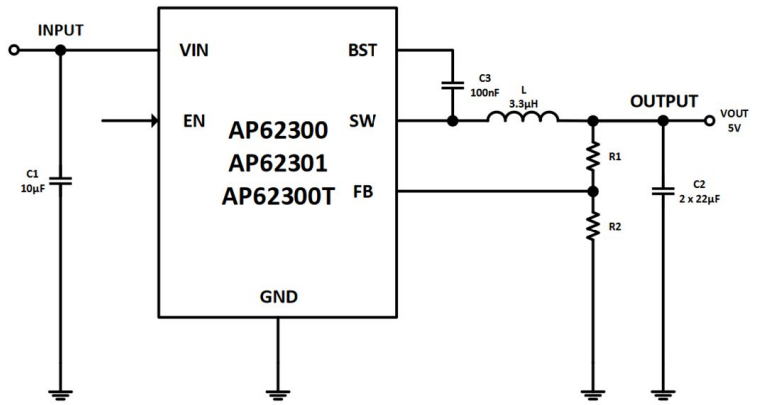
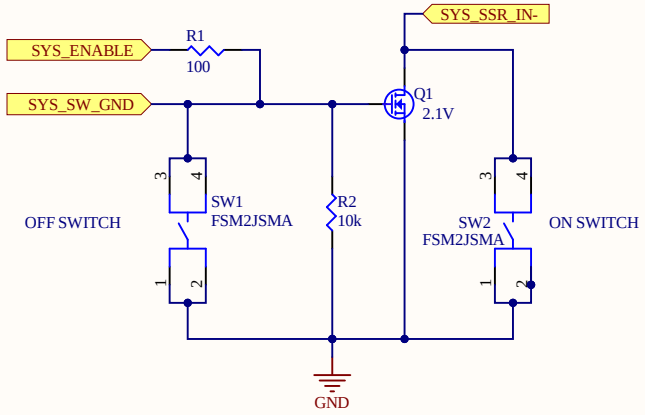
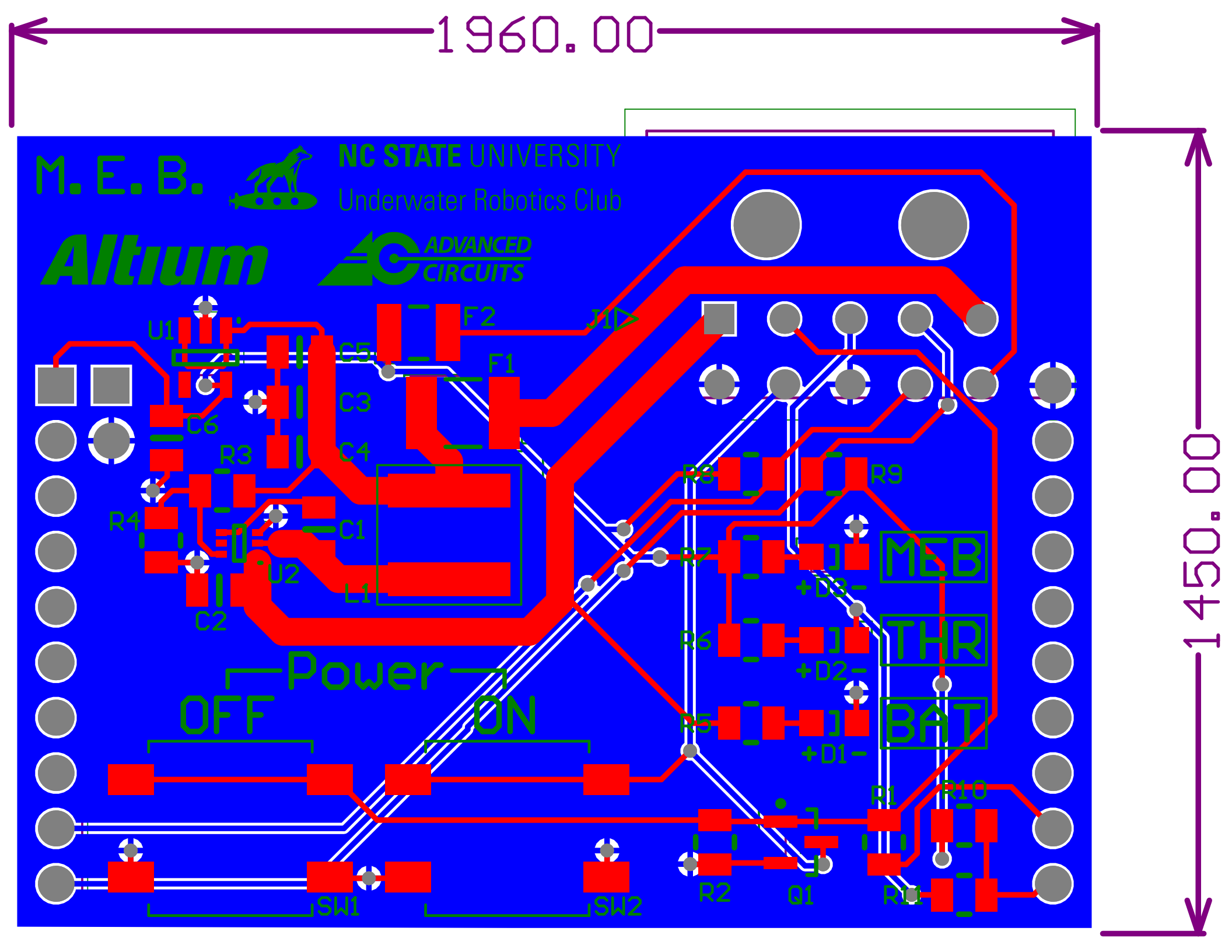


Figure 1. Typical Application Circuit

Title		
Size A4	Number	Revision
Date: 1/22/2022		Sheet of
File: C:\Users\..\power_regulation.SchDoc		Drawn By:



Title			
Size A4	Number		Revision
Date:	1/22/2022	Sheet of	
File:	C:\Users\..\system_SSR_control.SchDoc	Drawn By:	


1960.00
1450.00
M.E.B.
NC STATE UNIVERSITY
Underwater Robotics Club
Altium
ADVANCED CIRCUITS
U1
C5
F2
F1
J1
C6
C3
C4
R3
R4
C1
U2
L1
C2
R8
R9
R7
D3
MEB
R6
D2
THR
R5
D1
BAT
Power
OFF
ON
R1
R10
R2
Q1
R11
SW1
SW2