MAZE SOLVING ROBOT

Fall 2018 Final Report

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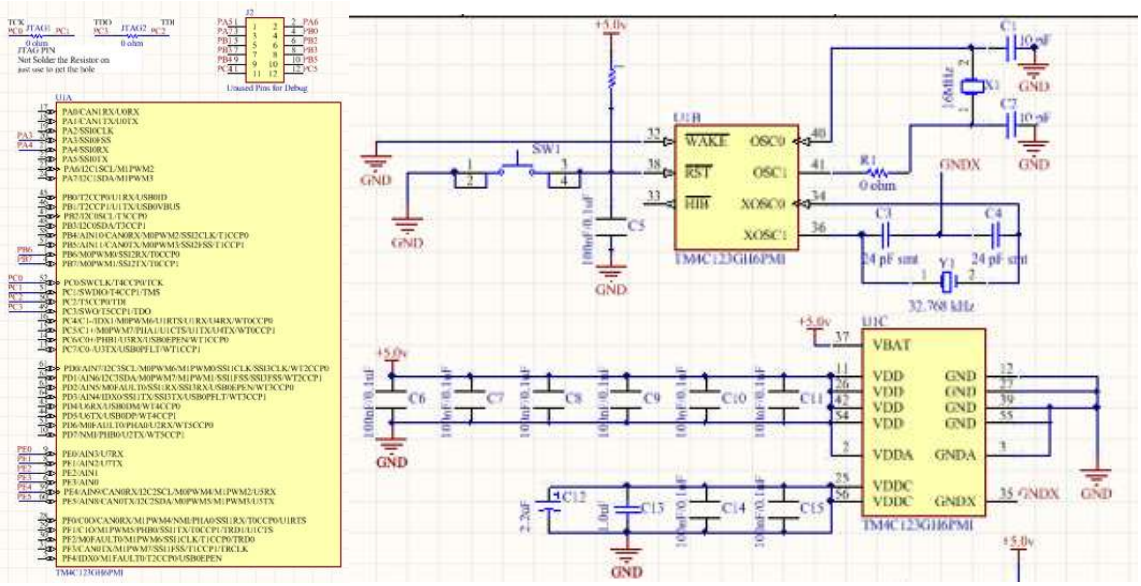
CECS 490B Tuesday, Thursday 6:30pm – 8:20pm

Due Date: December 20, 2018

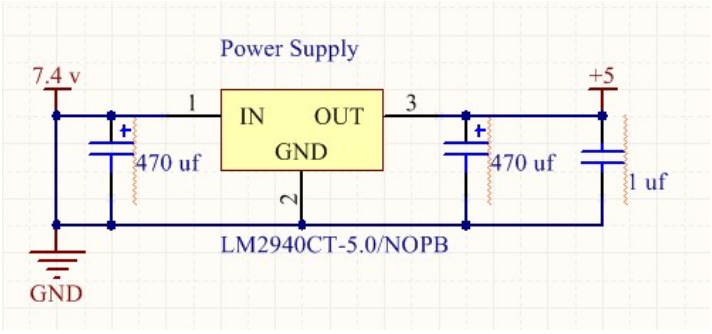
Subcomponent Descriptions:

❖ Tm4c123ghpm (MC):



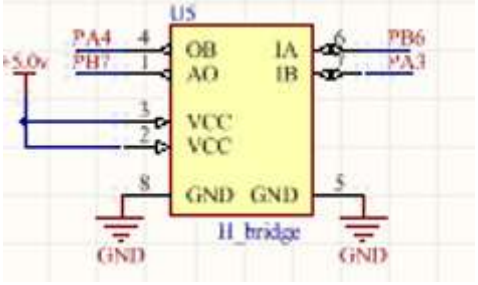
The microcontroller is 32-bit Arm processor with input power supply 5v, digital input and output pins. The debugging interface is JTAG. **JTAG:** tm4c123ghpm processor interface ready provided that is connected through port PC0(TCK), PC1(TMS), PC2(TDO) and PC3(TDI). It is used to debug the software.

❖ Power Supply:

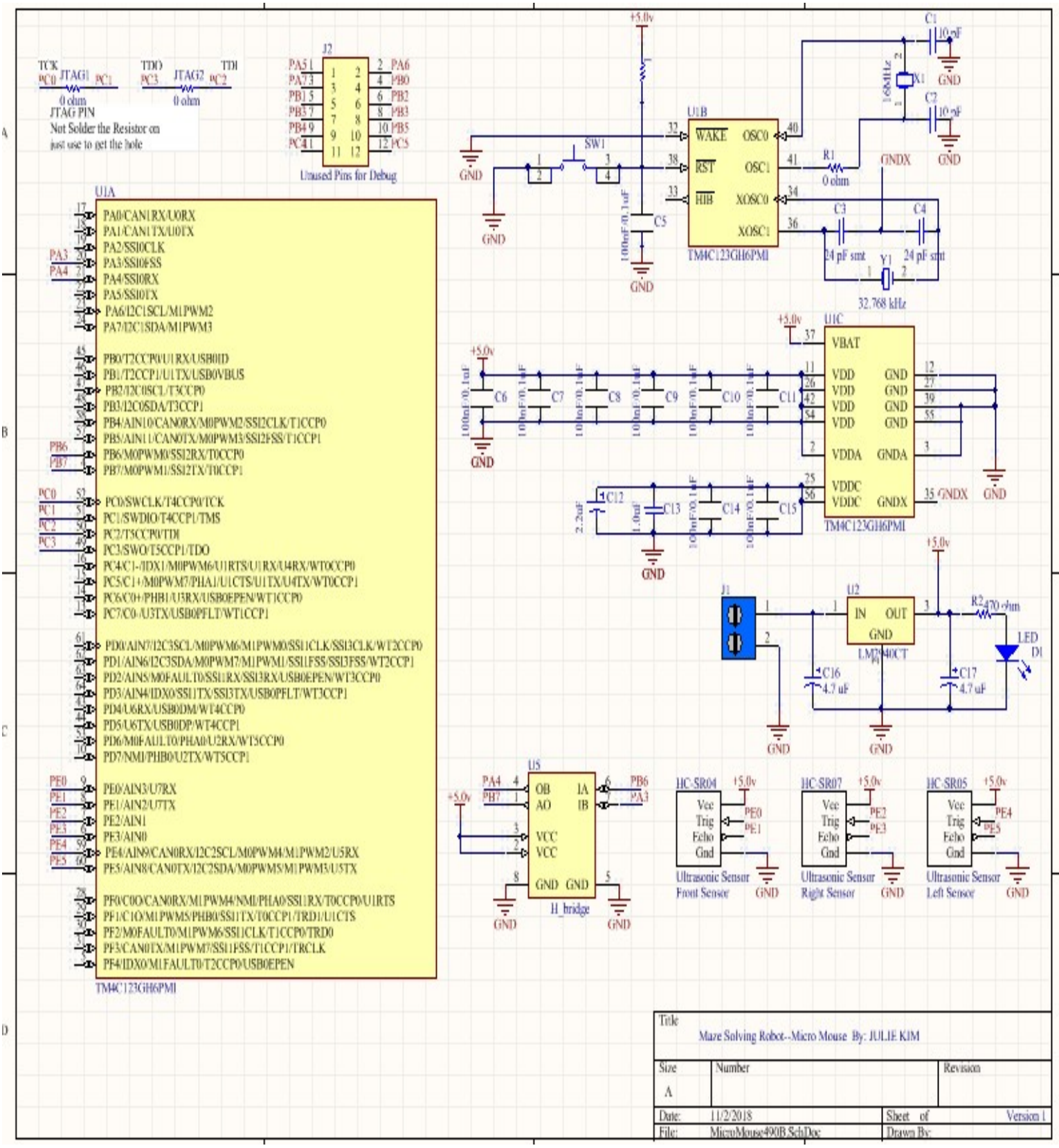


The LM0940CT-5v is positive regulator that can source 1 A of output current with a dropout voltage of 0.5v and maximum of 1 v.

❖ Motor:



Complete Schematic:

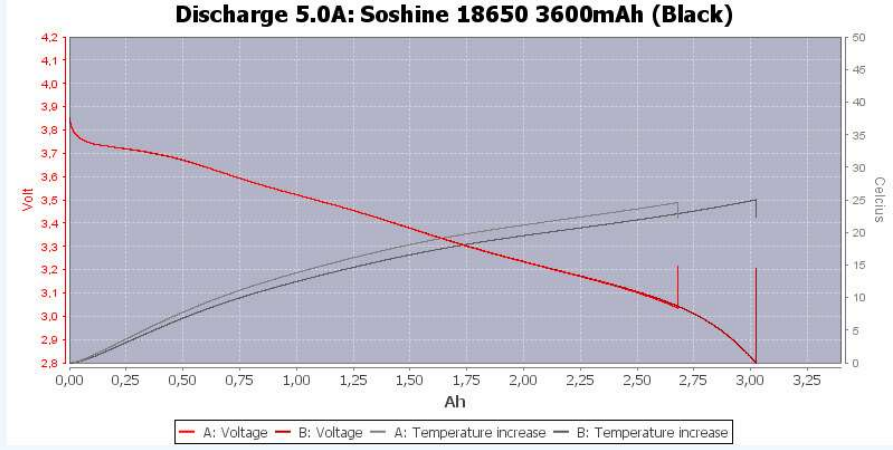


❖ Power Budget:

Component Name	#of Component	Current per Component	Current per Product	Supply Voltage	Power Supply	Power Total
Microcontroller tm4c123	1	500 mA	500 mA	3.3 v	1.65 w	
Regulator LM2940CT-5V	1	1A	1A	5v	5 w	
DC-Motor	2	2A	2A	5v	10w	
Ultrasonic Sensor	6	30 mA	180mA	5v	0.9w	
H-Bridge	1	1A	1A	5v	5w	22.55W

❖ Battery Discharge Curve:

Two Lithium batteries (18650 3600mAh 3.7v) are used



Simulations and Software Verifications:

❖ Power Supply Simulation:

Linear regulator LM2940CT-5v is used in the power supply designed. The input from the battery is 7.4v. In the simulation using LTspice is 12v and a 5v output regulator is used.