Bio-Sensor Wearable Development Board

Carl Demolder

Date 6/28/2020

Outline

- Schedule
  - Gantt Chart update
- Progress update
  - Current progress
  - Path forward

SCHEDULE

Georgia Tech
CREATING THE NEXT

Schedule Gantt chart

Task	6/3-6/7	6/7-6/14	6/14-6/21	6/21-6/28	6/28-7/5	7/5-7/12	7/19-7/26	7/26-7/31
ELECTRONICS DEVELOPMENT								
-SCHEMATIC GENERATION	✖	✖						
-PCB LAYOUT AND ROUTING			✖	✖				
-HARDWARE DEBUGGING								
FIRMWARE DEVELOPMENT								
-PROJECT STACK ORGANIZATION					●			
-SENSOR DRIVERS					●			
-RTT AND SERIAL DATA LOGGING								
-FIRMWARE DEBUGGING								

Georgia Tech
CREATING THE NEXT

PROGRESS TO DATE

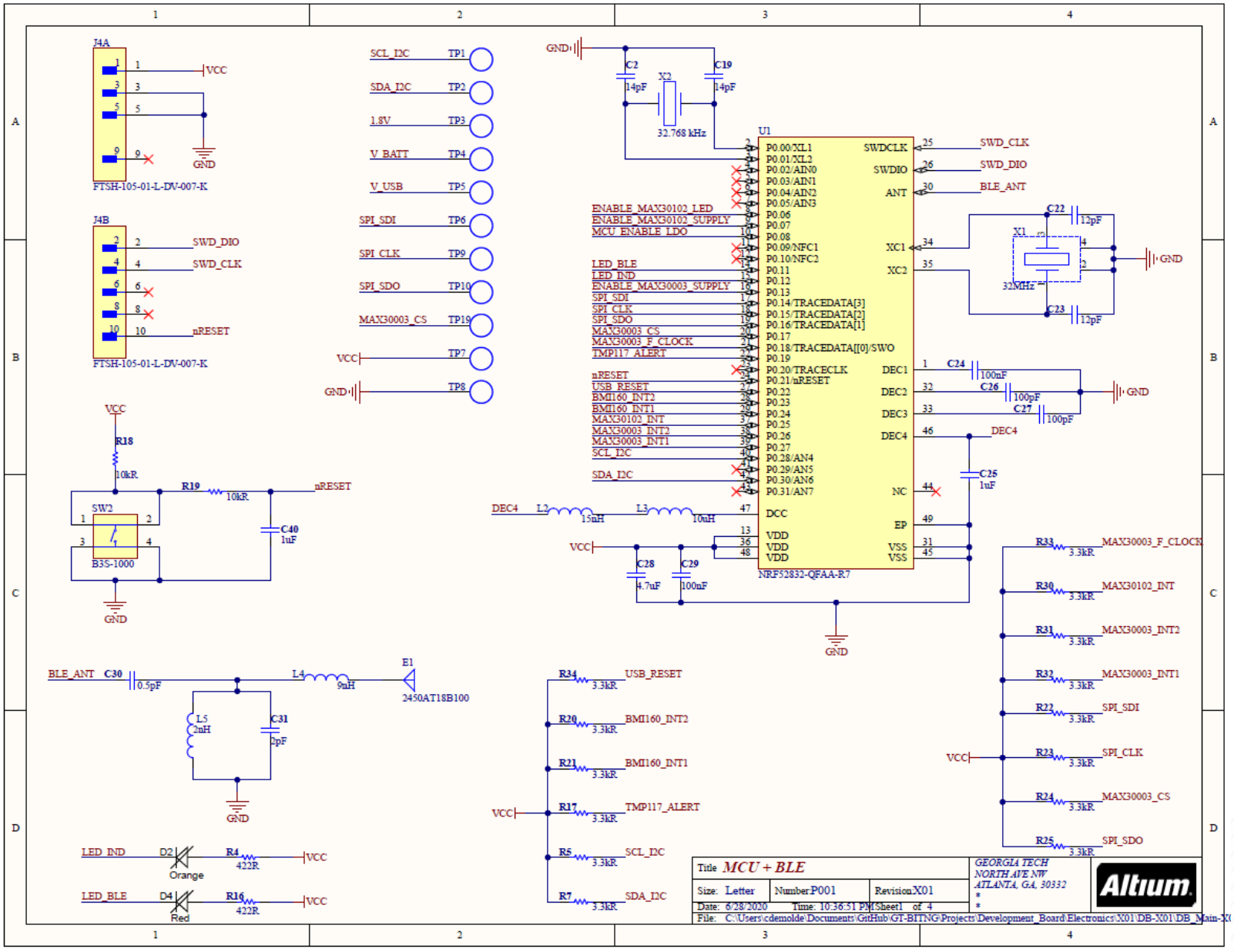
Georgia Tech
CREATING THE NEXT

Electronics development: schematic

- Schematic generation
  - ~~nRF52 with supporting circuitry (2 hours)~~
  - ~~BLE antenna and impedance matching circuit (2 hours)~~
  - ~~Wireless charging (5 hours)~~
  - ~~Lithium battery charging (2 hours)~~
  - ~~UI interaction (1 hour)~~
  - ~~USB charging (2 hours)~~
  - ~~Biosensors: temperature, IMU, ECG (4 hours)~~
  - ~~Test points, connectors, jumpers (2 hours)~~
- Estimated time: 20 hours
- Actual time spent: 22 hours

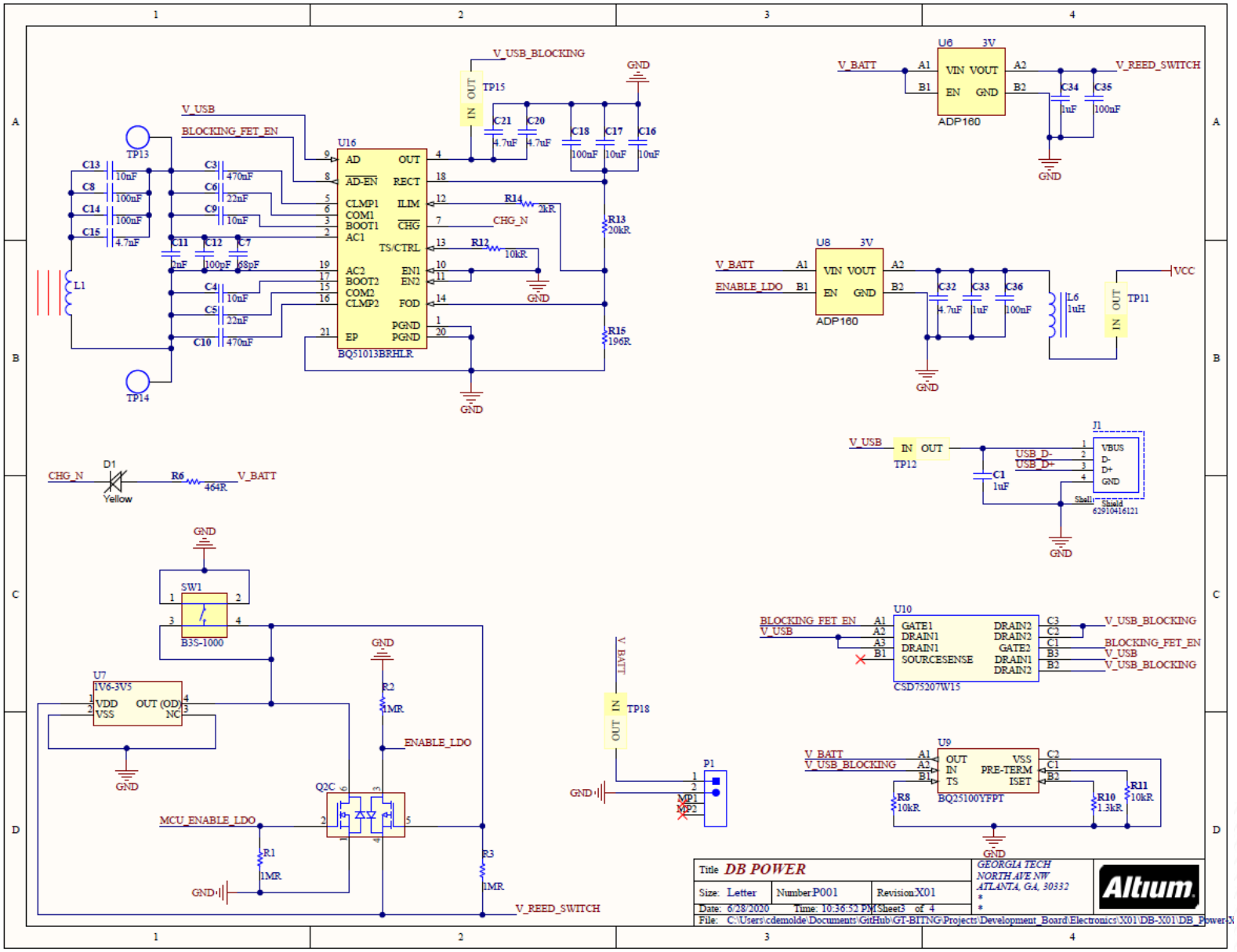
*Not in scope for current phase of development.

Progress to date: 6/28/2020



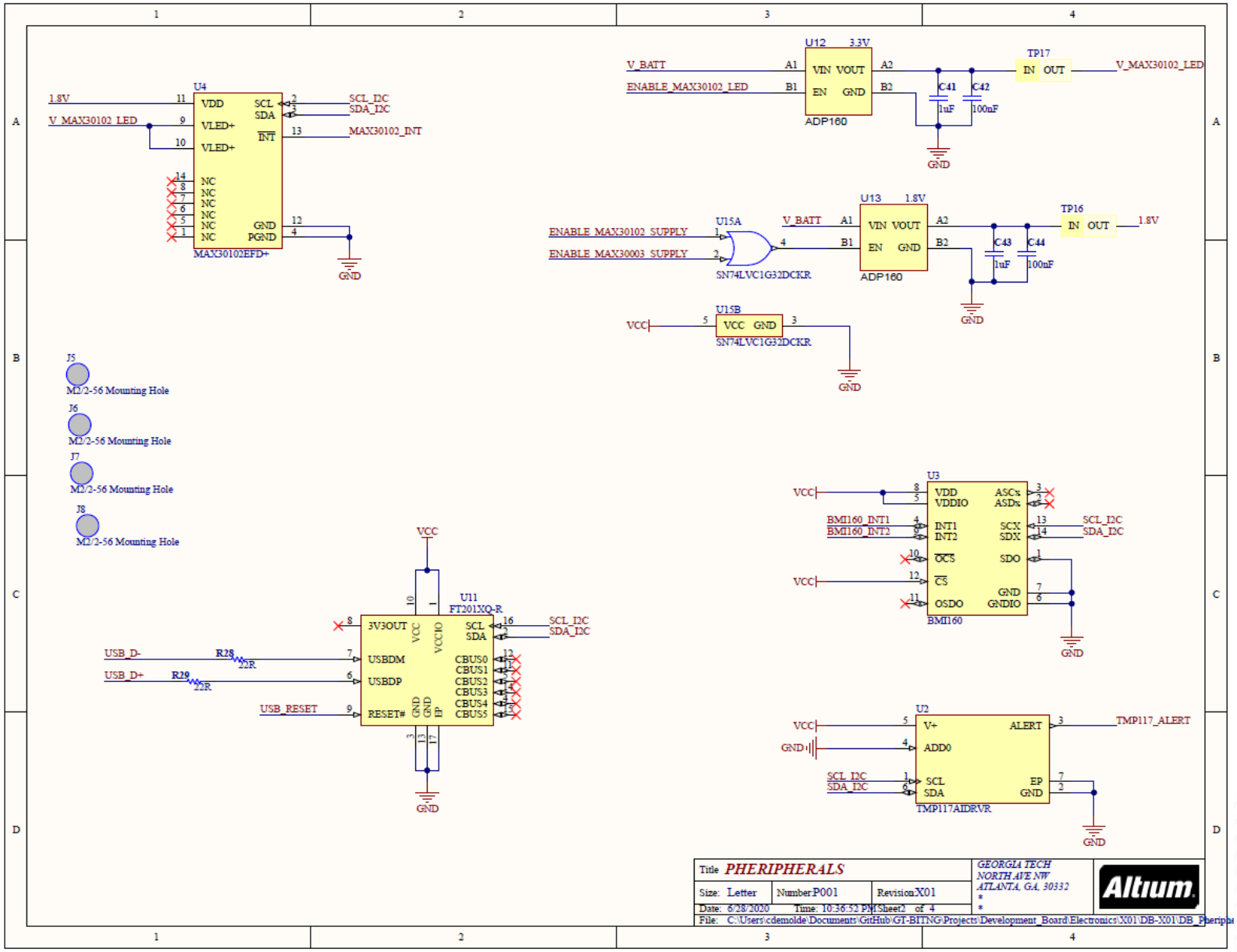
Georgia Tech
CREATING THE NEXT

Progress to date: 6/28/2020



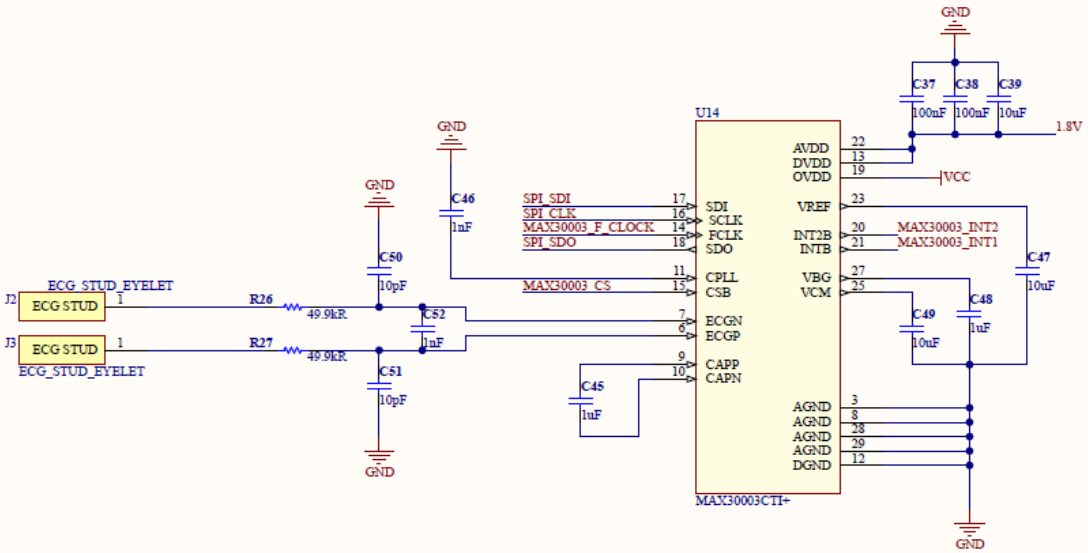
Georgia Tech
CREATING THE NEXT

Progress to date: 6/28/2020



Georgia Tech
CREATING THE NEXT

Progress to date: 6/28/2020



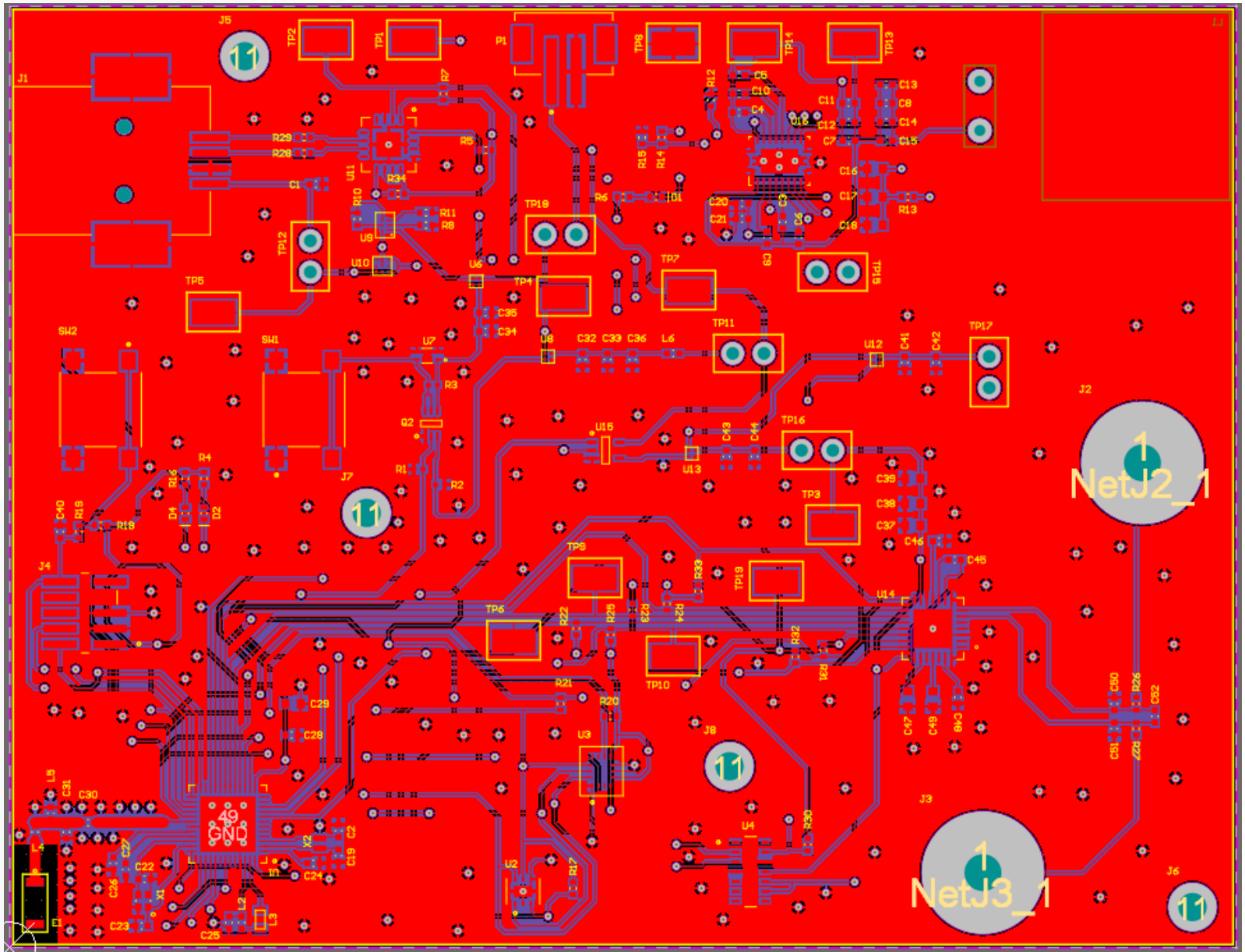
Title ECG		GEORGIA TECH NORTH AVE NW ATLANTA, GA, 30332
Size: Letter	Number P001	Revision X01
Date: 6/28/2020	Time: 10:36:52 PM Sheet 4 of 4	
File: C:\Users\cdemolde\Documents\GitHub\GT-BITNG\Projects\Development_Board\Electronics\X01\DB-X01\DB_ECG-X0		

Georgia Tech
CREATING THE NEXT

Electronics development: PCB design

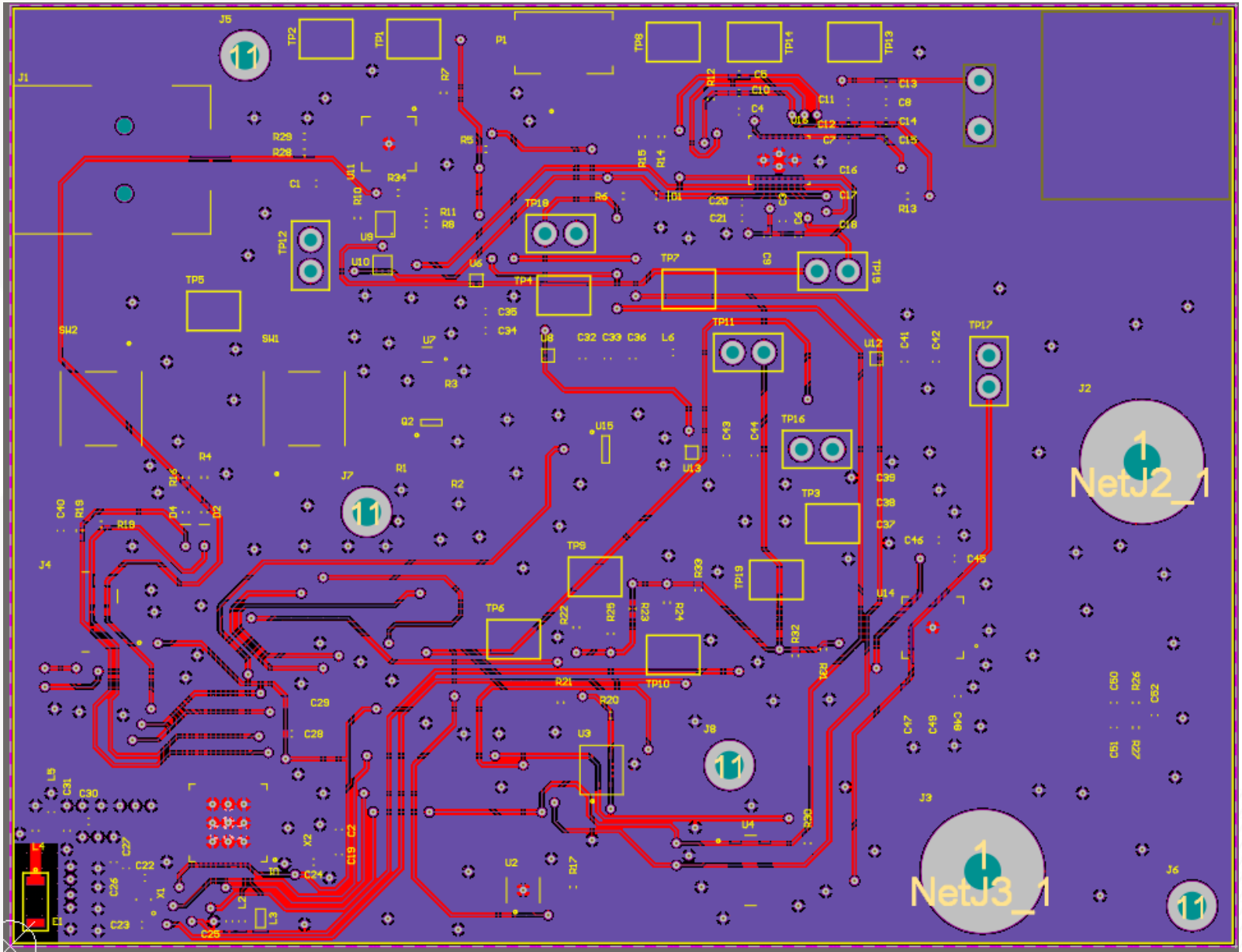
- PCB design
  - ~~Major component layout (2 hours)~~
  - ~~BLE antenna and impedance matching circuit (3 hours)~~
  - ~~Wireless charging (2 hours)~~
  - ~~Lithium battery charging (1 hours)~~
  - ~~Overall board construction(1 hour)~~
  - ~~USB charging (2 hours)~~
  - ~~Biosensors: temperature, IMU, ECG (3 hours)~~
  - ~~Test points, connectors, jumpers (1 hours)~~
  - ~~Gerber file generation (2 hours)~~
  - ~~BOM generation (2 hours)~~
- Estimated time: 16 hours
- Actual time spent: 20 hours

Progress to date: 6/28/2020



Georgia Tech
CREATING THE NEXT

Progress to date: 6/28/2020



Georgia Tech
CREATING THE NEXT

Progress to date: 6/28/2020

Georgia Tech
CREATING THE NEXT

PCB manufacturing specifications

- Dimensions: 99.568 x 76.454 mm
- Layers: 2
- Minimum trace/space: 6 mil
- Minimum hole size: 12 mil
- Thickness: 1.6mm
- Solder mask: Green
- Surface finish: HASL with lead
- Copper weight: 1 oz
- Material type: FR4

PCA quote

- PCB Manufacturing:
  - Price: $20
  - Manufacturer: PCBMinions
  - Lead time: 4 days
- BOM:
  - Price: ~$289.63
  - Board Quantity: 3
  - Supplier: Digikey/Mouser
  - Lead time: 1-5 days
- Stencil:
  - Price: ~46.25
  - Supplier: OSH Stencil
  - Lead time:

PATH FORWARD

Georgia Tech
CREATING THE NEXT

Path forward (6/28/20 – 7/05/20)

- Project and BLE
- Sensor drivers
  - I^2C driver
  - Temperature driver