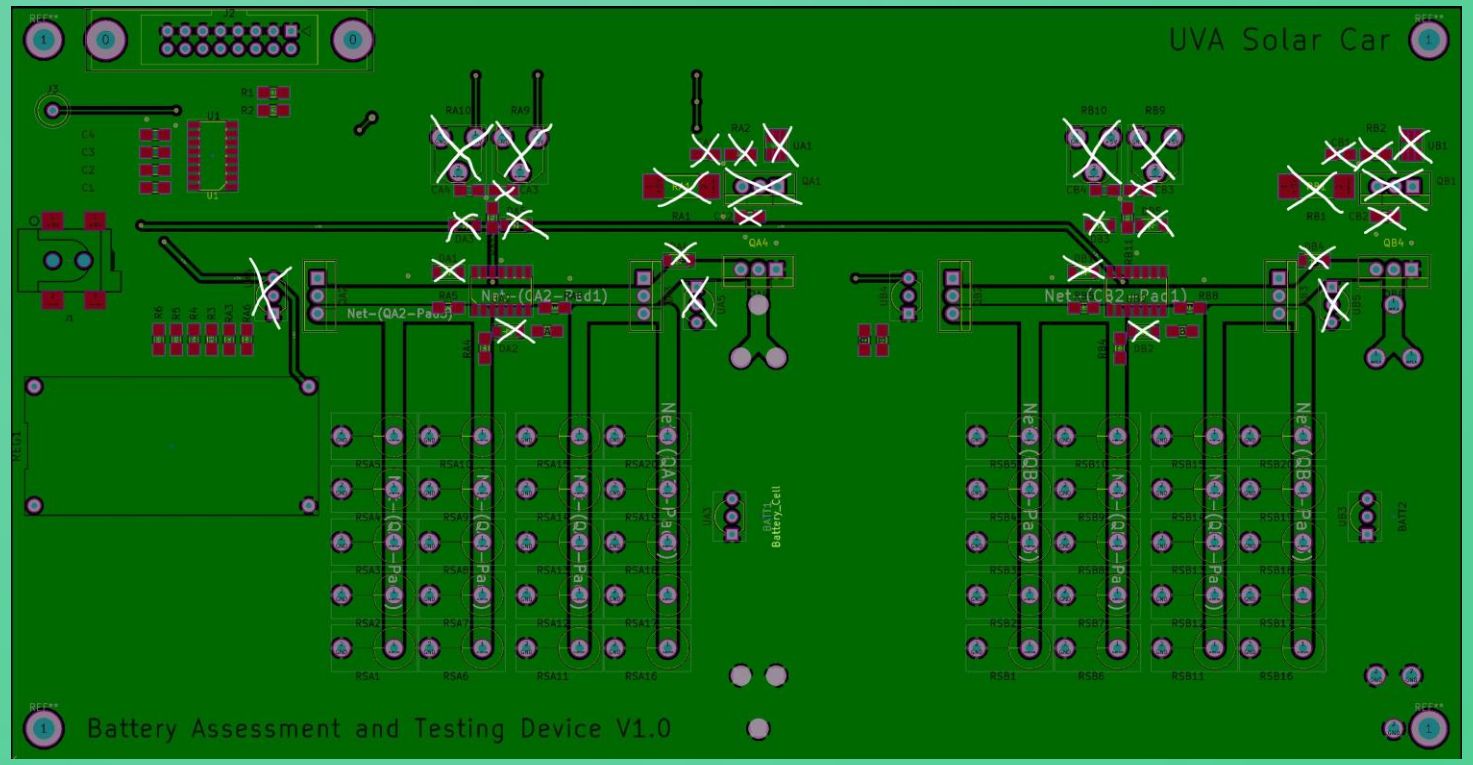
ASSEMBLY GUIDE

BATTERY ASSESSMENT AND TESTING DEVICE V1.0

UVA SOLAR CAR

WHAT **NOT** TO POPULATE

- UA1, UA4, UA5
- DA1 – DA5
- CA1 – CA4
- RA1, RA2, RA9, RA10
- QA1
- UB1, UB4, UB5
- DB1 – DB5
- CB1 – CB4
- RB1, RB2, RB9, RB10
- QB1



Why?

These slots were designated for hardware over-temperature and over-voltage protection. They were expensive to populate, and the same protection can be done through software. Other crossed off slots are for battery charging, which will be implemented externally.

SOLDERING COMPONENTS: 12 STEPS

1. Through hole resistors
2. Surface mount resistors
3. Capacitors
4. Op Amps
5. Analog to Digital Converter (ADC)
6. Wire Housing
7. Chip Select Pin
8. Buck Converter
9. Battery Contacts
10. Temperature Sensors
11. MOSFETS
12. DC Power Jack

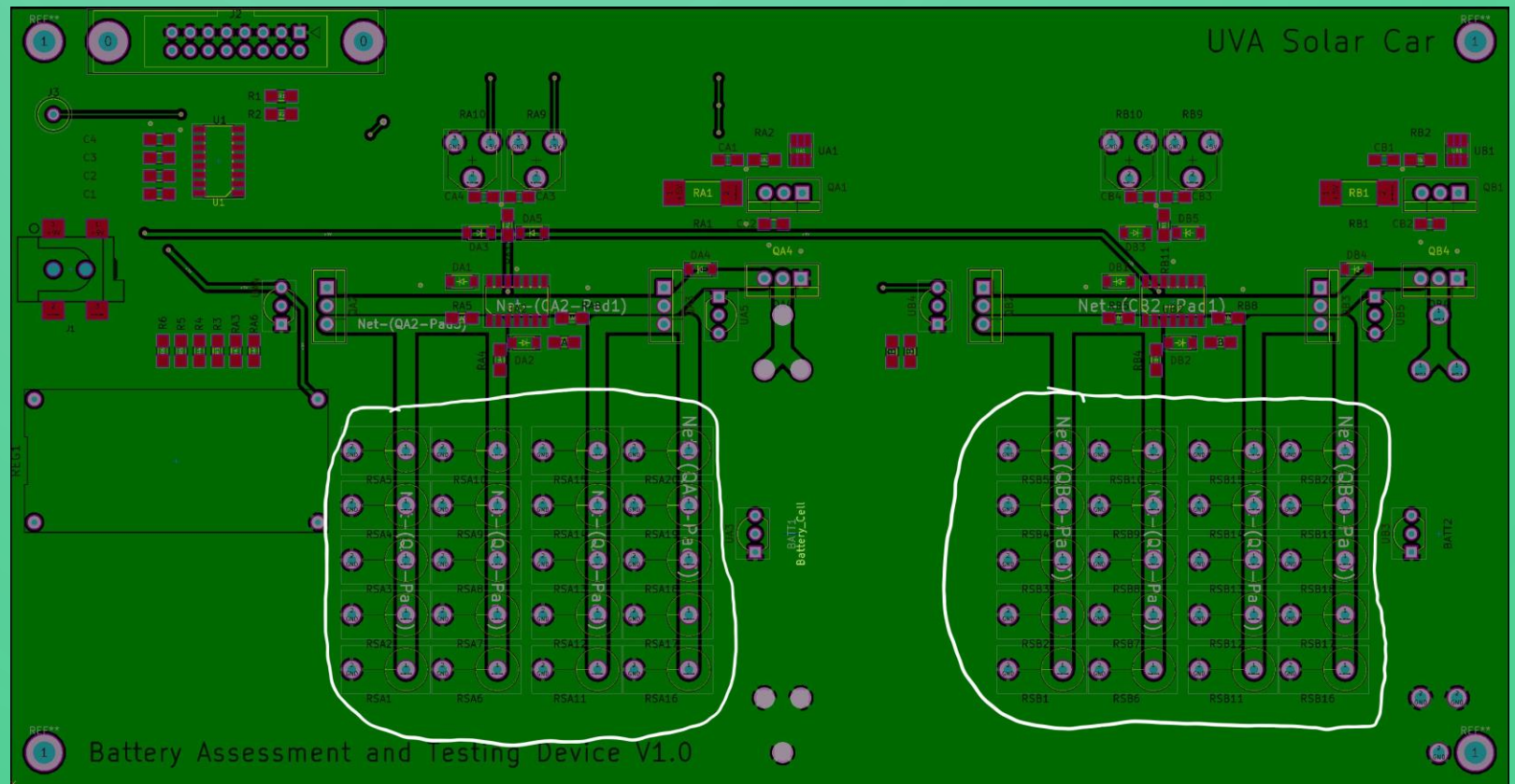
STEP 1: THROUGH HOLE RESISTORS

- RSA1 – RSA20
- RSB1 – RSB20

40 Total

0.6W, 10Ω

(All images link to product pages)



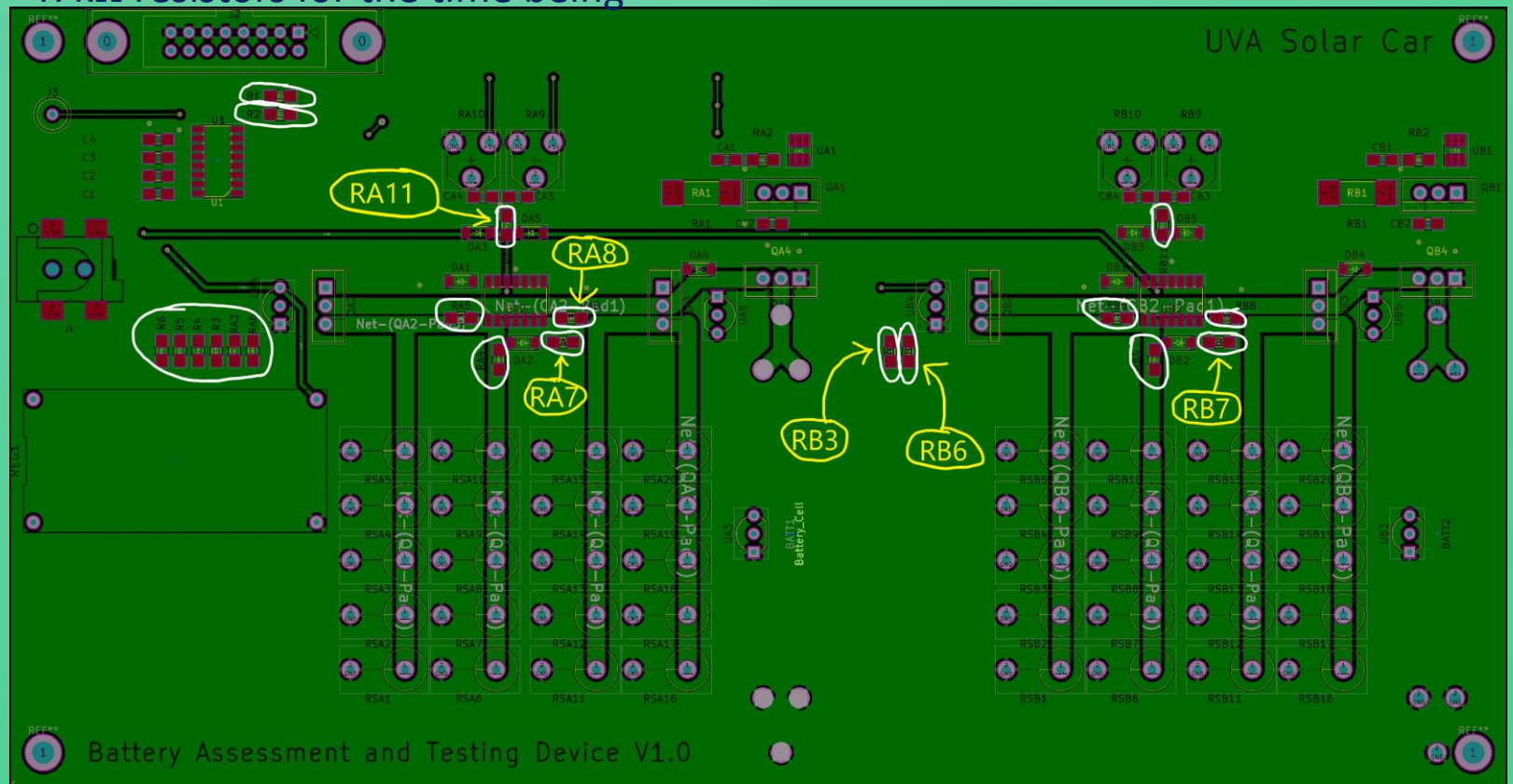
STEP 2: SURFACE MOUNT RESISTORS

0.0625W, 47kΩ

- R1 – R6
- RA3 – RA8, RA11
- RB3 – RB8, RB11

20 Total

Note:
RA11 and RB11 are supposed to be 10kΩ, but we will be using 47kΩ resistors for the time being

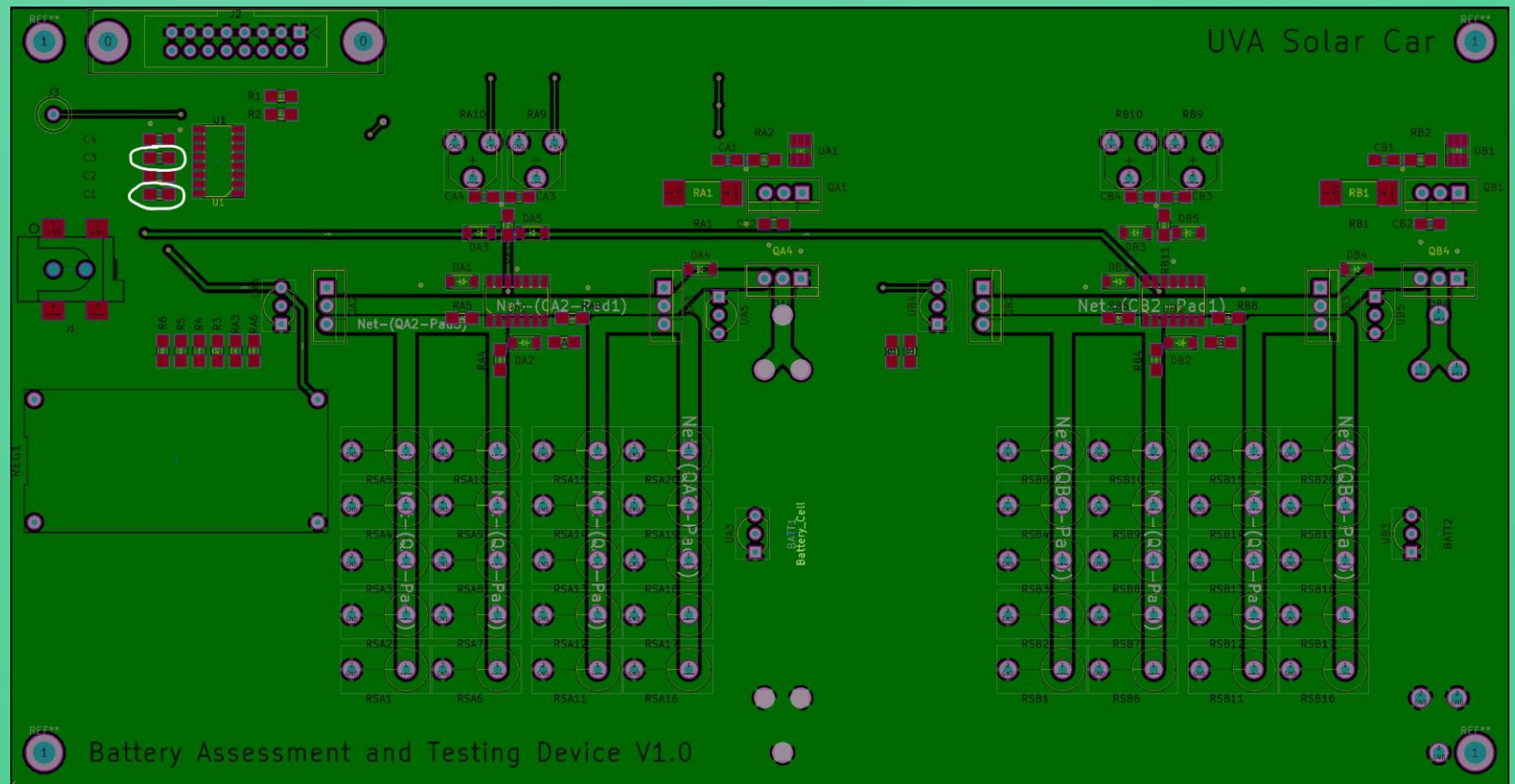


STEP 3A: SURFACE MOUNT CAPACITORS

10µF

- C1, C3

2 Total

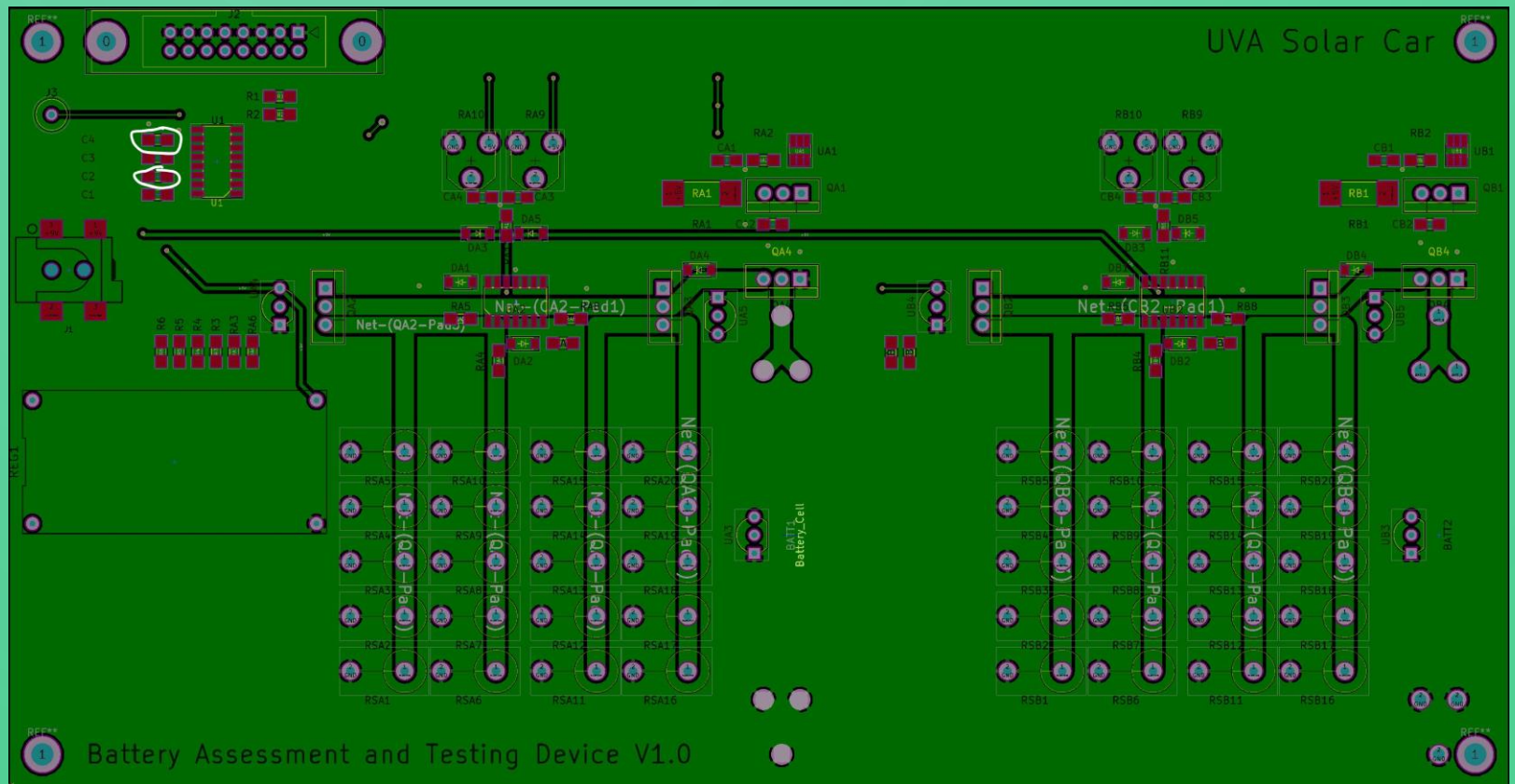


STEP 3B: SURFACE MOUNT CAPACITORS

0.1µF

- C2, C4

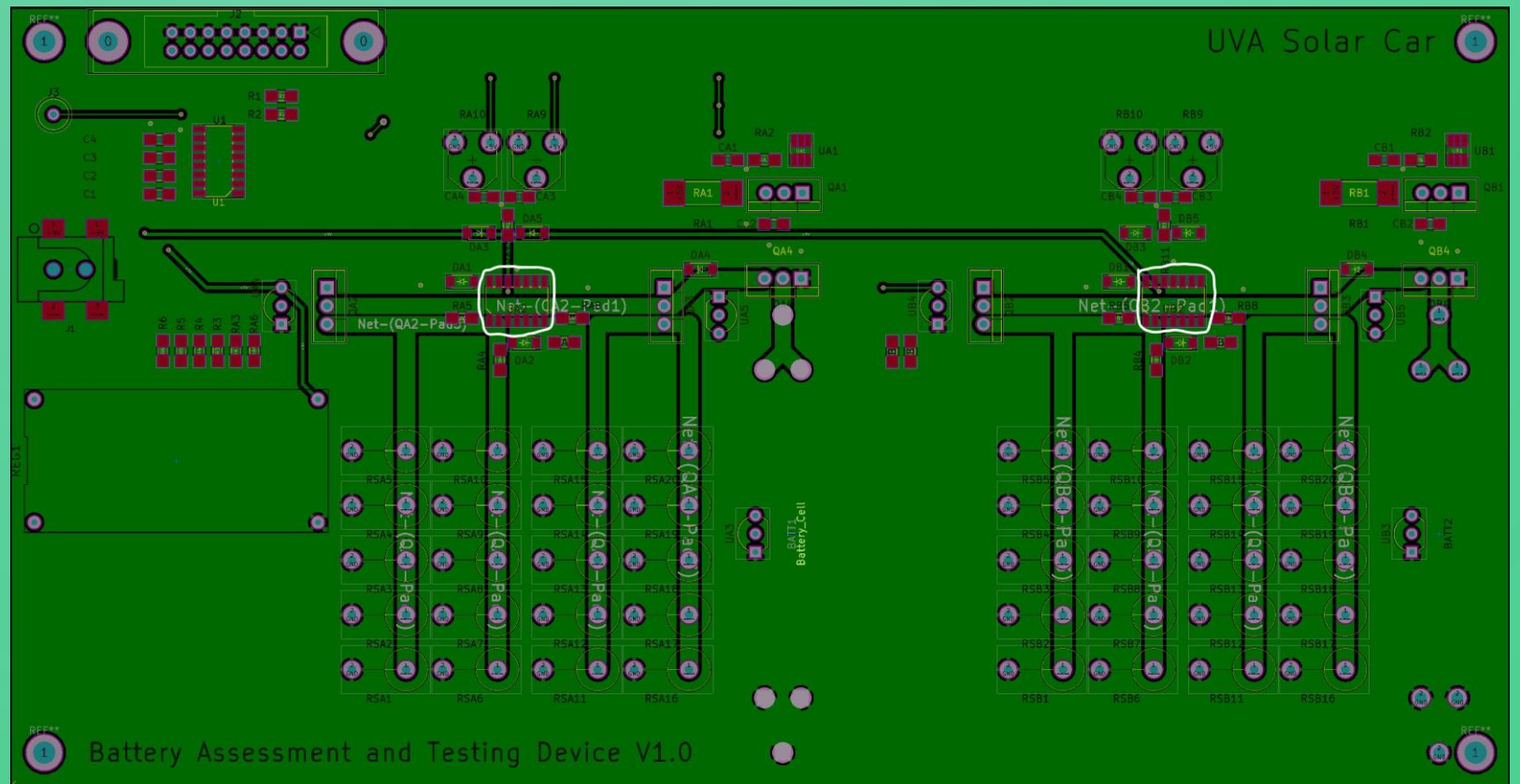
2 Total



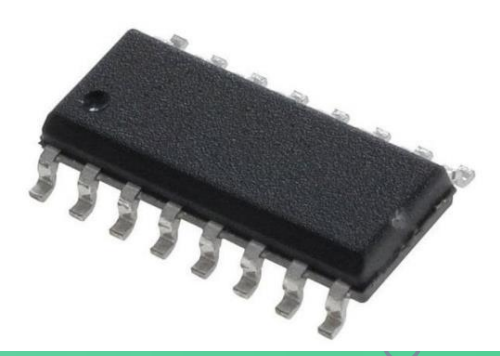
STEP 4: OP AMPS

- UA2
- UB2

2 Total

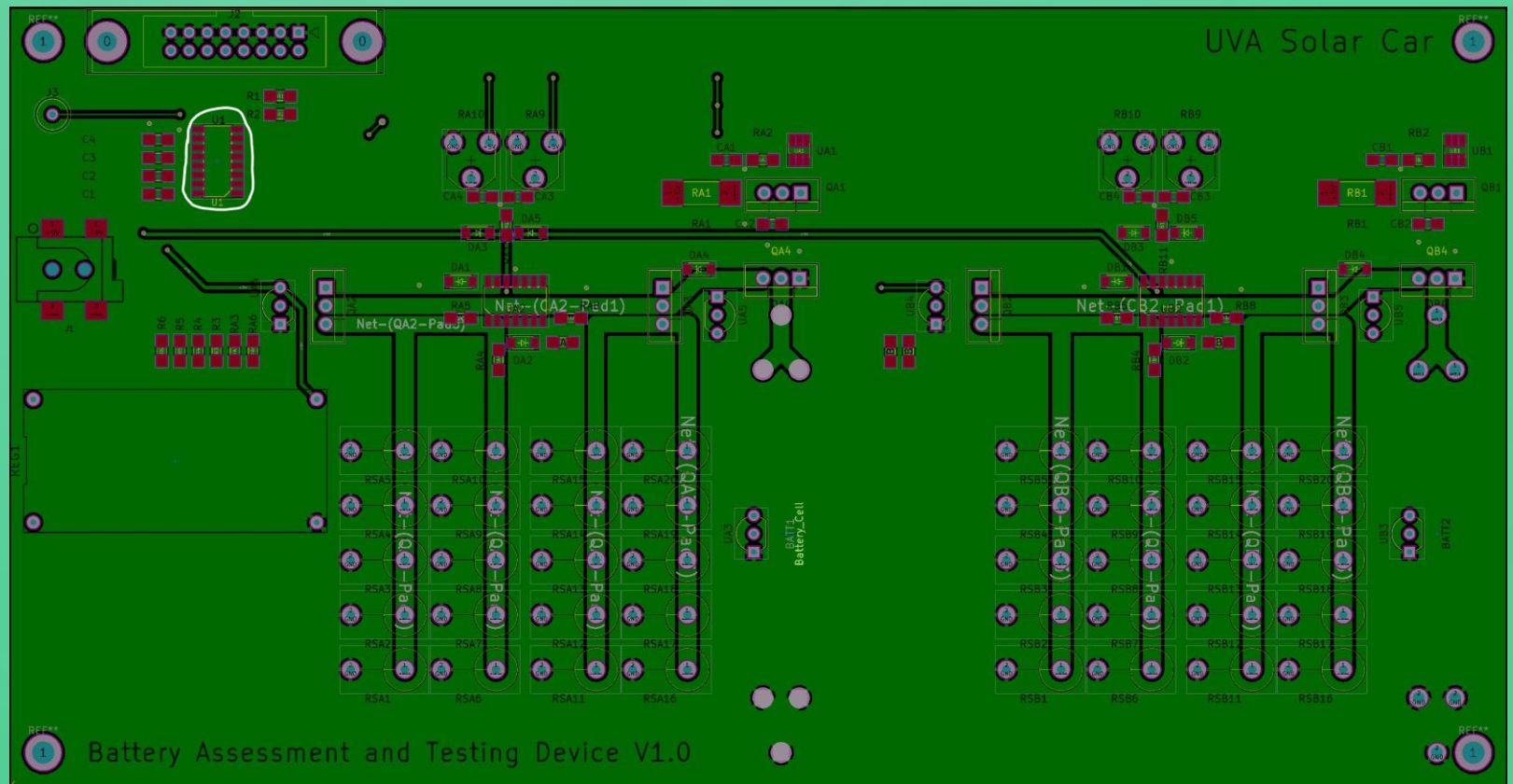


STEP 5: ANALOG TO DIGITAL CONVERTER (ADC)

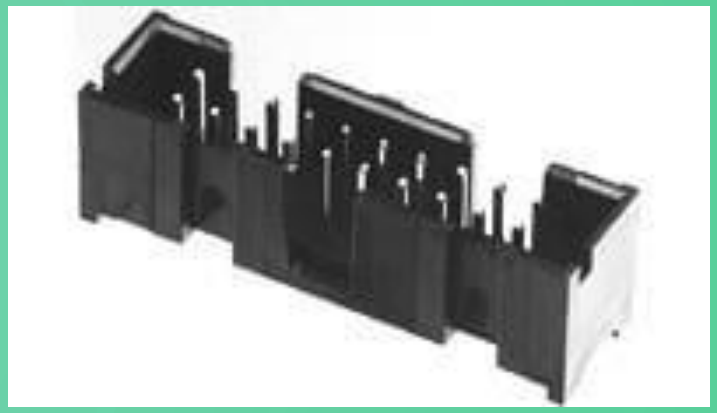


- U1

1 Total

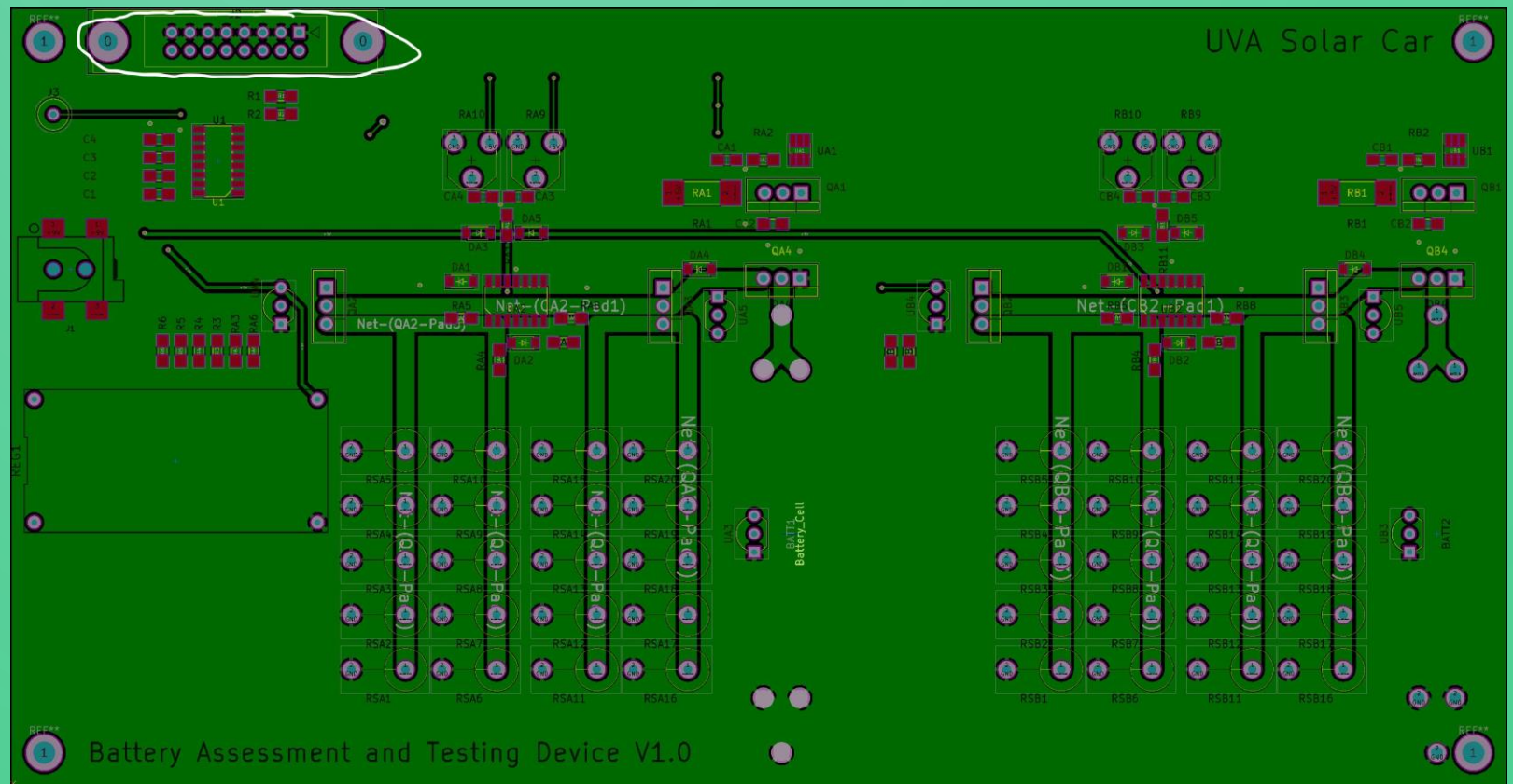


STEP 6: WIRE HOUSING



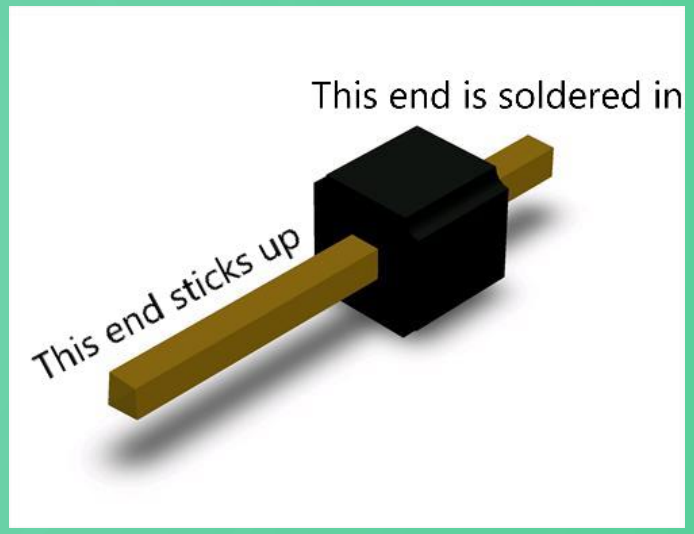
- J2

1 Total

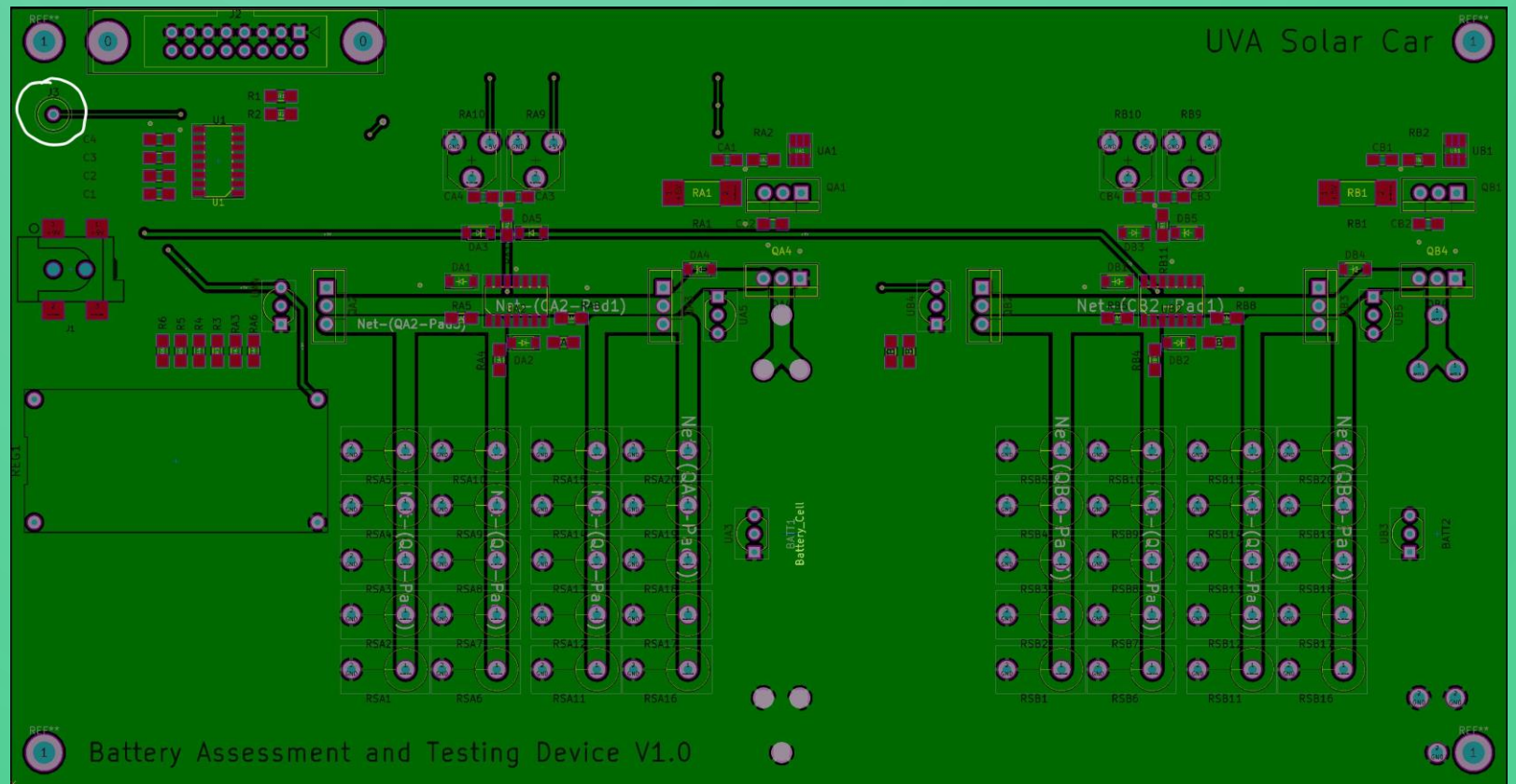


STEP 7: CHIP SELECT PIN

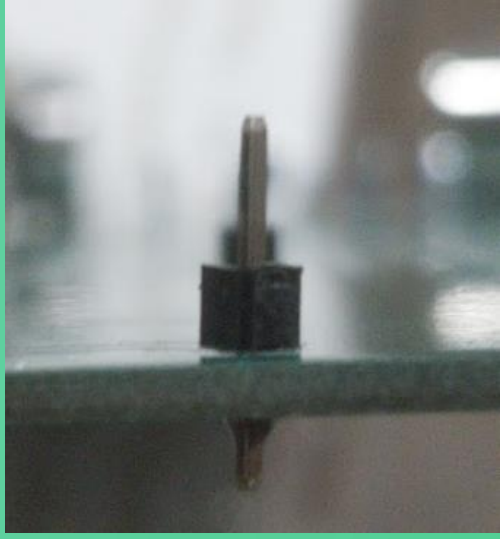
- J3



1 Total



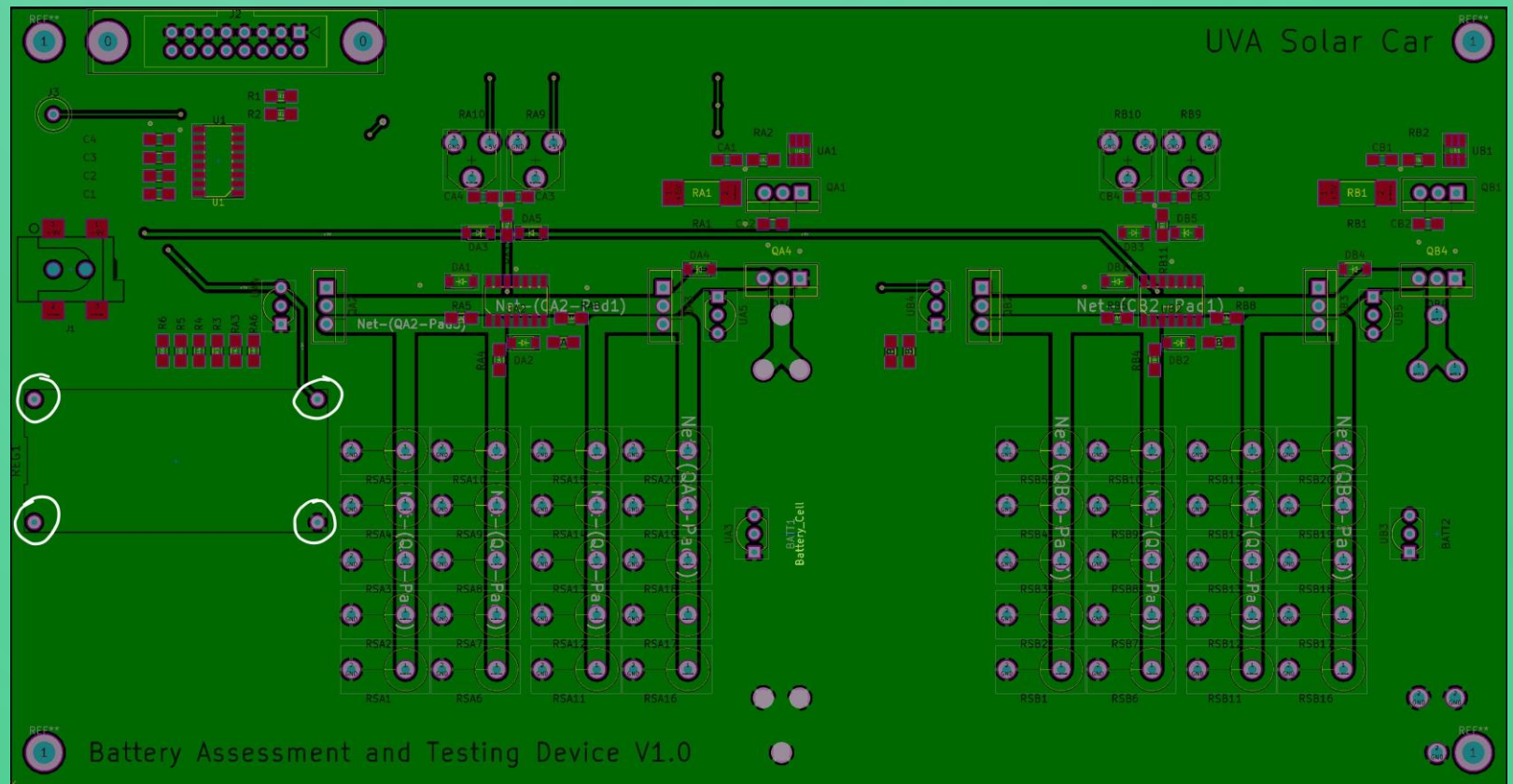
STEP 8A: BUCK CONVERTER PIN HEADERS



- REG1 (4 pins)

Solder pin headers in first with the longer end sticking up

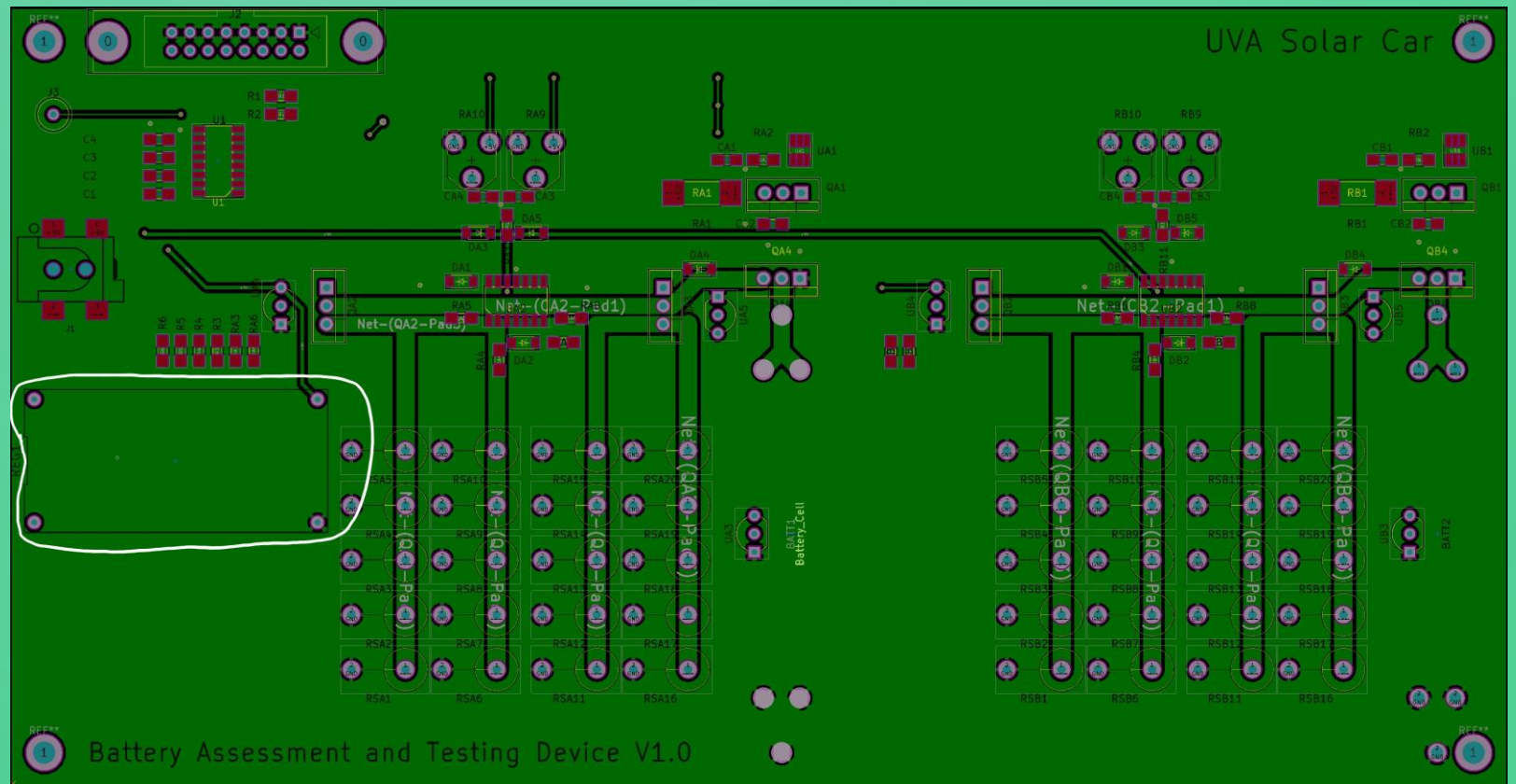
4 Total



STEP 8B: BUCK CONVERTER

- REG1

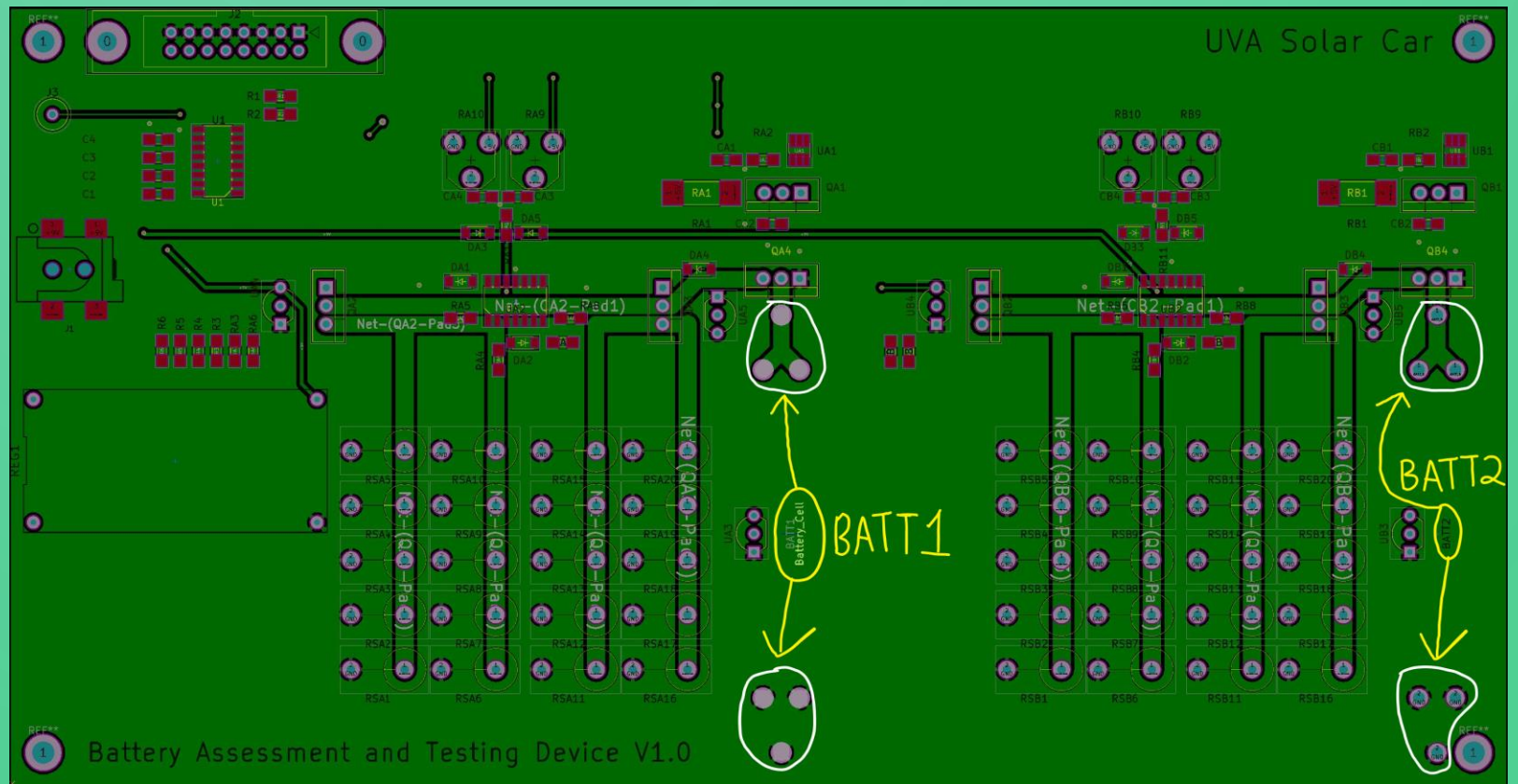
1 Total



STEP 9: BATTERY CONTACTS

- BATT1(x2)
- BATT2(x2)

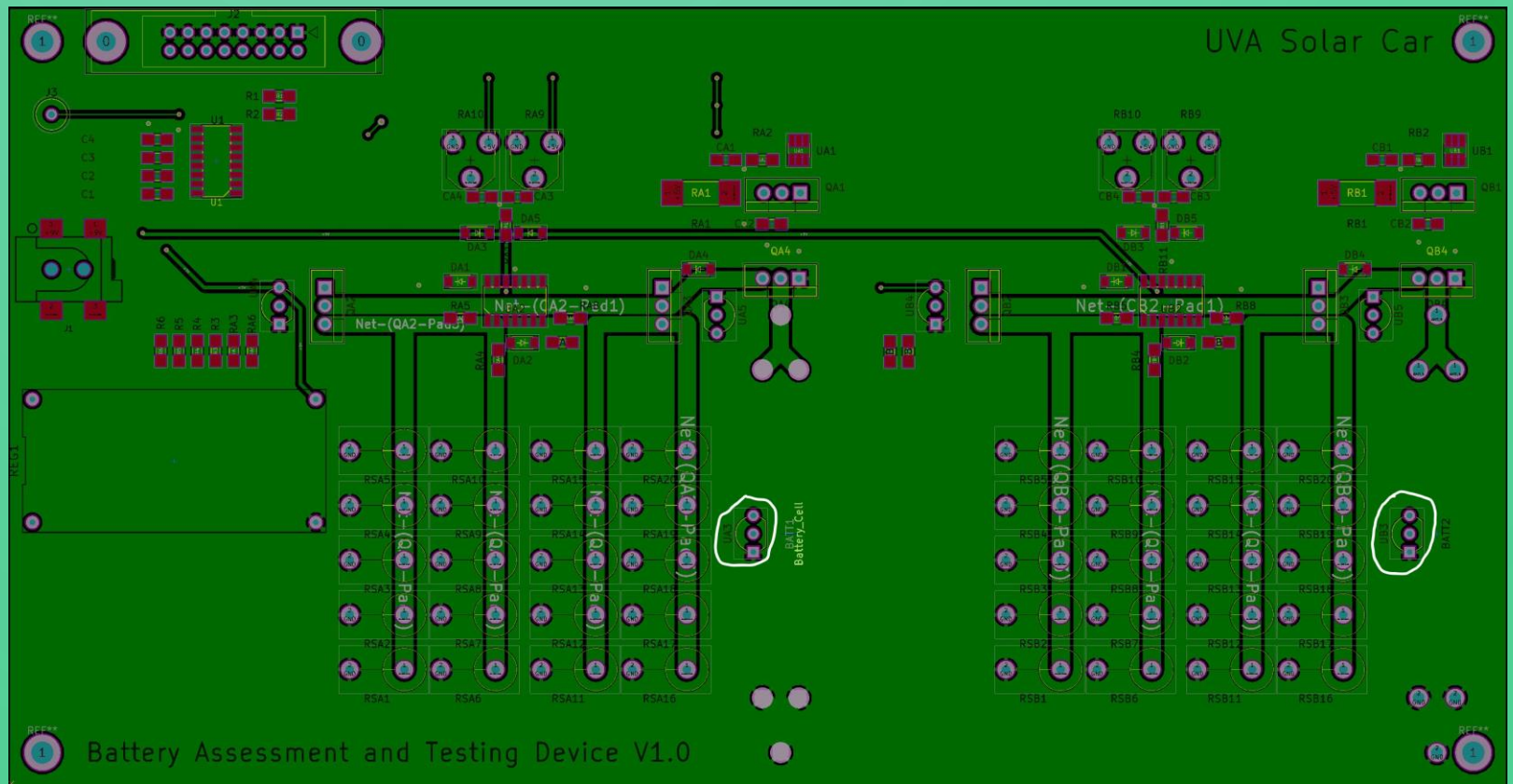
4 Total



STEP 10: TEMPERATURE SENSORS

- UA3
- UB3

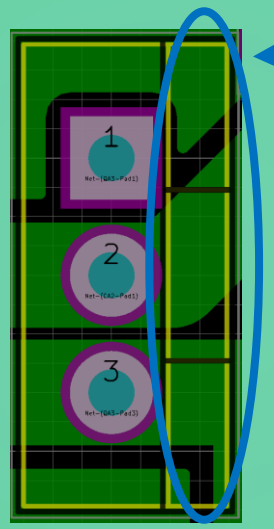
2 Total



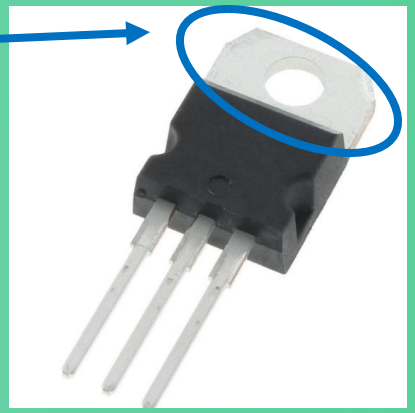
STEP 11A: MOSFETS

- QA2, QA3
- QB2, QB3

4 Total

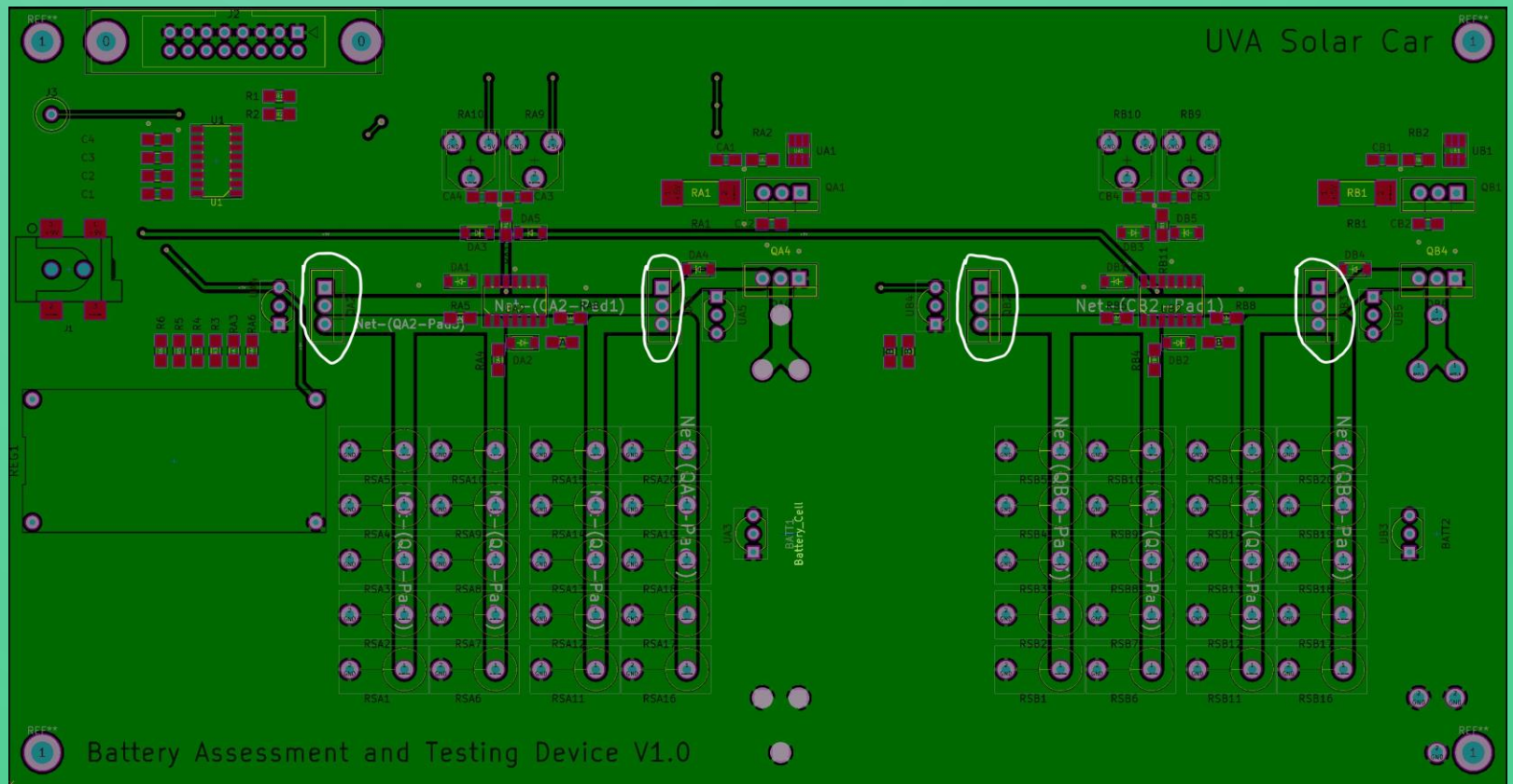


Line up heatsink with this side

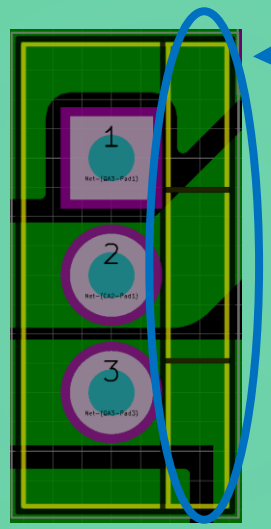


IRFZ44ZPBF

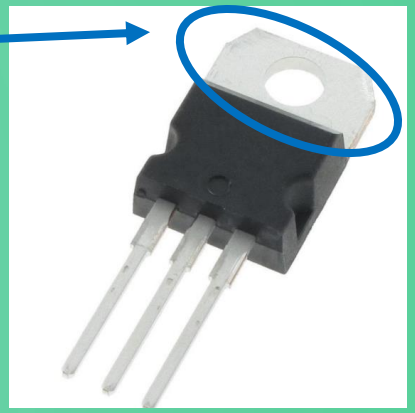
Solder these so that they stick up as high off the board as possible



STEP 11B: MOSFETS



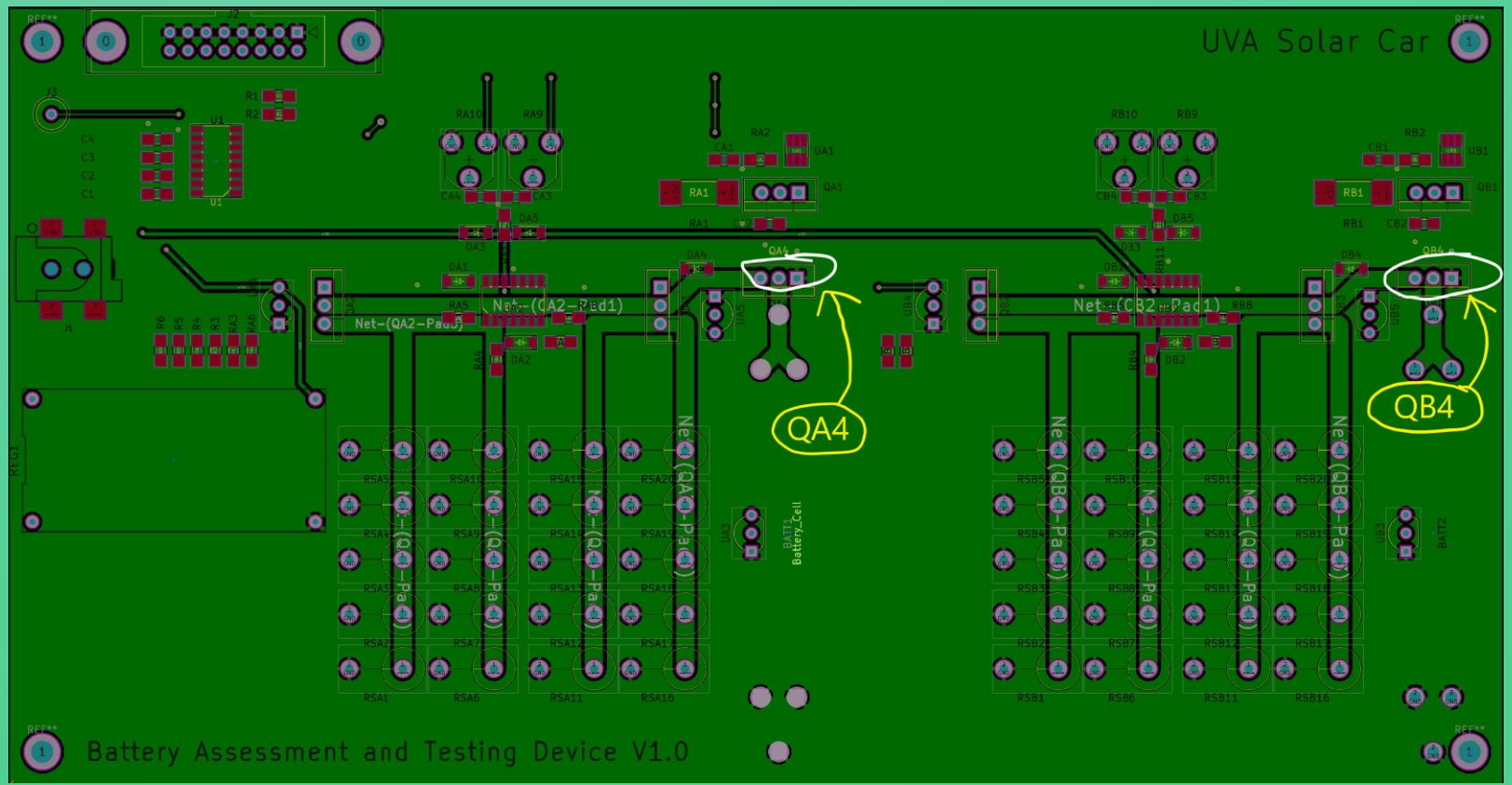
Line up heatsink with this side



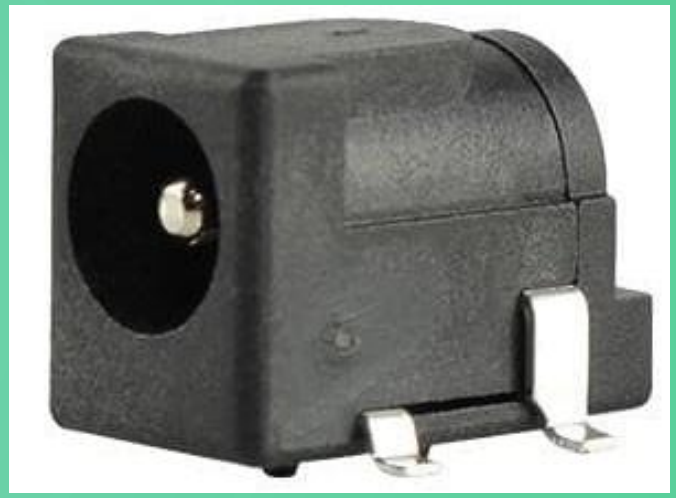
IPP45P03P4L-11

- QA4
- QB4

2 Total

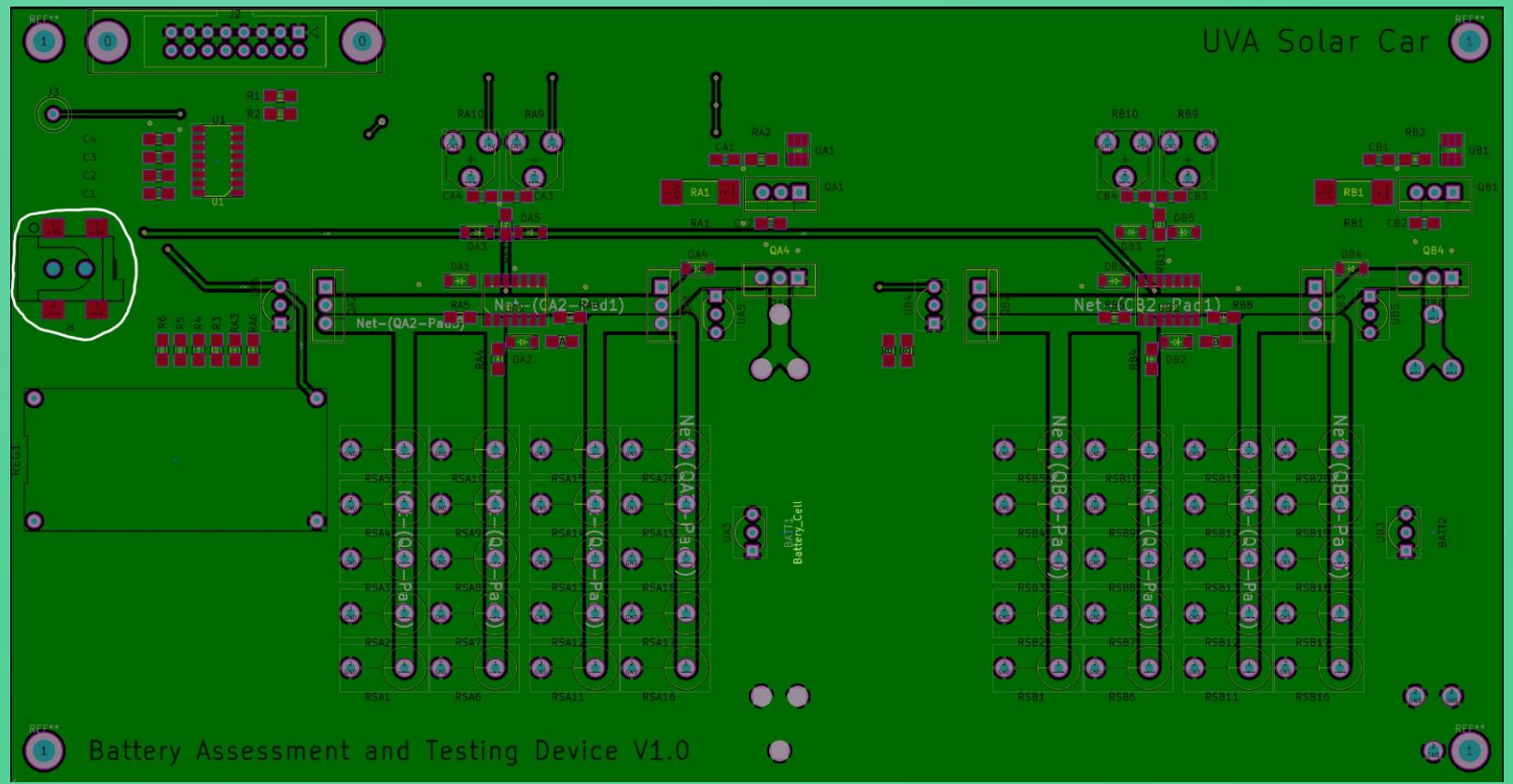


STEP 12: DC POWER JACK

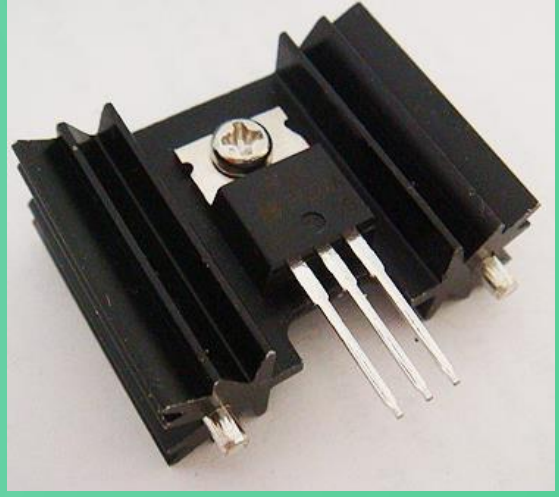


- J1

1 Total



FINISHING TOUCH



- Screw heatsinks to MOSFETS

Note: attatch upside down since there are no mounting holes

4 Total