Design and Routing of the Constant Current Source Board for SoLID

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Contents

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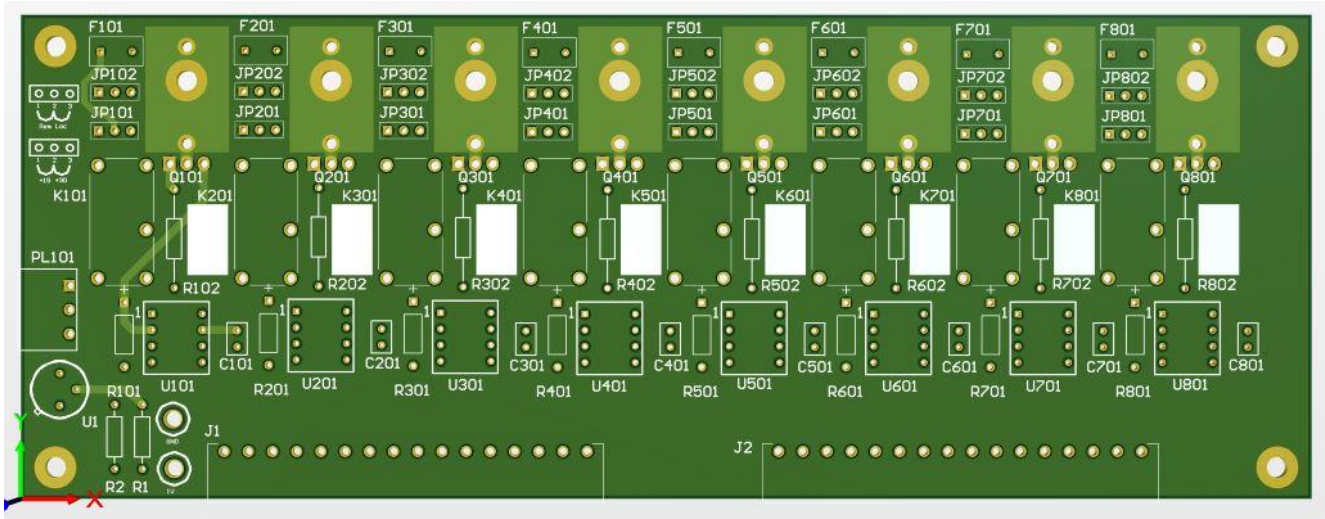
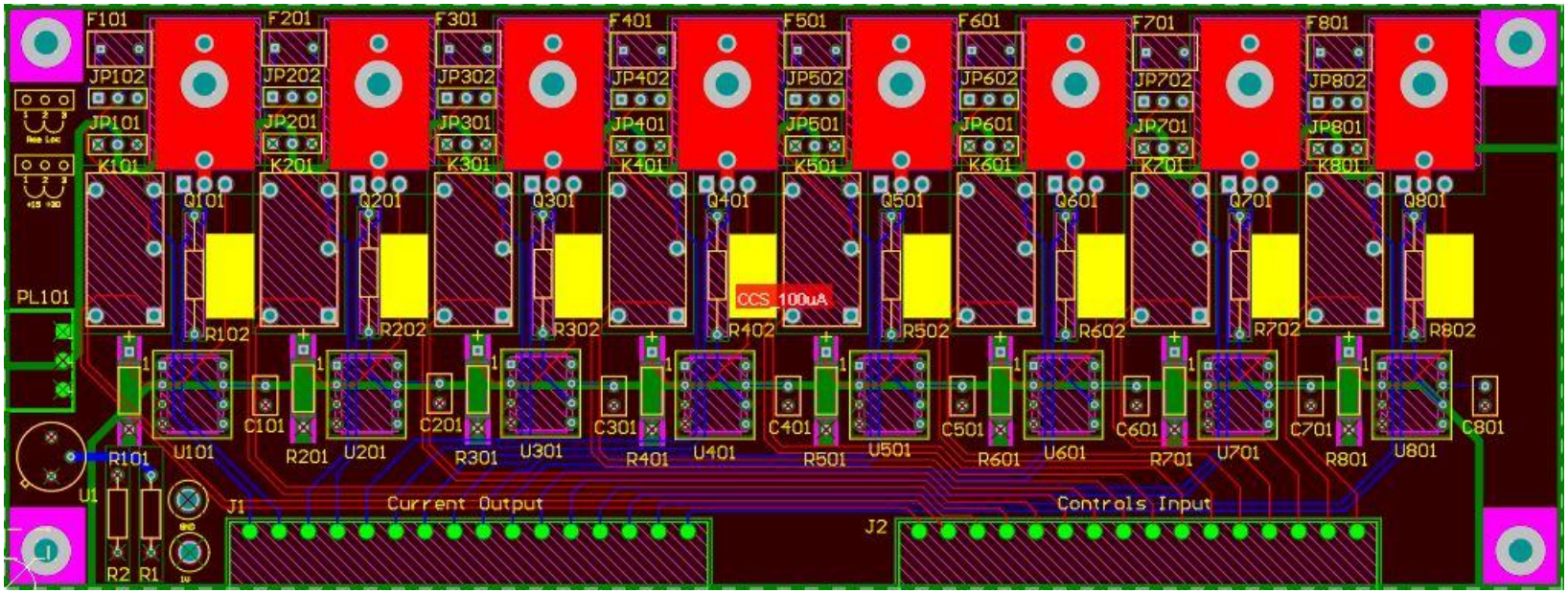


PCB Layers (All)

Ch. 1 Ch. 2 Ch. 3 Ch. 4 Ch. 5 Ch. 6 Ch. 7 Ch. 8



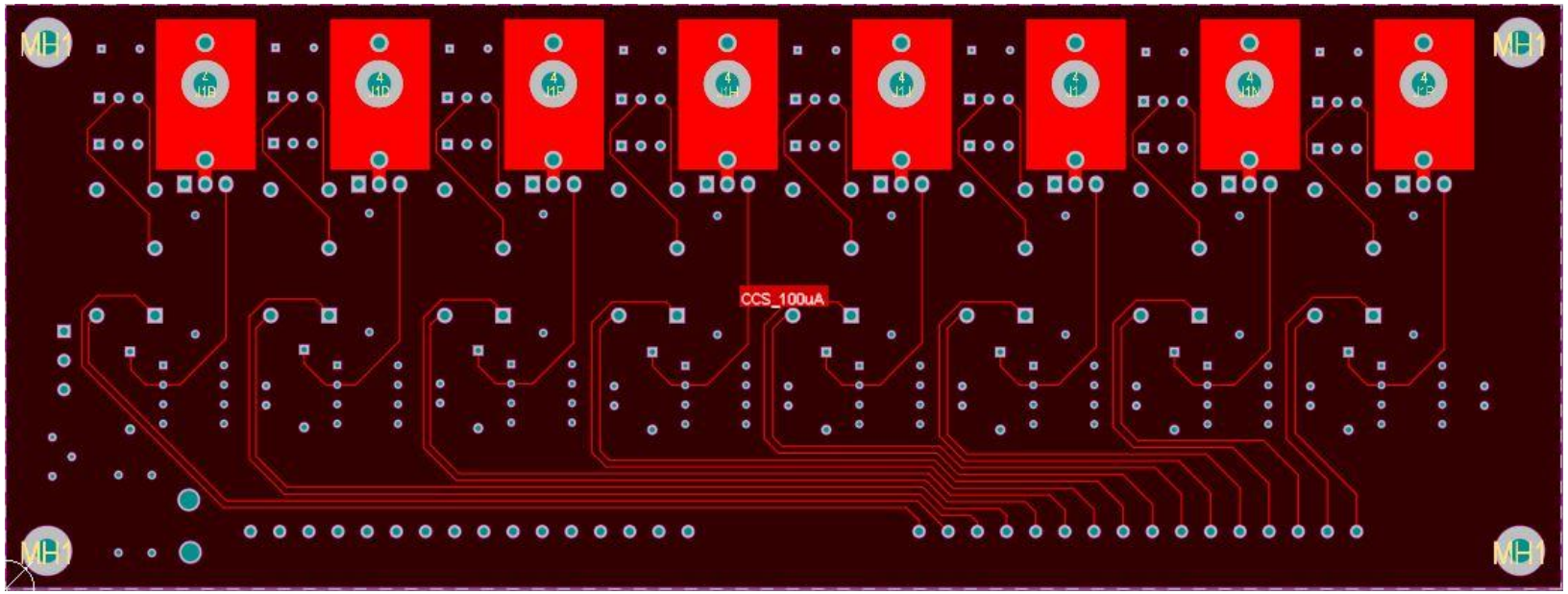
Power input

Current output

Controls input

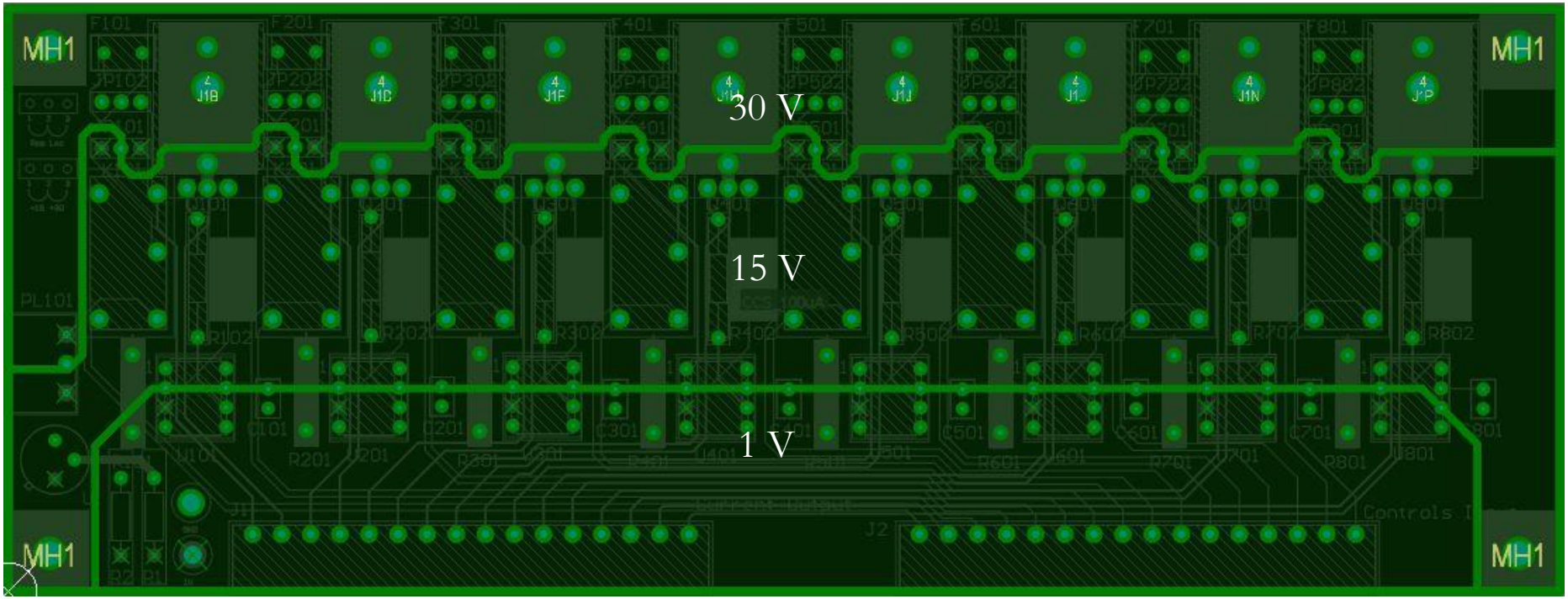
- Minimum clearance: 20 mils
- Min. trace width: 15 mils
- Eight constant current channels
- Channel pitch: 895 mils
- Four layers each with 1oz. copper

Component Layer (Top)



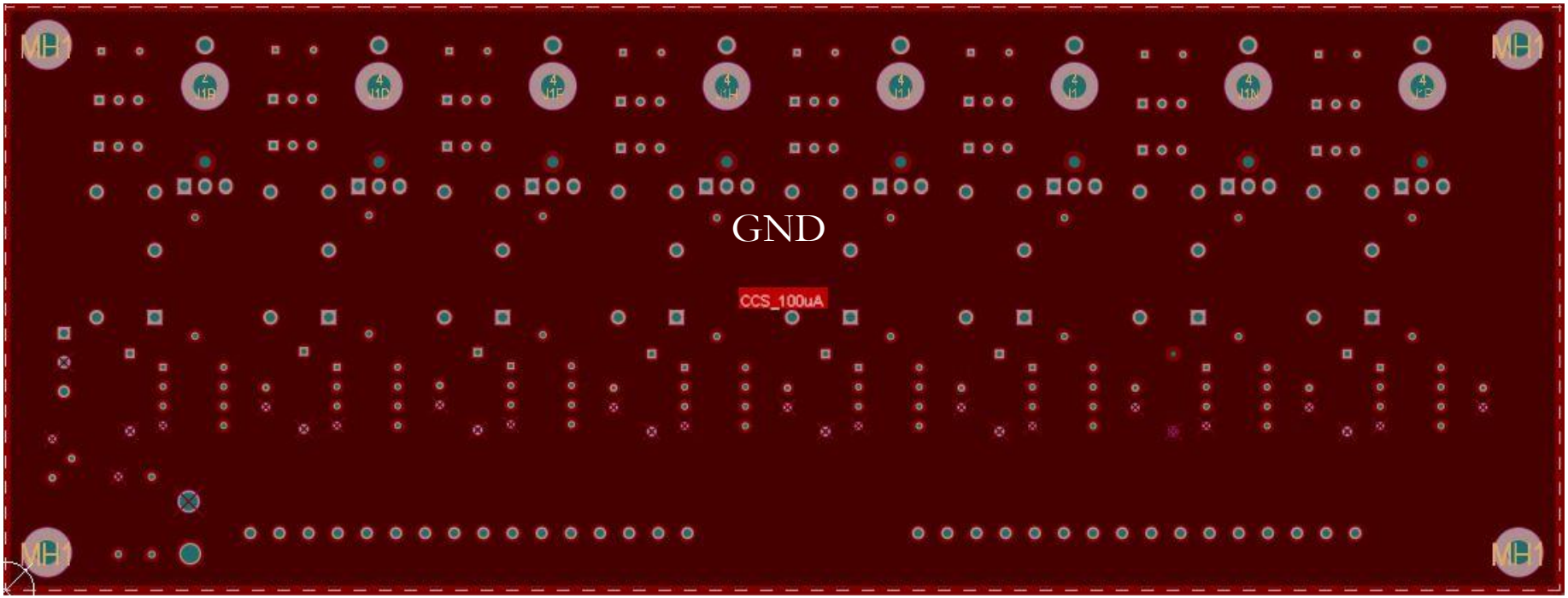
- Eight heat sink pads are connected to the Tip29C transistor collector and are not connected to any planes
- The heat sink is connected via the top through-hole pad with solder; the heat sink does not sit flat to the copper pour

Power Plane Layer



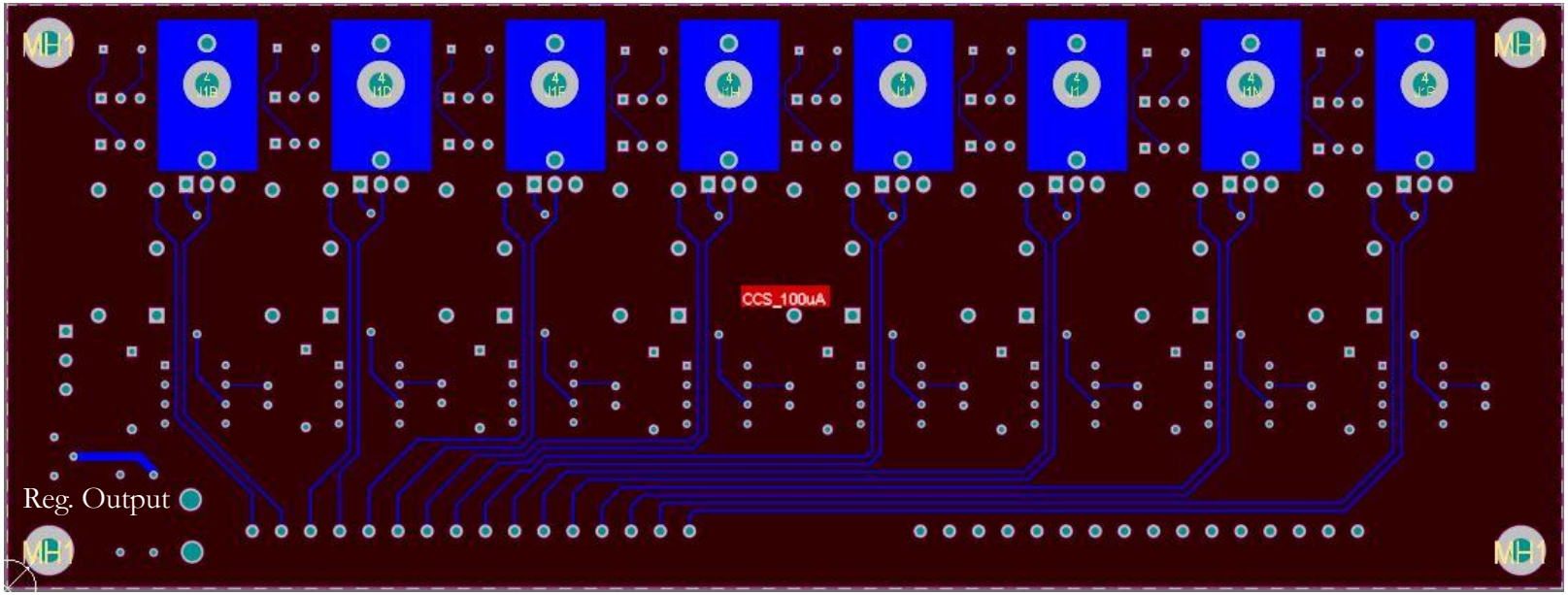
- Three areas of 1 oz. copper with 25 mils clearance:
  - 30 V, 15 V, 1 V

Ground Plane Layer



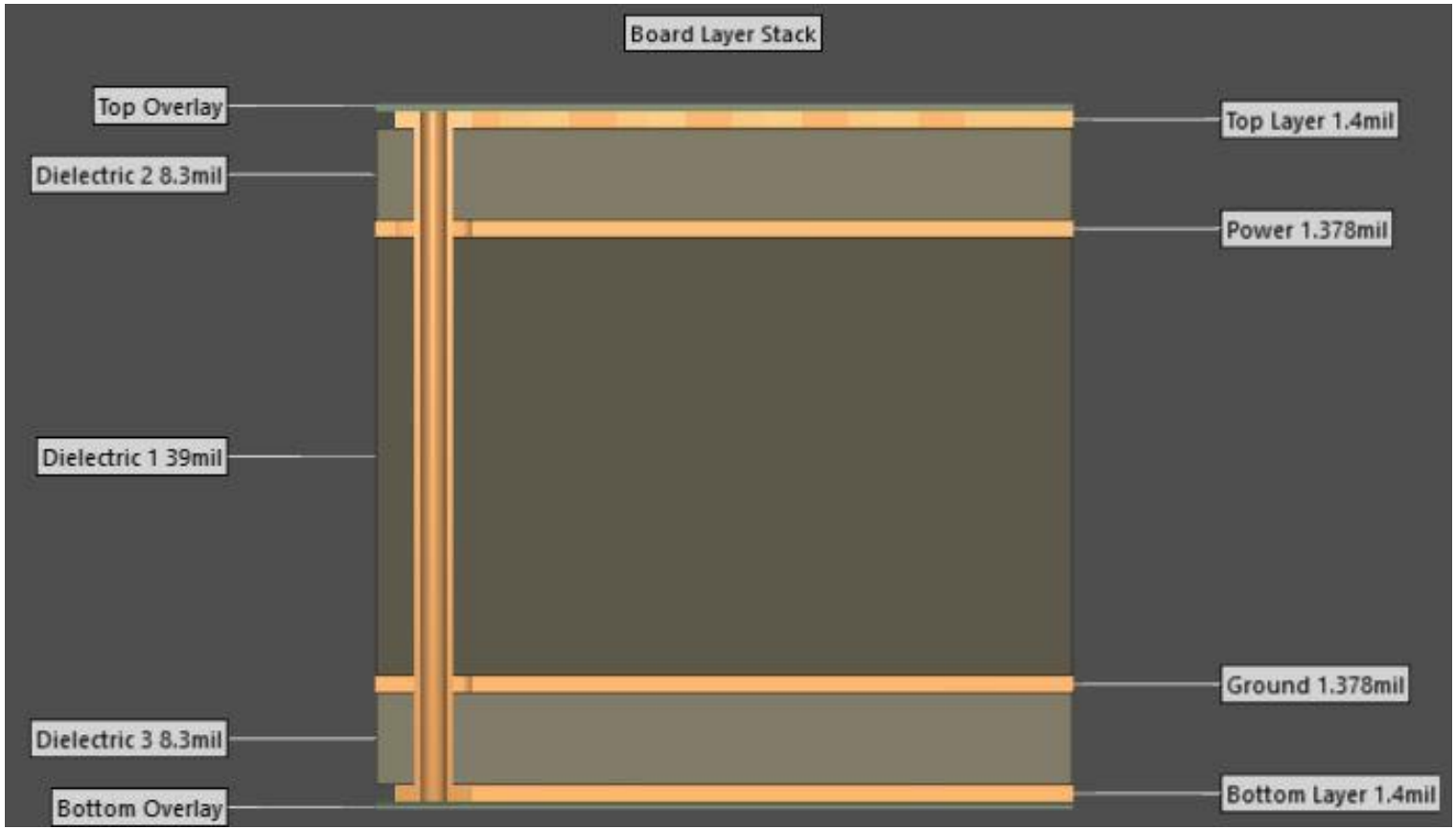
- One continuous plane of 1 oz. copper

Bottom layer



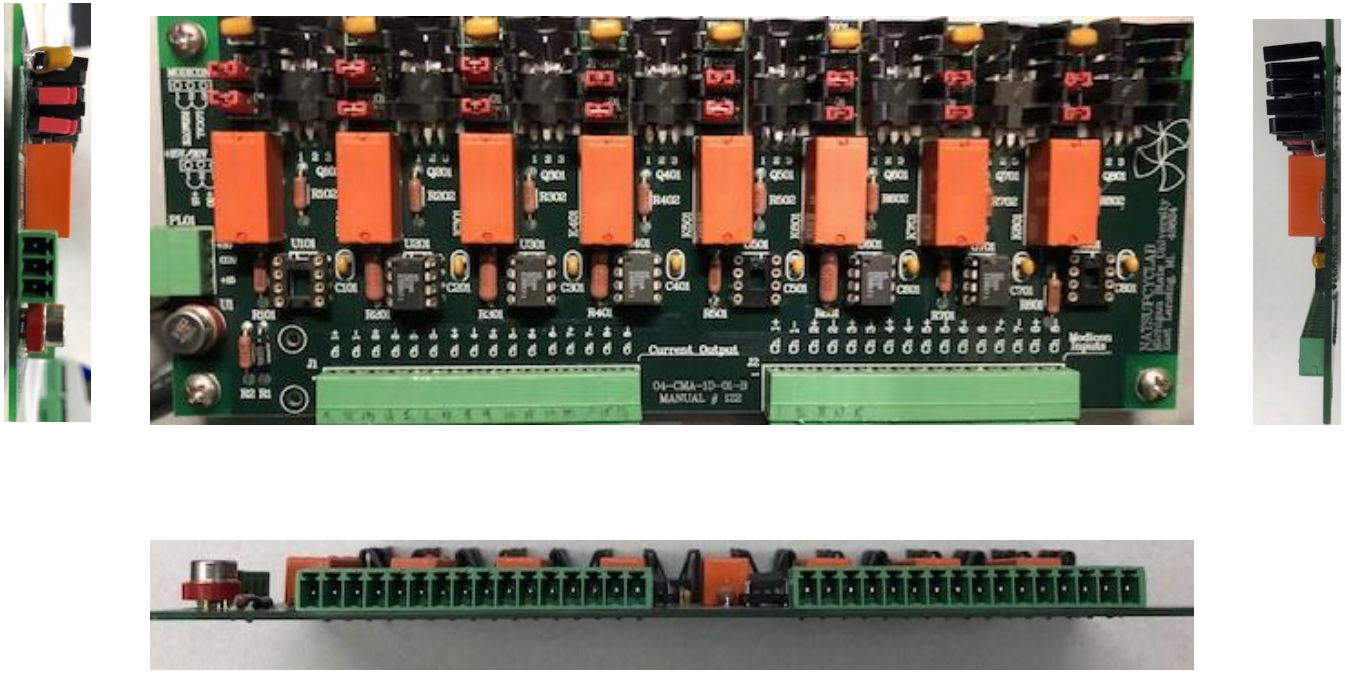
- Eight copper pours are connected to the Tip29Cs' heat sink
- Regulator output trace (50 mils)

Layer Stack-up



PCB thickness is ~62 mils

Hall C's Constant Current Source Board - Views



Max component height: 0.6 in. at TIP29c heat sink

Initial Routing Notes

- The initial routing is complete
  - The design has two voltage selections for each channel (15 V or 30 V)
    - What sensor types will utilize the alternate voltage?
    - Current CCS uses a single voltage (24 V)
  - Design review has started
  - **Components to make 10 boards have been ordered**

Conclusion

- Design and routing of CCS completed
- Design review started
- Components ordered
  - All parts are in stock and should arrive in January 2020

Thank You