

Electrical power system battery module 4 cells Hardware:

- Designed by: Amanda Batista Medeiros
- Based on FloripaSat-I Battery Board
- Reviewers: André M. P. Mattos
- Support: Gabriel M. Marcelino and Yan C. de Azeredo

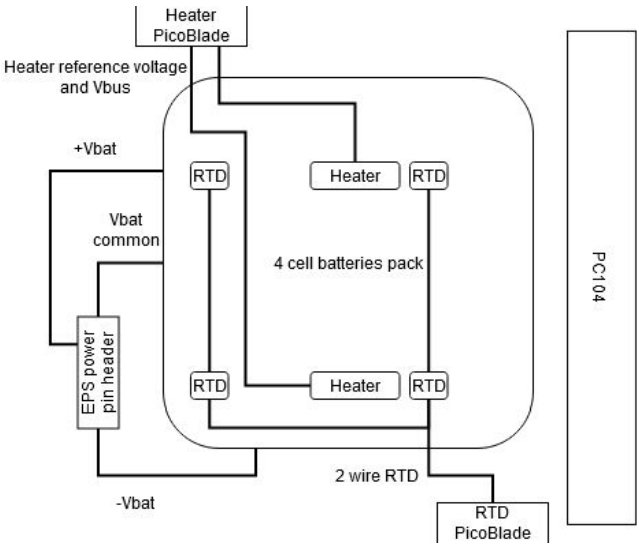
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Project github repository: <https://github.com/spacelab-ufsc/battery-module-4c>

Project info

Rev	Description	Date	Author
0.1	<ul style="list-style-type: none"><li>- Initial release</li><li>- Hardware improvements and fixes based on the first EPS batteries board</li><li>- Charge capacity increase, from 2 batteries (series) to 4 baterries (series/parallel)</li></ul>	04-Oct-2020	Andre M. P. Mattos

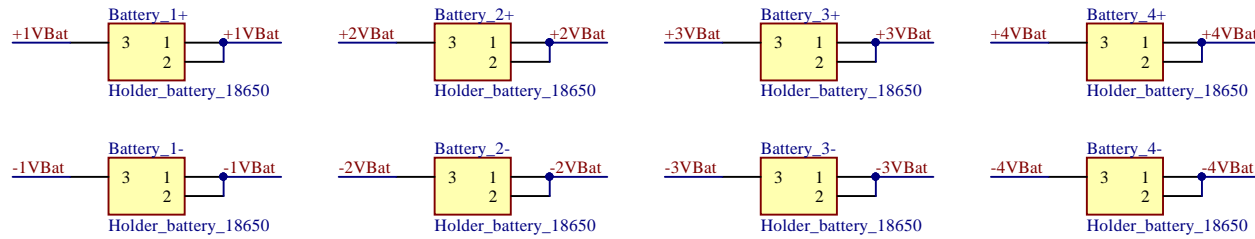
Revision History



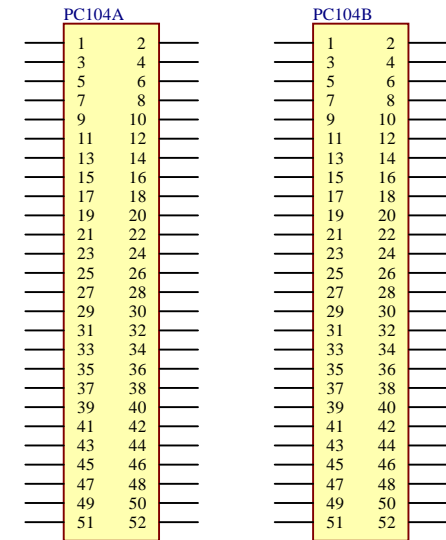
Block Diagram



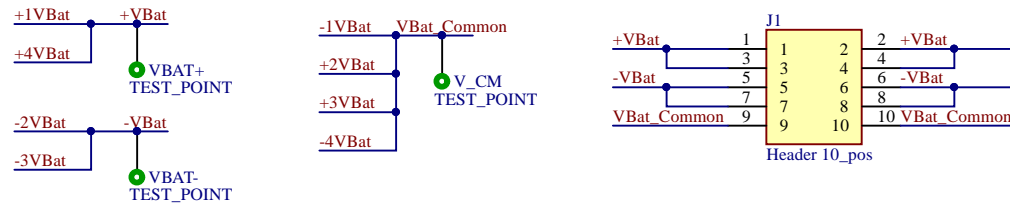
## BATTERIES' CONNECTORS



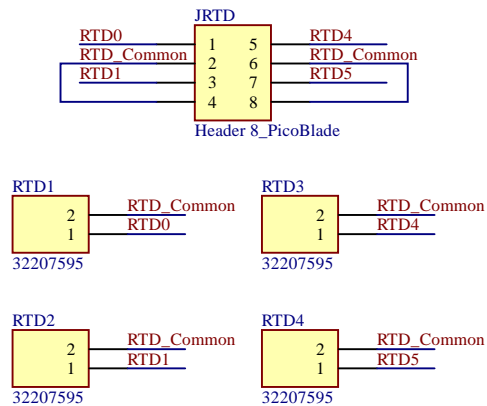
## PC104 CONNECTIONS



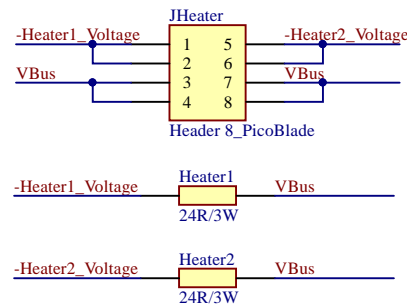
## BATTERY CONNECTIONS



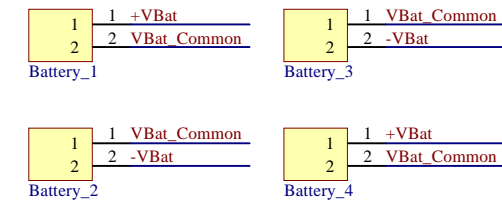
## RTD SENSORS CONNECTIONS



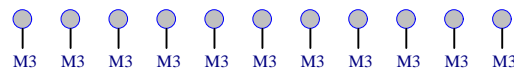
## HEATER CONNECTION



## BATTERIES' PADS



## MECHANICAL HOLES



SpaceLab - Federal University of Santa Catarina

Project: *bat2\_project.prjpcb* / [No Variations]Title: *Batteries pads and connectors*

Designed by: *Amanda Batista Medeiros*

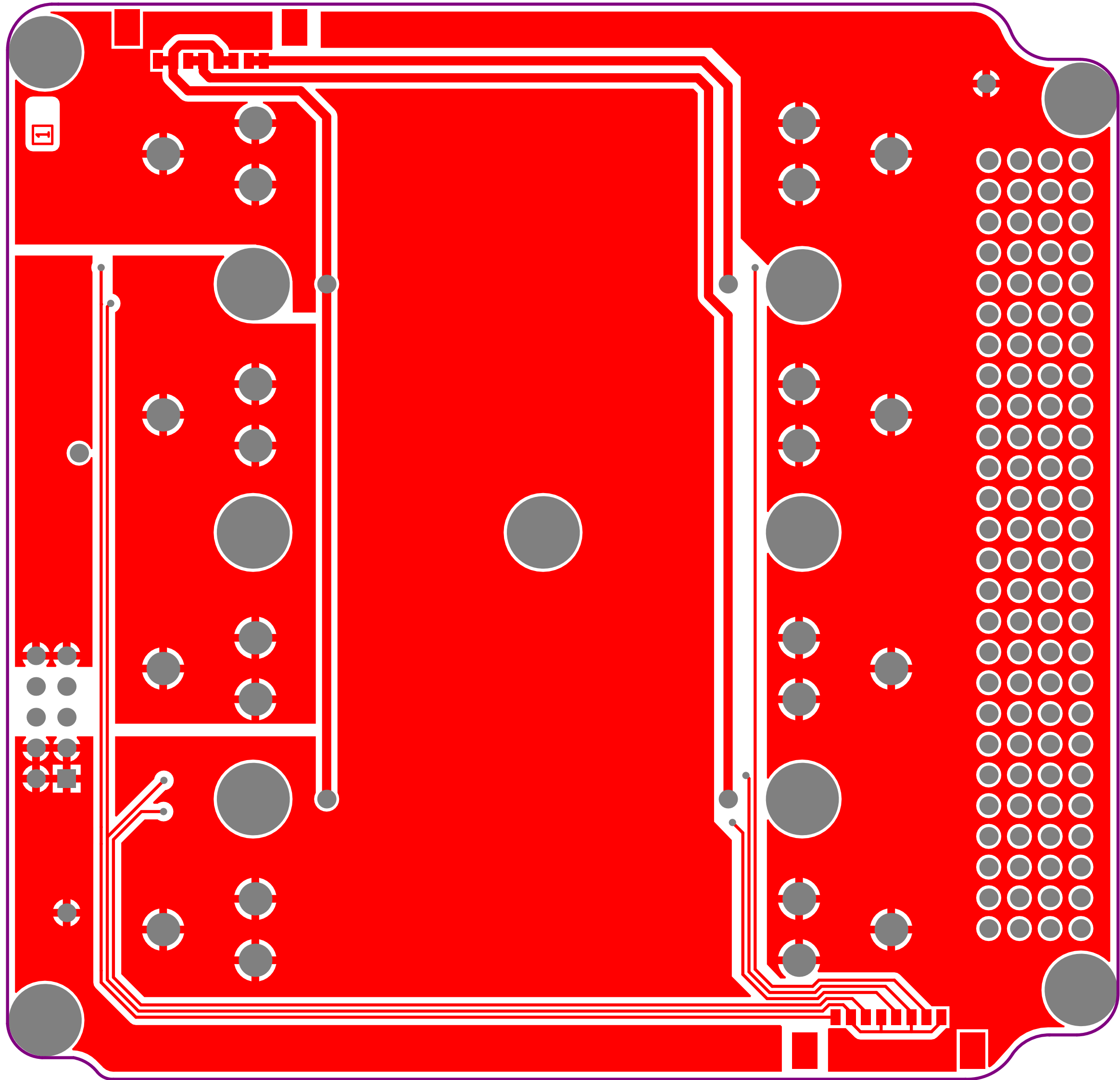
Date: 1/21/2021

Revision: *v0.1*

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Project Code: *BAT2*

Size: A4



Layer	Name	Material	Thickness	Constant	Board Layer Stack
1	Top Overlay				
2	Top Solder	Solder Resist	0.39mil	3.5	
3	Top Layer	Copper	1.38mil		
4	Dielectric Core	FR-4	59.06mil	4.2	
5	Bottom Layer	Copper	1.38mil		
6	Bottom Solder	Solder Resist	0.39mil	3.5	
7	Bottom Overlay				

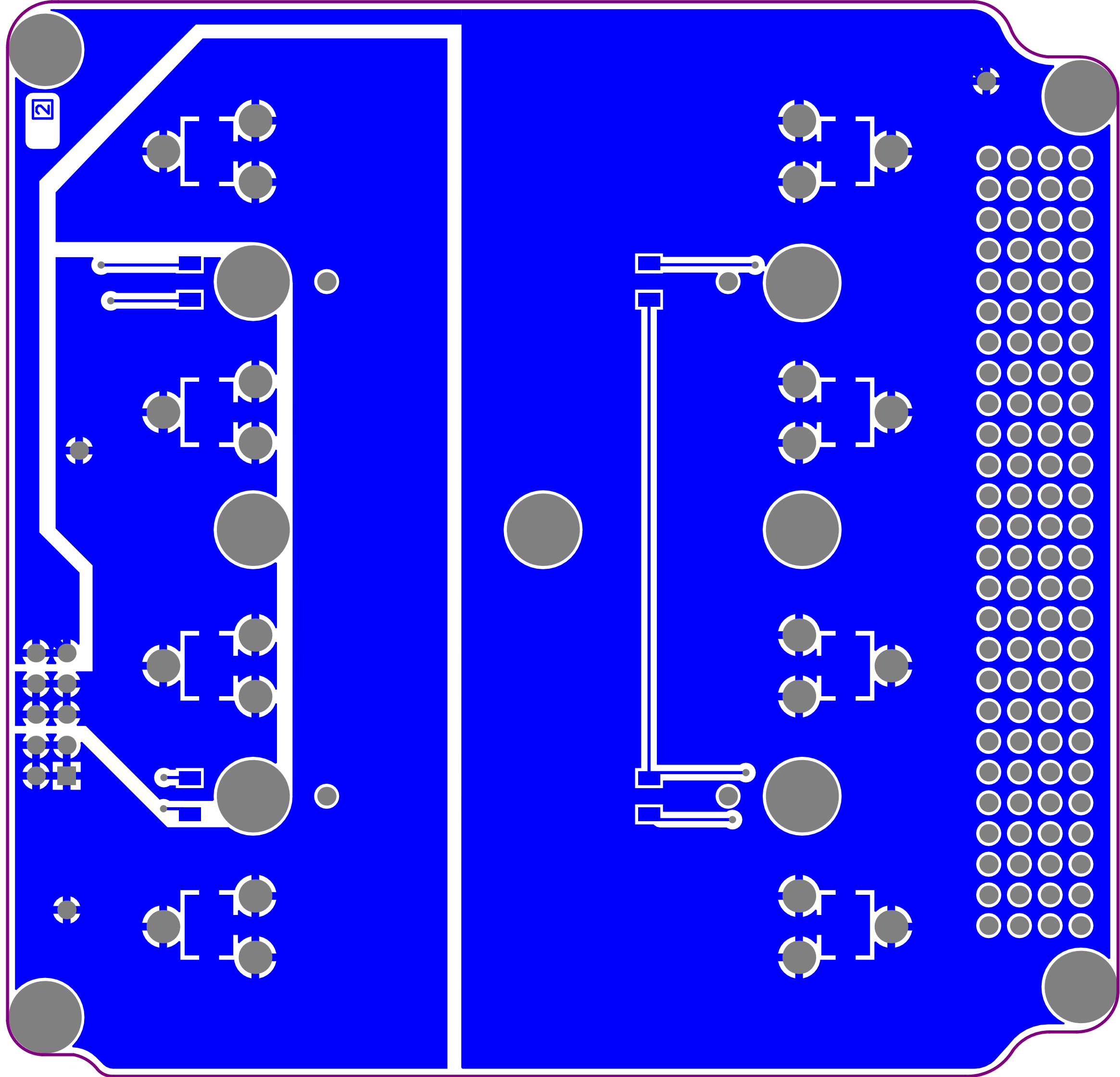
Fabrication specifications:

- Copper base 10Z:
  - PCB Material: Prepeg FR4—Standard
  - PCB Tickness: 1.6mm
  - PCB Surface: HASL (with lead)
- Silkscreen Color: White (top and bottom)
  - Soldermask Color: Green
  - Vias: Force Complete Tenting
  - Special: Stack—up (herein included)

Assembly specifications:

- Solder composition: Include lead
- Fiducials: 3 top and 3 bottom avaliable
- Check BOM for not placed components

SpaceLab - Federal University of Santa Catarina		
Project: Battery Board 4 cells		
Layer: <b>Top Layer</b>		
Designed by: Amanda B. Medeiros (based on FSat-I Bat)		Project Code: BAT2
Date: 1/21/2021	Version: v0.1	Size: A4




Layer	Name	Material	Thickness	Constant	Board Layer Stack
1	Top Overlay				
2	Top Solder	Solder Resist	0.39mil	3.5	
3	Top Layer	Copper	1.38mil		
4	Dielectric Core	FR-4	59.06mil	4.2	
5	Bottom Layer	Copper	1.38mil		
6	Bottom Solder	Solder Resist	0.39mil	3.5	
7	Bottom Overlay				

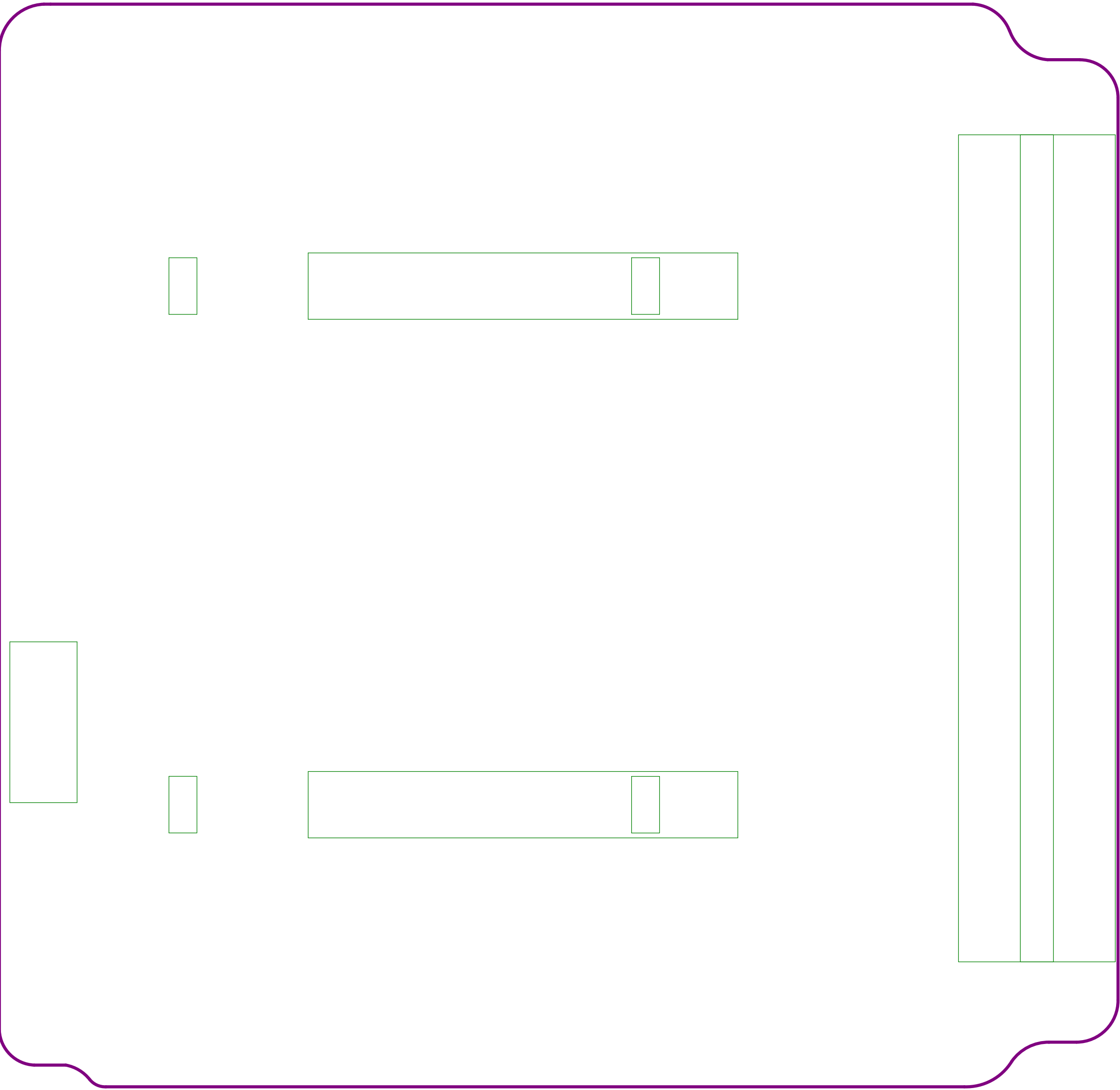
Fabrication specifications:

- Copper base 10Z:
  - PCB Material: Prepeg FR4—Standard
  - PCB Tickness: 1.6mm
  - PCB Surface: HASL (with lead)
- Silkscreen Color: White (top and bottom)
  - Soldermask Color: Green
  - Vias: Force Complete Tenting
  - Special: Stack—up (herein included)

Assembly specifications:

- Solder composition: Include lead
- Fiducials: 3 top and 3 bottom available
- Check BOM for not placed components

SpaceLab - Federal University of Santa Catarina		
Project: Battery Board 4 cells		
Layer: Bottom Layer		
Designed by: Amanda B. Medeiros (based on FSat-I Bat)		Project Code: BAT2
Date: 1/21/2021	Version: v0.1	Size: A4




Layer	Name	Material	Thickness	Constant	Board Layer Stack
1	Top Overlay				
2	Top Solder	Solder Resist	0.39mil	3.5	
3	Top Layer	Copper	1.38mil		
4	Dielectric Core	FR-4	59.06mil	4.2	
5	Bottom Layer	Copper	1.38mil		
6	Bottom Solder	Solder Resist	0.39mil	3.5	
7	Bottom Overlay				

Fabrication specifications:

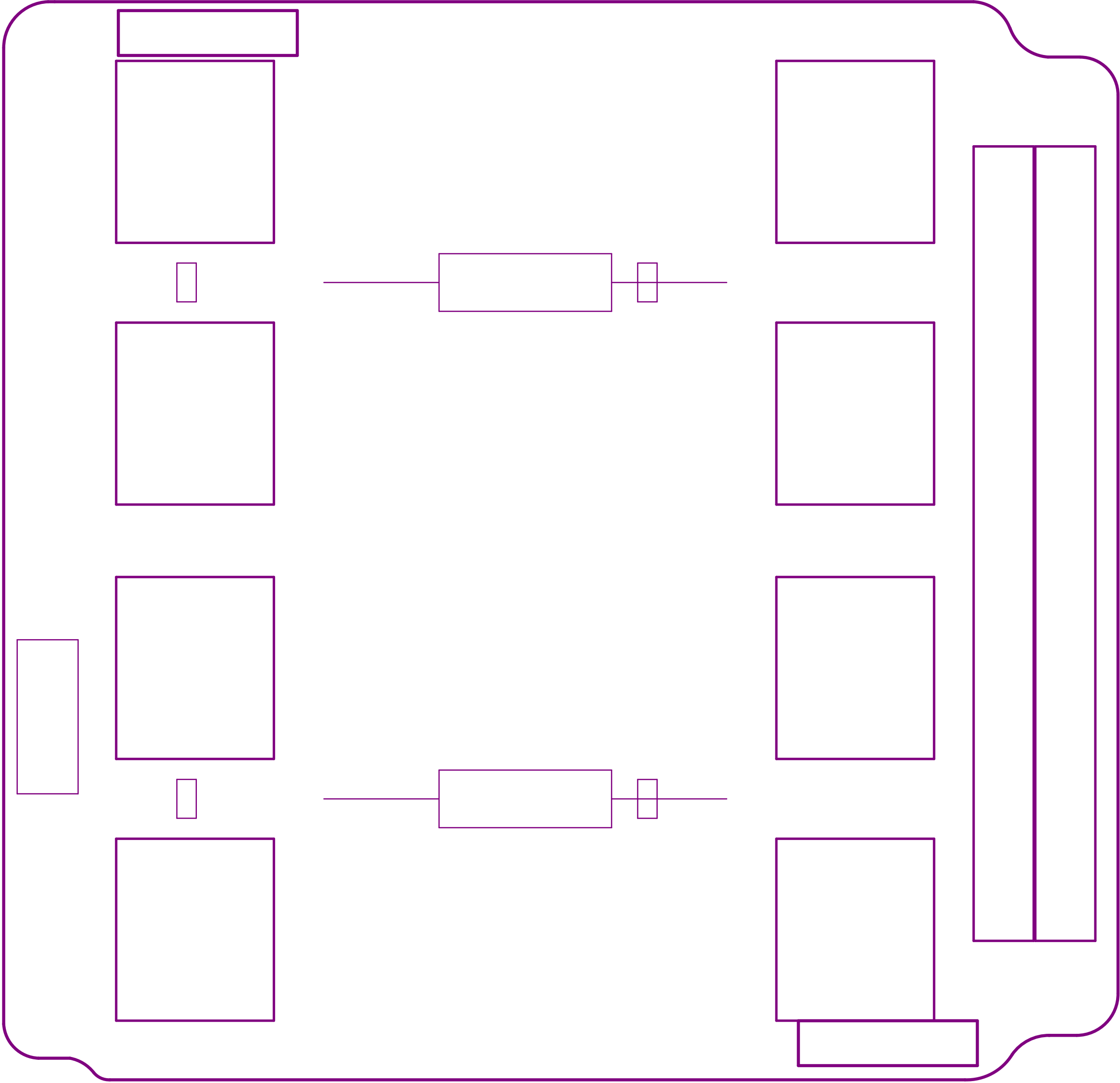
- Copper base 10Z:
  - PCB Material: Prepeg FR4—Standard
  - PCB Tickness: 1.6mm
  - PCB Surface: HASL (with lead)
- Silkscreen Color: White (top and bottom)
  - Soldermask Color: Green
  - Vias: Force Complete Tenting
  - Special: Stack—up (herein included)

Assembly specifications:

- Solder composition: Include lead
- Fiducials: 3 top and 3 bottom available
- Check BOM for not placed components

SpaceLab - Federal University of Santa Catarina		
Project: Battery Board 4 cells		
Layer: Mechanical 15		
Designed by: Amanda B. Medeiros (based on FSat-I Bat)		Project Code: BAT2
Date: 1/21/2021	Version: v0.1	Size: A4






Layer	Name	Material	Thickness	Constant	Board Layer Stack
1	Top Overlay				
2	Top Solder	Solder Resist	0.39mil	3.5	
3	Top Layer	Copper	1.38mil		
4	Dielectric Core	FR-4	59.06mil	4.2	
5	Bottom Layer	Copper	1.38mil		
6	Bottom Solder	Solder Resist	0.39mil	3.5	
7	Bottom Overlay				

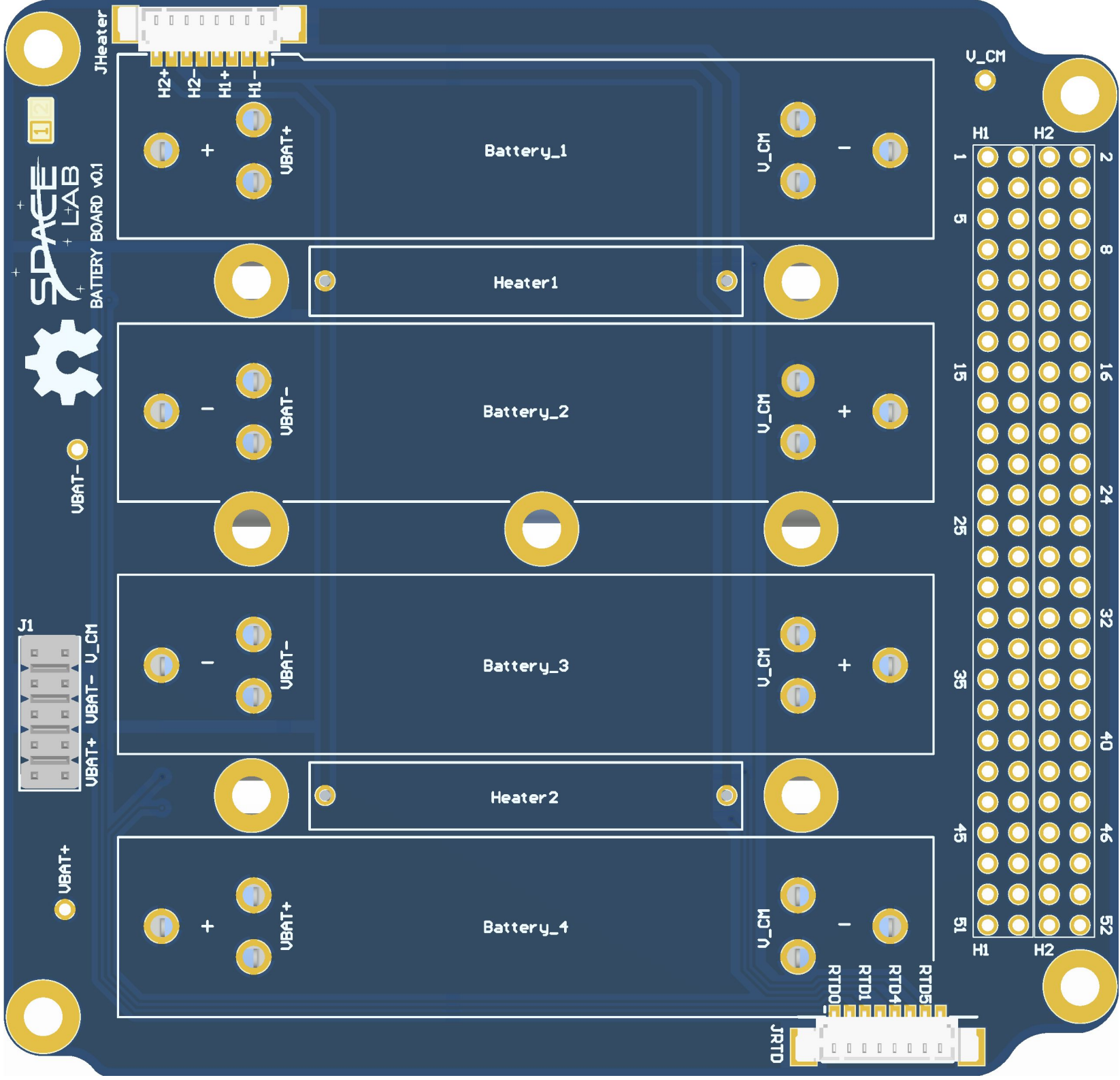
Fabrication specifications:

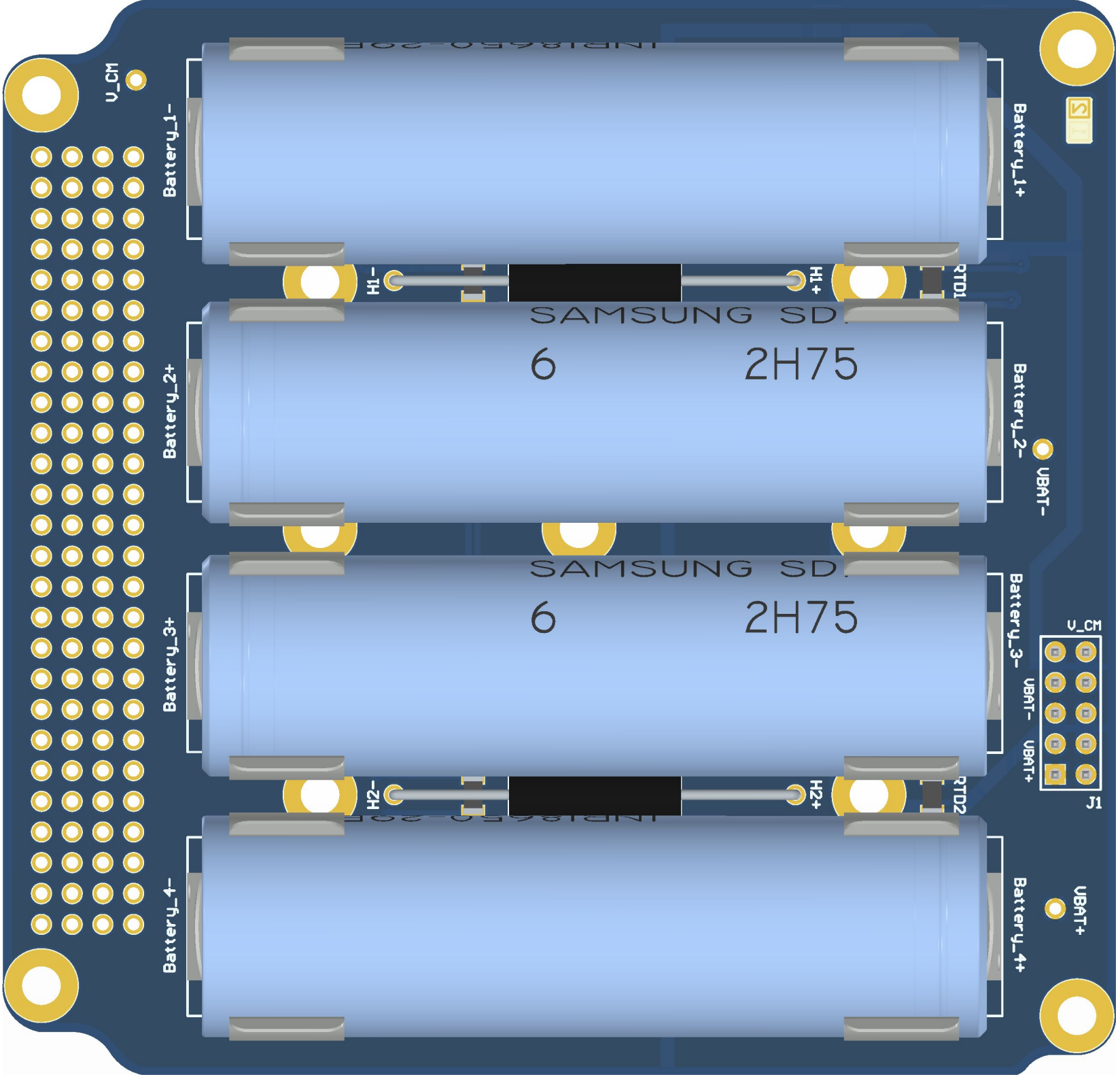
- Copper base 10Z:
  - PCB Material: Prepeg FR4—Standard
  - PCB Tickness: 1.6mm
  - PCB Surface: HASL (with lead)
- Silkscreen Color: White (top and bottom)
  - Soldermask Color: Green
  - Vias: Force Complete Tenting
  - Special: Stack—up (herein included)

Assembly specifications:

- Solder composition: Include lead
- Fiducials: 3 top and 3 bottom available
- Check BOM for not placed components

SpaceLab - Federal University of Santa Catarina		
Project: Battery Board 4 cells		
Layer: Mechanical 13		
Designed by: Amanda B. Medeiros (based on FSat-I Bat)		Project Code: BAT2
Date: 1/21/2021	Version: v0.1	Size: A4







Comment	Description	Quantity	Designator	Fitted
Holder_battery_18650	Cylindrical Battery Contacts, Clips, Holders & Springs 16- 19mm PC BATTERY CLIP	8	Battery_1-, Battery_1+, Battery_2-, Battery_2+, Battery_3-, Battery_3+, Battery_4-, Battery_4+	Fitted
32207595	Board Mount Temperature Sensors SMD1206(V) Pt 1000 Class B -50 to +130C	4	RTD1, RTD2, RTD3, RTD4	Fitted
TEST_POINT	Test Point - Headers & Wire Housings .100" Terminal Strip	3	V_CM, VBAT-, VBAT+	Fitted
24R/3W	Wirewound Resistors - Through Hole 3watts 24ohms 1%	2	Heater1, Heater2	Fitted
ESQ-126-39-G-D	PC / 104 Connectors .100" PC/104 Elevated Socket Strip	2	PC104A, PC104B	Fitted
Header 8_PicoBlade	Headers & Wire Housings VERTICAL HDR SMT 8P	2	JHeater, JRTD	Fitted
Header 10_pos	Connector	1	J1	Fitted