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. Azeredo

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

Project info

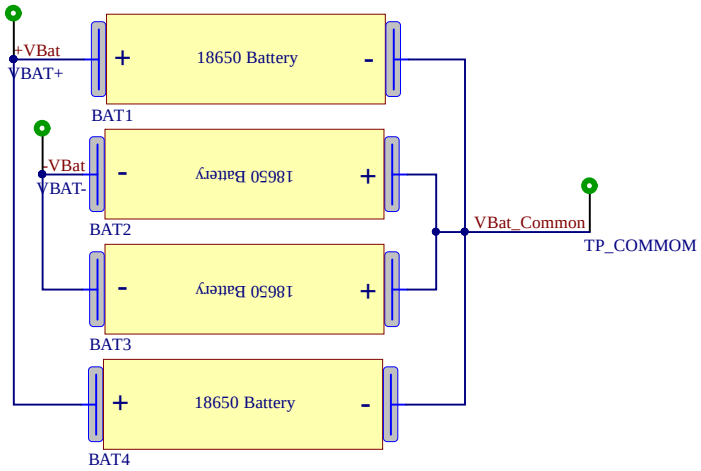
Rev	Description	Date	Author
0.1	- Initial release - Hardware improvements and fixes based on the first EPS batteries board - Charge capacity increase, from 2 batteries (series) to 4 baterries (series/parallel)	04-Oct-2020	Andre M. P. Mattos
0.2	- Updating battery contacts now using nickel strip pads - RTDs repositioning - New battery mechanical case mouting holes - Removing PC104 interface	16-Jun-2021	Yan C. Azeredo

Revision History

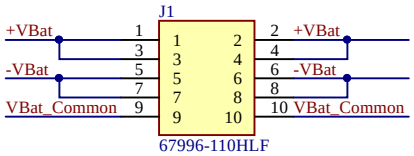
Block Diagram

SpaceLab - Federal University of Santa Catarina			
Project: *bat2_project.prjpcb / [No Variations]*			
Title: *Poject's info and block diagram*			
Designed by: *Amanda B. Medeiros*			Project Code: *BAT4C*
Date: 6/16/2021	Revision: *v0.2*	Sheet *1* of *2*	Size: A4

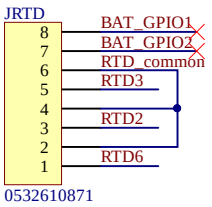
BATTERIES CONNECTIONS



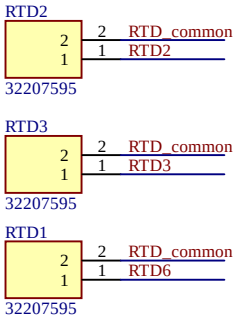
BATTERIES BOARD TO BOARD CONNECTOR TO EPS



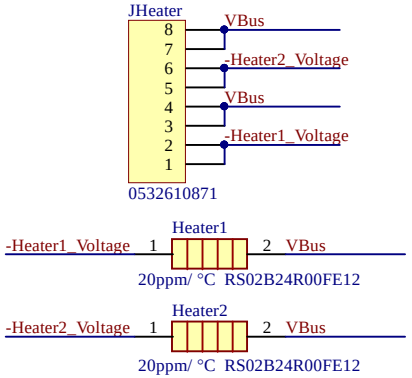
PICOBLADE INTERFACE



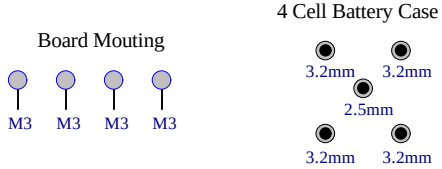
RTD SENSORS



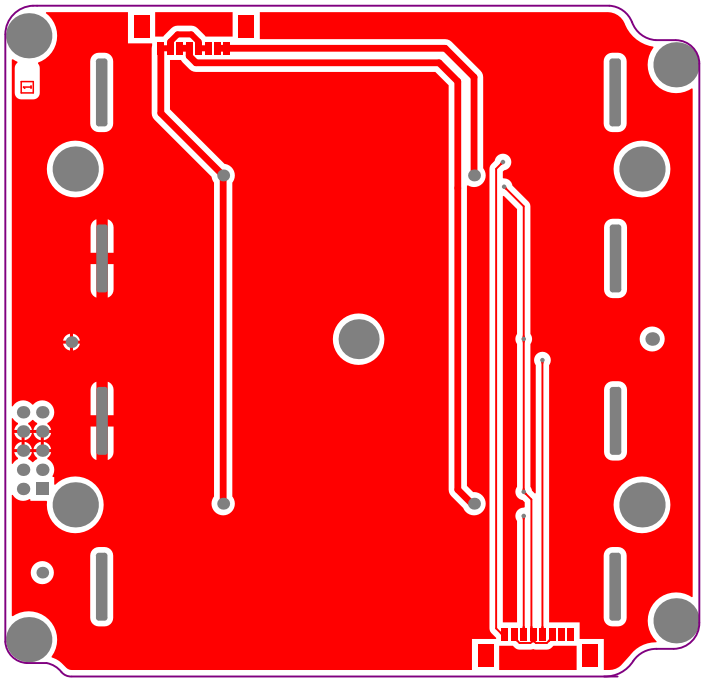
HEATER CONNECTION



MECHANICAL HOLES



SpaceLab - Federal University of Santa Catarina			
Project: *bat2_project.prjpcb / [No Variations]*			
Title: *Batteries pads and connectors*			
Designed by: *Amanda B. Medeiros*			Project Code: *BAT4C*
Date: 6/16/2021	Revision: *v0.2*	Sheet *2* of *2*	Size: A4



Layer	Name	Material	Thickness	Constant	Board Layer Stack
1	Top Overlay				
2	Top Solder	Solder Resist	0.010mm	3.5	
3	Top Layer	Copper	0.035mm		
4	Dielectric Core	FR-4	1.500mm	4.2	
5	Bottom Layer	Copper	0.035mm		
6	Bottom Solder	Solder Resist	0.010mm	3.5	
7	Bottom Overlay				

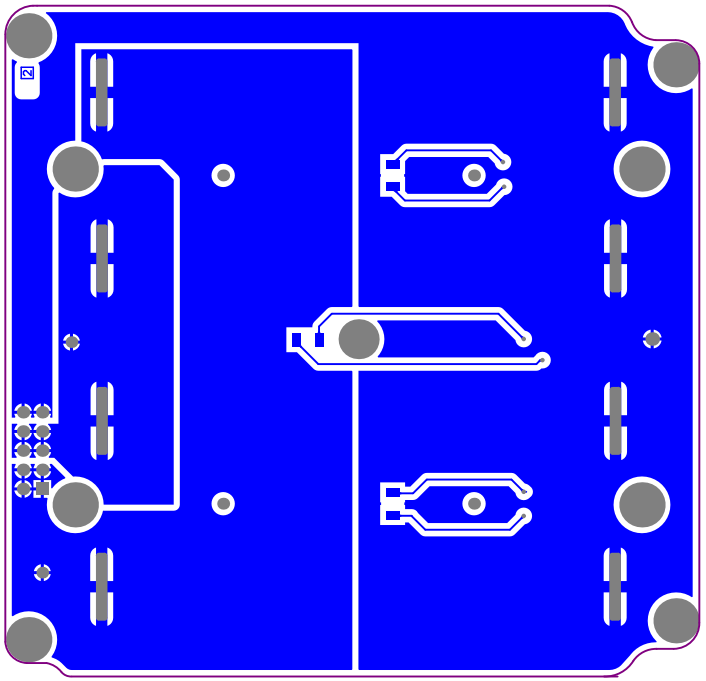
Fabrication specifications:

- Copper base 1OZ:
- 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
- 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		SPACELAB
Project: Battery Board 4 cells		
Layer: Top Layer Board Edge		
Designed by: Amanda B. Medeiros (based on FSat-I Bat)		Project Code: BAT4C
Date: 6/16/2021	Version: v0.2	Size: A4



Layer	Name	Material	Thickness	Constant	Board Layer Stack
1	Top Overlay				
2	Top Solder	Solder Resist	0.010mm	3.5	
3	Top Layer	Copper	0.035mm		
4	Dielectric Core	FR-4	1.500mm	4.2	
5	Bottom Layer	Copper	0.035mm		
6	Bottom Solder	Solder Resist	0.010mm	3.5	
7	Bottom Overlay				

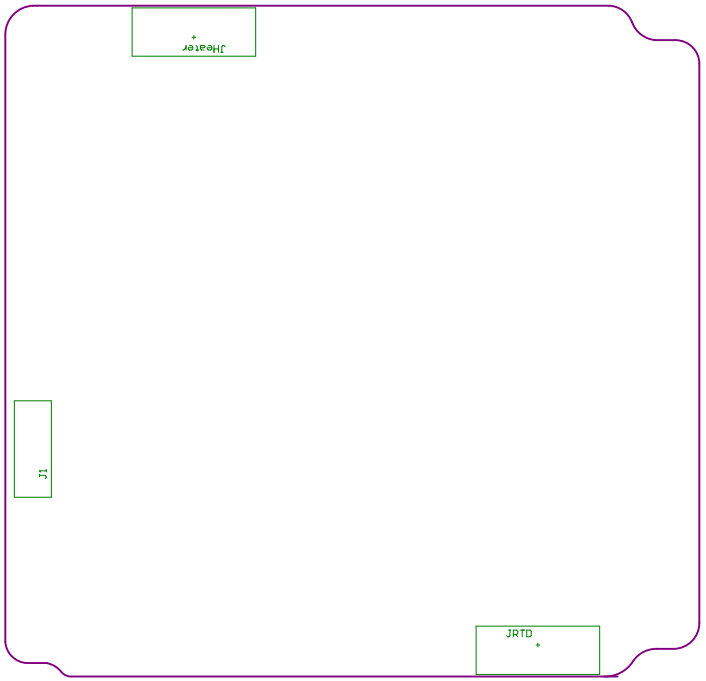
Fabrication specifications:

- Copper base 1OZ:
- 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
- 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		SPACELAB
Project: Battery Board 4 cells		
Layer: Bottom Layer Board Edge		
Designed by: Amanda B. Medeiros (based on FSat-I Bat)		Project Code: BAT4C
Date: 6/16/2021	Version: v0.2	Size: A4



Layer	Name	Material	Thickness	Constant	Board Layer Stack
1	Top Overlay				
2	Top Solder	Solder Resist	0.010mm	3.5	
3	Top Layer	Copper	0.035mm		
4	Dielectric Core	FR-4	1.500mm	4.2	
5	Bottom Layer	Copper	0.035mm		
6	Bottom Solder	Solder Resist	0.010mm	3.5	
7	Bottom Overlay				

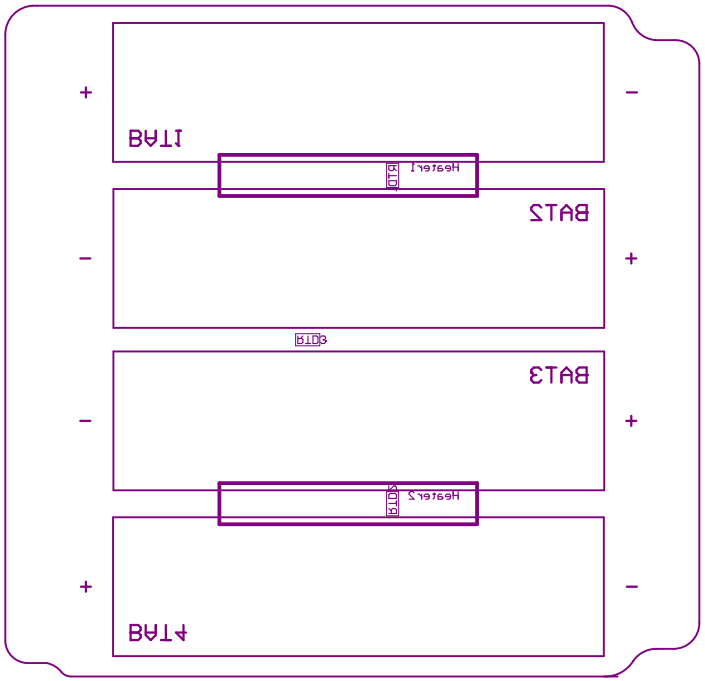
Fabrication specifications:

- Copper base 1OZ:
- 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
- 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		SPACELAB
Project: Battery Board 4 cells		
Layer: ASM Top Board Edge		
Designed by: Amanda B. Medeiros (based on FSat-I Bat)		Project Code: BAT4C
Date: 6/16/2021	Version: v0.2	Size: A4



Layer	Name	Material	Thickness	Constant	Board Layer Stack
1	Top Overlay				
2	Top Solder	Solder Resist	0.010mm	3.5	
3	Top Layer	Copper	0.035mm		
4	Dielectric Core	FR-4	1.500mm	4.2	
5	Bottom Layer	Copper	0.035mm		
6	Bottom Solder	Solder Resist	0.010mm	3.5	
7	Bottom Overlay				

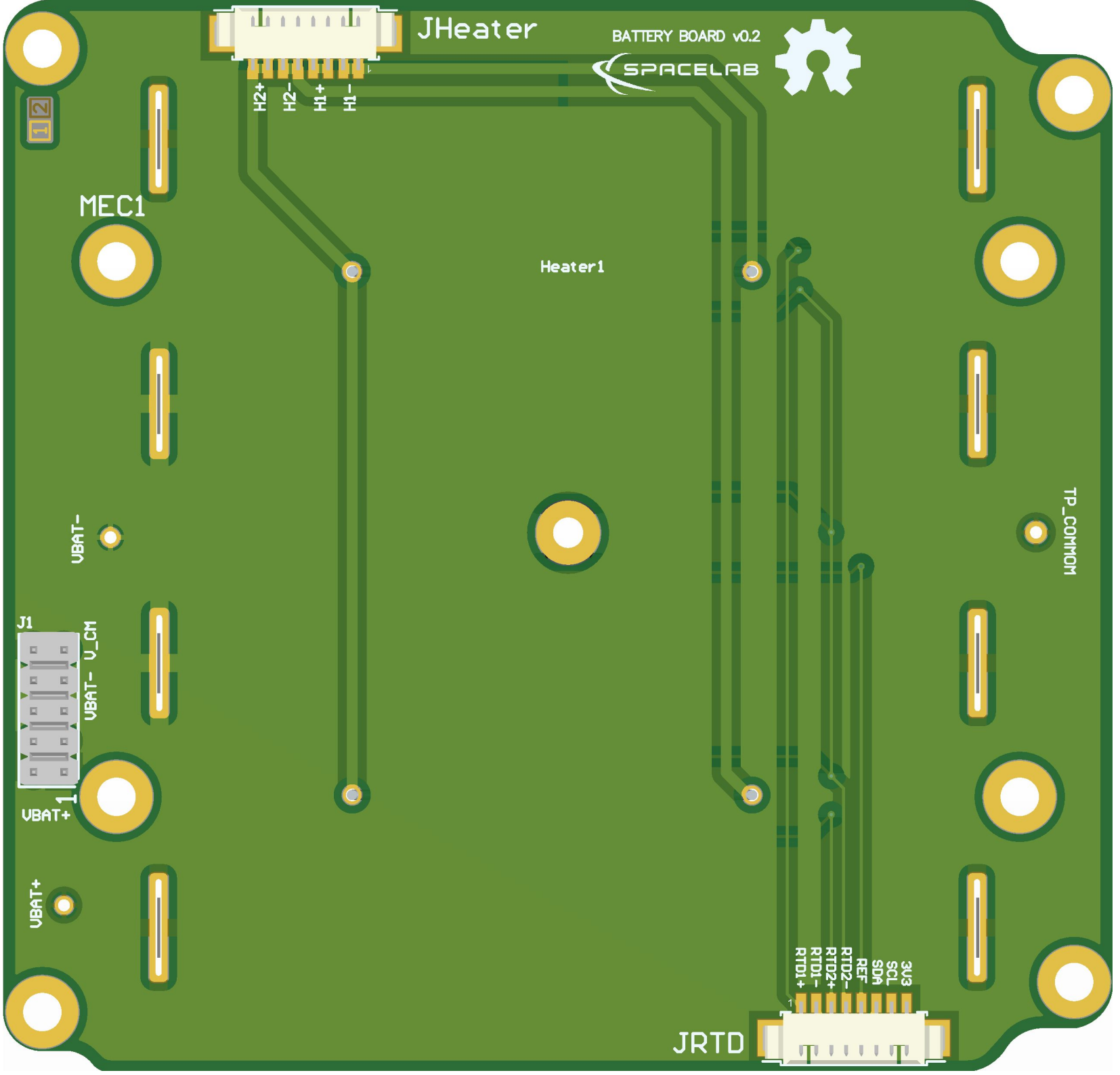
Fabrication specifications:

- Copper base 1OZ:
- 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
- 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		SPACELAB
Project: Battery Board 4 cells		
Layer: ASM Bottom Board Edge		
Designed by: Amanda B. Medeiros (based on FSat-I Bat)		Project Code: BAT4C
Date: 6/16/2021	Version: v0.2	Size: A4


JHeater
H2+
H2-
H1+
H1-
BATTERY BOARD v0.2
SPACELAB
MEC1
Heater1
VBAT-
TP_COMMOM
J1
VBAT- V_CM
1
VBAT+
VBAT+
3V3
SCL
SDA
REF
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RTD1+
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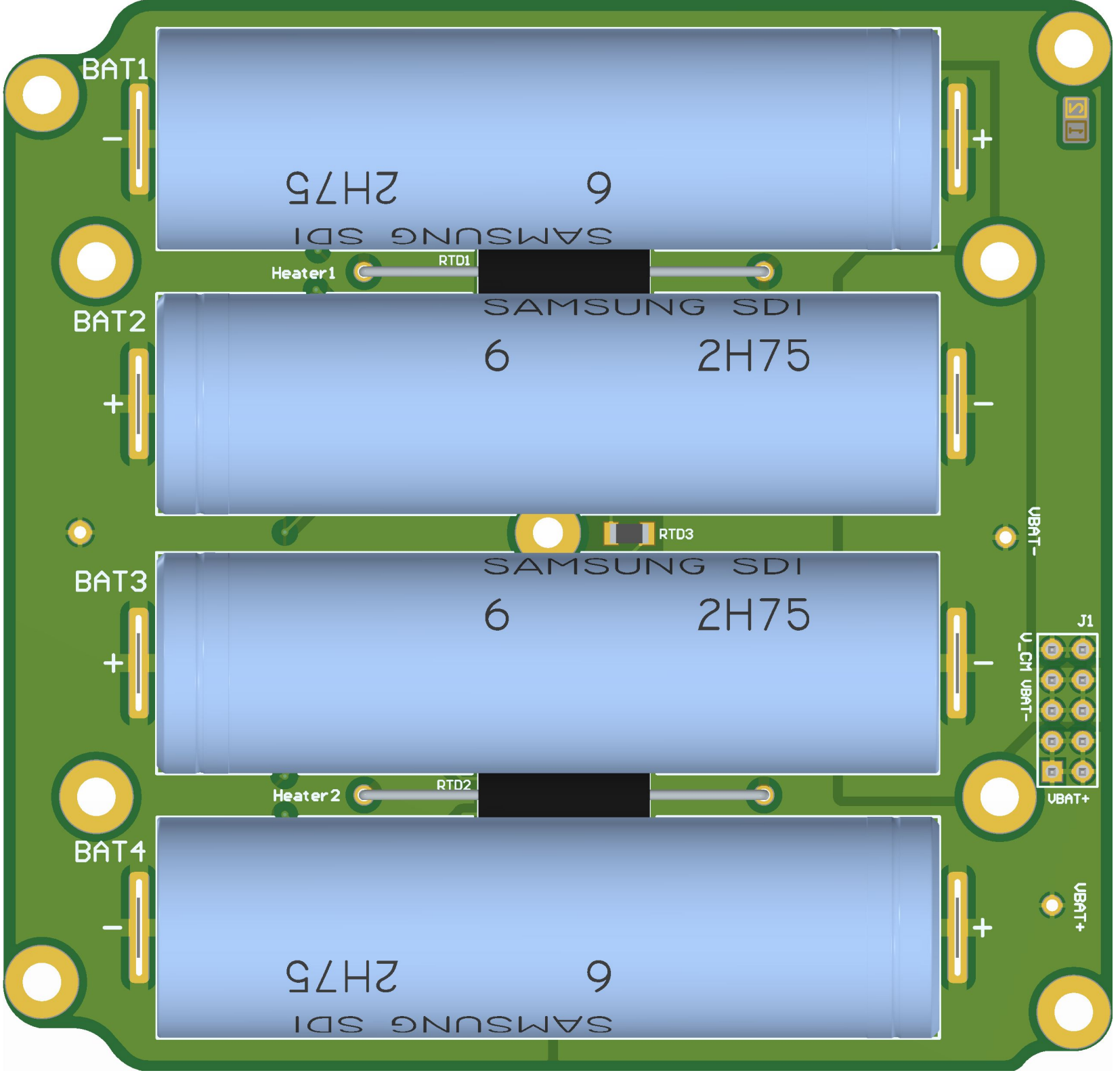
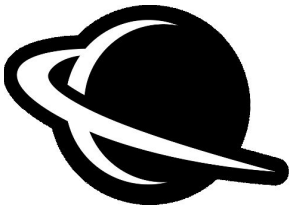
JRTD


BAT1
BAT2
BAT3
BAT4
SAMSUNG SDI
6
2H75
Heater1
RTD1
Heater2
RTD2
RTD3
VBAT-
VBAT+
J1
V_CM
VBAT-
VBAT+



Bill of Materials

Source Data From:	bat2_project.prjpcb	
Project:	bat2_project.prjpcb	
Variant:	None	
Project Code:	BAT4C	
Report Date:	6/16/2021	4:24:28 PM
Print Date:	16/06/2021	16:24:33

#	Designator	Quantity	mn Name Error:Manufa	umn Name Error:Manufacturer Part Nu	Partnumber	Description	olumn Name Error:Pa	olumn Name Error:Foo	lumn Name Error	Fitted
1	RTD1, RTD2, RTD3	3			32207595	1 kOhms RTD Platinum (Pt) ±0.3% 3850ppm/°C 1206 (3216 Metric)				Fitted
2	JHeater, JRTD	2			53261-0871	PicoBlade 8 Position Right Angle Connector Header Surface Mount 0.049" (1.25mm)				Fitted
3	Heater1, Heater2	2			RS02B24R00FE12	Wirewound Resistors - Through Hole 3watts 24ohms 1%				Fitted
4	J1	1			67996-110HLF	Headers & Wire Housings 2X5P UNSHRD HDR 30 microinch gold				Fitted