

UNIVERSITY OF CAPE TOWN



EEE3088F

PEER REVIEW OF GROUP 19'S PCB DISCOVERY HAT

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GROUP 18

JONATHAN APPS (APPJON001)

SHAMEERA CASSIM (CSSSHA020)

JAHAR PERSAD (PRSJAH002)

1. Adherence to Mr. Pead's Basic Requirements

Unacceptable

Ok attempt

Reasonable

Good

Excellent

1

2

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			4.8	
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Comment:

Requirement	Met?
1. (at least) 1x digital sensor (some communication port)	Yes
2. (at least) 1x analog sensor (ADC input)	Yes
3. An 18650 connector (Do Not Populate - Link provided on Padlet)	Yes
4. A Li-Ion battery charger	Yes
5. Input voltage polarity protection	Yes
6. Battery polarity protection	Yes

7. Battery Under-voltage cutout protection	Yes
8. (Soft requirement) Modularity between perceived elements to allow for bypassing to ensure you meet partial mark requirements in the event of module failure.	Yes, the 3 modules are connected by a single wire and can be disconnected. They also have several 0 ohm resistors.
9. USB micro connector, detect and input and have an onboard FTDI - USB connector LCSC number provided on Padlet	Yes
10. Working in teams of 3 each team will have a budget of R1500 for all components, manufacture, assembly and shipping. Currently, this is approximately \$100 (useful to think in USD as the part prices are listed in such)	The BOM appears to be accurate and the team comes in under budget for the total including extended parts. It was assumed that the \$24 for the extended parts is not included in the \$26.999 for the 5 boards and that assembly costs will be added at a later stage. (costs of assembling SMT parts need to be added).
11. Each team member must take the lead in 1 submodule: <ul style="list-style-type: none"> - Power management - Microcontroller interfacing - Sensing 	Yes

Comment: The team has met the requirements well and their documentation is good.

2. Adherence to Mr Pead's Debugger Requirements

Unacceptable

Ok attempt

Reasonable

Good

Excellent

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Comment:

Requirement	Met?
1. Input 5V - This is to provide high level power to your board.	No test point
2. Analog Data - This is to both see what your sensor outputs and to push a signal into your board. If we are to push an analog voltage you need to ensure we don't destroy your sensor (So maybe a jumper to disconnect)	Yes
3. Depending on what digital communication port you chose, I allowed for 4 pins.	Yes
4. Plug Detect is your USB detect line - which we can control and monitor to change your devices operation	Yes

5. The data the device is sending out. (will need to disconnect the FTDI - Think Jumpers)	Yes
6. GND	Yes

3. Schematic

Unacceptable	Ok attempt	Reasonable	Good	Excellent
1	2	3	4	5

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Comment:

The schematic was well laid out and had clear explanations for each part of each submodule. It's easy to follow and very well labeled.

4. PCB Layout

Is the PCB neatly laid out, does it appear care has been taken regarding trace location, routing, and thickness?

Unacceptable	Ok attempt	Reasonable	Good	Excellent
1	2	3	4	5

			4.5	
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Comment:

Overall, the pcb looks good. There are long traces that could be shortened. Shortening the traces would have provided the design with enhanced predictability, since power losses are minimized with short traces. It is clear that the thickness of the tracks have been considered, and that the routing is done in such a way as to simplify the HAT layout.

5. Silk Screen

Unacceptable	Ok attempt	Reasonable	Good	Excellent
1	2	3	4	5

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Comment:

There is a silkscreen that would make an engineer's life easier, since it includes annotation of components and test points that can be compared to the schematic. However, it will not be very useful for a user without technical knowledge of the circuit. A few of the labels are also underneath traces which will be an issue.

6. Low Voltage Protection Circuit

Unacceptable	Ok attempt	Reasonable	Good	Excellent
1	2	3	4	5

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Comment:

Nicely done!

7. Physical Board Design

Unacceptable	Ok attempt	Reasonable	Good	Excellent
1	2	3	4	5

			4	
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Comment:

Space could've been used more efficiently!

8. Test Points and Recovery Approaches

Unacceptable	Ok attempt	Reasonable	Good	Excellent
1	2	3	4	5

			4.8	
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Comment:

There are sufficient test points which give access to important parts of the circuit for debugging. It would be valuable to have an additional test point to monitor the 5V line out of the voltage regulator (power submodule).