5327R

Anycubic Photon 3d Printer

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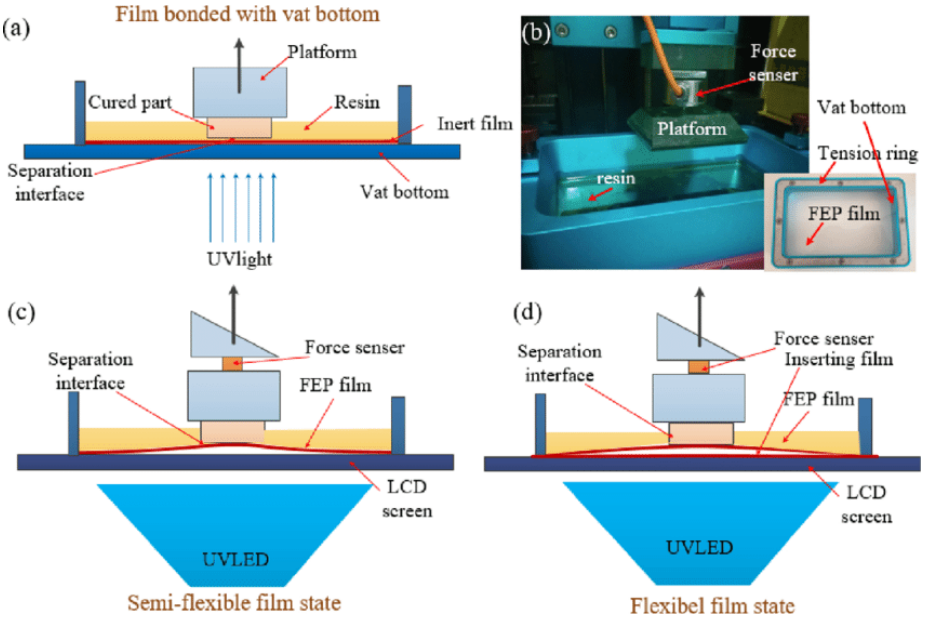
Intro:

Our team had a nice high quality 3d printer, and it WAS nice, until it broke. We were very disappointed about this, until we came across this engineering challenge. The one we use is called the Anycubic Photon is a popular resin-based 3D printer that utilizes a technique called stereolithography (SLA) to create highly detailed and accurate models. The process involves using a UV laser to cure liquid resin, layer by layer, into a solid object. The Anycubic Photon was chosen for this project because of its popularity in the 3D printing community and its unique technology which utilizes stereolithography (SLA) to create highly detailed and accurate models.

Approach:

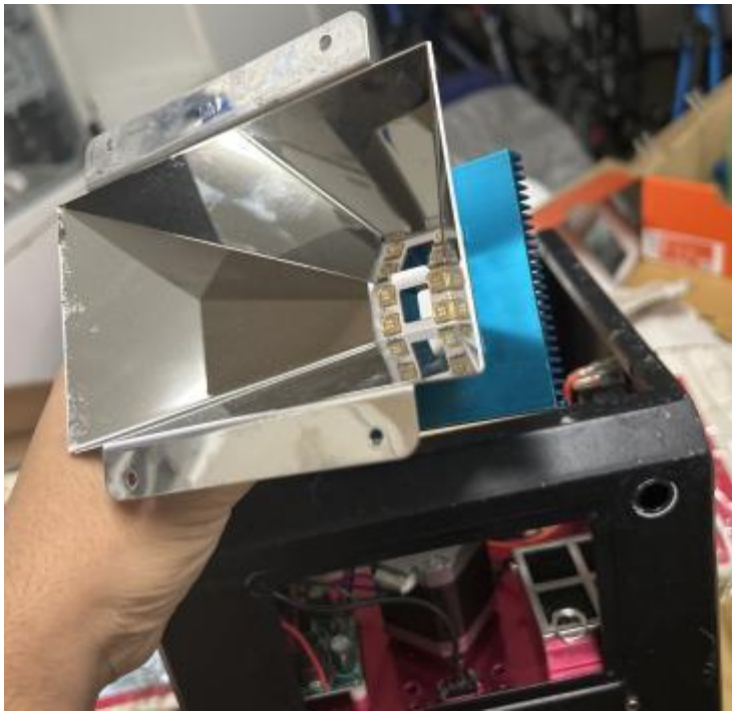


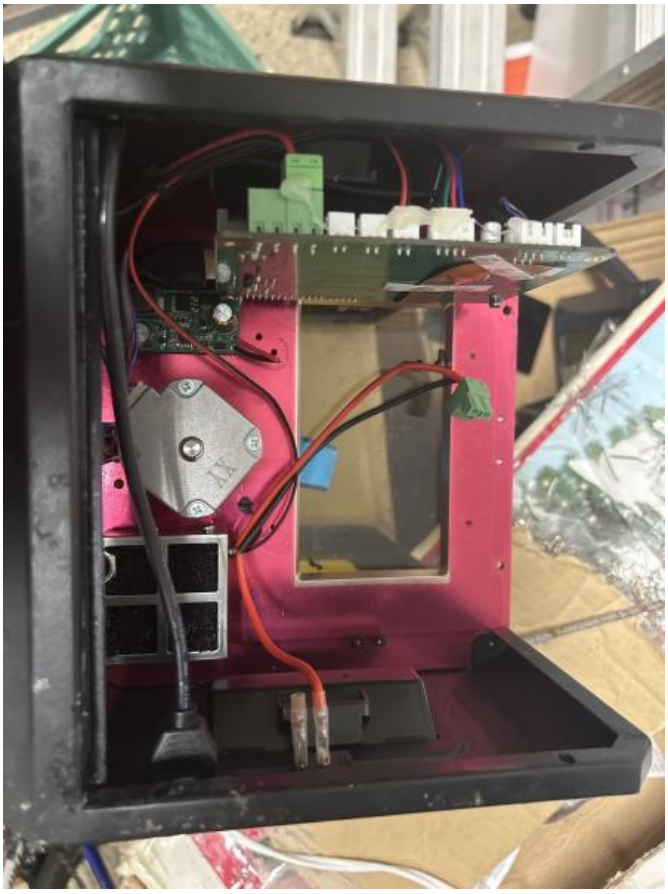
The approach taken for this project was to first research the Anycubic Photon 3D printer, its components, and the technology it uses. This provided a solid foundation of knowledge that was necessary for the disassembly process.

The next step was to gather the necessary tools for disassembling the printer, including a screwdriver set and a scraper and other various tools.

The disassembly process was then undertaken, starting with the removal of the build platform, followed by the resin vat and the UV laser.

The UV laser was then disassembled to reveal the lens and diode. Finally, the build platform and resin vat were disassembled to reveal their internal components.





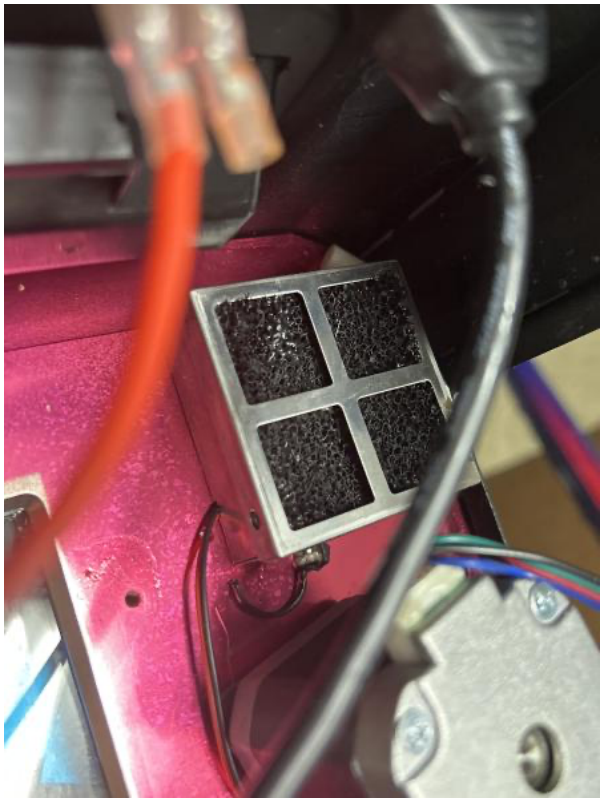
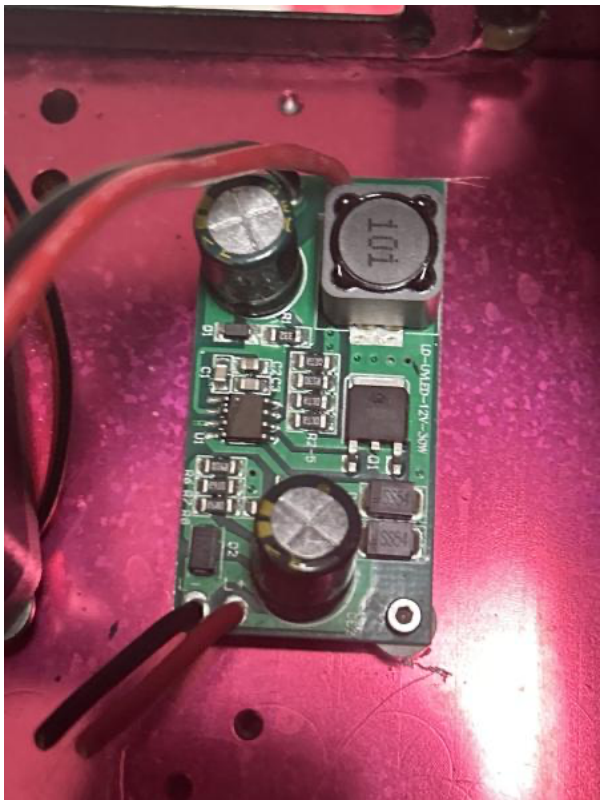
As the disassembly process progressed, notes and photographs were taken to document each step. These notes and photographs were later used to create a detailed record of the disassembly process, including the location and function of each component.

Throughout the disassembly process, care was taken to ensure that the printer was handled gently and that all screws and components were properly labeled and kept in order to aid in reassembling the printer if needed.

It is important to note that the process of disassembling a 3D printer can be complex and may require specialized knowledge and experience. Additionally, disassembling the printer may void the warranty, so it is important to check the manufacturer's instructions and warranty information before proceeding.

Components:

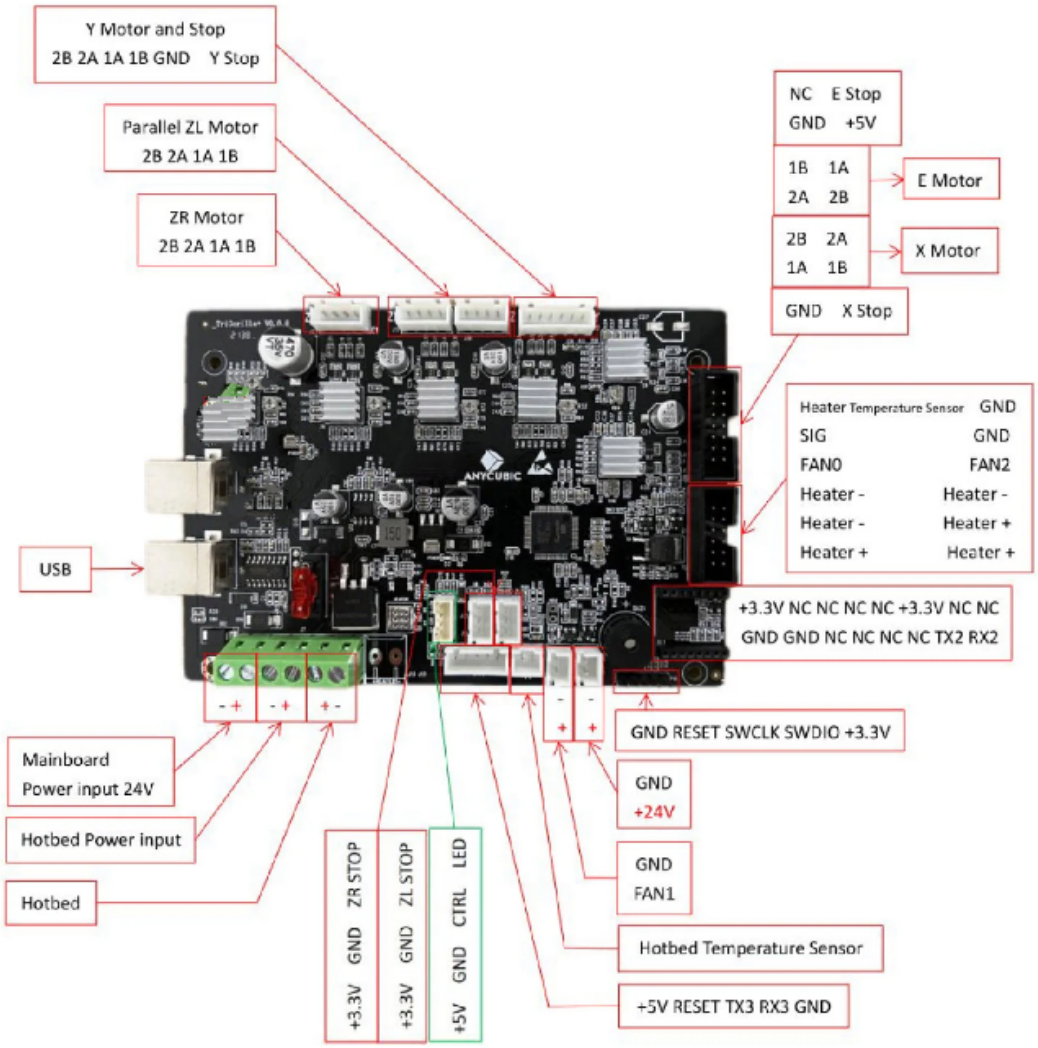
Description	Image
UV Radiation Shields (UV radiation Danger)	

Carbon Resin Filters (Resin is harmful to breathe in)	
Amperage Step-Up Unit (Allow Higher Current Draw)	

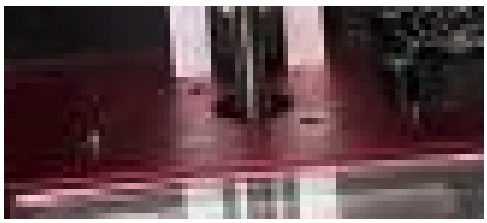
Resin Vat (stores resin while printing)	
4k Printing LCD (lets UV light through)	

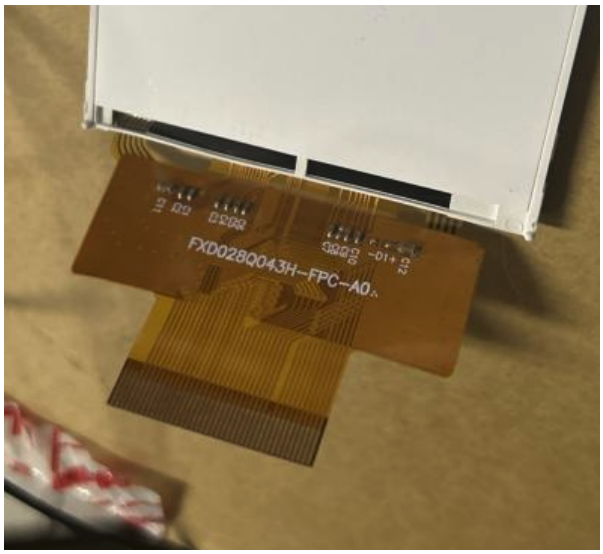
User Touchscreen + Backlight	
Bottle of Resin	

Motherboard Breakdown/Schematic:

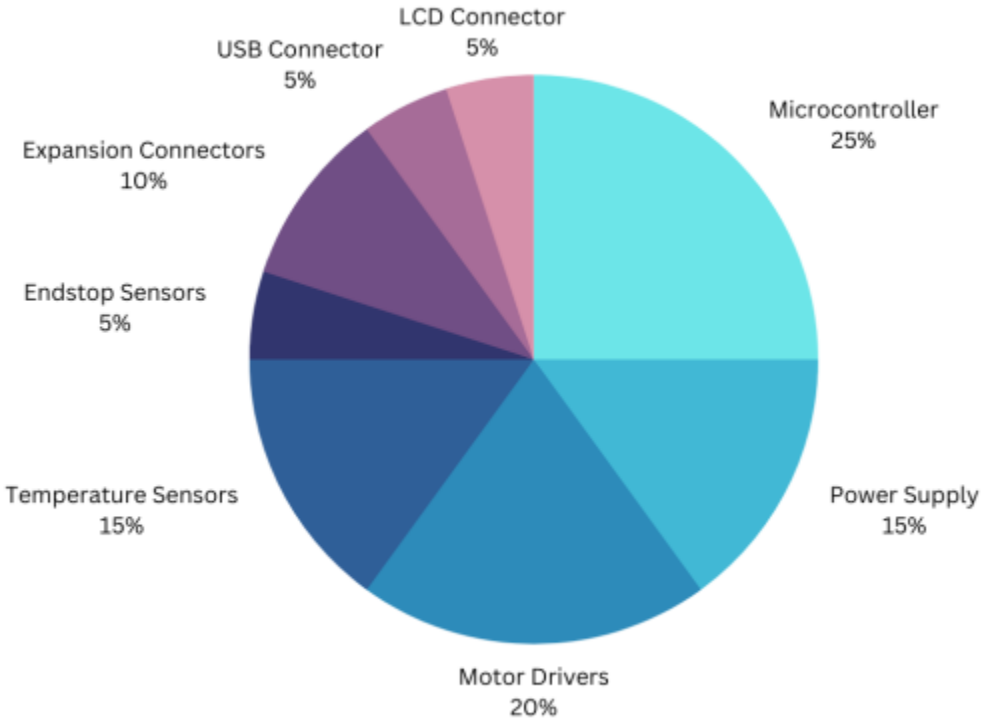


The Chitu V1 Mainboard is a motherboard specifically designed for use in 3D printers. It is known for its high performance and ease of use. The specific components of the Chitu V1 Mainboard include:

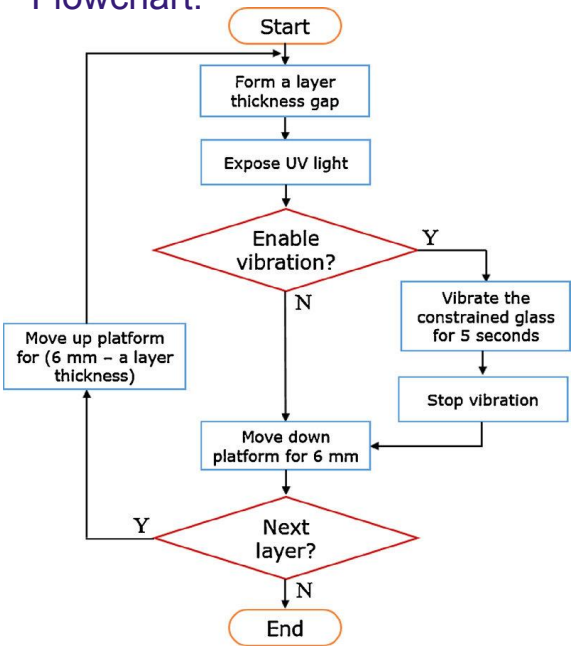
Microcontroller: This component is the brain of the motherboard and controls the various functions of the printer, including communication with other components. The Chitu V1 Mainboard uses the STM32F103ZET6 microcontroller.	
Power Supply: This component provides power to the other components of the motherboard. The Chitu V1 Mainboard uses a 12V input voltage and supports power supply of up to 50A.	(External)
Motor Drivers: These components control the movement of the printer's motors, including the movement of the build platform and the extruder. The Chitu V1 Mainboard uses the TMC2130 stepper motor driver.	
Temperature Sensors: These components monitor the temperature of the extruder and the build platform. The Chitu V1 Mainboard uses the NTC 100K thermistor.	(Its inbuilt into the fan system, which contains lead and for safety reasons we will not take apart)
Endstop Sensors: These components detect the position of the printer's motors and provide feedback to the microcontroller. The Chitu V1 Mainboard supports mechanical and optical endstop sensors.	
Expansion Connectors: These connectors allow for the addition of other components to the motherboard, such as additional stepper drivers or thermistors. The Chitu V1 Mainboard has connectors for thermistors, stepper drivers, and endstops.	

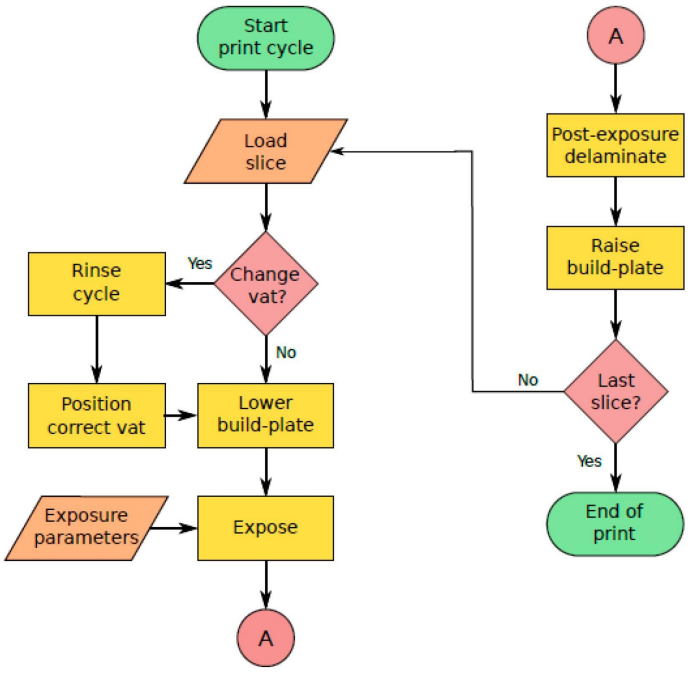
USB Connector: This component allows the printer to be connected to a computer for control and firmware updates.	
LCD Connector: This component allows the motherboard to connect to an external LCD display for control and status monitoring.	

Component Analysis:



Flowchart:

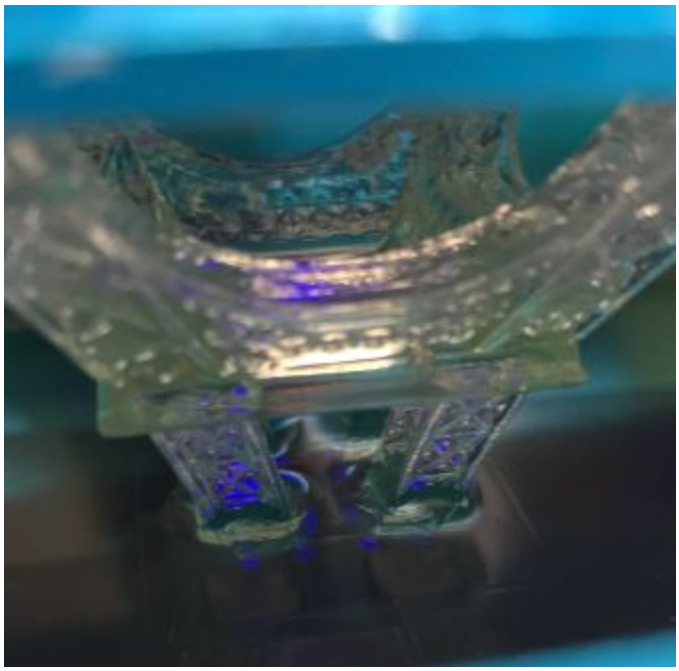




Findings:

1. The microcontroller is a high-performance component that controls the various functions of the printer and manages communication between other components.
2. The power supply is designed to provide stable and efficient power to the other components, which is important for proper operation of the printer.
3. The motor drivers are capable of handling high current loads and provide precise control of the motors, which is essential for accurate movement of the build platform and extruder.
4. The temperature sensors are used to monitor the temperature of the extruder and build platform, which is important for ensuring that the extruder and build platform are at the correct temperature for the specific material being used and to prevent overheating which can cause damage to the printer.
5. The endstop sensors provide feedback to the microcontroller on the position of the printer's motors, allowing the microcontroller to accurately control the movement of the motors and prevent the printer from moving beyond its physical limits.
6. The expansion connectors allow for the addition of other components to the motherboard, expanding the capabilities of the printer and allowing for customization to meet specific needs.
7. The USB connector allows for easy control of the printer and allows for updates to improve the performance of the printer.
8. The LCD connector allows for connection to an external display, which provides real-time information of the status of the printer and allows for easy monitoring of the printing process.
9. The Chitu V1 Mainboard uses high-quality components such as the STM32F103ZET6 microcontroller, TMC2130 stepper motor driver, and NTC 100K thermistor which ensures high performance and precision of the printer.
10. The motherboard is designed to be user-friendly with clear labeling and easy access to the various components and connectors.
11. The overall build quality of the motherboard is high, and it appears to be well-constructed and durable.
12. The motherboard has a good layout that allows for easy access to the various components, which makes it easier to troubleshoot and repair in case of issues.
13. It is worth noting that these are just examples and the actual findings will depend on the specific model and the condition of the printer.

Also, in the end, we even got it working as we found out the issue, one of the power wires got accidently cut!



Refrences:

Anycubic's official website (https://www.anycubic.com/) - This website provides information about the company's products, including the Anycubic Photon 3D printer, as well as technical specifications, user manuals, and software updates.

Anycubic Photon User Group on Facebook (https://www.facebook.com/groups/AnycubicPhoton/) - This group is a community of users who share their experiences and knowledge about the Anycubic Photon 3D printer.

Anycubic Photon YouTube channel (https://www.youtube.com/channel/UC_uDt21LlZVh1KjvZgO-Ojw) - This channel provides video tutorials and user guides that demonstrate how to set up, use, and troubleshoot the Anycubic Photon 3D printer.

"Anycubic Photon: The Ultimate Guide" by Jules Wilson (https://www.amazon.com/Anycubic-Photon-Ultimate-Guide-ebook/dp/B08KGZQW8Q/) - This book provides a comprehensive guide to the Anycubic Photon 3D printer, including information on its features, components, and how to use it effectively.