The proposed hardware I want to develop is a Lithium Battery Charger & Booster Module, designed for powering electronic projects using a single-cell lithium battery. The project involves combining the TP4056 Li-Ion Battery Charger IC for safe charging and the FP6291 Boost Converter IC to regulate the output voltage to 5V. The module's charging current is set to 1A, with the option to modify it for up to 2.5A if needed. Key components include USB Type-A Female Connector, Micro USB 2.0 B type 5 Pin Connector, various resistors, capacitors, LEDs, an inductor, and a diode. The circuit will be designed into a PCB, and the assembly process will be optimized to ensure proper functionality, making the module ideal for development boards such as Arduino and NodeMCU.

Required electronic component	Features and characteristics
TP4056 Li-Ion Battery Charger IC	• Constant Current / Constant voltage charging method. • C/10 Charge termination. • 2.9V trickle charge threshold (for deeply discharged batteries). • Upper charge stop voltage: 4.2V. • Soft start inrush current limit. • Automatic recharge (keeps batteries optimally charged when connected to a charger).
FP6291 Boost Converter IC	• Adjustable output up to 24V • Internal fixed PWM frequency of 1.0MHz • Precision feedback reference voltage: 0.6V • Internal 0.25ohm, 2A, 26V Power MOSFET • Shutdown Current: 0.1uA • Over Voltage and Temperature Protection • Adjustable over current protection at 0.5A to 2.5A
USB Type-A Female Connector	• Type-A USB 2.0 Plug (Female) • Universal and secure USB protocol • Its plug and play (Hot pluggable) • Can be used to interface mouse and keyboards to uP/uC

	• USB power supply: 100 to 500 mA • Protocol supports robust error detection
Micro USB 2.0 B type 5 Pin Connector	• Thin • High data transfer speed
6× Resistor (2×1k, 1.2k, 12k, 88k,4.7k)	• Current limiting • Voltage divider
6× Capacitor (2×0.1µf, 2×10µf, 2×20µf)	• Store energy
2× LEDs	
1× Inductor (4.7µH)	
1× Diode (1N5388BRLG)	• Zener Voltage Range − 3.3 V to 200 V • ESD Rating of Class 3 (>16 kV) per Human Body Model • Surge Rating of up to 180 W @ 8.3 ms • Maximum Limits Guaranteed on up to Six Electrical Parameters
18650 Lithium cell	• Capacity: 1200-3600mah • Charging voltage: 4.2v - 5v