

SOLAR POWER BANK

Design Thinking

TEAM NO :-13

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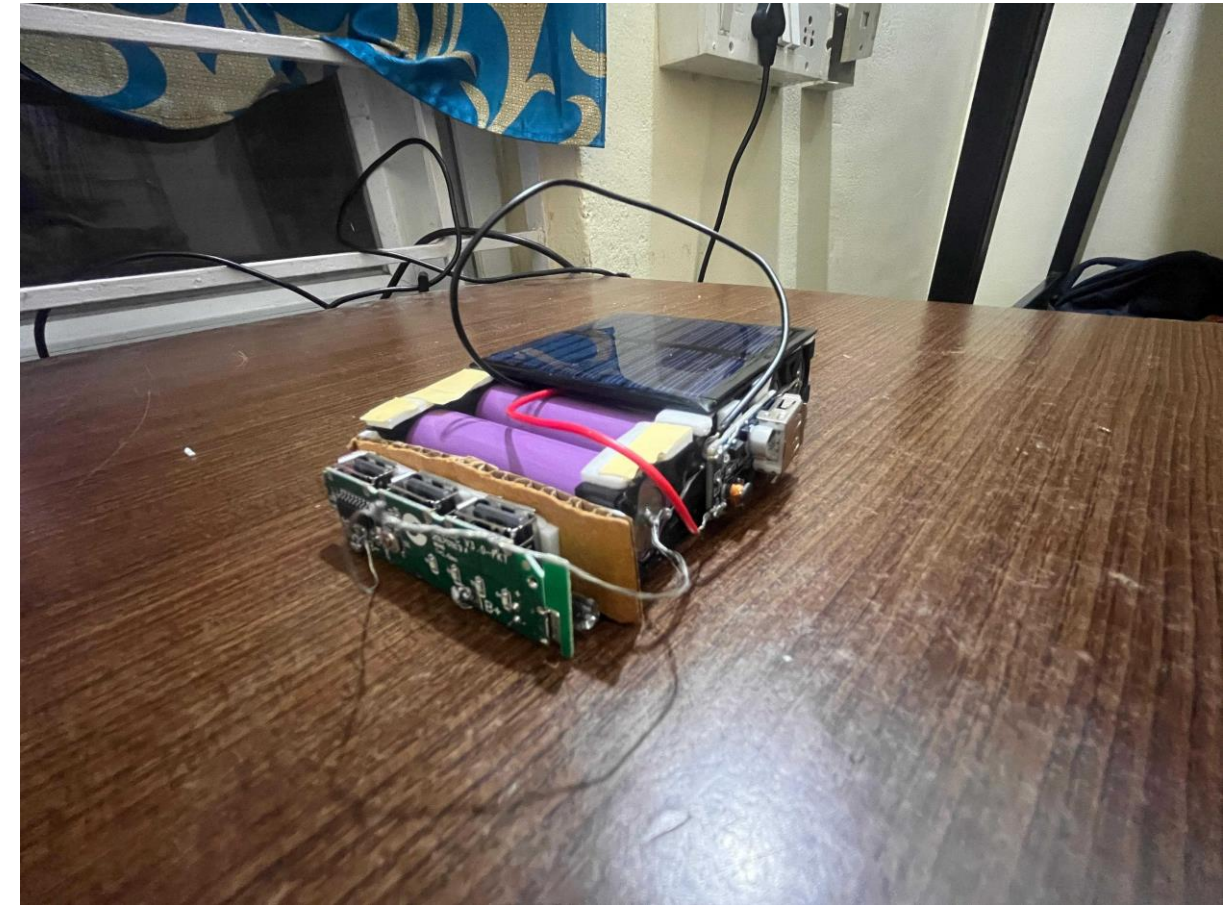
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Final Product Diagram

The final product diagram should showcase the layout, with the solar panel on one side of the casing, USB output ports on another, and an internal view showing the battery, circuit board, and wiring. Use exploded views to highlight components.



GROUP PICTURE



Working Video



Power Bank in Sunlight Video



The battery is charging using sunlight

Record

[illegible]

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[illegible]

G.Shashank
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Record

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Sharath Chandra
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What is a Solar Power Bank?

A solar power bank is a portable battery pack that can be recharged using solar energy. It allows you to charge your electronic devices on the go, without relying on traditional electrical outlets.



Problem Statement

Limited Battery Life

Smartphones, tablets, and other devices often have limited battery life, which can be a problem when you're away from power sources.

Unreliable Grid Access

In many parts of the world, the electrical grid can be unstable or inaccessible, making it difficult to charge devices.

Environmental Impact

Relying on fossil fuel-powered electrical sources can have a negative impact on the environment.

Solutions

1

Renewable Energy

Solar power banks provide a renewable energy source to charge devices, reducing the need for grid-based electricity.

2

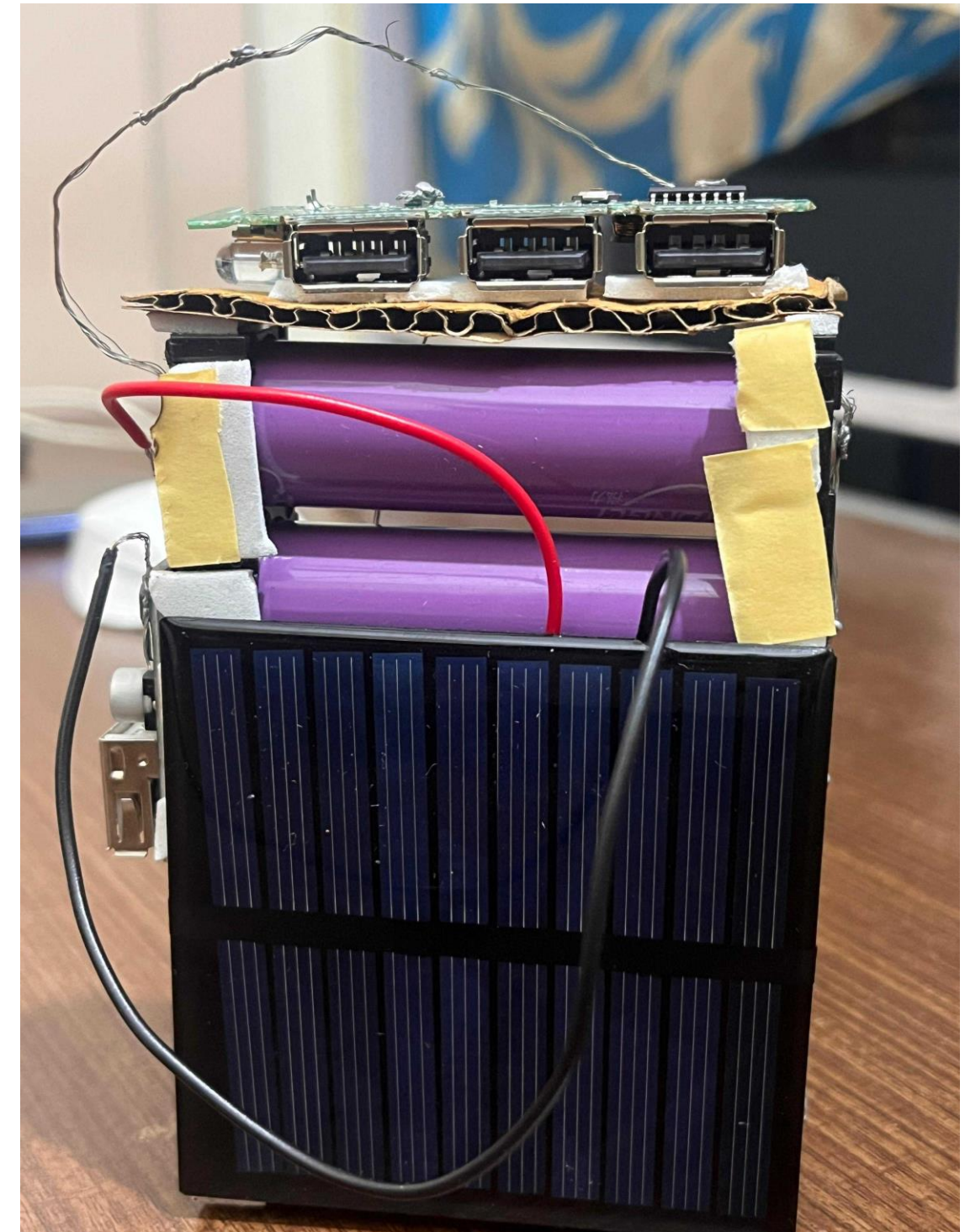
Portability

Solar power banks are lightweight and compact, making them easy to carry and use anywhere.

3

Sustainability

Using solar power banks can help reduce your carbon footprint and promote environmental sustainability.



Uses

Outdoor Activities

Solar power banks are ideal for camping, hiking, and other outdoor activities where access to power outlets is limited.

Emergency Preparedness

They can be used as a backup power source during power outages or natural disasters.

Remote Work

Solar power banks enable you to charge devices in areas with unreliable grid access, allowing for remote work and communication.

Travel

They are a compact and convenient way to keep your devices powered up while on the go.

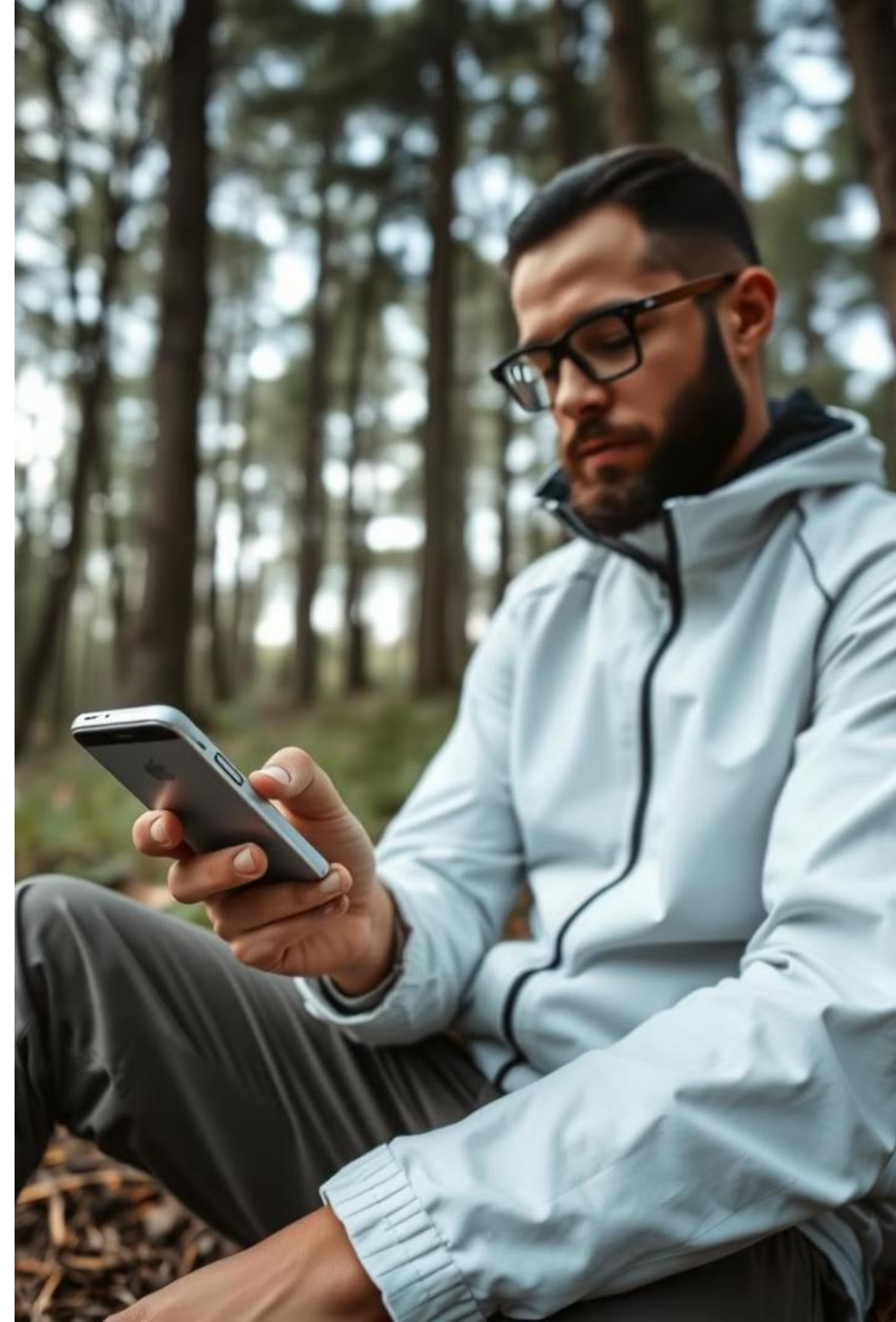
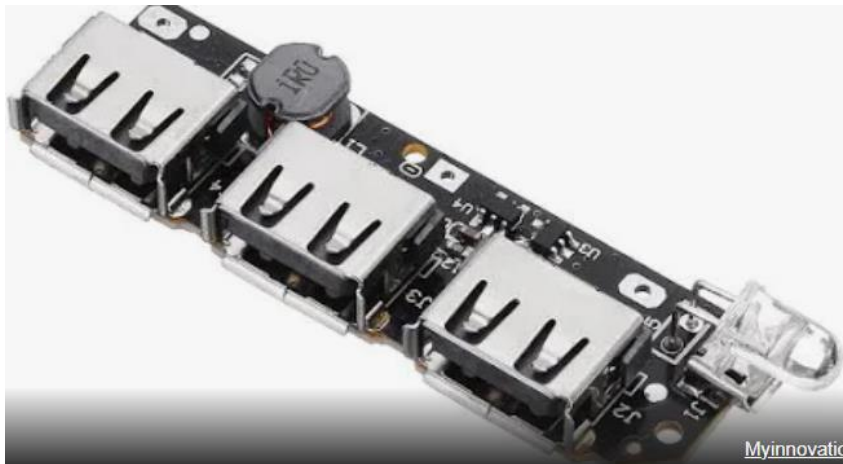


Diagram with Dimensions

- Solar Panel: 15 x 10 cm (dimensions vary based on capacity)
- Battery (Lithium-ion): 7 x 5 cm, thickness of 2 cm
- Controller Circuit: 5 x 3 cm
- USB Output Ports: Standard size (3 x 2 cm)





Components



Solar Panel

Converts sunlight into electrical energy to charge the battery.



Battery

Stores the electrical energy generated by the solar panel.



USB Ports

Allow you to connect and charge your electronic devices.



Step-up Booster Module

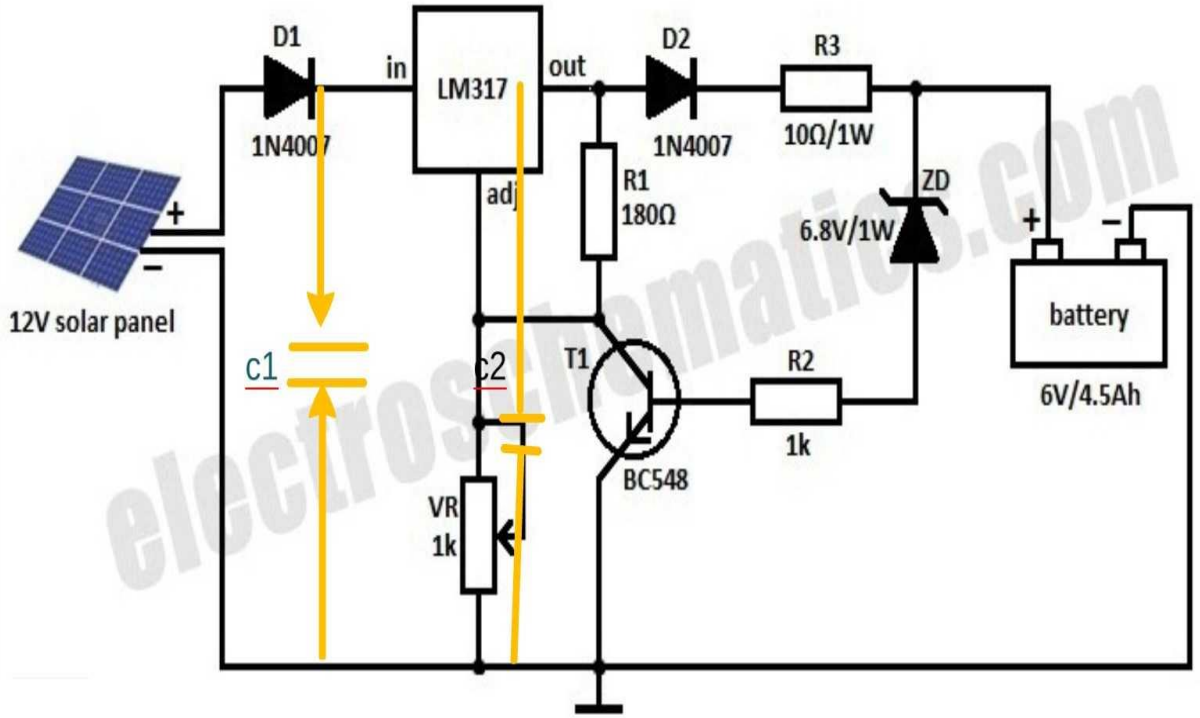
A 5V 600mA booster raises low battery voltage to 5V for small devices.

Cost Per Material

- Solar Panel (5V/1W): Rs. 150
- 18650 Li-ion (3000mAh) Rechargeable Battery : $58 * (5) = \text{Rs. } 290$
- Power Bank Board (Charging module): Rs. 300
- 3 section 18650 Lithium Battery Support Bracket : $13 * (2) = \text{Rs. } 26$
- 2 section 18650 Lithium Battery Support Bracket : $8 * (2) = \text{Rs. } 16$
- 5V 600mA DC-DC Step-up Booster Module for single cell battery : Rs. 36
- Wiring and Connectors : Rs. 150
- Total Cost + Tax = Rs. 1050 (depending on material quality and volume of order)

Circuit Diagram

Solar Panel	Converts sunlight into electrical energy
Step-up Booster Module	Regulates the flow of electricity from the solar panel to the battery
Battery	Stores the generated electrical energy
USB Ports	Allows the stored energy to be used for charging devices





Working Process



Solar Absorption

The solar panel converts sunlight into electrical energy.

Battery Charging

The charge controller directs the electrical energy to the battery for storage.

Device Charging

The stored energy can then be used to charge connected devices via the USB ports.

Risks and Challenges

Weather Dependence

Solar power banks rely on sunlight, making them less effective in overcast or rainy conditions.

Capacity Limitations

The battery capacity of solar power banks may be limited, requiring frequent recharging.

Durability Concerns

Solar power banks need to be well-constructed to withstand the elements and frequent use.

Conclusion

The design of a solar power bank requires attention to durability, efficiency, and energy storage. Successfully addressing challenges leads to a versatile device that provides sustainable, portable power, meeting the needs of both urban and remote users.

Thank You!