# The Juice Box F Solar-Charging Power Bank

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### Problem

- Recharge Electronics in Remote Areas Without Mains Power
- Must Be Capable of Being Recharged Remotely
- Temperature and Power Consumption Must Be Known for Safe and Easy Use

#### Goals

- 200Wh Capacity, 100W Max. Discharge, 16W Min. Charge Rate
- Portable and Low-Cost
- Safe and Easy to Use

# Design

- 265x104x192mm Dimensions, 3kg Weight, 3D-Printed Enclosure
- 257Wh Battery Capacity
- Automatic Buck-Boost Converter to Ensure Constant 12V Supply
- 100W Inverter with 2 USB Ports
- Custom MPPT Solar Charge
  Controller, with 30W Solar Panel
- 16x2 LCD Screen for Status Measurement Display
- Temperature Dependant RGB
  Cooling Fan

# Results

- Achieved Max. Steady Discharge Rate of 100W.
- Max. 25W Charge Rate
- Accurate System Measurements and Display
- 26°C Operating Temperature

# Conclusions

- Final Design Fulfilled All Goals
- Could Be Improved by Designing Custom Power Electronics and Including the Display of Battery Capacity







