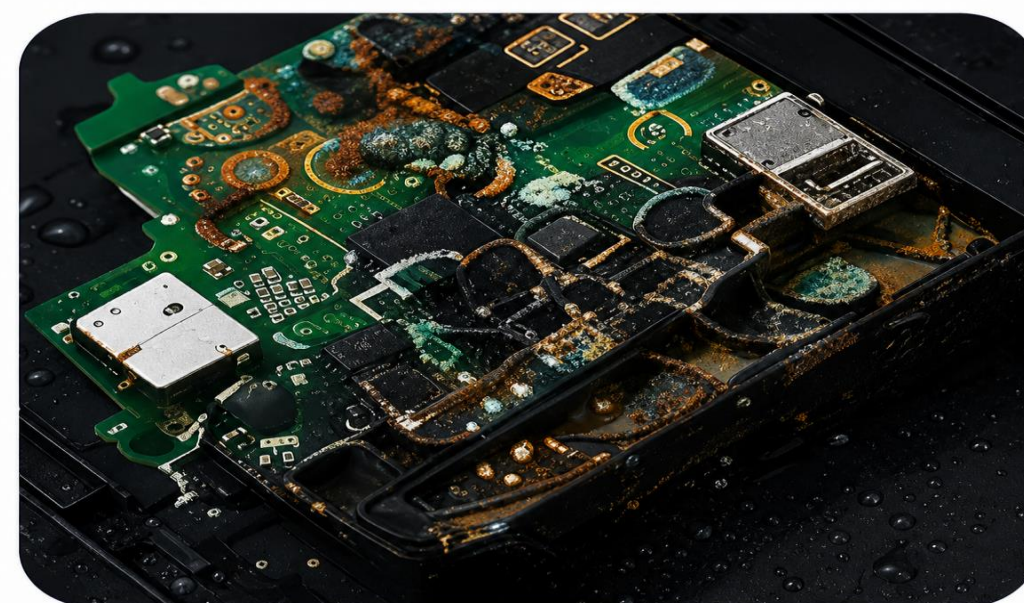
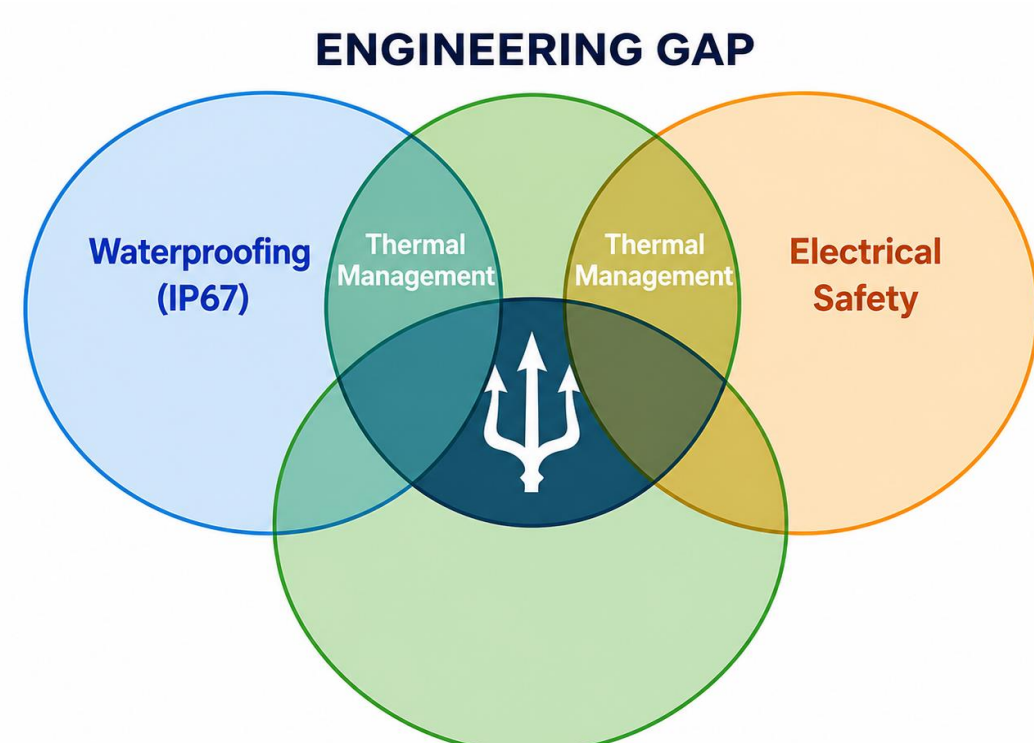
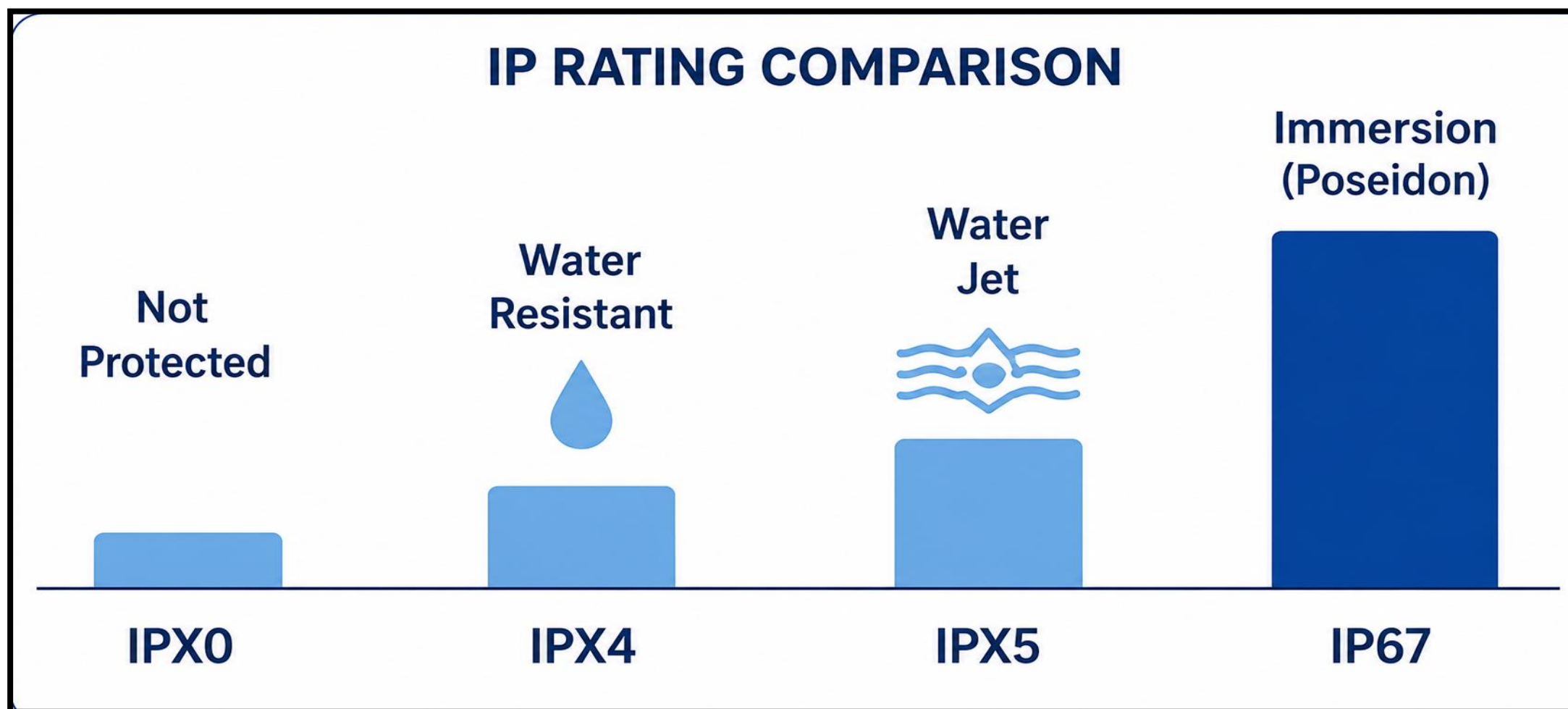




A sealed portable power system designed for safe operation in wet, submerged, and industrial environments.

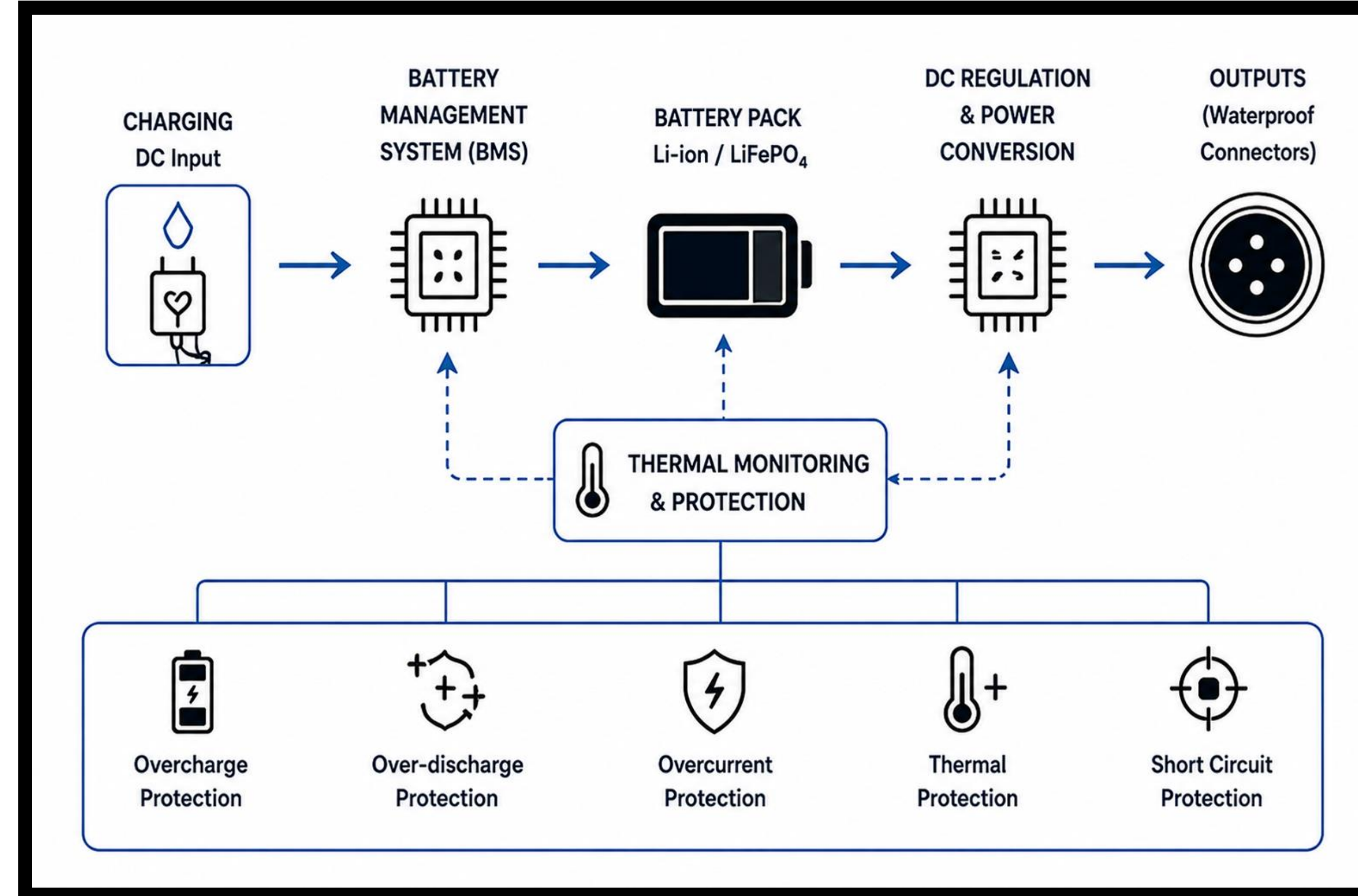
1. PROBLEM & ENGINEERING GAP

Most portable power banks are only splash resistant and fail in wet or submerged conditions. Connectors are the primary failure point, and sealed systems suffer from thermal build-up.



Corrosion leading to electrical failure

2. SYSTEM ARCHITECTURE



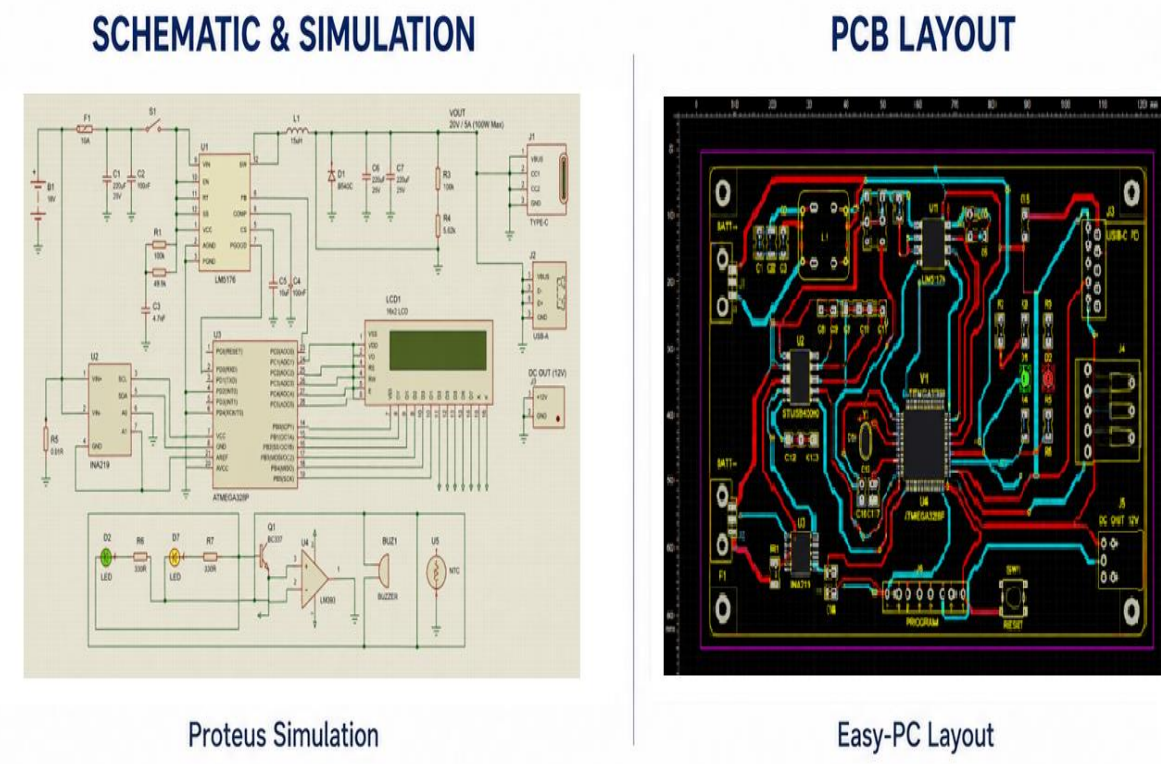
4. WATERPROOF DESIGN & CONNECTORS



LOW VOLTAGE OUTPUTS = HIGHER SAFETY



5. DESIGN IMPLEMENTATION



7. LIMITATIONS

- No full certification-level IP67 testing.
- Thermal performance partially estimated using calculations.
- No long-duration endurance testing.
- Pro and Max variants digitally validated only.
- Cost constraints limited full-scale prototyping.

8. FUTURE WORK & VARIANTS

VARIANT	CAPACITY	POWER	TARGET USE
Standard	≈100Wh	100W	Consumer / Personal
Pro	≈300Wh	200W	Power Tools / Field Work
Max	≈1000Wh+	500W+	Industrial / Emergency

- Full IP67 certification and validation
- LiFePO₄ integration for Pro/Max
- Extended endurance & lifecycle testing
- Solar charging capability
- Smart monitoring & app integration
- Industrial tool battery compatibility

9. CONCLUSION

Poseidon demonstrates that safe, waterproof portable power delivery is achievable through integrated engineering design.

By combining electrical protection, thermal management, and mechanical sealing, Poseidon successfully addresses the limitations of existing products and provides a scalable platform for industrial and consumer applications.

Reliable power. Any environment.



3. ENGINEERING ANALYSIS & CALCULATIONS

POWER OUTPUT

$$P = V \times I$$
$$20V \times 5A = 100W$$

Target continuous output power: 100W

BATTERY ENERGY

$$E = V \times Ah$$
$$3.7V \times 5Ah = 18.5Wh$$

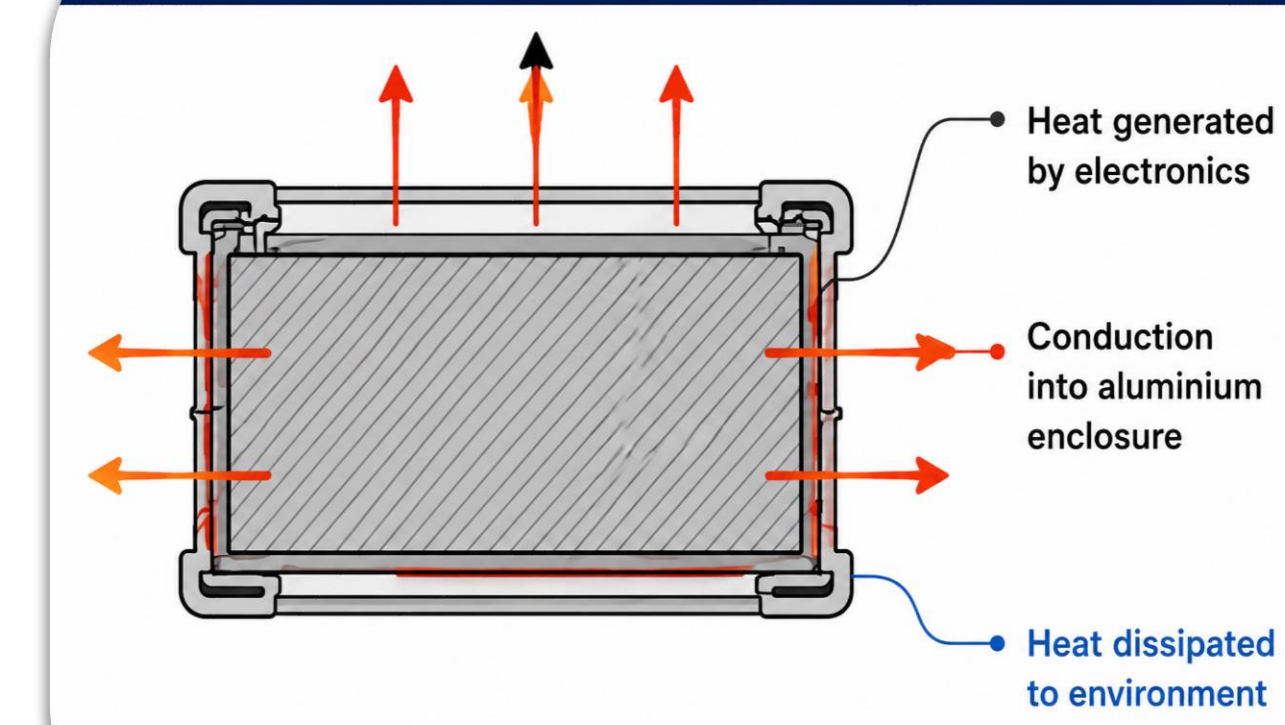
Example cell: 3.7V 5Ah Li-ion

EFFICIENCY & HEAT

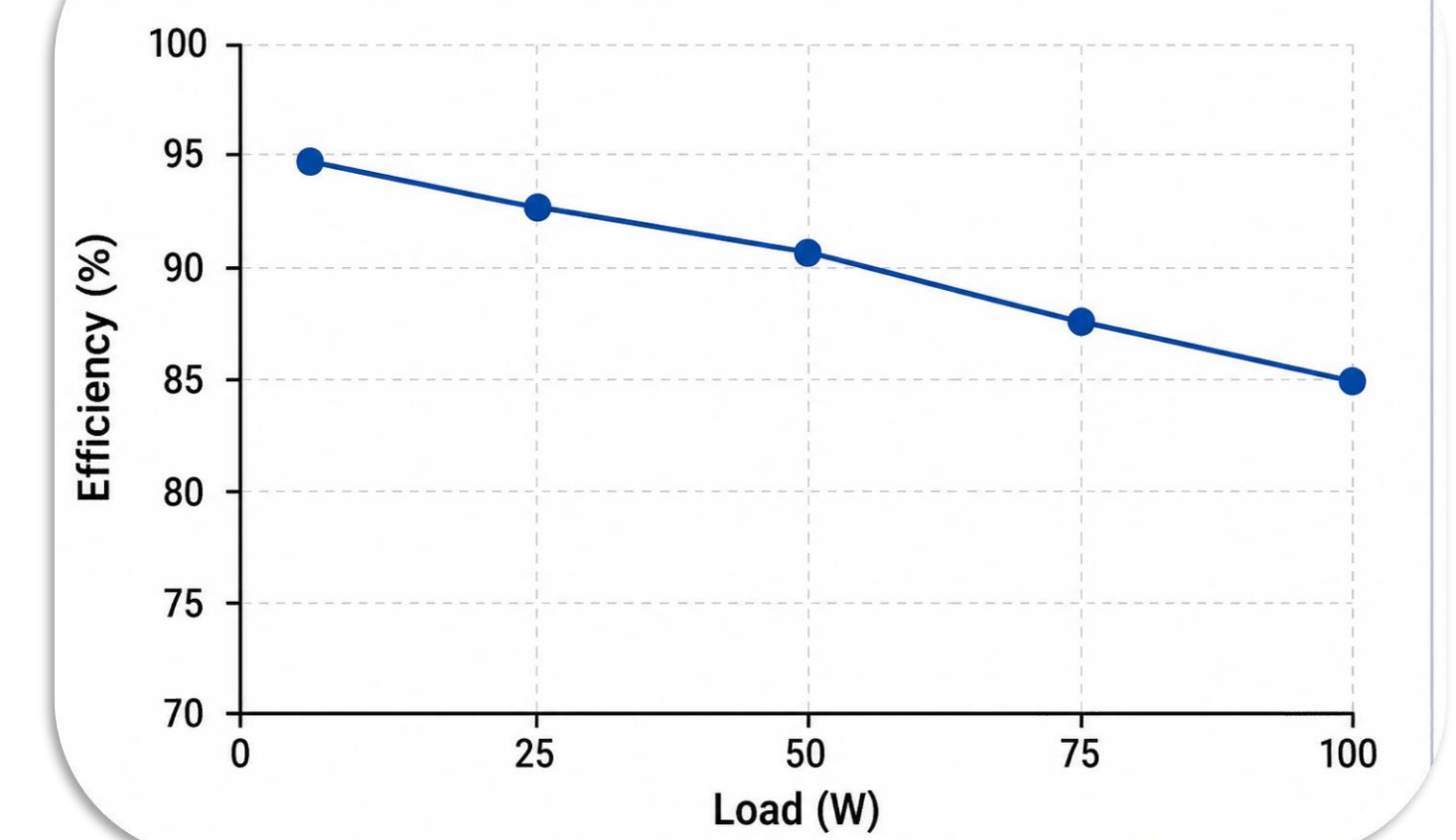
$$\eta = \frac{P_{out}}{P_{in}} \times 100$$
$$\approx 90\% \text{ Efficiency}$$

Heat Loss:
≈ 10W @ 100W load

THERMAL PATH (PASSIVE COOLING)



EFFICIENCY VS LOAD

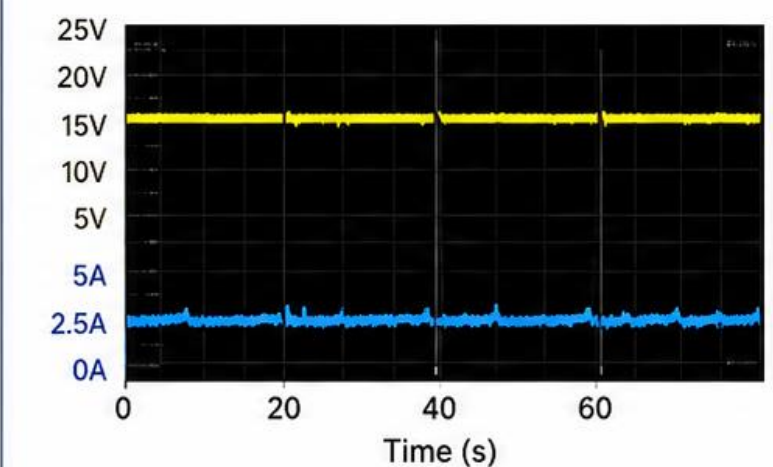


BATTERY CHEMISTRY COMPARISON

Feature	Li-ion (Standard)	LiFePO ₄ (Pro / Max)
Energy Density	High	Moderate
Thermal Stability	Moderate	High
Cycle Life	500 – 800	2000 – 4000+
Safety	Good	Excellent
Use Case	Compact / Portable	Industrial / High Load

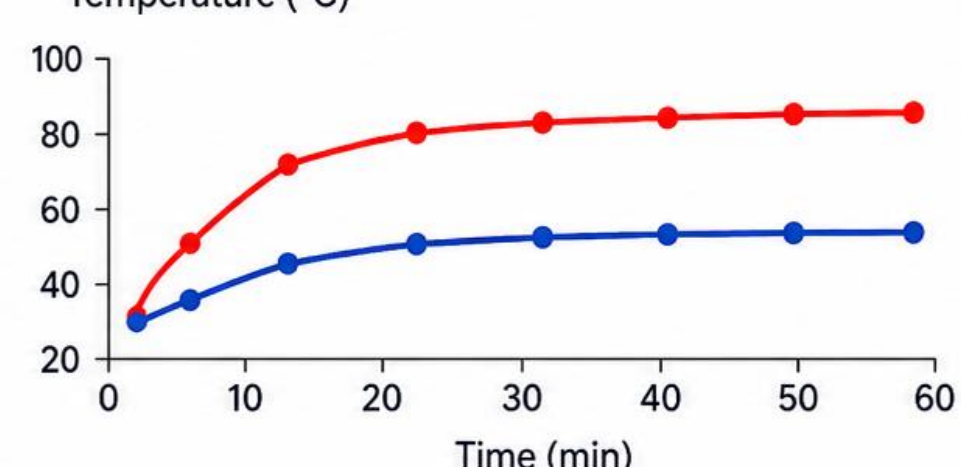
6. RESULTS & VALIDATION

SIMULATION RESULTS



Stable voltage regulation and correct system response under load and fault conditions.

THERMAL ANALYSIS



Passive cooling maintains safe operating temperatures under full load.

TESTING RESULTS

Test	Expected	Measured	Status
Output Voltage (20V)	20.0V	19.8V	PASS ✓
Output Current (5A)	5.0A	4.98A	PASS ✓
Power Output	100W	99.2W	PASS ✓
Efficiency	≥90%	89.4%	PASS ✓
Overcurrent Trip	5.5A	5.45A	PASS ✓

PROTECTION VALIDATION

