

## Portable electronics power in simple terms

Runtime • Safety • Size • Cost • Reliability

### 1. Battery is part of the system

Real batteries behave differently from laboratory power supplies.

**You may experience:**

- Voltage drop under load
- Startup current surges
- Internal resistance losses
- Aging effects
- Temperature sensitivity



*Low-quality battery designs are more prone to these effects.*

### 2. Choose the right chemistry

Battery chemistry determines performance, size, lifespan and cost. **Common options:**



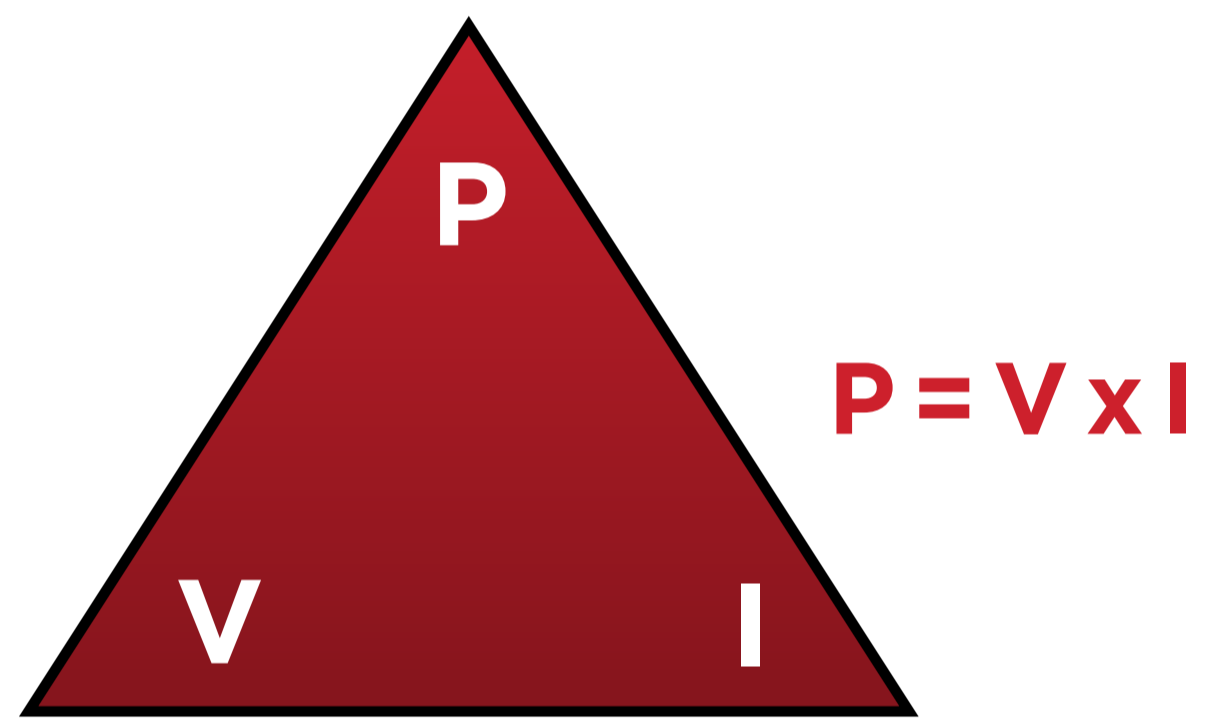
*No single chemistry fits every application!*

■ Rechargeable ■ Non Rechargeable

### 3. Start with key electrical requirements


These define battery size and capability:


- Voltage** – define the operating window
- Current** – include peak loads & surges
- Standby drain** – affects shelf life
- Energy (Wh)** – size for end-of-life runtime



*Electrical power (P) is calculated as voltage (V) multiplied by current (I).*

### 4. Temperature impacts performance

 **Cold:** reduced voltage and runtime

 **Hot:** accelerated aging / safety risk

*Thermal design directly affects reliability. Some primary (non-rechargeable) lithium batteries are rated for extreme temperatures, depending on chemistry and construction.*

### 5. Safety requires layers

Protection comes from multiple design elements:



*Safety is system-critical; standards vary by manufacturer.*

### Design checklist

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Voltage range defined    | <input checked="" type="checkbox"/> Energy sized in Wh                    |
| <input checked="" type="checkbox"/> Peak current validated   | <input checked="" type="checkbox"/> Thermal conditions considered         |
| <input checked="" type="checkbox"/> Standby drain understood | <input checked="" type="checkbox"/> Safety addressed                      |
| <input checked="" type="checkbox"/> Lifetime modelled        | <input checked="" type="checkbox"/> Certification requirements understood |

## DESIGN WITH CONFIDENCE

Partner with a global battery manufacturer trusted in mission-critical applications for decades. Scan to connect with our battery experts.

