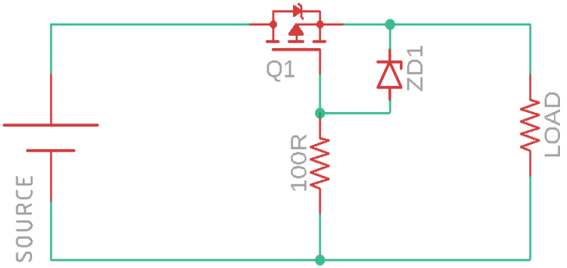
What Is Reverse Polarity Protection ?



Swipe >

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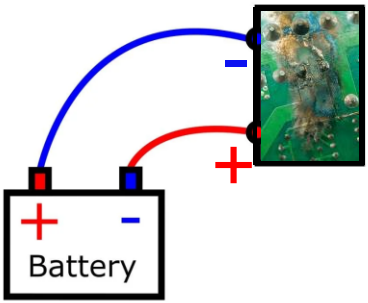
The Problem

- Many devices lack **mechanical safeguards** against reversed power connection.
- Both **users** and **developers during testing** can connect power backwards.

That leads to

- Unusable PCBs
- Lost development time
- Warranty returns
- In some cases, **fire hazard**



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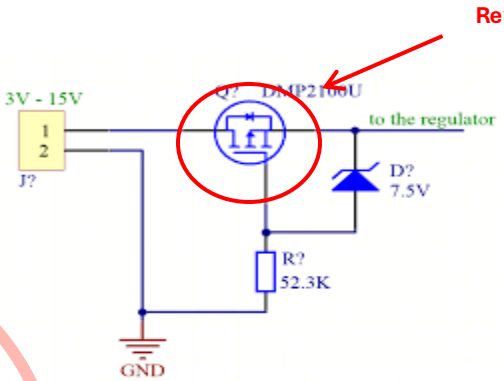
What Is Reverse Polarity Protection?

- Allows the device to function only when power is connected correctly.
- Blocks current if the supply is reversed.
- Protects ICs, passives, and connectors from permanent damage.



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Electrical Protection Methods

- **Series diode**: simple, but introduces voltage drop.
- **Schottky diode**: lower drop, higher cost.
- **MOSFET-based solution**: minimal loss, efficient for low-power designs.
- **Fuse with reverse blocking**: protects against severe faults, but not reusable.

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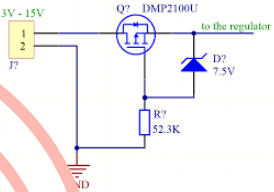
Electrical vs Mechanical Protection

Electrical protection

- Adds only a few cents to BOM.
- Covers both users and developers.
- Prevents burnt devices, wasted time, and warranty claims.
- Small design choice → safeguards revenue, reputation, and safety.

Mechanical-only protection

- No extra circuit cost, saves board space.
- Risk remains during testing when power is applied directly.



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Design Considerations

- Decide between **mechanical** and **electrical** protection based on product use.
- Factor in:
- Cost and board space
- Reliability in the field
- Risks during testing and development
- Well-chosen protection prevents avoidable failures and supports long-term product trust.




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