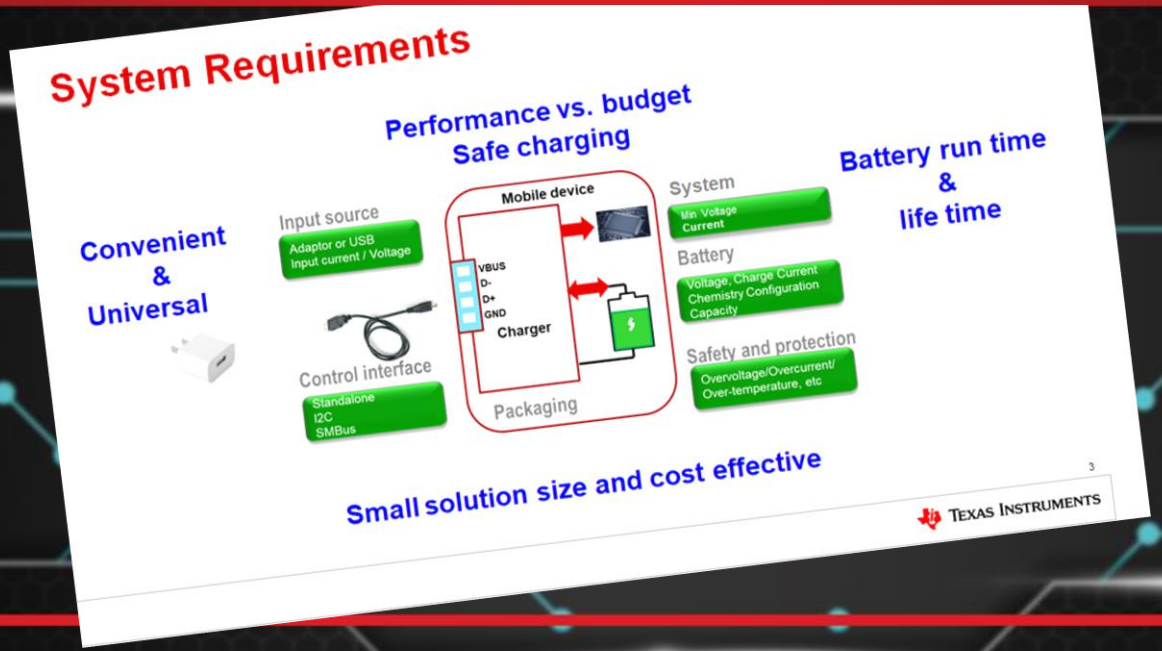
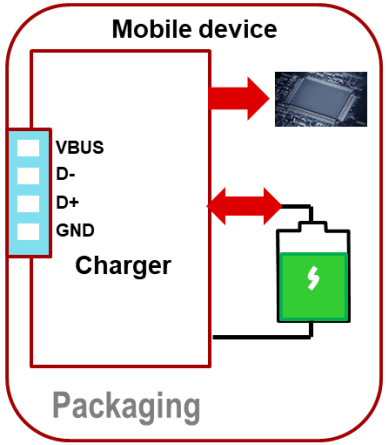
TOPOLOGIES AND BASIC CHARGING OF MULTI-CELL CHARGE CONTROLLERS



System requirements

Performance vs. budget
safe charging

Convenient & universal

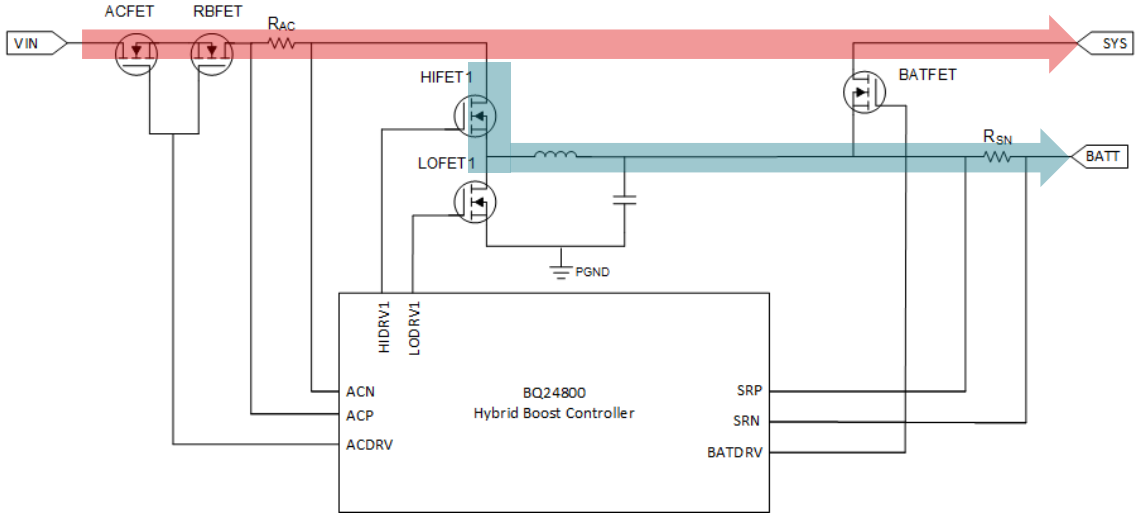


Battery run time & life time

Small solution size and cost effective

Hybrid boost architecture

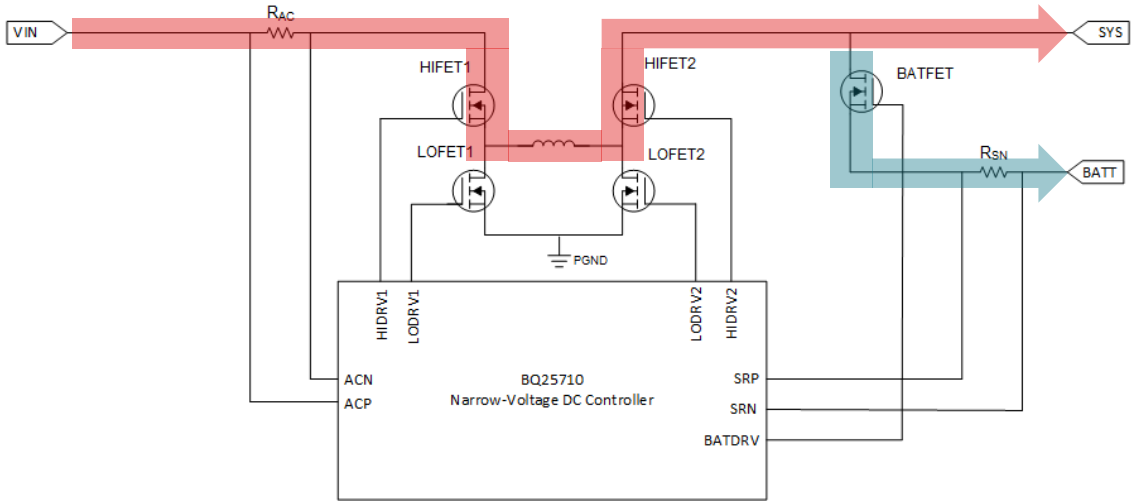
- No switching power loss from adapter to system.
- System at adapter voltage when adapter attached and battery voltage when adapter removed. (Wide VDC)
- Battery supplements adapter via Hybrid Boost



The Hybrid Boost architecture provides a direct power path from the adapter to the system and a regulated path through the buck regulator to charge the battery.

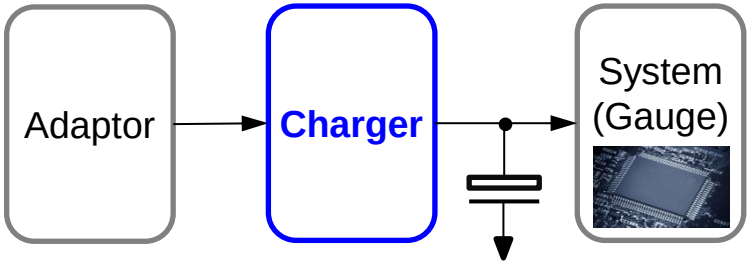
Narrow-voltage DC architecture

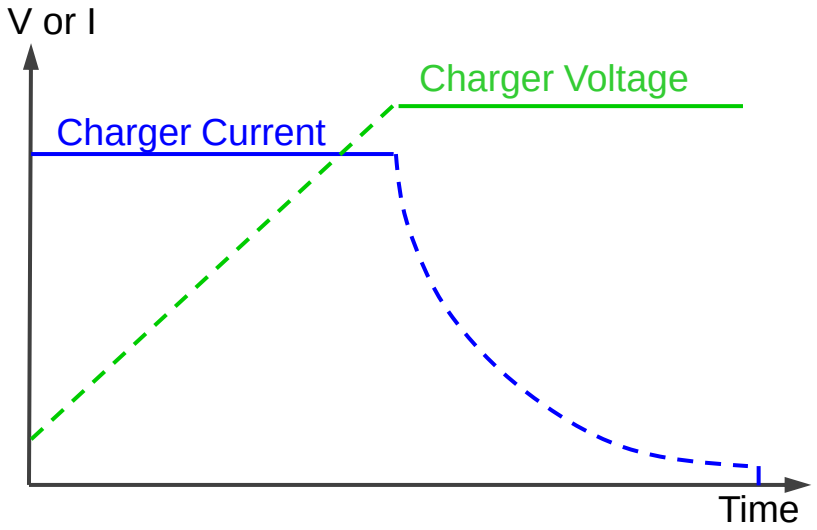
- System power provided via buck-boost switching
- System at battery voltage whether adapter is attached or not. (Narrow VDC)
- Battery supplements adapter directly through the BATFET



The NVDC architecture provides system power through the switching regulator, maintaining a consistent voltage.

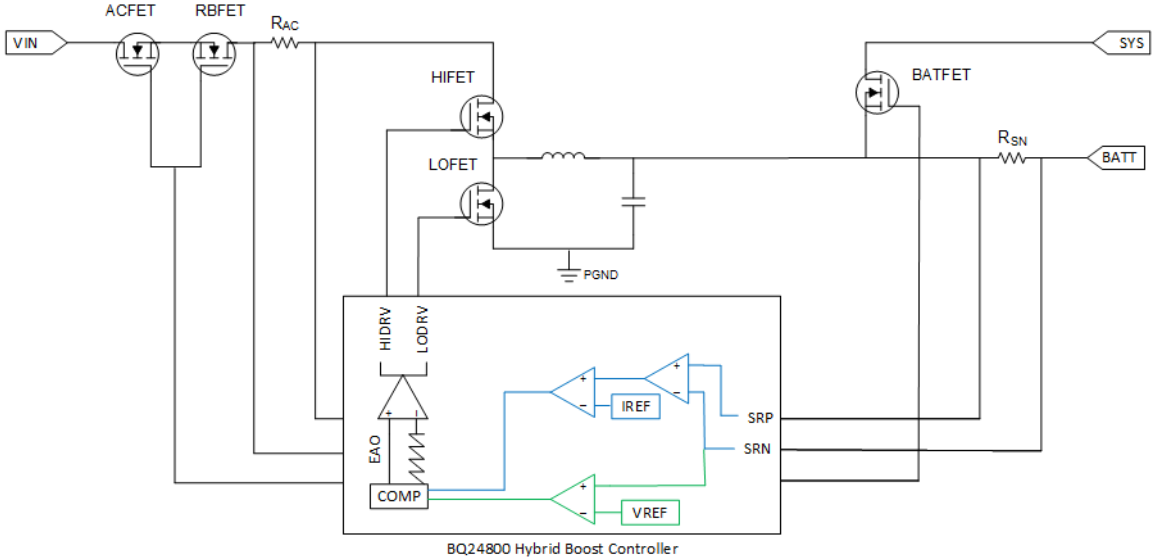
An application with charging system

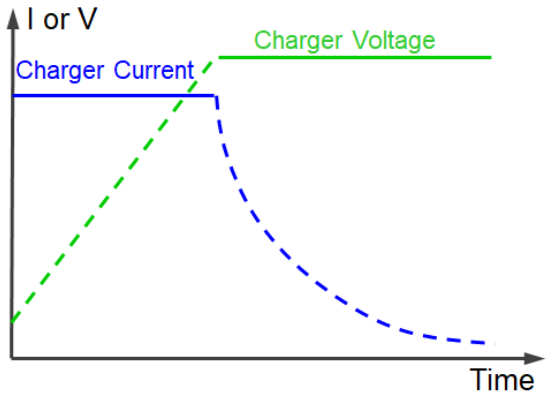




- **Charging system functions:**
  - Regulation: constant voltage (CC) and constant current (CV)
  - Safety of charging and status of charging
  - Features for better customer experience and cost effective
    Dynamic power management, power path, on-the-go (OTG)

Battery charging loops





- Constant voltage and constant current loops for charging
- Input is the adaptor and output is the and battery
- Battery can be a ***load*** or a ***source***

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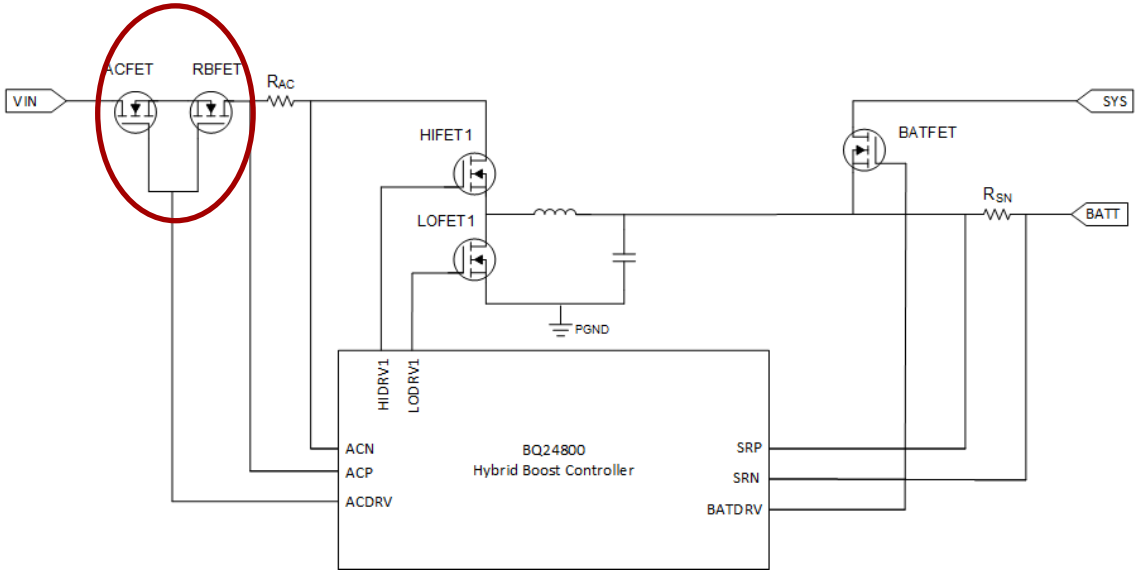
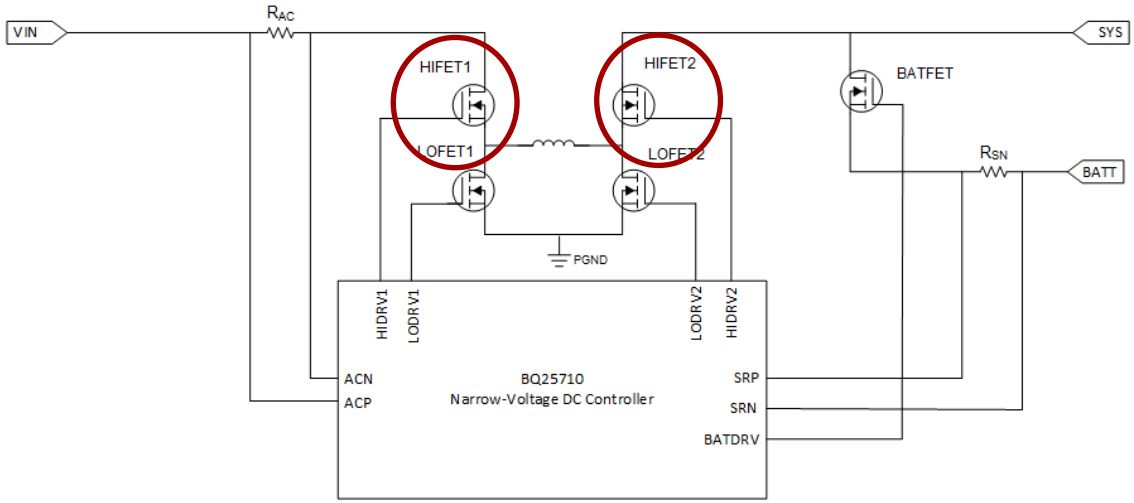
Reverse-current blocking and system protection



ACFET / RBFET isolate adapter from SYS to protect during:
Adapter Overvoltage, Adapter Overcurrent, Adapter Short

Reverse-current blocking and system protection



High-side FETs may be turned off to isolate adapter from SYS to protect during:
Adapter Overvoltage, Adapter Overcurrent, SYS Overvoltage,
Battery Overvoltage

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