

EMBEDDED BATTERY CHARGERS

Rechargeable batteries need to be recharged. This can be accomplished in a number of different ways depending on the chemistry and application. Simple batteries can use a simple off-the-shelf battery charger where the cells can be removed from the product and placed in a charger designed for charging the cells. This is common for rechargeable NiCd and NiMH type batteries.

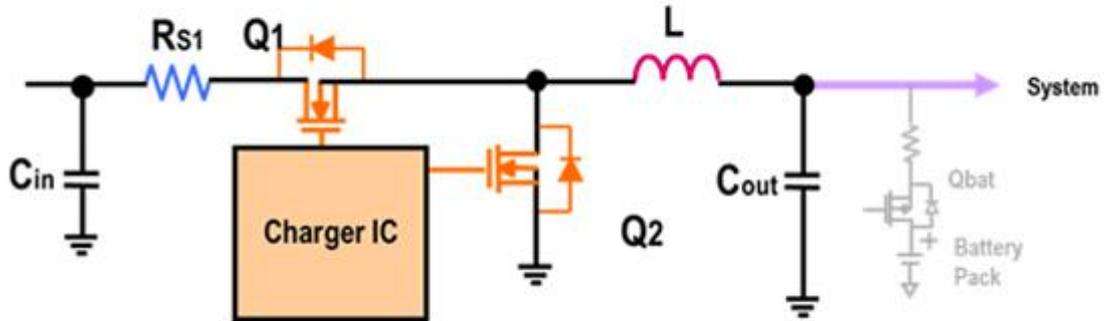
Larger, more complex batteries can use a similar method using a less universal type of battery charger. This type of charging is commonly found in the power tool market where the larger battery is removed from the tool and placed into an external battery charger.

Other common charging methods are to use an external charger that plugs into the product or an external power supply that supplies power to the internal charger in the product. These are common methods used in the cell phone and laptop markets, respectively.



What Is An Embedded Charger?

An embedded charger is a battery charger that is included with the battery and is part of the battery.



Embedded Battery Charger IC Diagram

Advantages of Embedded Battery Chargers:

- Increased Battery Life: The cells are always properly charged under all environmental conditions.
- Unauthorized battery chargers are unlikely to damage the battery.
- No need for external chargers.
- Perceived simpler solution by end user.

Disadvantages of Embedded Battery Chargers:

- Increased initial cost, which may be negated with increased battery life.
- Functioning charger circuitry is discarded at the end of battery life.
- Added internal heat near cells can accelerate aging of the cells.

Why Do You Need It and What Purpose Does it Serve?

It can be used when different chemistry batteries will be used in the same product. For example:

A lower cost version of the same product uses a NiMH battery; a NiMH battery charger can be part of the battery. When power is plugged into the product, power is routed to the NiMH charger and charges the battery with the required algorithm for the NiMH chemistry.

If the same product is manufactured with a Li-Ion battery, a Li-Ion charger can be embedded in the Li-Ion battery and it will charge with the same input power as if a NiMH battery was installed.

Maybe the same product offers a non-rechargeable version of the same product, then a primary non-rechargeable battery would have no

battery charger attached, and the product would use the non-rechargeable battery and use the input wall power to power the product and not recharge the non-rechargeable battery.

Another application is when a product is being updated and it needs to be backwards compatible for a product already in the field. A charger can take power from an existing charger in the product designed to charge a different chemistry and convert the power to properly charge the newer chemistry without the product's original charger detecting any charging error. This is very useful when greater performance is needed in the field with minimal upgrade expense.

Also, with an embedded charger, unregulated power can be used to charge the internal battery from a number of sources including inexpensive wall bricks, car cigarette adapters, and USB ports.