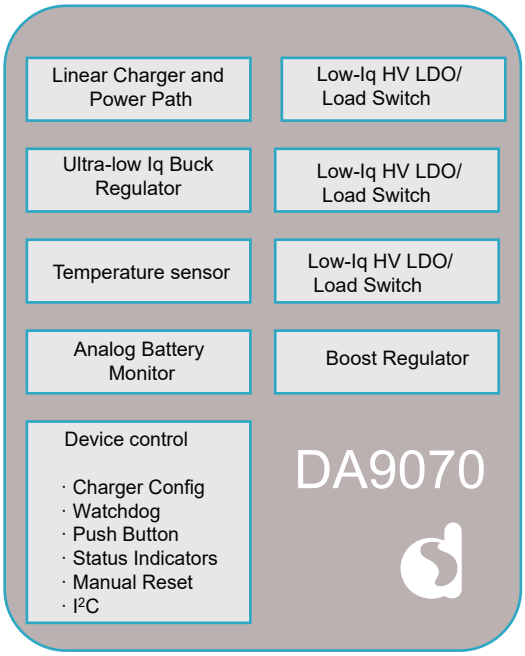
DA9070

Highly integrated PMIC for wearables and home automation extends battery life in the smallest footprint.

The PMIC comprises of linear charger with Power Path management, ultra-low Iq buck regulator and LDO/Load Switches, wide output boost regulator, analog battery monitor, watchdog and protection features in a compact WLCSP package with I²C configurability.



The device has several power saving modes to increase battery life whether the product sits on the shelf or is in use. Further savings in power are achieved with the ultra-low Iq buck converter that is efficient down to 10 µA load currents and low Iq LDOs with uncommitted inputs which can be connected to either the battery or buck output.

The integrated boost regulator supports sensors and display supply needs with a wide configurable output voltage.

The device supports charge current up to 500 mA to speed up the charge cycle. The charge profile is programmable by resistors or in software, allowing either stand-alone operation or host control.

Battery protection features are available to prevent the battery from over-heating and over-discharge. The input is 22 V tolerant and is immune to plug-in of the wrong adaptor. Dynamic power path management enables charging from multiple power sources, and automatically balances current delivered to the system and for charging the battery.

An integrated analog battery monitor facilitates on-demand battery voltage and discharge current monitoring for to create a battery fuel gauge solution. A watchdog input monitors the processor and upon detecting a stall in the processor, it power-cycles the buck converter to avoid an indefinite hang up in the system. Status outputs and I²C allow the host to set PMIC behavior and monitor its status.

Features

- Increased battery life
  - 900 nA (no load, total battery current) buck converter, programmable down to 0.6 V, 300 mA-capable
  - Three configurable 800 nA Quiescent Current LDOs/Load Switches, 150 mA-capable
- Fast charge
  - 500 mA (max) charge current; 2 mA (min)
  - Programmable pre-charge, fast charge, and termination voltage
  - Dynamic power path balances multiple power sources
  - Termination current programmable down to 500 µA
  - ±0.5 % accurate termination voltage
- Battery protection
  - Battery thermal- and over-discharge protection
  - 22 V tolerant input
  - Automatic battery temperature monitoring in all operation modes
- Configurable battery monitors
  - Battery current (IMON)
  - Battery voltage (VBAT_DIV)
  - Battery temperature (TEMP_SNS)
- Power saving modes optimized for storage and operation
- High integration and configurability
  - Wide output voltage boost regulator (4.5V to 18 V)
  - I²C enabled analog battery monitors for Software Fuel Gauging
  - Watchdog input and power-cycling to prevent system stall
  - Reset input and status outputs
  - Low external component count
  - Compact, 42 pin, 2.97 mm x 2.66 mm WLCSP package

Applications

- Wearable devices
  - Fitness trackers
  - Smart watches
- Home automation devices
  - Smoke detectors
  - Smart thermostats
  - Smart doorlocks
- Health monitoring medical accessories
- Portable gaming systems
- Wireless headphones, earbuds and earbud cradles
- Rechargeable Toys
- High Efficiency, ultra-low power applications

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