Battery Charger IC

A new microprocessor-controlled battery charger IC offering a solution for this application&#151and eliminating the need for several external components&#151was announced by Siliconix incorporated.
Offered in a small-outline TSSOP-16 package with a 1.2-mm height profile, the new Si9731DQ works with system microprocessor or microcontroller of cell phones, PDAs, and other handheld appliances to provide a complete chemistry-independent battery charger solution.
The Si9731DQ uses two internal power MOSFETs to provide trickle charging or fast charging depending on battery voltage at the beginning of the charge cycle. If battery voltage is below 3.4 V, the Si9731DQ detects the voltage from an ac adapter and initiates trickle charging until the battery voltage reaches a sufficient level to wake up the system microprocessor. Once activated, the microprocessor disables trickle charging and enables PWM-controlled fast charging via the Si9731DQ. Both the trickle-charge and fast-charge MOSFET components of the Si9731DQ provide bi-directional current blocking on the off state, eliminating the need for an external Schottky diode.
For maximizing the charge capacity of lithium ion batteries, the Si9731DQ integrates a precision reference and error amplifier to provide constant-voltage-mode charging to a 4.1-V or 4.2-V termination with 50-mV accuracy.
Since it uses a pulse charging technique with short on-times and long off-times, power dissipation is kept to a minimum, but unlike and competing solution, no external inductor is required. The Si9731DQ typically draws just 1 mA of current in normal mode and a maximum of 1 &#956 A of current in shutdown mode &#151 an order of magnitude improvement over competing solutions.
Because the Si9731DQ is microprocessor controlled, it gives designers maximum flexibility &#151 allowing the same IC to be used for lithium ion or nickel battery designs, different charger types, different charging algorithms, and different power management architectures.
The Si9731DQ can be used in conjunction with a regulated or unregulated external dc power source, including most low-cost wall adapters rated from 4.5 to 12 V.

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