

TI Battery Management IC Increases Battery Safety in Cell Phones

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Texas Instruments today announced an intelligent battery management [integrated circuit](#) (IC) that easily identifies potentially unsafe batteries not approved by consumer electronics manufacturers for use in their devices. The bq26150 device authenticates battery packs used in cell phones, PDAs, digital still cameras, notebooks or other portable applications.

TI's bq26150 resides in the battery pack and communicates with the host system's micro-controller or applications processor. The host processor, such as TI's OMAP2420 application processor, interrogates the battery pack upon pack insertion with a request for data over a single-wire communications line. The secure battery management IC calculates data obtained from a secret decryption key known only by the end-equipment system manufacturer.

The data is uniquely programmed in the bq26150 circuit using secure, non-volatile memory. If the battery information checks out, the system can allow normal system operation with the battery pack. A manufacturer can program the system to take action to protect the consumer if the battery pack response is not correct, or if the battery pack is not approved or determined to be defective. For instance, a manufacturer may decide to render the system inoperable, or only allow discharging of the battery, but not charging.

Secure Validation Technology

The first battery management IC in a series of battery pack security products from TI, the bq26150 obtains important security data information based on a cycle redundancy check (or CRC) architecture, which combines the unique identification with a random challenge to produce a transmitted result. The next battery security IC from TI will be based on a SHA-1/HMAC encryption architecture, originally developed by the U.S. National Security Administration.

The new SHA-1-based circuit, expected to be in production in the first half of 2005, will provide an additional level of security. Other security ICs planned for 2005 combine battery validation with other functions, such as battery fuel gauging and primary safety control. Providing increased levels of integration, the new battery management devices are designed to meet demands of future portable systems with regard to end-user safety, design features and cost.

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