# Single-Cell LED and Motor Timer-Controllers Simplify Design of AA/AAA Battery-Operated Electronic Appliances

Semtech Corporation announced the newest devices in its sub-1 V mixed-signal LED and motor timer-controller platform for easy, fast and cost-effective design of small, light weight, ultra-low power, battery-operated electronic appliances. The new SX8120 and SX8121 devices operate intrinsically at 0.9 V to control a DC motor or other continuous low-voltage element and drive a high-brightness LED directly from a single battery.

Because they operate inherently at 0.9V, these devices do not require an external boost converter and inductor, saving board space and cost. Additionally, unlike MCUs, which require custom development, these controllers feature pin-programmable timer functions, eliminating the need for lengthy software tuning, making them easy to use and cost-effective.

This combination of features significantly reduces the overall size and weight, extends the battery life, simplifies design, shortens time-to-market, and lowers the total BOM (bill-of-materials) cost for a wide range of small consumer home and office appliances, such as shavers, electric toothbrushes, buzzers, toys, and LED lamps. When the battery is rechargeable, the devices also include a voltage monitor to enable a simple USB charger.

SX8120 and SX8121 timer-controllers operate between 0.9V and 2V over the full industrial temperature range of -40° to +85°C, making them ideally suited to operate from one AA or AAA alkaline, NiMH or NiCd battery. The devices have a continuous output that can be activated on the press of a button to control either a DC motor or other continuous low voltage function, as well as a burst output to drive a high-brightness white or green LED, or other feature requiring a voltage

boost.

SX8120 and SX8121 are battery safe. They start controlling I/Os at 0.6V to prevent unexpected behavior in external components and current drain during start-up phase. They also feature a battery overload indicator for slow NiMH or NiCd chargers management. At power down (low battery), the I/Os are controlled again down to 0.6 V and the current consumption is guaranteed less than 10 µA over the full industrial temperature range to avoid battery leakage. In addition, the circuits will not start a load when the battery is low and it will stop a load if it drops the battery too low. This allows for completely safe and predictable battery operation under any conditions.

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