

## Tiny Li-ion Charger Targets Wearable Applications

[Texas Instruments'](#) bq25100 single-cell Li-ion charger is being introduced as the industry's smallest, lowest-power linear battery charger. Offered in a 0.9-mm by 1.6-mm WCSP package (a 6-pin BGA), the bq25100 may be compared with existing charger ICs from TI and others that measure 2 mm x 2 mm. And with its reduction in chip size, the bq25100 is said to offer a solution size that is half that of the existing charger solutions. Targeted applications include wearable products such as fitness accessories, smart watches, Bluetooth headsets and low-power handheld devices.

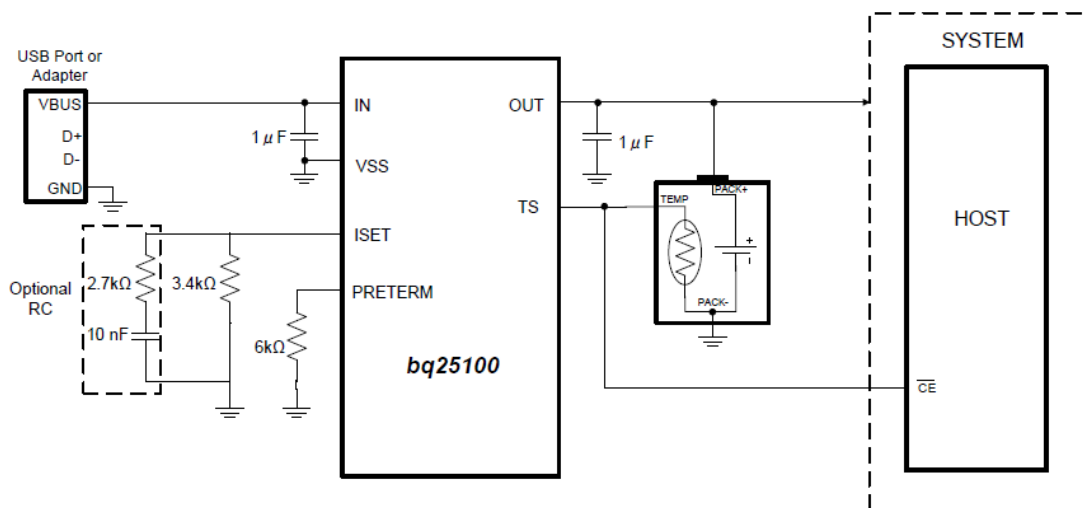
The device supports input voltages up to 30 V, and allows accurate control of fast-charge currents as low as 10 mA or as high as 250 mA, and precise charge termination down to 1 mA to support tiny Li-ion coin batteries. The bq25100 also can support a leakage current of less than 75 nA to extend standby operation. A typical application circuit is shown in Fig. 1.

According to Texas Instruments, a single-cell Li-ion charger solution based on the bq25100 can occupy a footprint as small as 2.8 mm x 4.1 mm or approximately 11.5 mm<sup>2</sup>. This is based on the pc board design described in TI's [TIDA-00318 reference design](#) (see Fig. 2.)

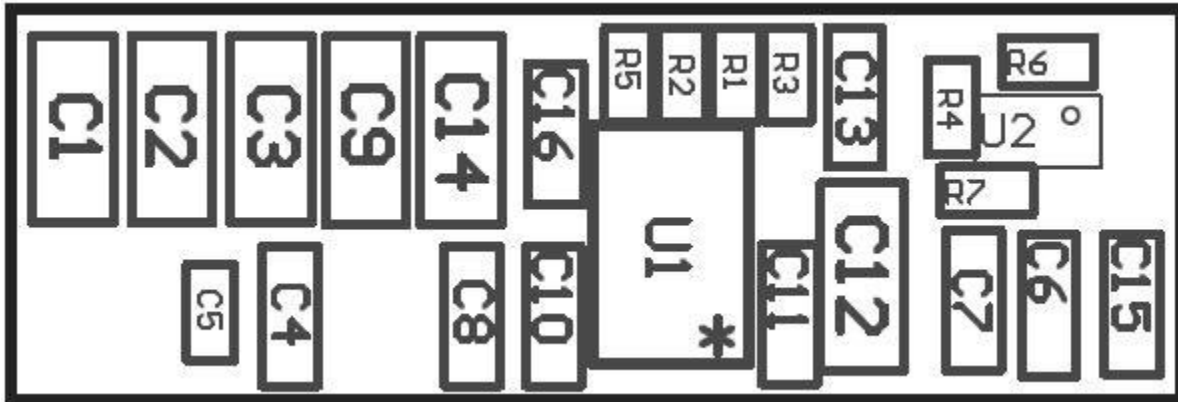
The bq25100 also supports the implementation of wireless charging in small portable and wearable applications. This can be accomplished by pairing the bq25100 linear charger on the same board with TI's bq51003 2.5-W, Qi-compliant wireless charging receiver. Both devices are featured on a new TI design reference board that measures 75 mm<sup>2</sup> (Fig. 2 again.). Wearable product designers can add wireless power capability by following the guidelines in "[Adapting Qi-compliant wireless power solutions to wearable products.](#)"

The company has been supporting Humavox to integrate the bq25100 in its wireless charging solutions for wearable devices and portable healthcare devices under Humavox's ETERNA RF-based wireless charging platform.

For more details, see the bq25100 [datasheet](#). The bq25100 is shipping in volume production, and is priced at \$0.75 each in 1,000-unit quantities. An evaluation module, the bq25100EVM-654 can be ordered via the TI eStore.



*Fig. 1. Only a few external passive components are needed to complete a compact single-cell Li-ion charger solution based on the bq25100. The charger IC supports input voltages up to 30 V, and allows accurate control of fast-charge currents as low as 10 mA or as high as 250 mA, with precise charge termination down to 1 mA.*



*Fig. 2. In TI's TIDA-00318 wireless charging reference design, the bq25100 (labeled U2 here) implements a single-cell charger design that measures 2.8 mm x 4.1 mm, which is fraction of this pc board's 5-mm x 15-mm overall footprint.*