

PMIC Cuts Solution Size, Extends Battery Life For Wearables And Hearables

[Maxim Integrated Products'](#) MAX77654 single inductor, multiple output (SIMO) power management IC (PMIC) slashes solution size by half and extends battery life by 20% in consumer devices, according to the company. This next-generation SIMO PMIC generates three outputs with just one inductor at 91% efficiency, which is said to be 16% greater than traditional four-chip systems.

With significantly reduced solution size, system designers can pack more functionality in their applications such as wearables, hearables and other compact consumer devices when compared to using traditional power solutions (Fig. 1) The MAX77654 builds on the company's portfolio of SIMO PMICs.

The MAX77654 SIMO PMIC replaces three buck-boost converters and three inductors with a single converter and a single inductor. It also replaces two LDOs/load-switches, a battery charger and additional passives, resulting in a 50% smaller solution, according to Maxim.

A typical solution consists of a SIMO PMIC, nine capacitors and an inductor. According to the company such a solution represents a 40% reduction in the number of components and a 23% reduction in BOM cost versus discrete solutions (Fig. 2).

The company adds that this PMIC also enables 20% longer battery life by delivering 91% efficiency. With less than 500-nA shutdown current and a low supply current of 6 μ A with five regulators operating, designers can add more functions to their ultra-low-power consumer devices.

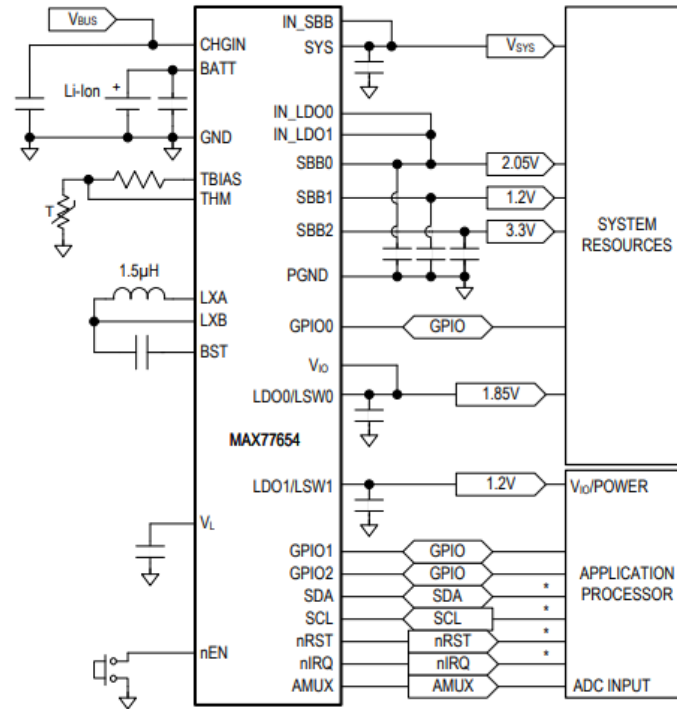
Another performance claim for the MAX77654 is that it yields lower heat dissipation and reduces system board temperature by more than 20°C when compared against an alternative single inductor system power solution. Additionally, this SIMO PMIC provides low output voltage ripple—less than 20 mVp-p for noise sensitive rails.

"Maxim Integrated's breakthrough scalable SIMO PMIC, MAX77654, offers the smallest form factor solution with the highest system efficiency," says Karthi Gopalan, director, Mobile Solutions Business Unit at Maxim Integrated. "The MAX77654 SIMO PMIC frees up board real estate to pack value-add modules such as voice commands, payment, GPS receivers, biometrics, gesture control, 3-D recognition and camera."

The MAX77654 is available at Maxim Integrated's website for \$2.00 in quantities of 1000 and is also available from authorized distributors. An evaluation kit, the MAX77654EVKIT# is available for \$105. For more information, see the MAX77654 product [page](#) and the MAX77654EVKIT product [page](#).



Fig. 1. The single inductor, multiple output (SIMO) power management IC (PMIC) provides highly-integrated battery charging and power supply solutions for low-power applications where size and efficiency are critical. In replacing traditional power management architectures, the PMIC reduces BOM count by up to 40% for compact consumer devices, according to the vendor.



*PULLUP RESISTORS NOT DRAWN

Fig. 2. Typical application diagram. The IC features a SIMO buck-boost regulator that provides three independently programmable power rails (SBB0, SBB1 and SBB2) from a single inductor. In addition, two 100-mA LDOs provide ripple rejection for audio and other noise-sensitive applications. The LDOs can also be configured as load switches to manage power consumption by disconnecting external blocks when not required. A highly-configurable linear charger supports a wide range of Li-ion battery capacities and includes battery temperature monitoring for additional safety (JEITA).