

Pack More Power in Your Cool, Small Smart-Home Hub

Introduction

Smart hubs are fast becoming a common household item. Used to wirelessly control door locks, lights, thermostats, audio and electric appliances, they are also equipped to send notifications to the homeowner (Figure 1). These wall-powered, soap-sized gadgets are packed with electronics and often include backup batteries in case of power outage. To fit in such a small space while minimizing heat generation, the on-board power management system must be small and efficient. This article reviews a typical approach for powering a smart hub. It then presents a new solution that delivers more efficient power in a smaller space, enabling longer backup battery run-times and smaller form factors to accommodate today's smarter homes.



Figure 1. Smart-home Hub Illustration

Typical Power Management Implementation

As an example, a typical smart hub system (illustrated in Figure 2) wirelessly communicates with a smart vacuum cleaner. The smart hub is powered by a wall adapter and has a backup battery in case of a power outage.

In the event of a power outage, the backup battery should provide operation for up to 10 hours. In a typical implementation, four AA alkaline batteries in series provide 6V and a 2Ah charge. Accordingly, the smart hub must consume less than 200mA on average to last for 10 hours during a power outage.

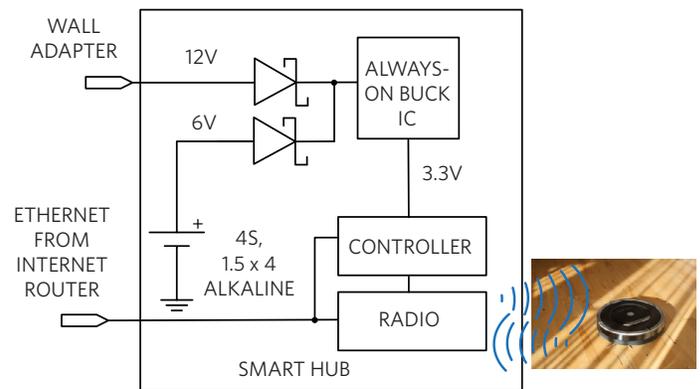


Figure 2. Typical Smart Hub System

The power management circuit includes an always-on buck converter and two diodes that multiplex the two input power sources. The footprint of the smart hub's power circuit, including active and passive components, is shown in Figure 3.

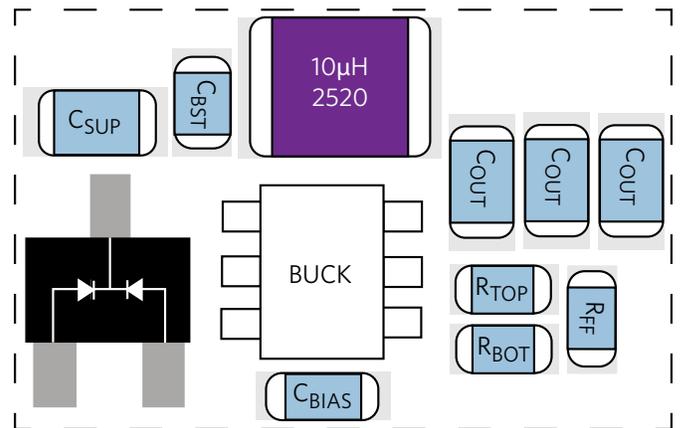


Figure 3. Typical Smart Hub Power Section Footprint (46mm²)

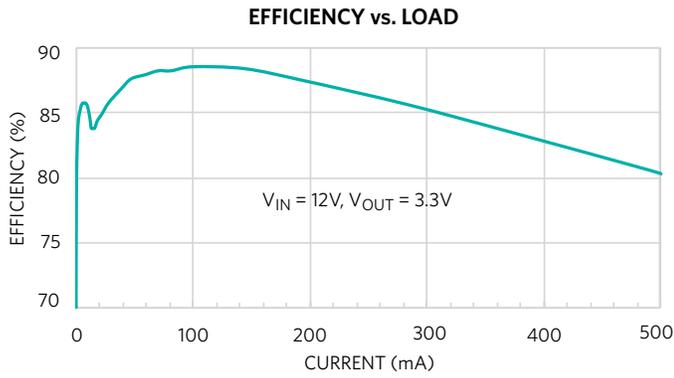


Figure 7. MAX77756 Efficiency Curve

Conclusion

Smart hubs are small, cool gadgets that require space and power-efficient solutions. By integrating an always-on buck converter and a MOSFET-based input MUX into a single chip, it's possible to achieve a 28% reduction in the power management footprint and have best-in-class efficiency as shown by the MAX77756.

Learn more:

[MAX77756 24V Input, 500mA Buck Converter with Dual-Input Power MUX](#)

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