

APPLICATION NOTE 911

## High-Efficiency Boost Converter Provides 48V for IP Phones

IP phones require that data and power on the same cable. A high voltage power source of 48V is required, to reduce the voltage drop in the cable. This application note describes a DC-DC step-up converter that can deliver the required 48V supply, from the 12V source typically available in the host of such systems. It delivers low-voltage ripple, essential to prevent data errors.

Isolation is provided by the 12V power-supply. For a system with one or two ports, a custom-designed DC-DC converter is more suitable than power modules, or "bricks", since bricks tend to be bulkier and are more expensive. They are more suitable for systems that support more ports, where the power demand is higher.

The MAX668 is an excellent choice for the design of a DC-DC step-up converter. The MAX668, a current-mode controller, operates in the PWM mode at medium and heavy loads, providing high-efficiency and low-noise. With power levels greater than 20W, efficiencies of more than 90% are achievable.

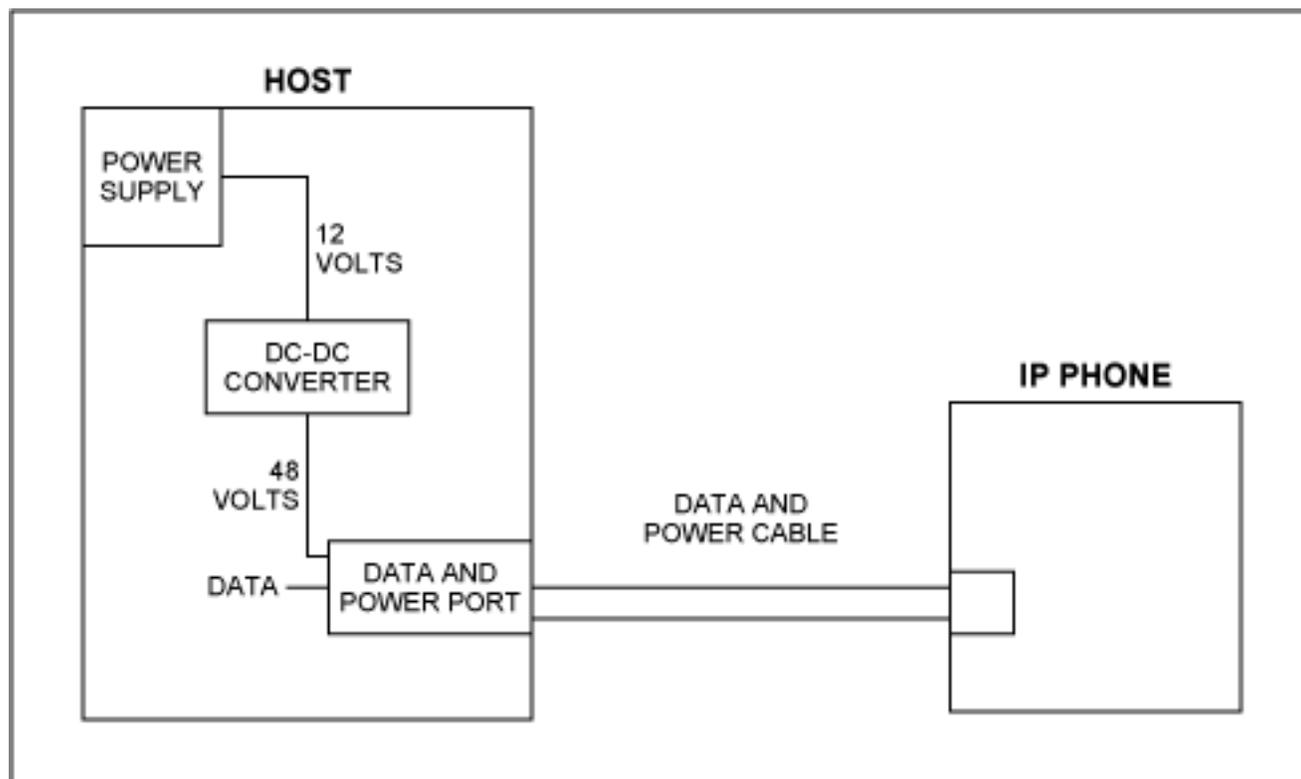


Figure 1.

The circuit of **Figure 2** has a 48V output and can deliver current up to 1 ampere, enough to power a system with two ports. L2 and C8 form a post filter to further reduce the ripple voltage below 50mV. A switching frequency of 400kHz was chosen as a compromise between switching loss and the size of inductor L1. Increasing the value of gate resistance R7 will reduce EMI noise, but increase switching loss. A value of 2.0Ω was chosen. At an input voltage of 12V, a full load of 1 ampere and an output of 48V, the peak-peak voltage ripple was 36mv with a conversion efficiency of 91%.

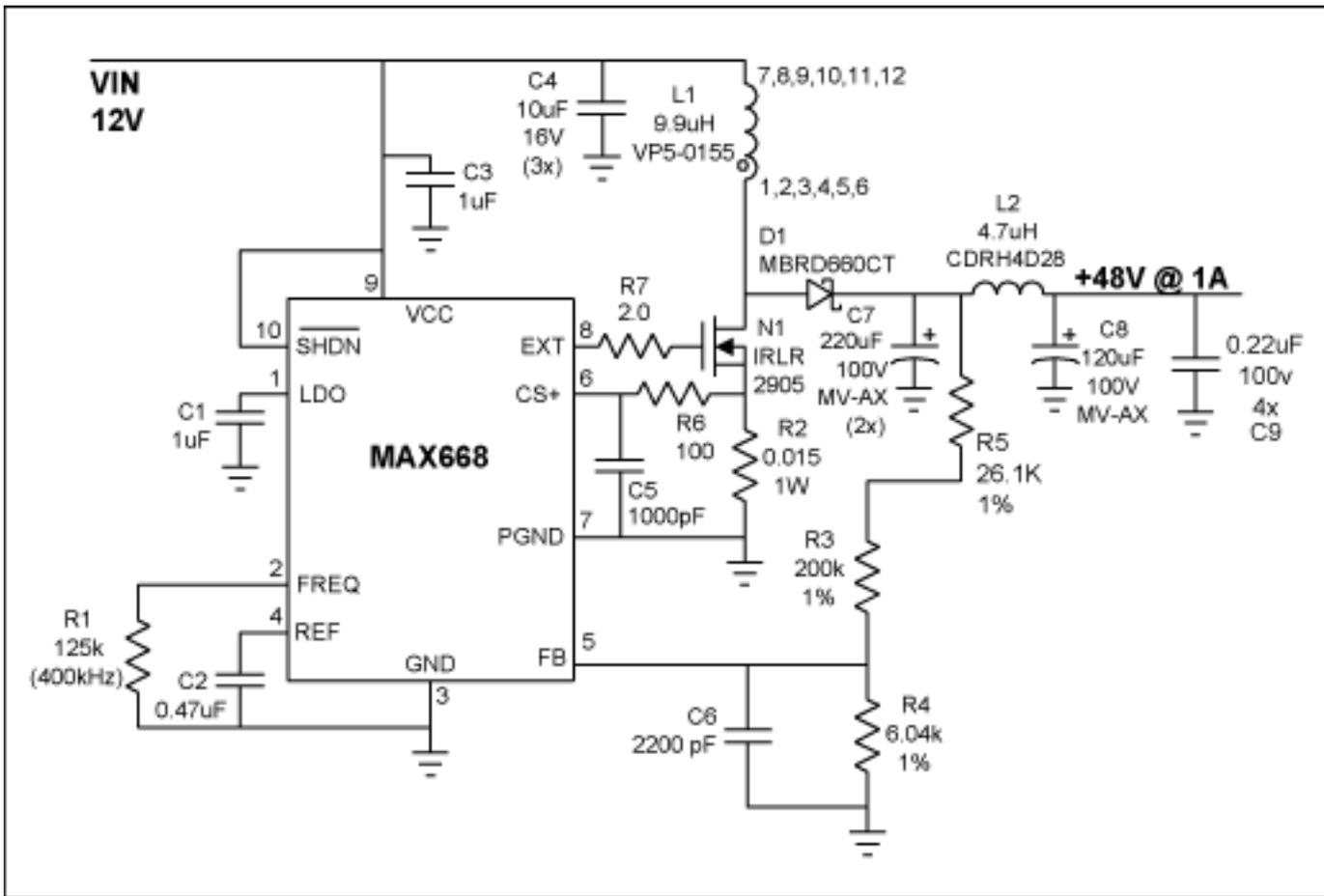


Figure 2.

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### More Information

For technical questions and support: <http://www.maxim-ic.com/support>

For samples: <http://www.maxim-ic.com/samples>

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### Related Parts

MAX668: [QuickView](#) -- [Full \(PDF\) Data Sheet](#) -- [Free Samples](#)

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