

Dual-Phase Hybrid Step-Down Synchronous Controller with Load Current Monitor

FEATURES

- ▶ 98.5% Peak Efficiency in 48V to 12V Application
- ▶ 97.8% Full Load Efficiency at 1kW Output Power
- ▶ Wide V_{IN} Range: 19V to 90V (100V ABS Max)
- ▶ Output Voltage Up to 35V
- ▶ 10V Gate Drive for Optimal Efficiency
- ▶ Output Current Monitor
- ▶ $EXTV_{CC}$ Input for Improved Die Temperature
- ▶ $\pm 1.25\%$ Output Voltage Accuracy
- ▶ R_{SENSE} or Inductor DCR Current Sensing
- ▶ Phase-Lockable Fixed Frequency 150kHz to 1.5MHz
- ▶ CLKOUT Pin for Multi-ICs Parallel Operation
- ▶ Soft Switching and Low EMI Performance
- ▶ Overtemperature and OC/OV Protection
- ▶ 48-Lead 7mm x 7mm Plastic QFN Package

APPLICATIONS

- ▶ 54V/48V to 5V/12V Conversion
- ▶ Intermediate Bus Converters
- ▶ High Current Distributed Power Systems
- ▶ Telecom, Datacom, and Storage Systems

GENERAL DESCRIPTION

The LTC7822 uses an ADI-proprietary architecture that merges a soft switching charge pump topology with a dual-phase interleaved synchronous step-down converter to provide superior efficiency and low EMI performance compared to traditional switching architectures. In a typical 48V to 12V application, up to 98.5% efficiency is attainable with the LTC7822.

With reduced switching losses, the hybrid converter allows higher switching frequency without sacrificing much efficiency. The proprietary dual-phase topology greatly reduces the capacitor number in the charge pump stage compared to the single-phase hybrid converters. LTC7822 supports both standard discrete inductors and coupled inductors.

The LTC7822 can be easily paralleled to provide higher output current with its accurate current sharing capability and frequency synchronization function. Current monitor provides an analog voltage reflecting the load current.

All registered trademarks and trademarks are the property of their respective owners. Protected by U.S. patents, including 11,594,956 and 11,652,415.

TYPICAL APPLICATION

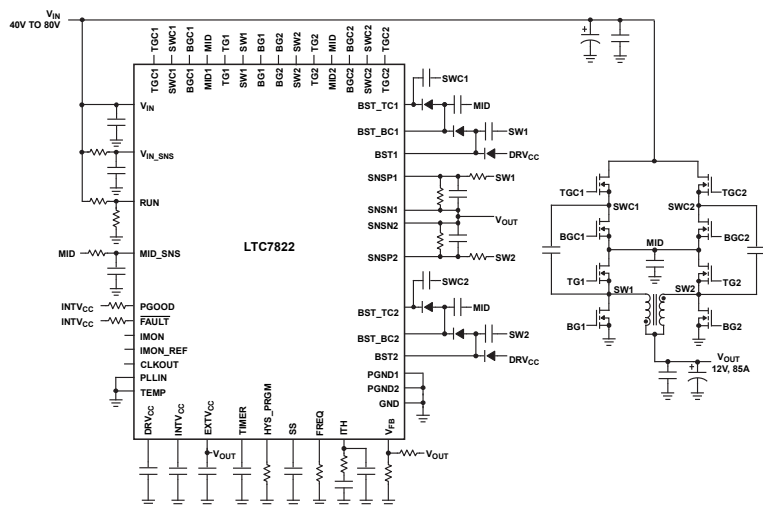


Figure 1. 12V 85A Step-Down Converter

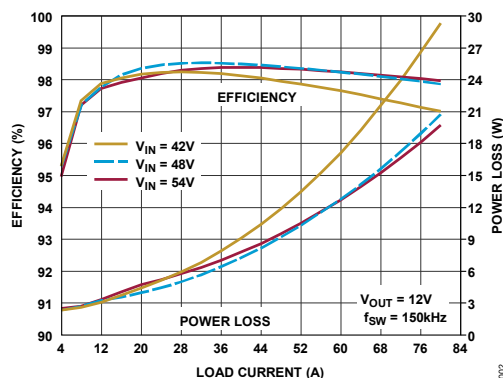


Figure 2. Efficiency and Power Loss vs. Load Current for $V_{OUT} = 12V$

ALL INFORMATION CONTAINED HEREIN IS PROVIDED “AS IS” WITHOUT REPRESENTATION OR WARRANTY. NO RESPONSIBILITY IS ASSUMED BY ANALOG DEVICES FOR ITS USE, NOR FOR ANY INFRINGEMENTS OF PATENTS OR OTHER RIGHTS OF THIRD PARTIES THAT MAY RESULT FROM ITS USE. SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE. NO LICENCE, EITHER EXPRESSED OR IMPLIED, IS GRANTED UNDER ANY ADI PATENT RIGHT, COPYRIGHT, MASK WORK RIGHT, OR ANY OTHER ADI INTELLECTUAL PROPERTY RIGHT RELATING TO ANY COMBINATION, MACHINE, OR PROCESS, IN WHICH ADI PRODUCTS OR SERVICES ARE USED. TRADEMARKS AND REGISTERED TRADEMARKS ARE THE PROPERTY OF THEIR RESPECTIVE OWNERS. ALL ANALOG DEVICES PRODUCTS CONTAINED HEREIN ARE SUBJECT TO RELEASE AND AVAILABILITY.