ABRIDGED

19-0681; Rev 2; 11/07

EVALUATION KIT AVAILABLE

Smallest, All-Internal MOSFET, 7-Channel DSC PMIC in Tiny 5mm x 5mm Thin QFN

General Description

The MAX8680 highly efficient complete power-supply solution is designed for digital still cameras (DSCs) and digital video cameras (DVCs). The device integrates seven on-chip power MOSFET DC-DC converters with up to 95% efficiency to power all critical power supplies in DSC systems. Each converter also features True Shutdown™, as well as internal compensation to minimize external component count. The seven DC-DC converter outputs are:

- Step-up synchronous-rectified DC-DC converter (SU). The MAX8680 is bootstrapped from V_{SU}.
- MAIN synchronous-rectified step-down DC-DC converter (M) for DSP I/O supply voltage.
- DDRZ synchronous-rectified step-down DC-DC converter (Z) for DSP DDR supply voltage.
- Low-voltage (down to 1V) synchronous-rectified step-down DC-DC converter (SD) for DSP core supply voltage.
- High-voltage, step-up DC-DC converter with current regulation and PWM dimming control (LEDBST) for white LEDs (WLED).
- High-voltage step-up DC-DC converter (CCDBST) for CCD imagers or positive LCD bias supplies.
- Transformerless inverting DC-DC converter (CCDINV) for CCD imagers or negative LCD bias supplies.

The MAX8680 has an independent/simultaneous power-on sequence of the CCDBST and CCDINV converters. For a preset power-on sequence of CCDBST before CCDINV, contact the factory.

The MAX8680 operates with 1-cell lithium-ion (Li+) battery, two-AA cell, or dual-battery designs and is available in a 5mm x 5mm, 40-pin thin QFN package. The MAX8680 operates over the -40°C to +85°C extended temperature range.

Applications

DSCs and DVCs

PDAs and Portable Media Players

GPS Navigation Systems

Ordering Information

PART	TEMP RANGE	PIN-PACKAGE	PKG CODE
MAX8680ETL+	-40°C to +85°C	40 Thin QFN-EP* 5mm x 5mm x 0.8mm	T4055-2

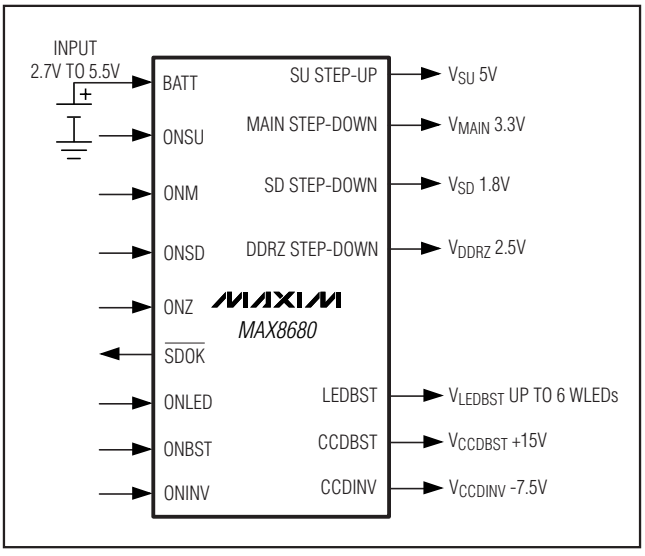
+Denotes a lead-free package.

**EP= Exposed paddle.*

Features

- ♦ **95% Efficient Synchronous-Rectified DC-DC Converters**
- ♦ **90% Efficient Boost-Buck Operation**
- ♦ **85% Efficient DC-DC Converters for CCD, LCD, WLED, and/or OLED**
- ♦ **Internal Compensation on All Channels**
- ♦ **True Shutdown on All Step-Up Converters**
- ♦ **Overload Protection**
- ♦ **Soft-Start for Controlled Startup Current**
- ♦ **Dropout Operation (100% Duty Cycle) on Step-Down Converters**
- ♦ **Regulated Current Output for Up to 6 White LEDs**
- ♦ **PWM Dimming of WLED Current**
- ♦ **Adjustable LED Overvoltage Protection Up to 27V**
- ♦ **Transformerless Inverting Converter for CCD**
- ♦ **2MHz Switching Frequency for Low-Voltage Channels**
- ♦ **±2.5% Switching Frequency Accuracy**
- ♦ **1µA Shutdown Supply Current**
- ♦ **Power-On Voltage Tracking for Core and Main Outputs**
- ♦ **All Internal Power MOSFETs**
- ♦ **$\overline{SDOK}$ Power-OK Indicator**

Typical Operating Circuit



Pin Configuration appears at the end of data sheet.

True Shutdown is a trademark of Maxim Integrated Products, Inc.

For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim's website at www.maxim-ic.com.

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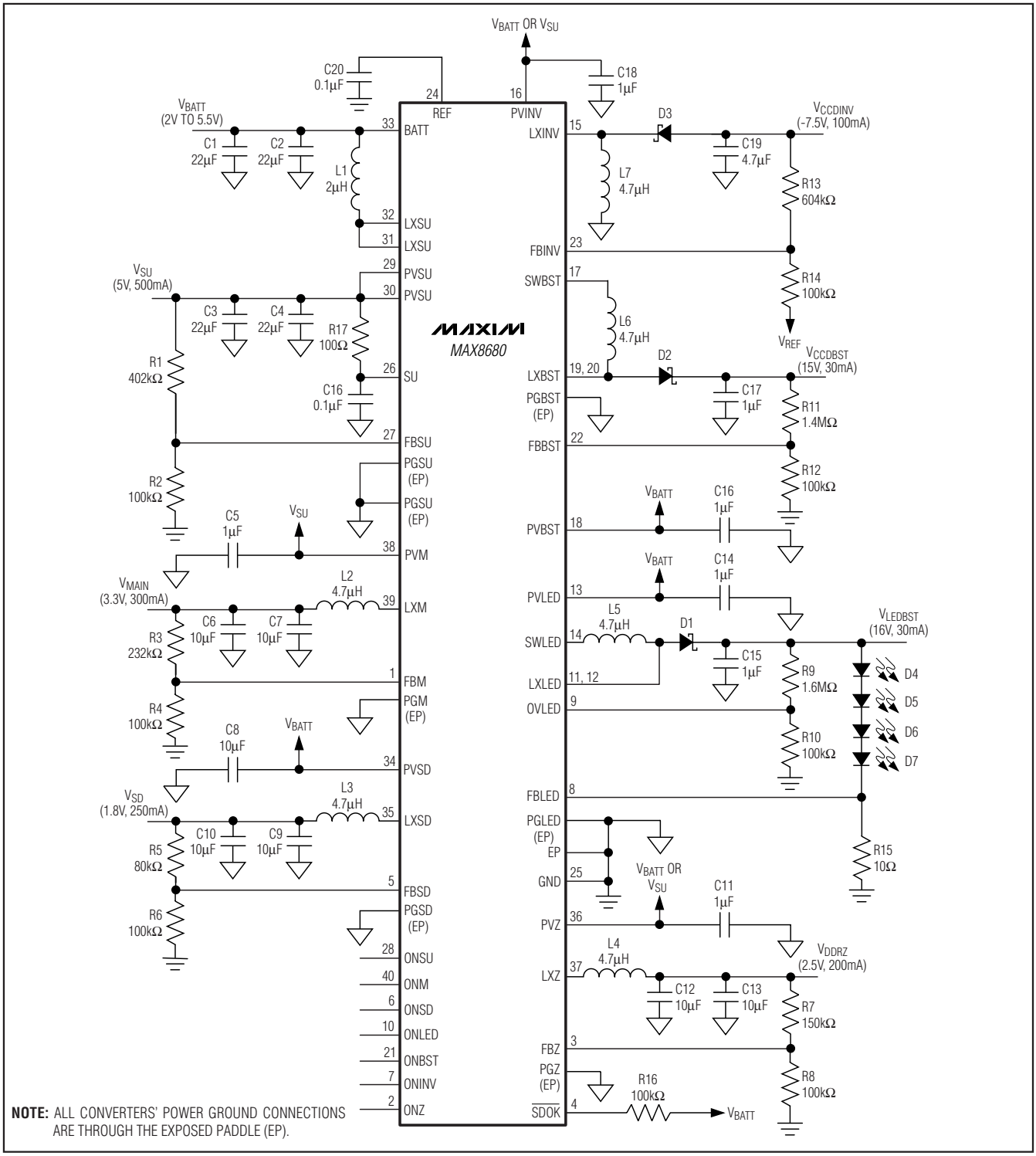


Figure 1. MAX8680 Typical Application Circuit (for Li+ Cell Design, Connect PVZ and PVINV to BATT; for Two-AA or Dual-Battery Design, Connect PVZ and PVINV to PVSU)