

## DESCRIPTION

Demonstration circuit 1271 is a high efficiency, small footprint, step-down DC-DC converter featuring the LTC3854EDDB. Its output supplies 1.5V @ 15A and its input voltage range is 4.5V to 14V. The demo board uses a high density, two sided drop-in layout with a minimal amount of components. The power components, excluding the bulk output capacitors and bulk input capacitors, fit within a 1.38" X 0.56" area on the top layer. The control circuit on the bottom layer fits within a 0.44" X 0.50" area.

This demo board provides the user with a simple, low parts count solution for a high output, low output voltage current buck converter. The LTC3854 operates at a switching frequency of 400kHz and CCM at light load.

**Design files for this circuit board are available. Call the LTC factory.**

**Table 1. Performance Summary ( $T_A = 25^\circ\text{C}$ )**

| PARAMETER                                       | CONDITION                                                                    | VALUE               |
|-------------------------------------------------|------------------------------------------------------------------------------|---------------------|
| Minimum Input Voltage                           |                                                                              | 4.5V                |
| Maximum Input Voltage                           |                                                                              | 14V                 |
| Output Voltage $V_{OUT}$                        | $V_{IN} = 4.5\text{V to } 14\text{V}$ , $I_{OUT} = 0\text{A to } 15\text{A}$ | 1.5V $\pm 2\%$      |
| Maximum Output Current                          |                                                                              | 15A                 |
| Typical Output Ripple $V_{OUT}$                 | $V_{IN} = 12\text{V}$ , $I_{OUT} = 15\text{A}$ (20MHz BW)                    | 15mV <sub>P-P</sub> |
| Nominal Switching Frequency                     |                                                                              | 400kHz              |
| Efficiency (see Figure 3 for efficiency curves) | $V_{IN} = 12\text{V}$ , $I_{OUT} = 15\text{A}$                               | 86.9% typical       |

## QUICK START PROCEDURE

Demonstration circuit 1271 is easy to set up to evaluate the performance of the LTC3854EDDB. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

- 1) Place RUN pin jumper in the ON position.
- 2) With power off, connect the input power supply between  $V_{IN}$  and GND.
- 3) Turn on the power at the input.
- 4) Check for the proper output voltages.  
 $V_{OUT} = 1.47\text{V to } 1.53\text{V}$

- 5) Once the proper output voltages are established, adjust the loads within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters.

**NOTE:** When measuring the output voltage ripple, care must be taken to avoid a long ground lead on the oscilloscope probe. See Figure 2 for proper scope probe technique. Short, stiff leads should be soldered to the (+) and (-) terminals of an output capacitor. The probe's ground ring needs to touch the (-) lead and the probe tip needs to touch the (+) lead.

# QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1271

## HIGH EFFICIENCY, SMALL FOOTPRINT, STEP-DOWN DC-DC CONVERTER

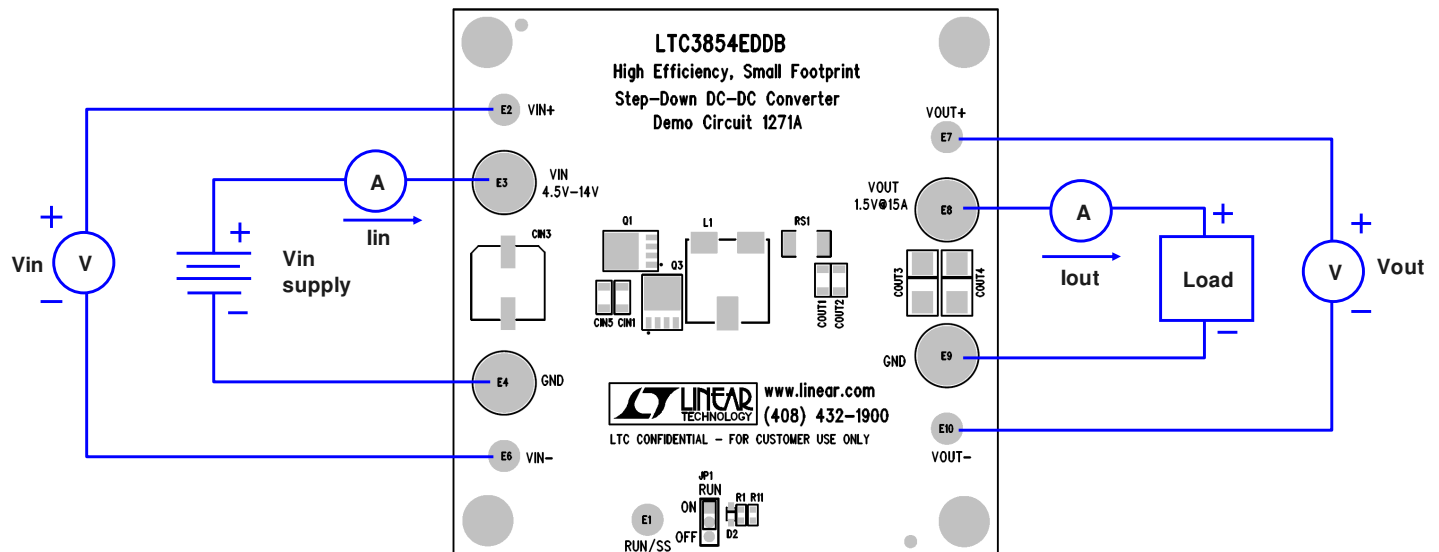


Figure 1. Proper Measurement Equipment Setup

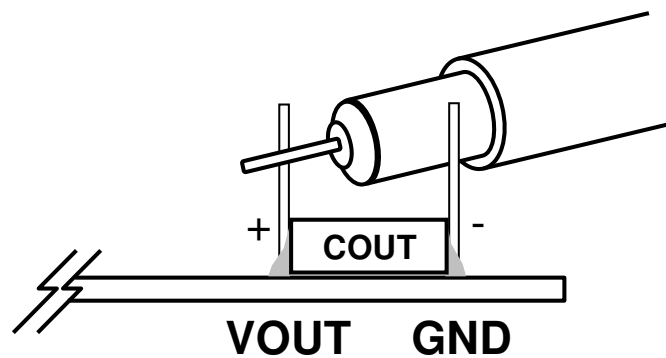


Figure 2. Measuring Input or Output Ripple

### 1.5V/15A LTC3854EDDB converter

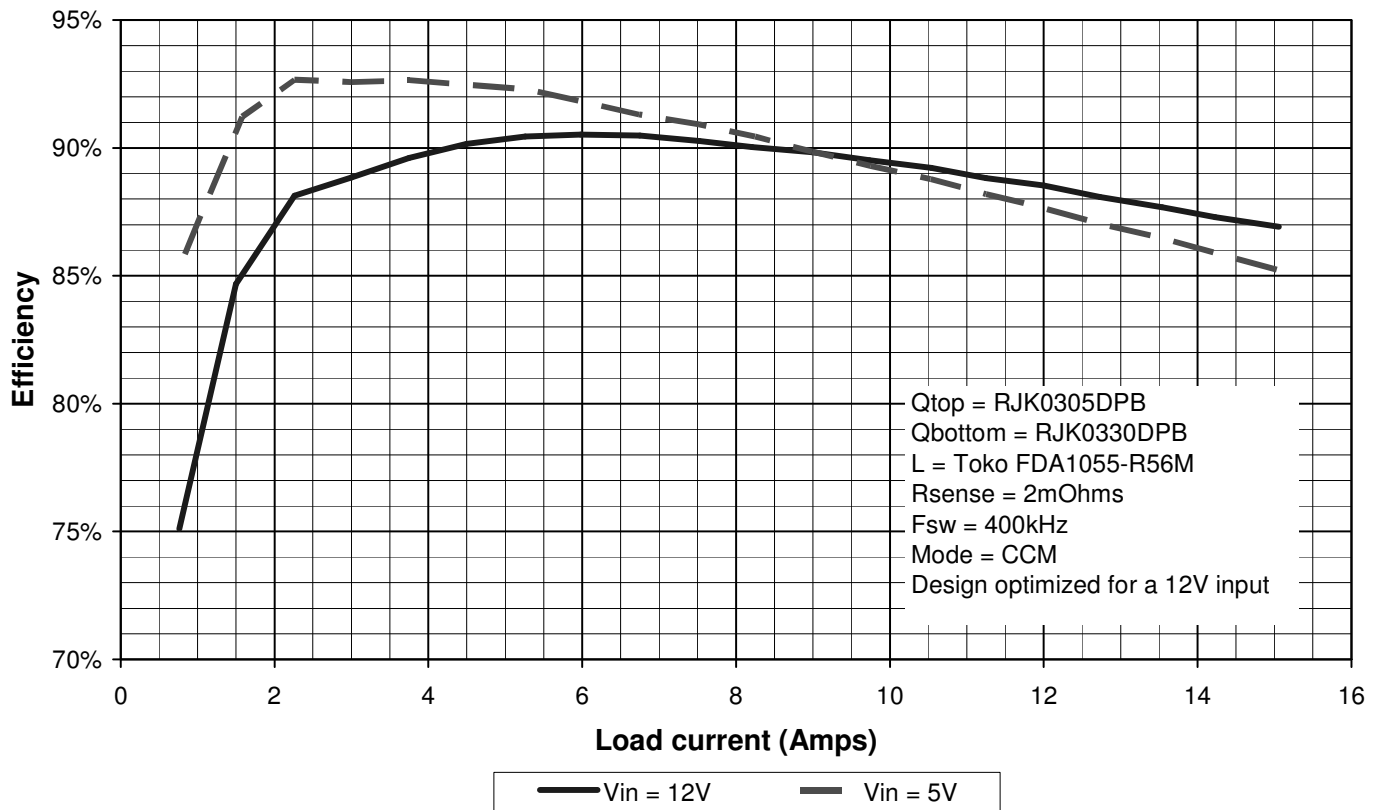
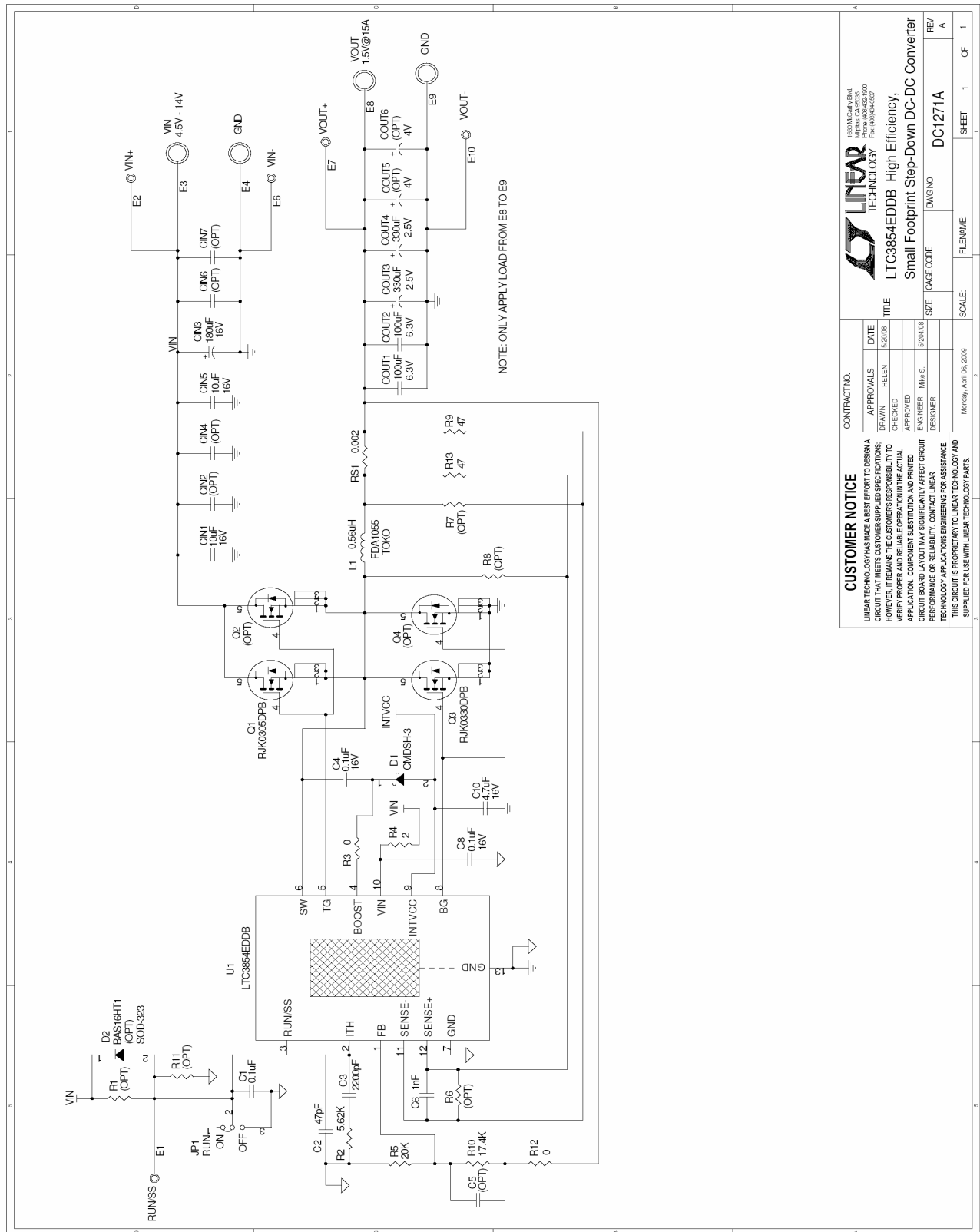


Figure 3. Typical Efficiency Curves

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## HIGH EFFICIENCY, SMALL FOOTPRINT, STEP-DOWN DC-DC CONVERTER



| CUSTOMER NOTICE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | CONTRACT NO. |  | APPROVALS |  | DATE    |  | TITLE                                                                  |  | REV |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------|--|-----------|--|---------|--|------------------------------------------------------------------------|--|-----|--|
| LINEAR TECHNOLOGY HAS MADE A BEST EFFORT TO DESIGN A CIRCUIT THAT MEETS CUSTOMER-SUPPLIED SPECIFICATIONS. HOWEVER, IT REMAINS THE CUSTOMER'S RESPONSIBILITY TO VERIFY PROPER AND RELIABLE OPERATION IN THE ACTUAL APPLICATION. COMPONENT SUBSTITUTION AND PRINTED CIRCUIT BOARD LAYOUT MAY SIGNIFICANTLY AFFECT CIRCUIT PERFORMANCE OR RELIABILITY. CONTACT LINEAR TECHNOLOGY APPLICATIONS ENGINEERING FOR ASSISTANCE. THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS. |  | DRAWN        |  | HELEN     |  | 5/20/08 |  | LTC3854EDDB High Efficiency, Small Footprint Step-Down DC-DC Converter |  | REV |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | CHECKED      |  | APPROVED  |  | 5/20/08 |  | SIZE                                                                   |  | A   |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | ENGINEER     |  | MM S.     |  | 5/20/08 |  | SCALE                                                                  |  | 1   |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | DESIGNER     |  | MM S.     |  | 5/20/08 |  | SHEET                                                                  |  | 1   |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |              |  |           |  |         |  | FLENAME                                                                |  | OF  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |              |  |           |  |         |  | DC:1271A                                                               |  | 1   |  |



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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