

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 _{P-P}
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 VIN 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

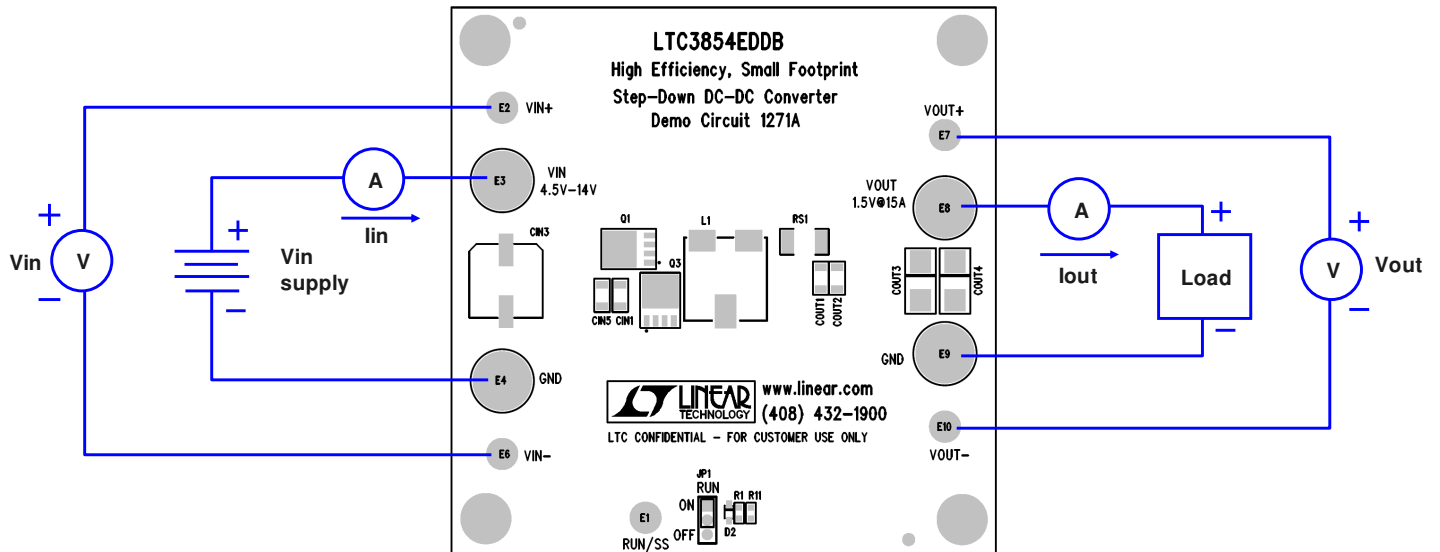


Figure 1. Proper Measurement Equipment Setup

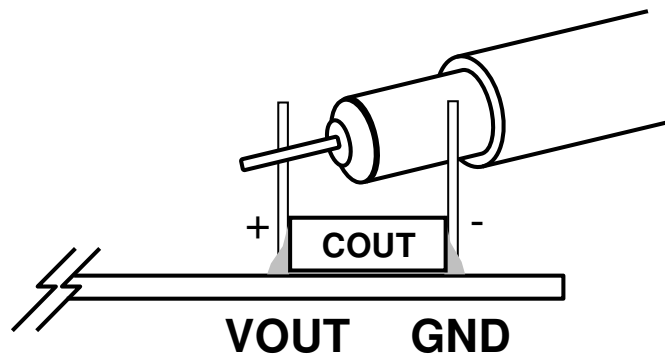


Figure 2. Measuring Input or Output Ripple

1.5V/15A LTC3854EDDB converter

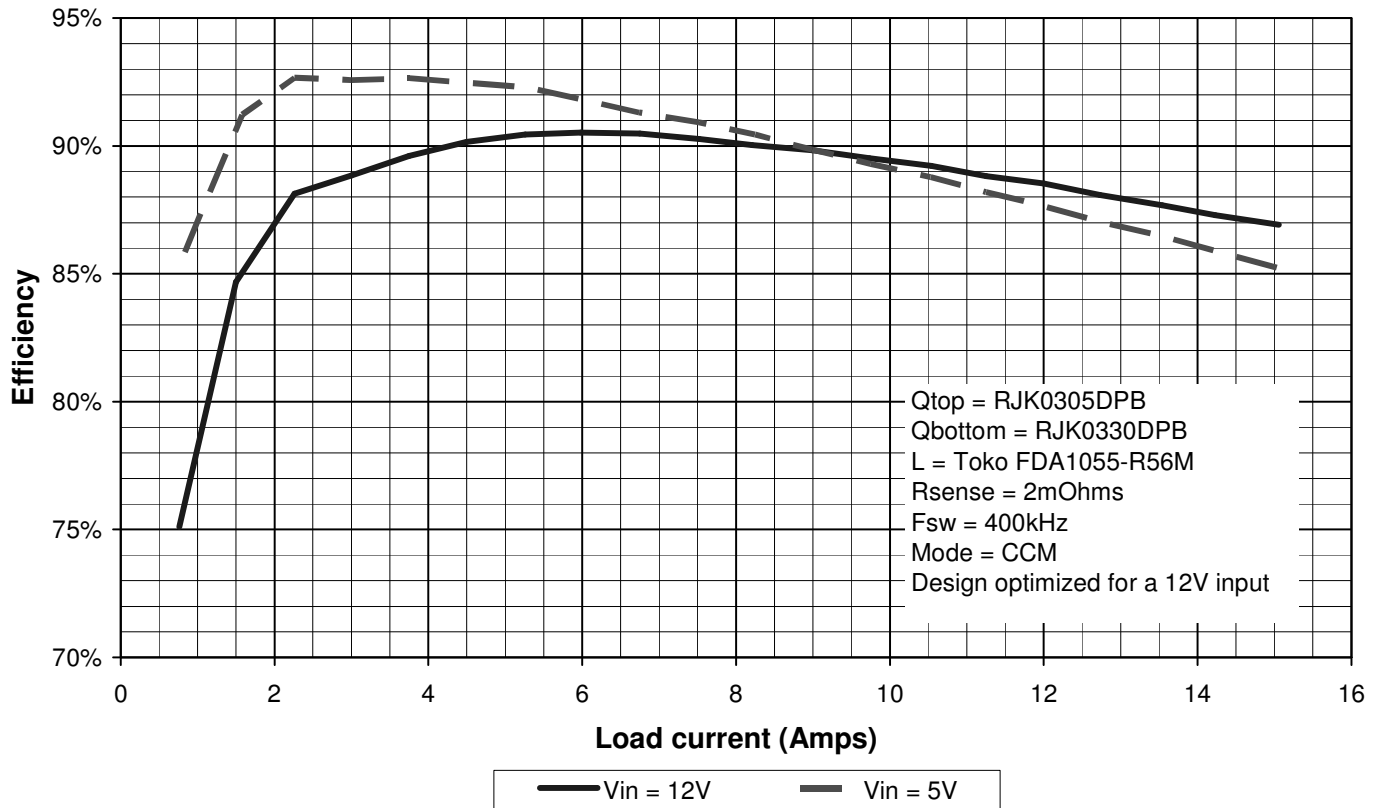
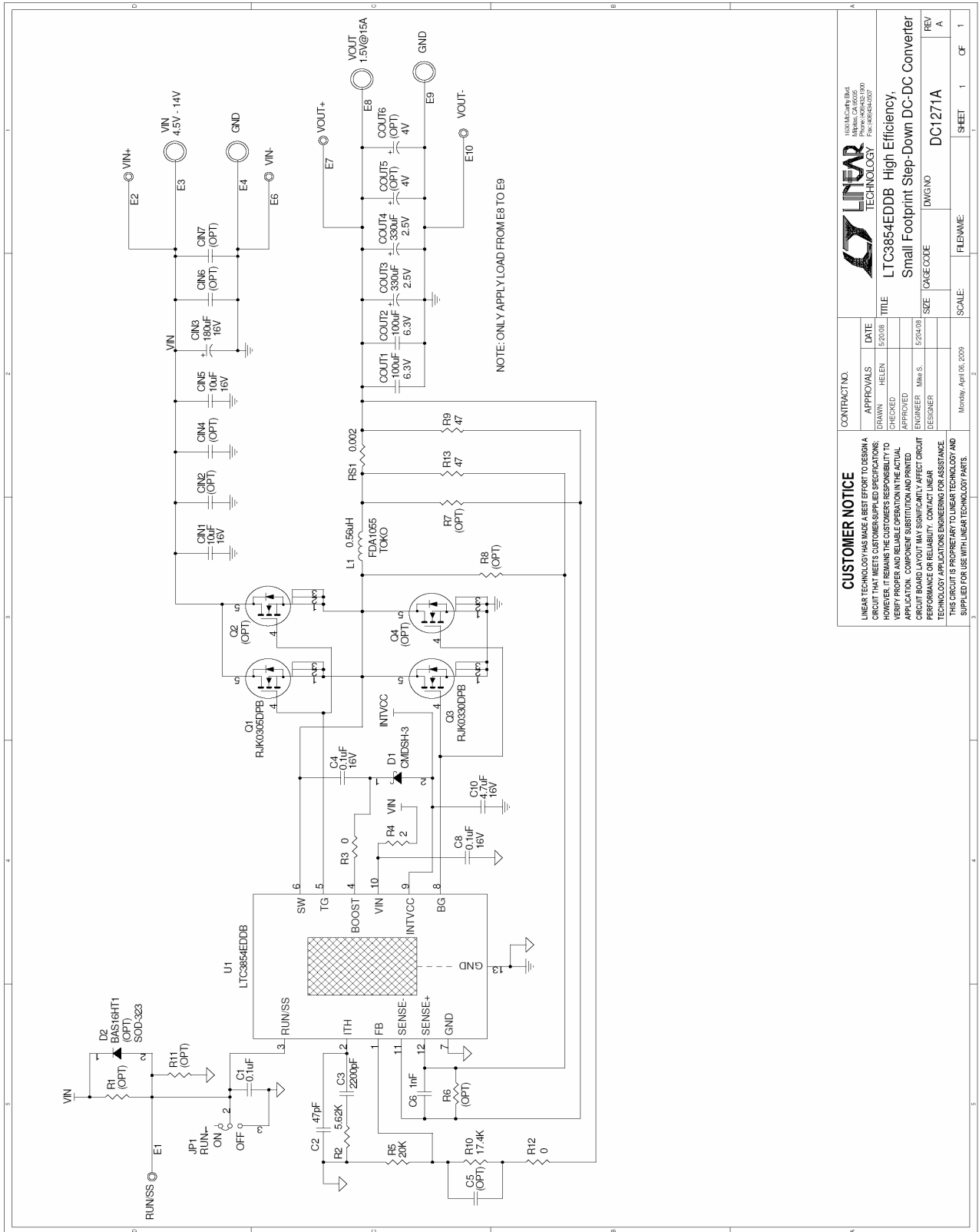


Figure 3. Typical Efficiency Curves

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CONTRACT NO.		DATE	
APPROVALS	HELEN	5/20/08	
DRAWN	HELEN		
CHECKED	APPROVED		
ENGINEER	MMH S.	5/20/08	
DESIGNER			
TITLE		LTC3854EDDB High Efficiency, Small Footprint Step-Down DC-DC Converter	
SEE	CAGE CODE	DWG NO	DC:1271A
REV			A
SHEET	1	OF	1

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LINEAR TECHNOLOGY

Monday, April 08, 2008

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