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°C)

PARAMETER	CONDITION	VALUE
Minimum Input Voltage		4.5V
Maximum Input Voltage		14V
Output Voltage V_{OUT}	V_{IN} = 4.5V to 14V, I_{OUT} = 0A to 15A	1.5V ±2%
Maximum Output Current		15A
Typical Output Ripple V_{OUT}	V_{IN} = 12V, I_{OUT} = 15A (20MHz BW)	15mV_{P-P}
Nominal Switching Frequency		400kHz
Efficiency (see Figure 3 for efficiency curves)	V_{IN} = 12V, I_{OUT} = 15A	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} = 1.47V to 1.53V
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.

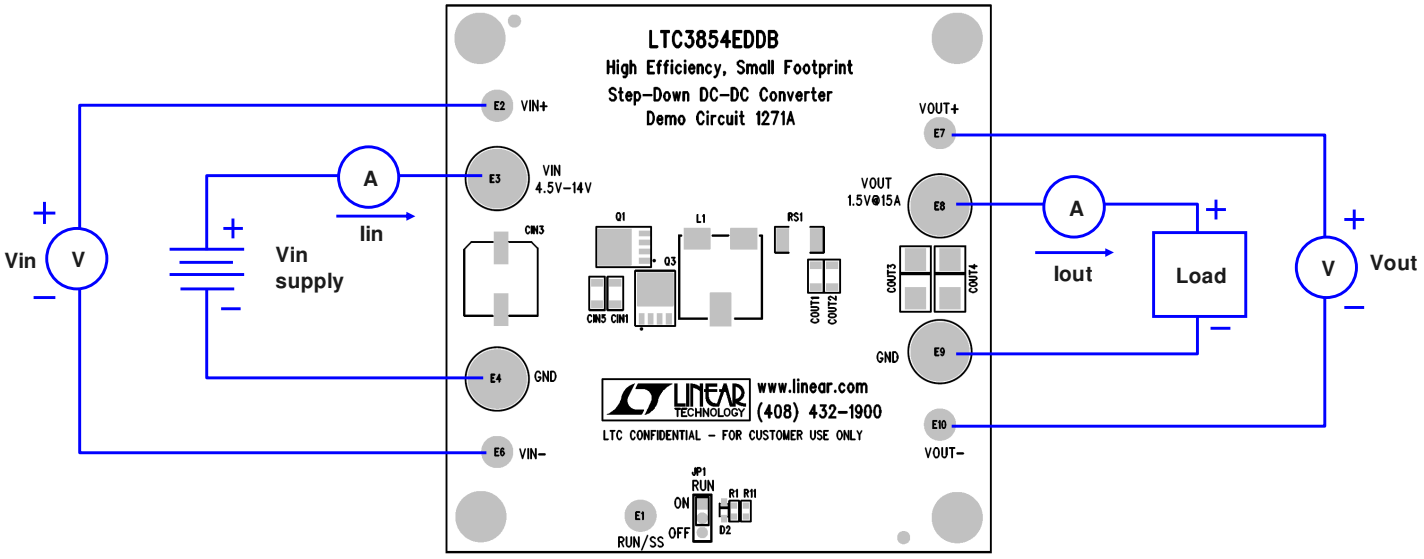


Figure 1. Proper Measurement Equipment Setup

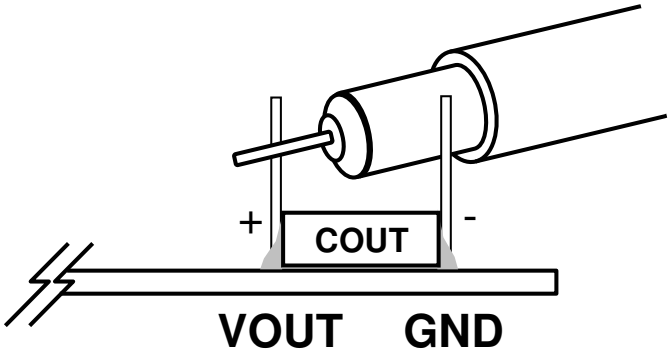


Figure 2. Measuring Input or Output Ripple

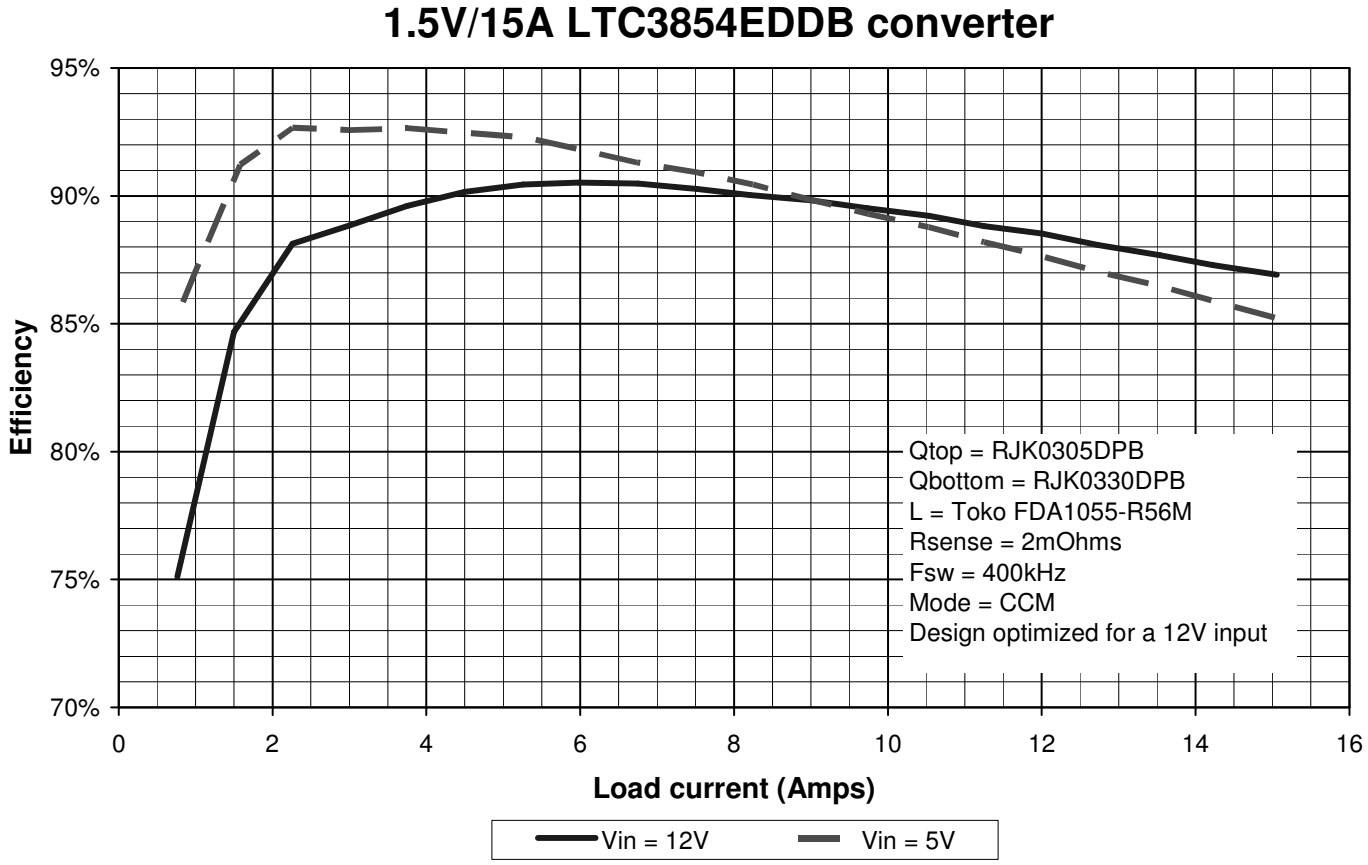
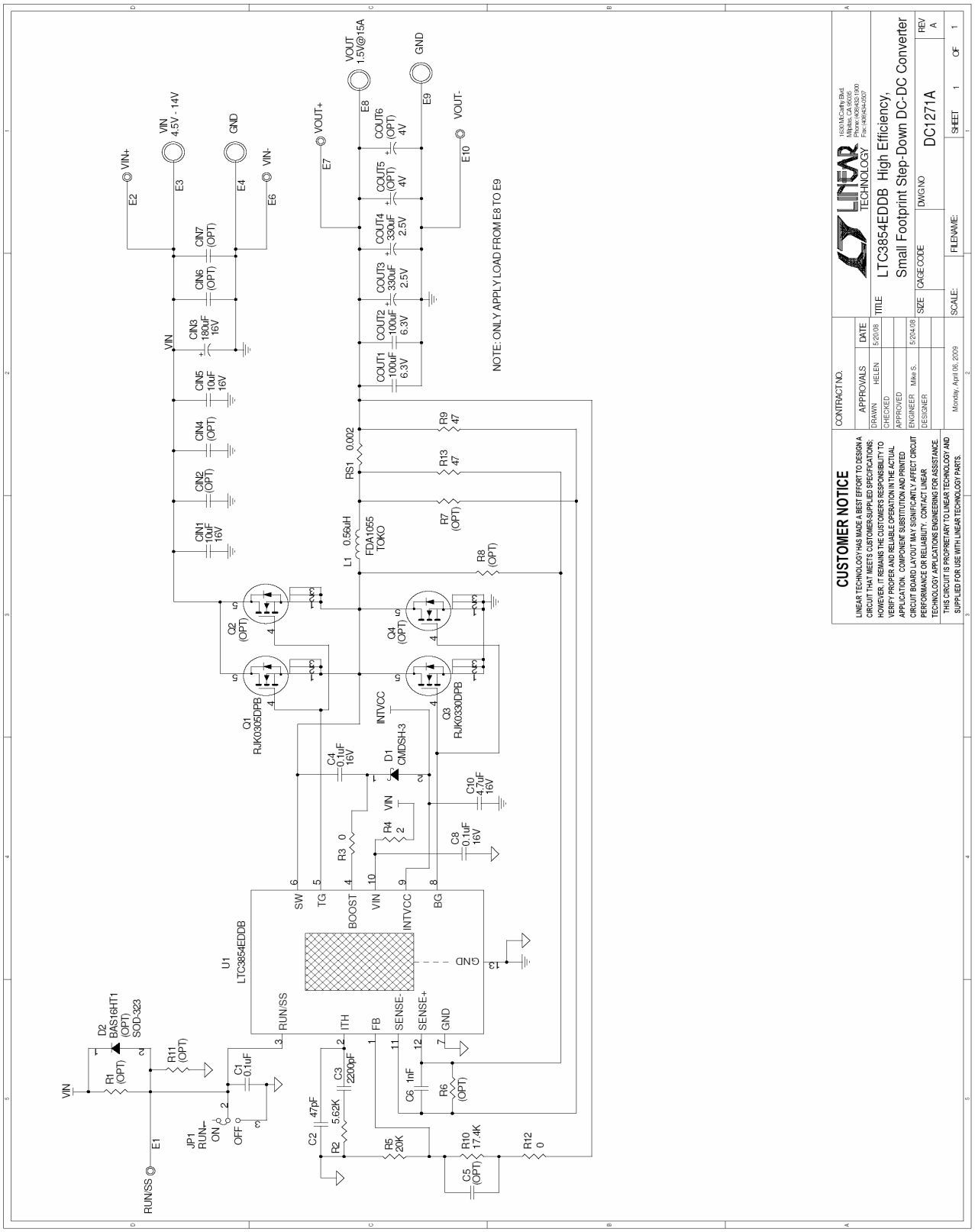


Figure 3. Typical Efficiency Curves


VIN+
VIN
4.5V - 14V
GND
VIN-
VOUT+
VOUT
1.5V@15A
GND
VOUT-
NOTE: ONLY APPLY LOAD FROM E8 TO E9
LTC3854EDDB
High Efficiency, Small Footprint Step-Down DC-DC Converter
DC1271A
CUSTOMER NOTICE
LINEAR TECHNOLOGY HAS MADE A BEST EFFORT TO DESIGN A CIRCUIT THAT MEETS CUSTOMER-SUPPLIED SPECIFICATIONS; HOWEVER, IT REMAINS THE CUSTOMERS 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.