# 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) | 15m$V_{P-P}$ |
| 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.

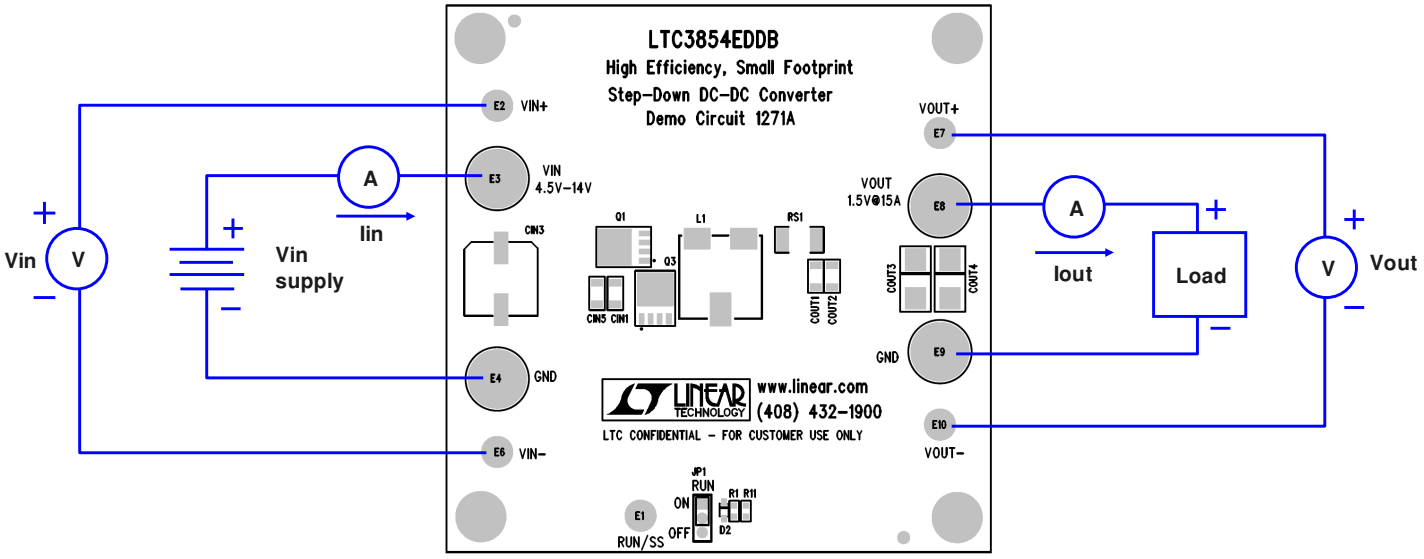



**Figure 1. Proper Measurement Equipment Setup**

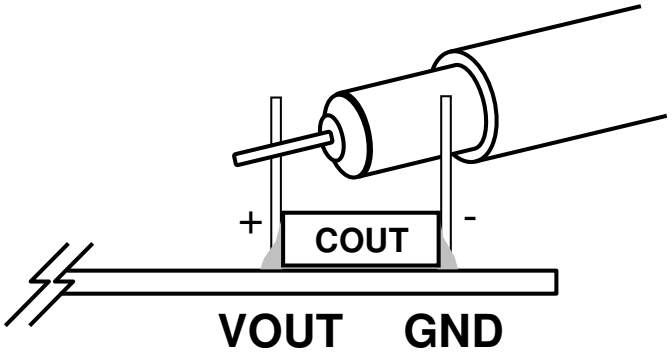



**Figure 2. Measuring Input or Output Ripple**

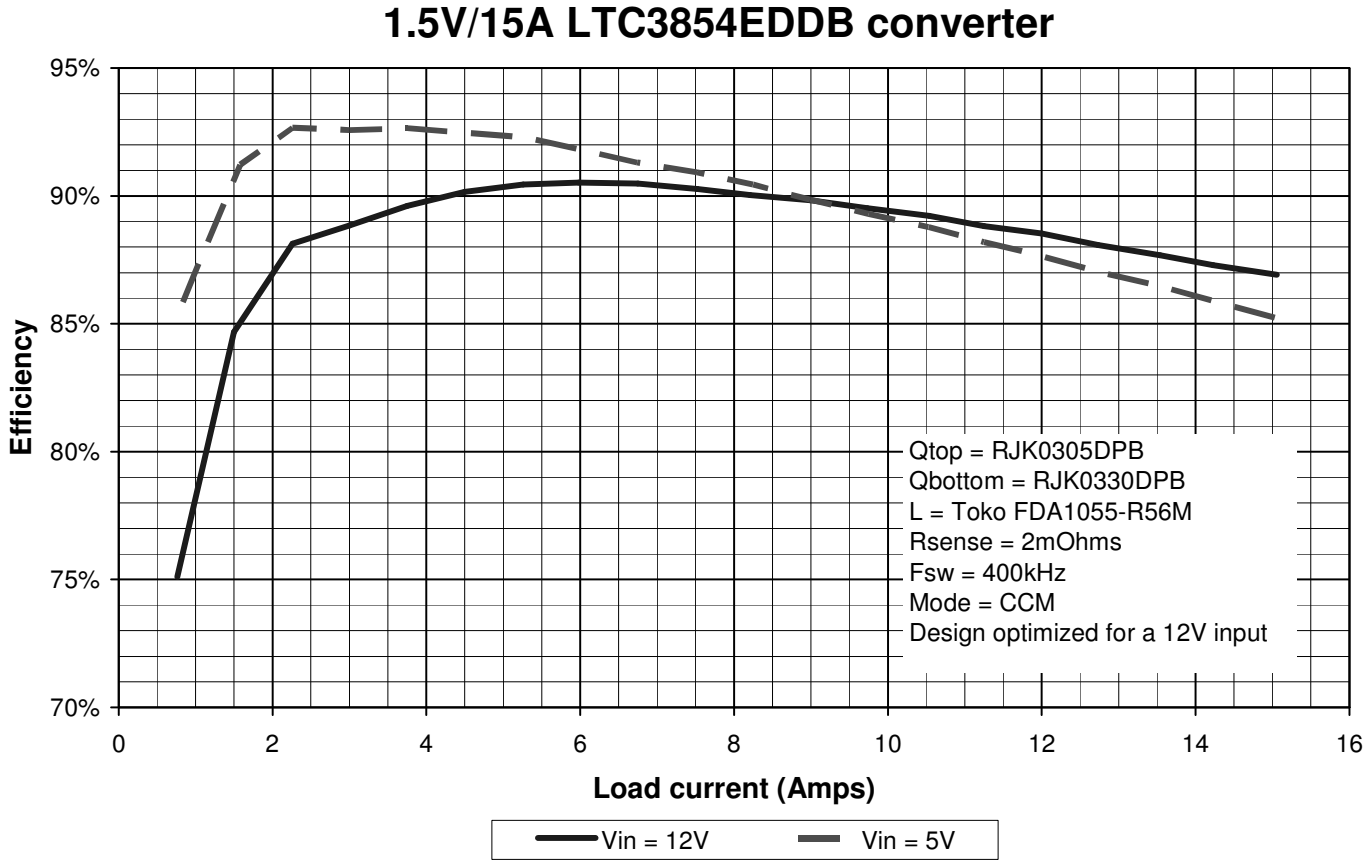
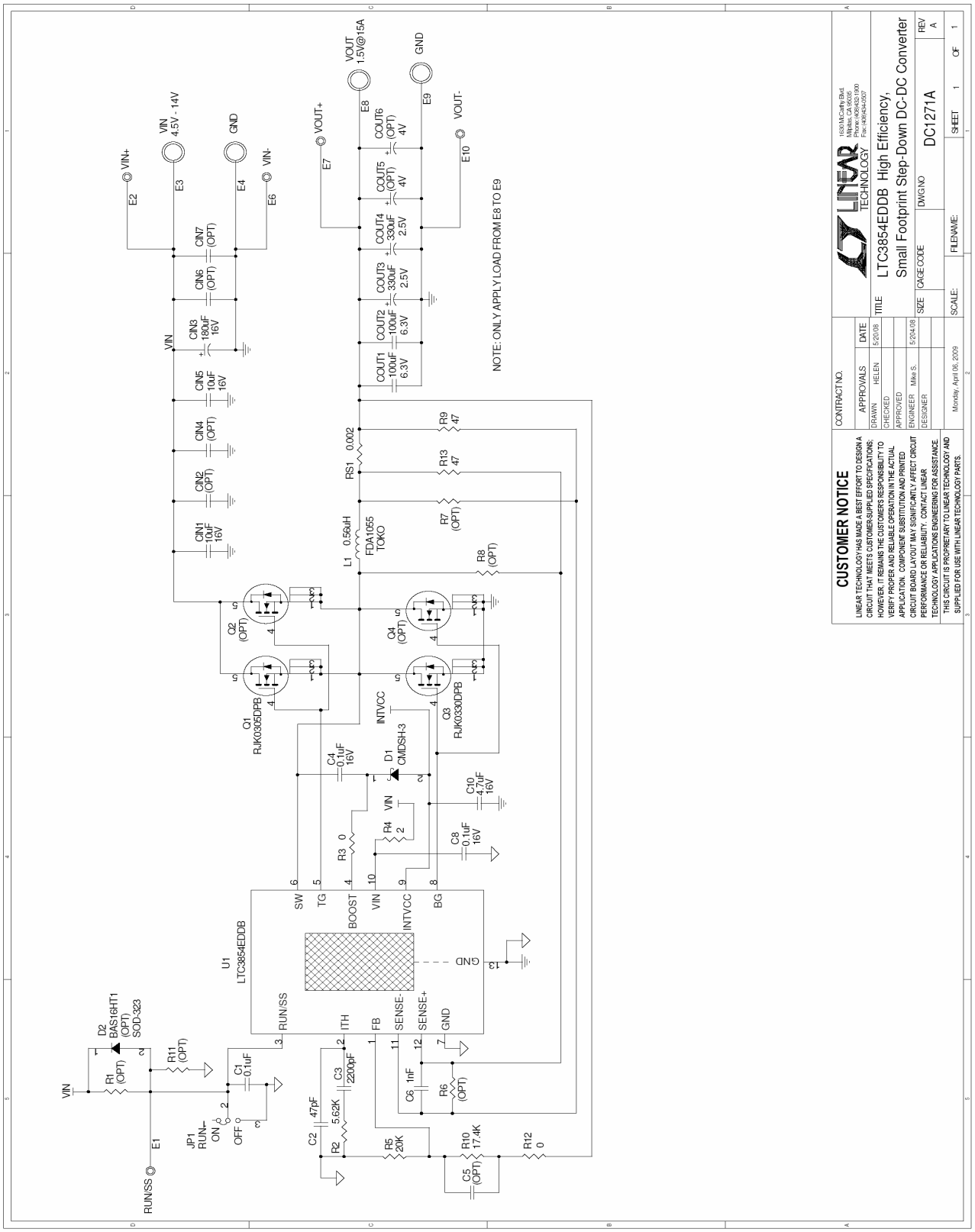



**Figure 3. Typical Efficiency Curves**


VIN+
VIN
4.5V - 14V
GND
VIN-
VOUT+
VOUT
1.5V@15A
GND
VOUT-
NOTE: ONLY APPLY LOAD FROM E8 TO E9
U1
LTC3854EDDB
Q1
RJK0305DPB
Q2 (OPT)
Q3
RJK0330DPB
Q4 (OPT)
L1 0.56uH
FDA1055
TOKO
RS1 0.002
D1
CMDSH-3
D2
BAS16HT1
(OPT)
SOD-323
JP1
RUN
ON
OFF
RUN/SS
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CONTRACT NO.
APPROVALS
DRAWN HELEN 5/20/08
CHECKED
APPROVED
ENGINEER Mike S. 5/20/08
DESIGNER
DATE
TITLE
LTC3854EDDB High Efficiency, Small Footprint Step-Down DC-DC Converter
SIZE
CAGE CODE
DWG NO
DC1271A
REV A
SCALE:
FILENAME:
SHEET 1 OF 1
Monday, April 06, 2009
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