DEMO CIRCUIT 1450A
QUICK START GUIDE

LTC3854EDDB
SMALL FOOTPRINT BUCK CONVERTER

DESCRIPTION

Demonstration circuit 1450A is a small foot print, high efficiency synchronous buck converter with 4.5V to 26V input range. It can supply 5A maximum load current at 2.5V output. The demo board features the LTC®3854EDDB controller. The controller features a 400kHz constant frequency current mode architecture. With a wide input range and output range, the LTC3854 is ideal for automotive, telecom, industrial and distributed DC power systems. This board has a compact solution size with dual So-8 MOSFETs, small inductor and capacitor footprints. The package of LTC3854EDDB is a small, low thermal impedance, 12-Lead (3mm x 2mm) plastic DFN.

The RUN/SS pin (JP1) provides both soft-start and enable features. To shut down the converter, one simple way is to force the RUN pin below 0.4V (JP1: OFF).

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

Table 1. **Performance Summary (T_A = 25°C)**

PARAMETER	CONDITION	VALUE
Input Voltage Range		4.5V to 26V
Output Voltage, V_{OUT}	V_{IN} = 4.5-26V, I_{OUT} = 0A to 5A	2.5V ±2%
Maximum Output Current, I_{OUT}	V_{IN} = 4.5-26V, V_{OUT} = 2.5V	5A
Typical Efficiency	V_{IN} = 15V, V_{OUT} = 2.5V, I_{OUT} = 5A	89.5%
Typical Switching Frequency		400kHz

QUICK START PROCEDURE

Demonstration circuit 1450A is easy to set up to evaluate the performance of the LTC3854EDDB. Refer to Figure 1 for the proper measurement equipment setup and follow the procedure below:

1. With power off, connect the input power supply to Vin (4.5V-26V) and GND (input return).
2. Connect the 2.5V output load between Vout and GND (Initial load: no load).
3. Connect the DVMs to the input and outputs.
4. Turn on the input power supply and check for the proper output voltages. Vout should be 2.5V+/-2%.
5. Once the proper output voltages are established, adjust the loads within the operating range and observe the output voltage regulation, ripple voltage and other parameters.

Note: When measuring the output or input voltage ripple, do not use the long ground lead on the oscilloscope probe. See Figure 2 for the proper scope probe technique. Short, stiff leads need to 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.

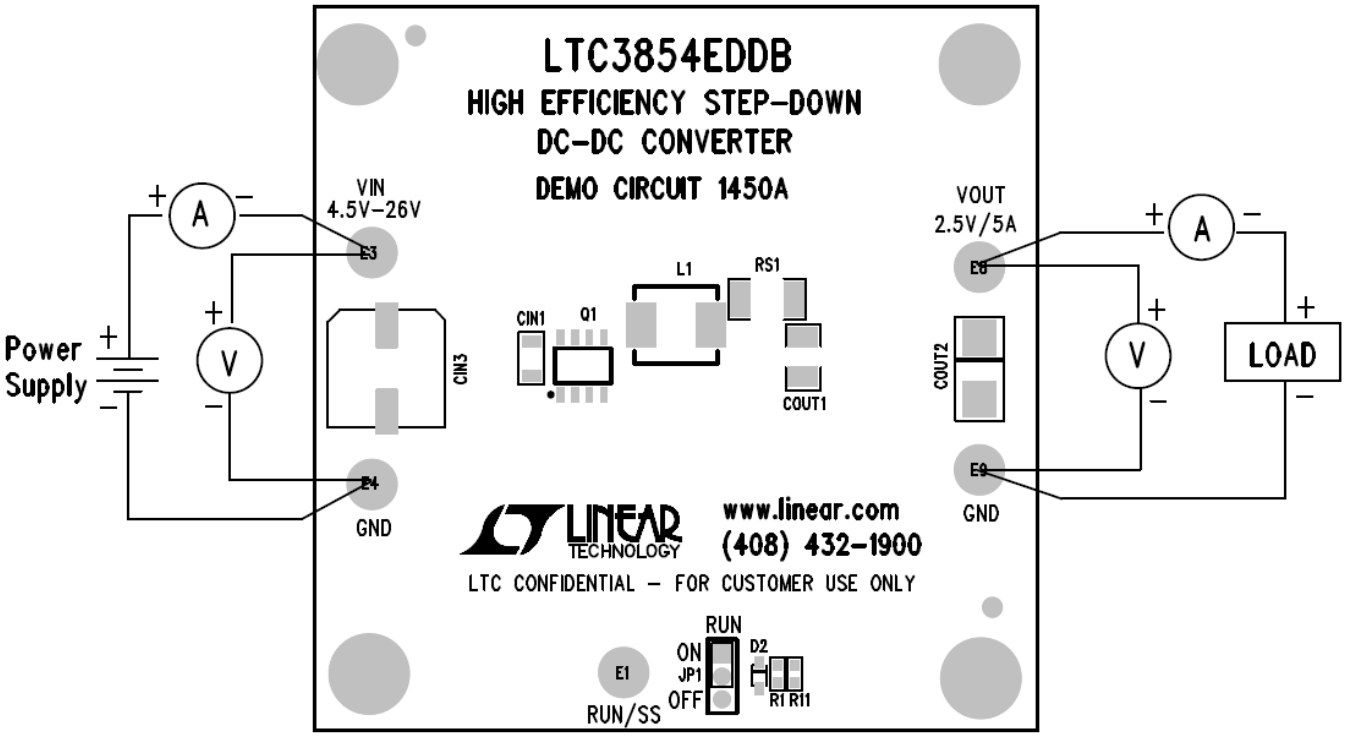


Figure 1. Proper Measurement Equipment Setup

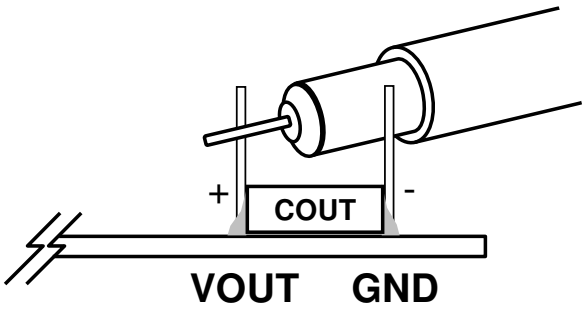


Figure 2. Measuring Output Voltage Ripple

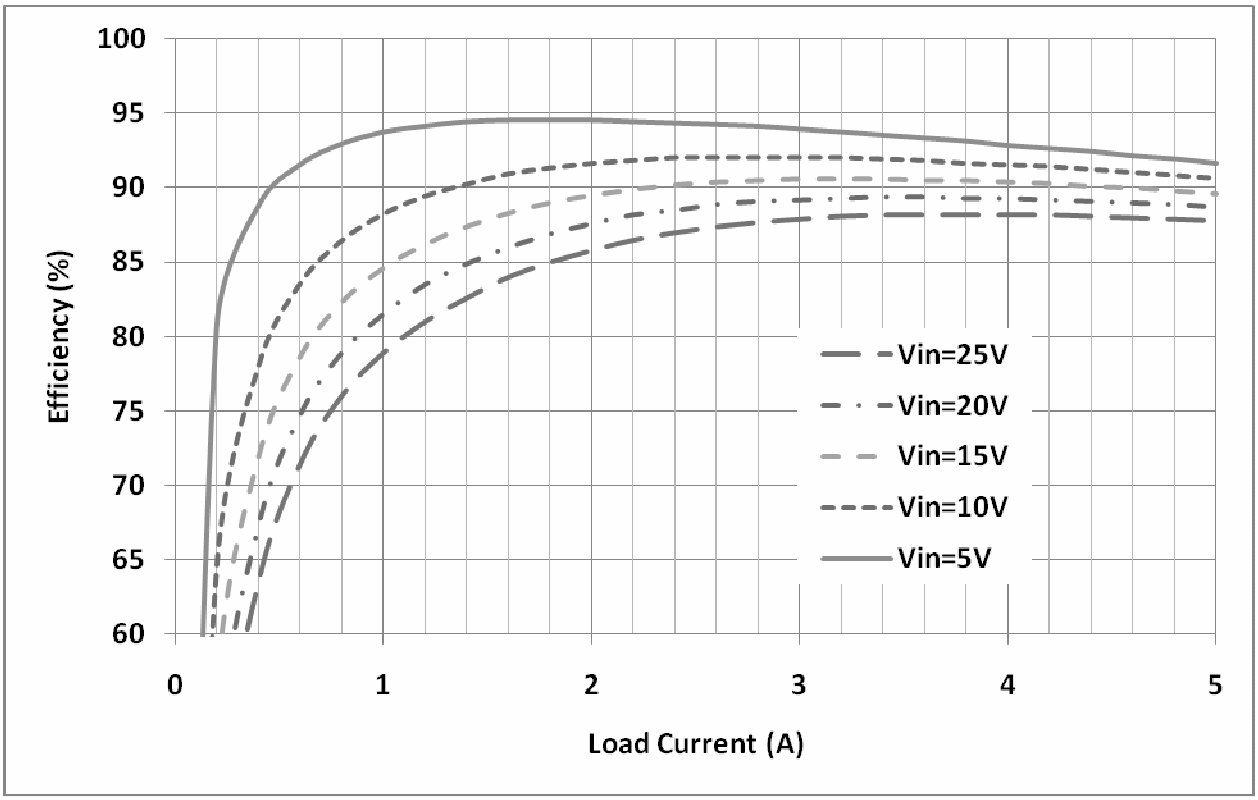
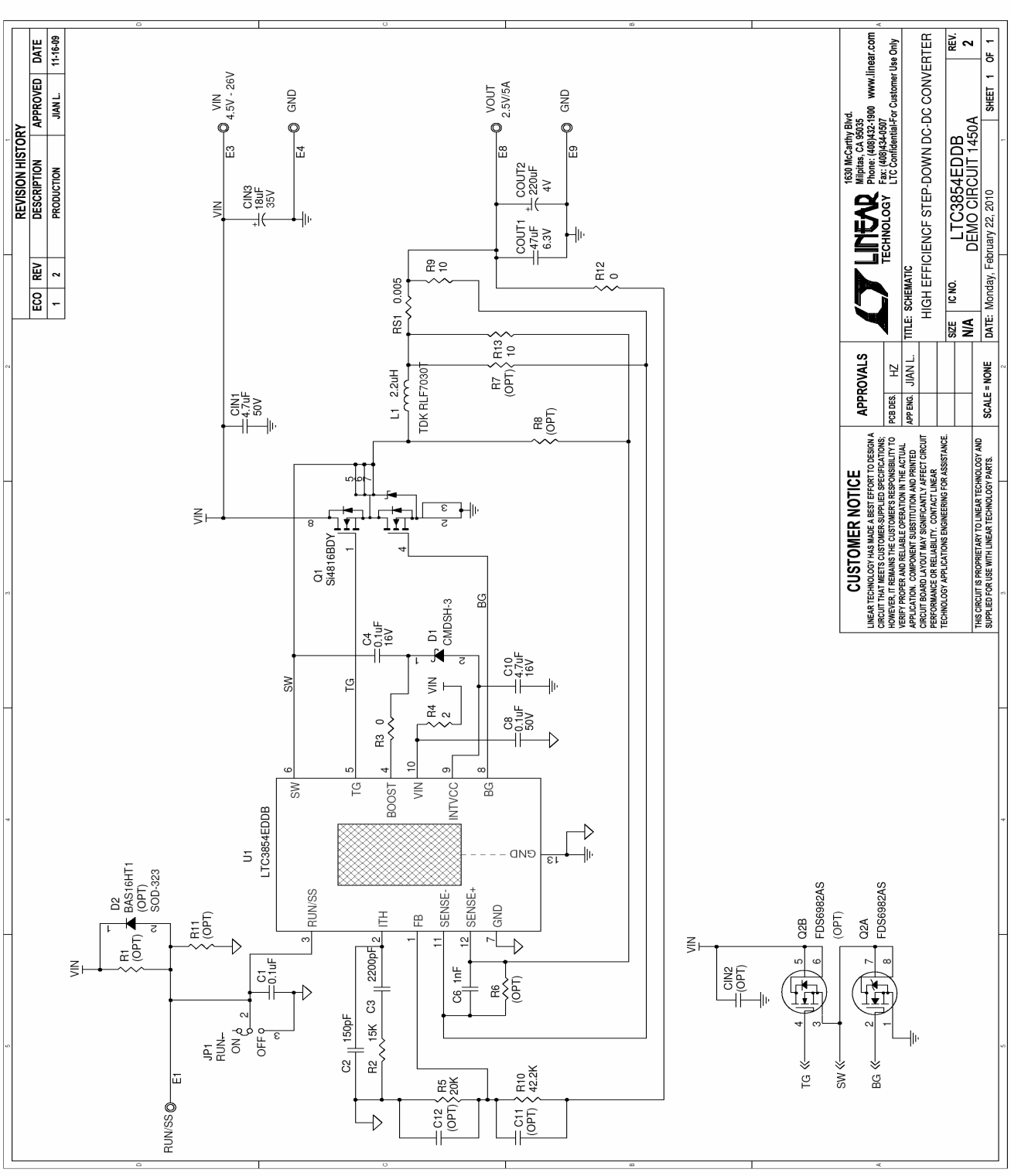


Figure 3. Efficiency vs load current


REVISION HISTORY
ECO REV DESCRIPTION APPROVED DATE
1 2 PRODUCTION JIAN L. 11-16-09
CUSTOMER NOTICE
APPROVALS
PCB DES. HZ
APP ENG. JIAN L.
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Milpitas, CA 95035
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LTC Confidential-For Customer Use Only
TITLE: SCHEMATIC
HIGH EFFICIENCF STEP-DOWN DC-DC CONVERTER
SIZE N/A
IC NO. LTC3854EDDB
DEMO CIRCUIT 1450A
REV. 2
DATE: Monday, February 22, 2010
SHEET 1 OF 1
SCALE = NONE
U1 LTC3854EDDB
Q1 Si4816BDY
Q2A FDS6982AS
Q2B FDS6982AS
D1 CMDSH-3
D2 BAS16HT1 (OPT) SOD-323
L1 2.2uH TDK RLF7030T
RS1 0.005
VIN 4.5V - 26V
VOUT 2.5V/5A
GND
RUN/SS
JP1 RUN–ON OFF
CIN1 4.7uF 50V
CIN2 (OPT)
CIN3 18uF 35V
COUT1 47uF 6.3V
COUT2 220uF 4V
C1 0.1uF
C2 150pF
C3 2200pF
C4 0.1uF 16V
C6 1nF
C8 0.1uF 50V
C10 4.7uF 16V
C11 (OPT)
C12 (OPT)
R1 (OPT)
R2 15K
R3 0
R4 2
R5 20K
R6 (OPT)
R7 (OPT)
R8 (OPT)
R9 10
R10 42.2K
R11 (OPT)
R12 0
R13 10
SW
TG
BG
BOOST
INTVCC
RUN/SS
ITH
FB
SENSE–
SENSE+
GND