

**LTC3854EMSE**  
**WIDE INPUT RANGE AND SMALL FOOTPRINT**  
**BUCK CONVERTER****DESCRIPTION**

Demonstration circuit 1487A is a small foot print, wide input voltage range, high efficiency synchronous buck converter with 4.5V to 34V input range. It can supply 12A maximum load current at 2.5V output. The demo board features the LTC®3854EMSE 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. The demo board uses a high density, two sided drop-in layout with a minimal amount of components. The package of LTC3854EMSE is a small, low thermal impedance 12-lead plastic MSOP.

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 ( $T_A = 25^\circ\text{C}$ )**

PARAMETER	CONDITION	VALUE
Input Voltage Range		4.5V to 34V
Output Voltage, $V_{OUT}$	$V_{IN} = 4.5\text{-}34\text{V}$ , $I_{OUT} = 0\text{A to }12\text{A}$	$2.5\text{V} \pm 2\%$
Maximum Output Current, $I_{OUT}$	$V_{IN} = 4.5\text{-}34\text{V}$ , $V_{OUT} = 2.5\text{V}$	12A
Typical Efficiency	$V_{IN} = 20\text{V}$ , $V_{OUT} = 2.5\text{V}$ , $I_{OUT} = 12\text{A}$	92%
Typical Switching Frequency		400kHz

## QUICK START PROCEDURE

Demonstration circuit 1487A is easy to set up to evaluate the performance of the LTC3854EMSE. 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  $V_{in}$  (4.5V-34V) and GND (input return).
2. Connect the 2.5V output load between  $V_{out}$  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.  $V_{out}$  should be  $2.5V \pm 2\%$ .
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.

# LTC3854EMSE

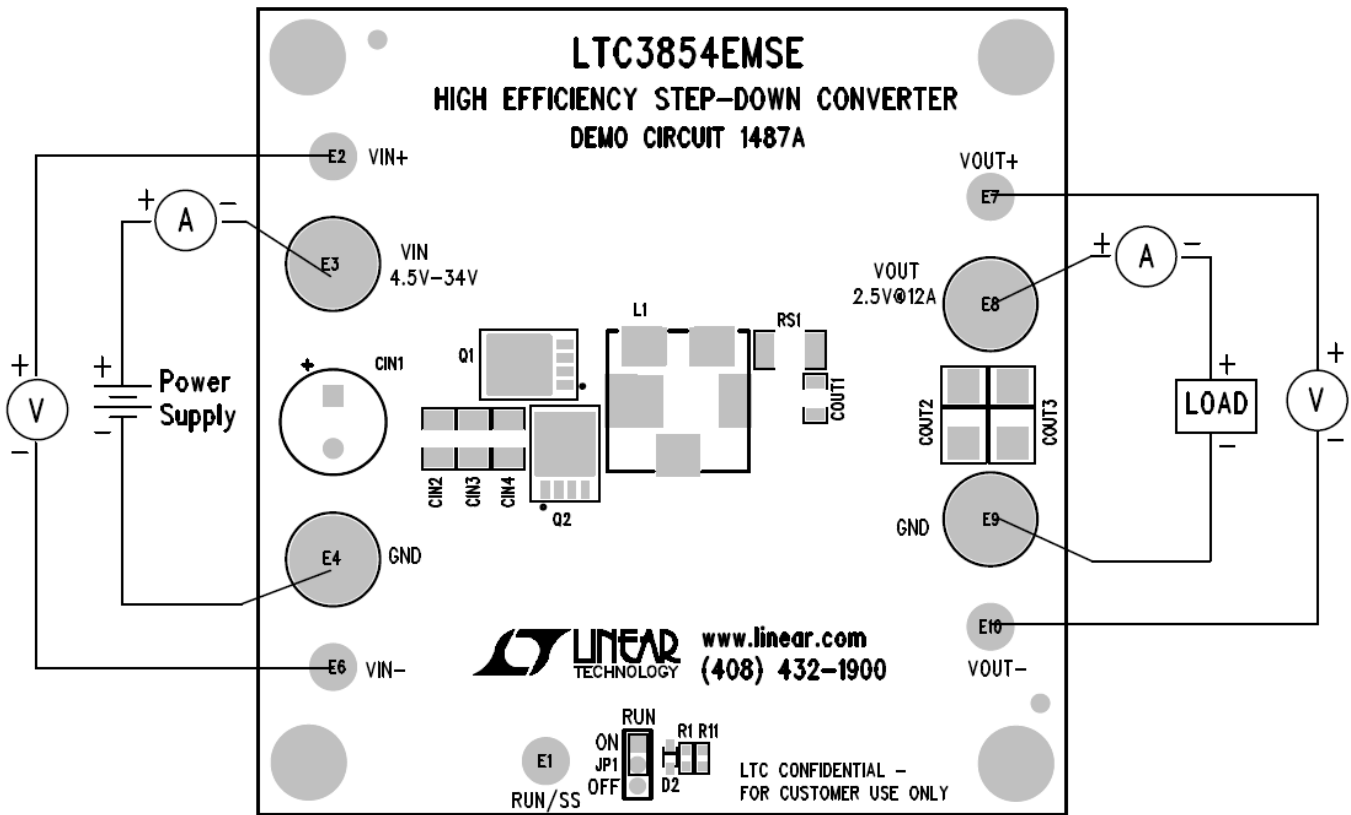


Figure 1. Proper Measurement Equipment Setup

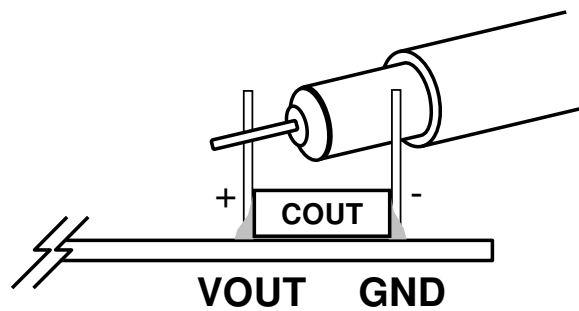


Figure 2. Measuring Output Voltage Ripple

# LTC3854EMSE

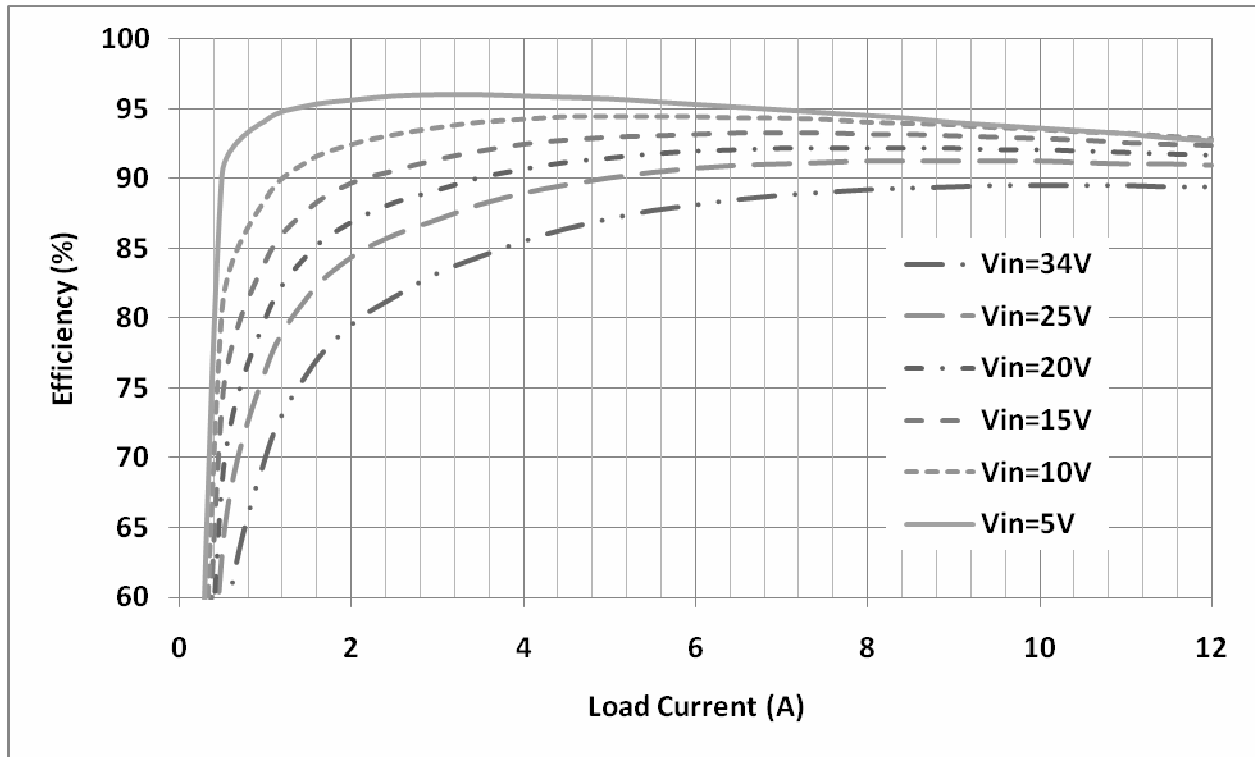
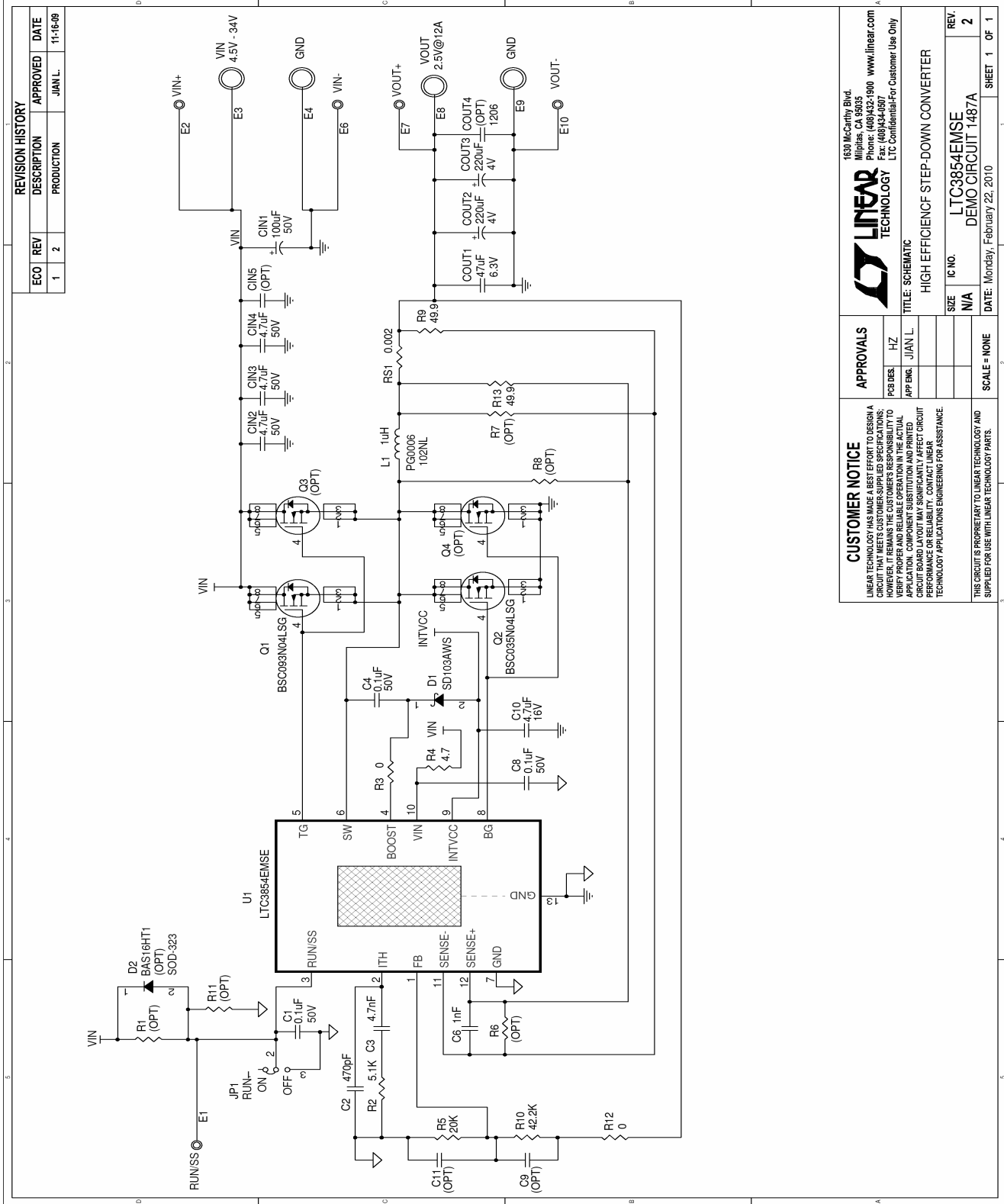


Figure 3. Efficiency vs load current

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REVISION HISTORY		
ECO	REV	DESCRIPTION
1	2	PRODUCTION
		APPROVED
		JAN.L.
		DATE
		11-16-09

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**TITLE: SCHEMATIC**  
 HIGH EFFICIENCY STEP-DOWN CONVERTER

IC NO. LTC3854EMSE  
 DEMO CIRCUIT 1487A

SIZE N/A  
 SCALE = NONE

DATE: Monday, February 22, 2010  
 SHEET 1 OF 1