

## DESCRIPTION

Demonstration circuit 882 is a small size, low profile, low cost and high efficiency synchronous step-down DC/DC converter featuring the LTC3809EDD-1 controller. The demo board is capable of providing 2A output current with 2.75V to 9.8V input range. Burst mode/Pulse skipping/Forced continuous operation is selectable. The constant frequency current mode architecture with MOSFET  $V_{DS}$  sensing eliminates the need for a sense resistor and improves efficiency. The maximum peak cur-

rent sense threshold can be easily selected with IPRG pin. Switching frequency is internally set at 550KHz.

The demo board has optional power component footprints to deliver higher output current and a tracking function, allowing  $V_{out}$  to track an external voltage signal at the TRACK terminal (JP4: Track).

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

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**Table 1. Performance Summary ( $T_A = 25^\circ\text{C}$ )**

PARAMETER	CONDITION	VALUE
Input Voltage Range		2.75V to 9.8V
$V_{OUT}$	$V_{IN} = 2.75\text{V}-9.8\text{V}$ , $I_{OUT} = 0\text{A to } 2\text{A}$	$1.8\text{V} \pm 2.5\%$
Maximum load current $I_{OUT}$	$V_{IN} = 2.75\text{V}-9.8\text{V}$	2A
Typical Output Ripple Voltage	$V_{IN} = 3.3\text{V}$ , $I_{OUT} = 2\text{A}$ (20MHz BW)	8mV <sub>P-P</sub>
Typical Switching Frequency		550kHz

## QUICK START PROCEDURE

Demonstration circuit 882 is easy to set up to evaluate the performance of the LTC3809-1. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below: (Initial jumper positions: JP1 selected; JP4: Soft Start)

**NOTE:** When measuring the input or output voltage ripple, care must be taken to avoid a long ground lead on the oscilloscope probe. Measure the input or output voltage ripple by touching the probe tip directly across the  $V_{in}$  or  $V_{out}$  and GND terminals. See Figure 2 for proper scope probe technique.

1. With power off, connect the input power supply to  $V_{in}$  (2.75V-9.8V) and GND (input return).

2. Connect the 1.8V load between  $V_{out}$  and GND (Initial load: 0 A).
3. Connect the DVMs to the input and output.
4. Turn on the input power supply and check for the proper output voltage.  $V_{out}$  should be  $1.8\text{V} \pm 2.5\%$ .
5. Once the proper output voltage is established, adjust the load within the operating range and observe the output voltage regulation, ripple voltage and other parameters.

# QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 882

## SYNCHRONOUS STEP-DOWN CONVERTER WITH OUTPUT TRACKING

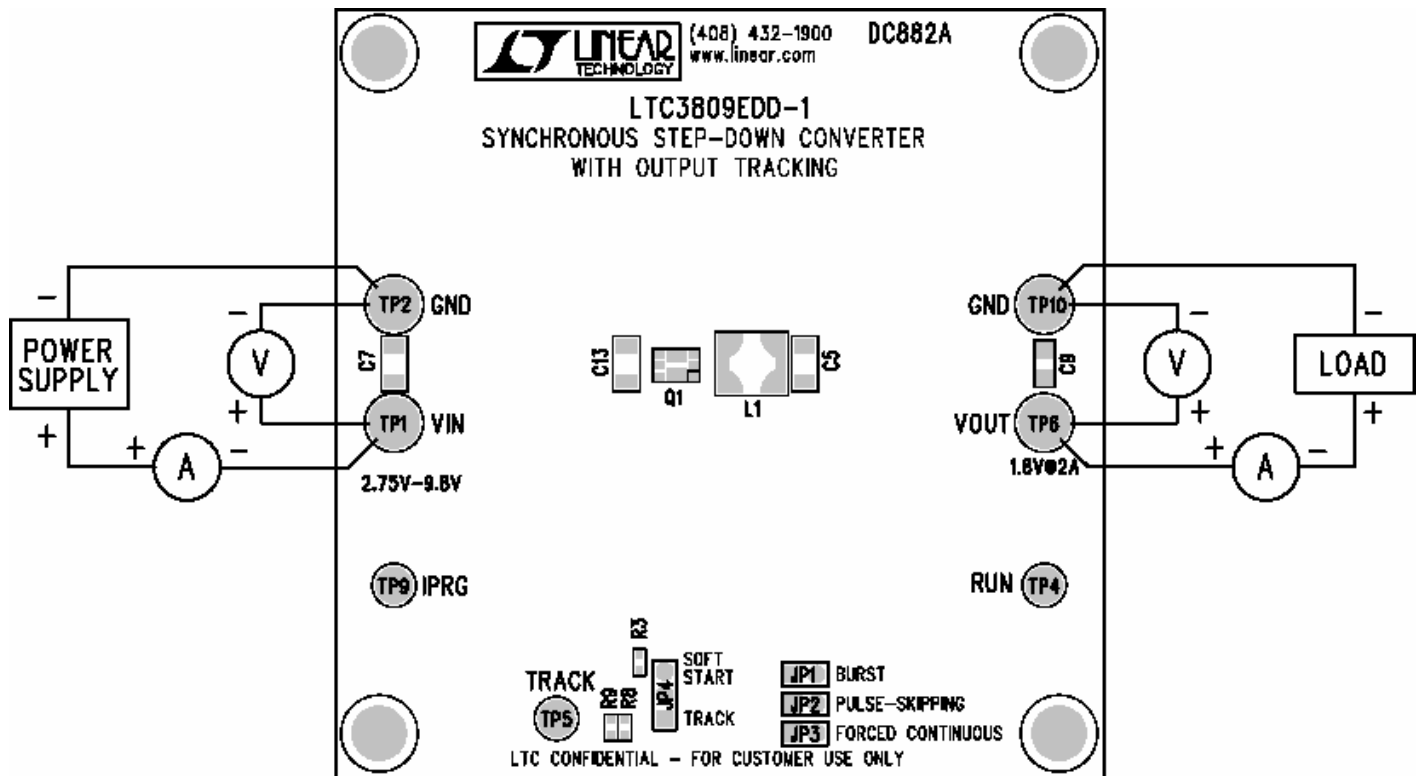


Figure 1. Proper Measurement Equipment Setup

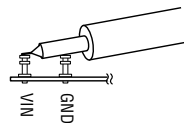


Figure 2. Measuring Input or Output Ripple

# QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 882

## SYNCHRONOUS STEP-DOWN CONVERTER WITH OUTPUT TRACKING

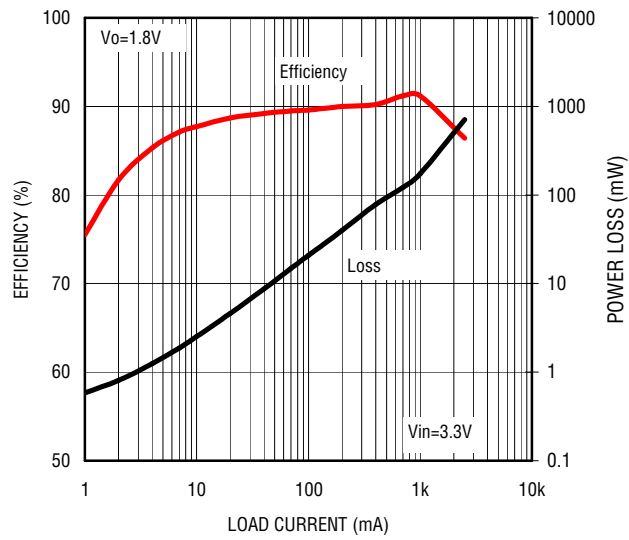
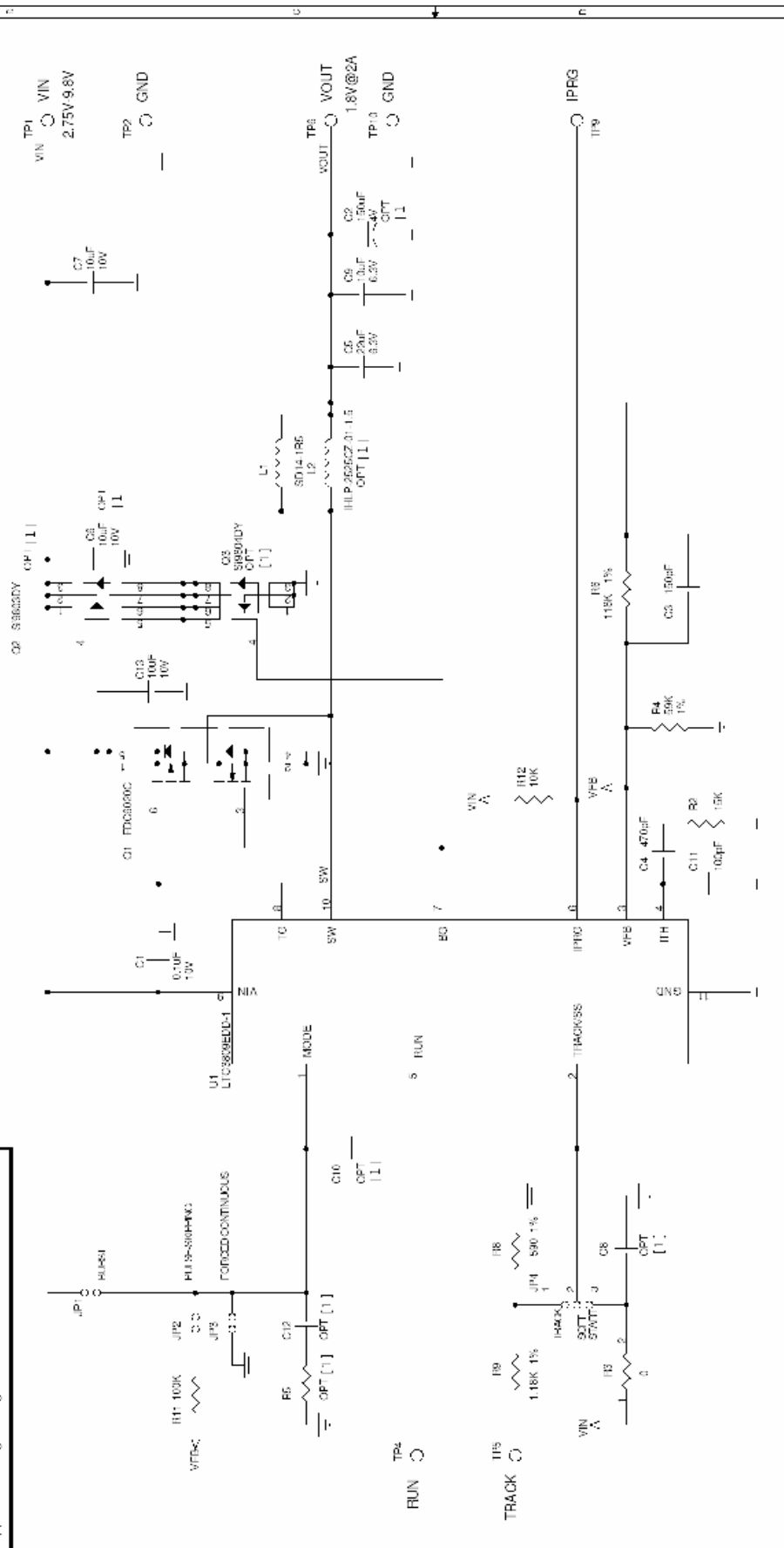


Figure 3. Efficiency and Loss vs Load Current (Burst Mode)

# QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 882 SYNCHRONOUS STEP-DOWN CONVERTER WITH OUTPUT TRACKING

This circuit is proprietary to Linear Technology and supplied for use with Linear Technology parts.  
**Customer Notice:** Linear Technology has made a best effort to design a circuit that meets customer-supplied specifications; however, it remains the customer's 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 Applications Engineering for assistance.



ECO	REV	DESCRIPTION	DATE	APPROVED
	1	PHOTO	12/06/04	

CONTRACT NO.	DATE	TITLE
	12/08/04	SCH, LTC3809EDD-1, SYNCHRONOUS STEP-DOWN CONVERTER WITH OUTPUT TRACKING

UNLESS OTHERWISE SPECIFIED	APPROVED	SCALE: NONE	SHEET	1	OF	1
DIMENSIONS ARE IN INCHES	ENGINEER					
2 PLACES, 3 PLACES, ...	DESIGNER					
INTERPRET DIM AND TOL						
PER ASME Y14.5M-1994						
THIS ANGLE PROJECTION						
DO NOT SCALE DRAWING						

SIZE	DATE	FILE NAME	DESIGNER
1	12/08/04	882A-1.DSN	DWNGNO



100 MAGNITUDE  
 100 MAGNITUDE  
 100 MAGNITUDE  
 100 MAGNITUDE

UNLESS OTHERWISE SPECIFIED  
 DIMENSIONS ARE IN INCHES  
 2 PLACES, 3 PLACES, ...  
 INTERPRET DIM AND TOL  
 PER ASME Y14.5M-1994  
 THIS ANGLE PROJECTION  
 DO NOT SCALE DRAWING

NOT 5% UNLESS OTHERWISE SPECIFIED  
 [1] DO NOT STOP (S-TOP)  
 2. WITH LISTING LTC3809EDD-1, SW=2.0V, SP=100µM, R=0.0, S=1.0, OUT=1.8V, SWFT=START, R3=330k, R11, R12, R13, R14, R15, R16, C1, C2, C3, C4, C5, C6, C7, C8, C9, C10=1000pF.