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

LTC3809EDD-1

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 current 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 Vout 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°C)

PARAMETER	CONDITION	VALUE
Input Voltage Range		2.75V to 9.8V
V_{OUT}	V_{IN} = 2.75V-9.8V, I_{OUT} = 0A to 2A	1.8V ±2.5%
Maximum load current I_{OUT}	V_{IN} = 2.75V-9.8V	2A
Typical Output Ripple Voltage	V_{IN} = 3.3V, I_{OUT} = 2A (20MHz BW)	8mV_{P-P}
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 Vin or Vout and GND terminals. See Figure 2 for proper scope probe technique.

1. With power off, connect the input power supply to Vin (2.75V-9.8V) and GND (input return).
2. Connect the 1.8V load between Vout 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. Vout should be 1.8V+/-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.

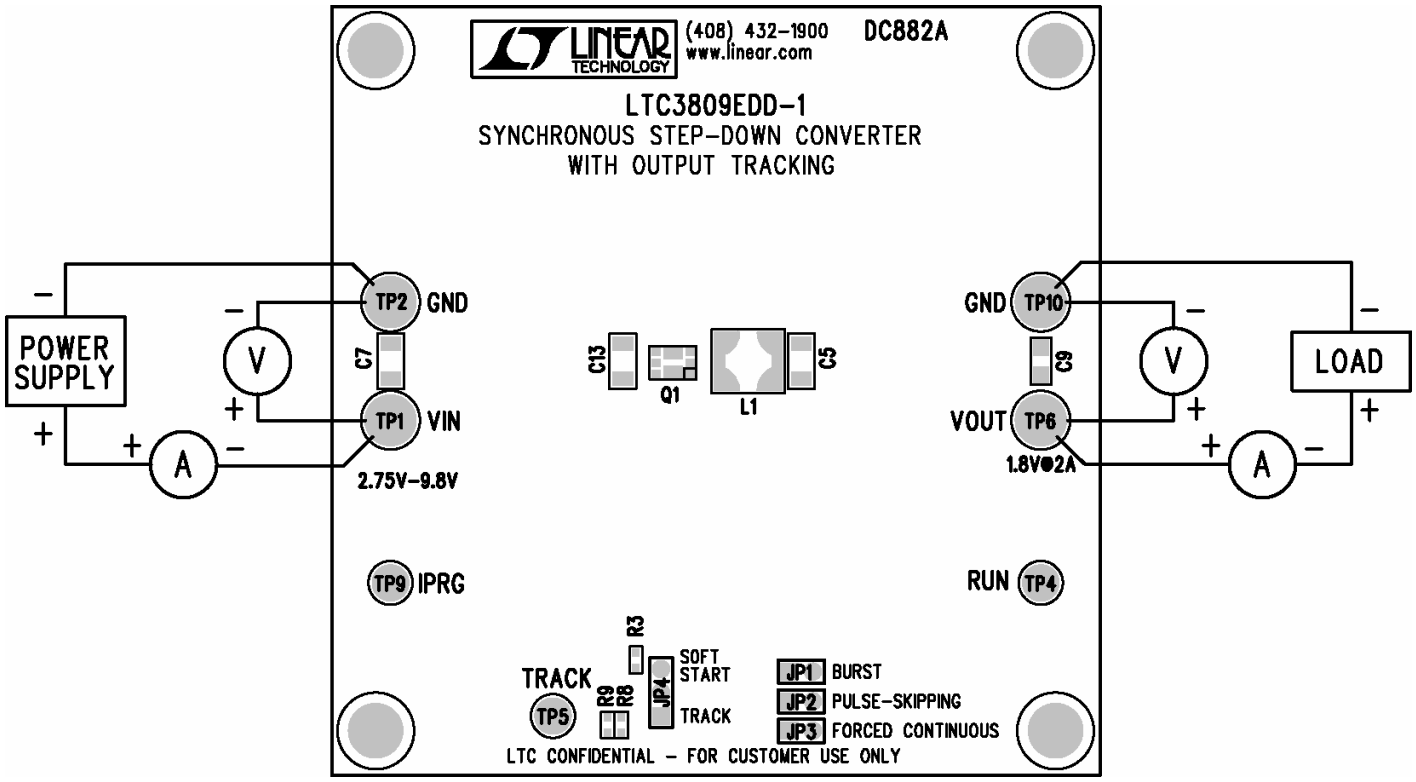


Figure 1. Proper Measurement Equipment Setup

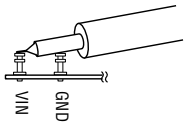


Figure 2. Measuring Input or Output Ripple

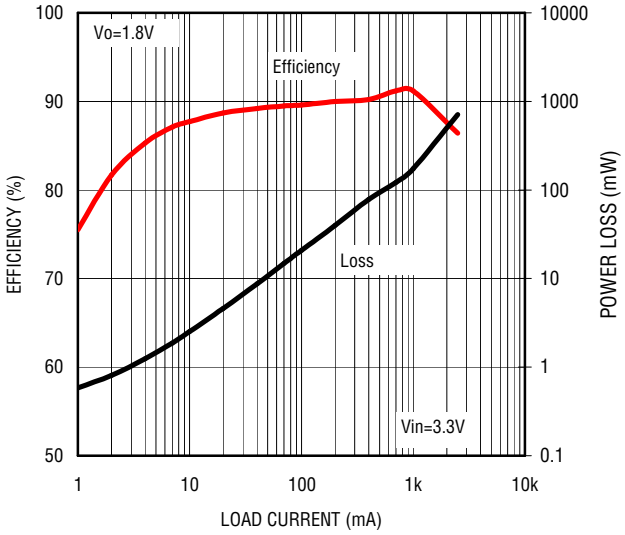
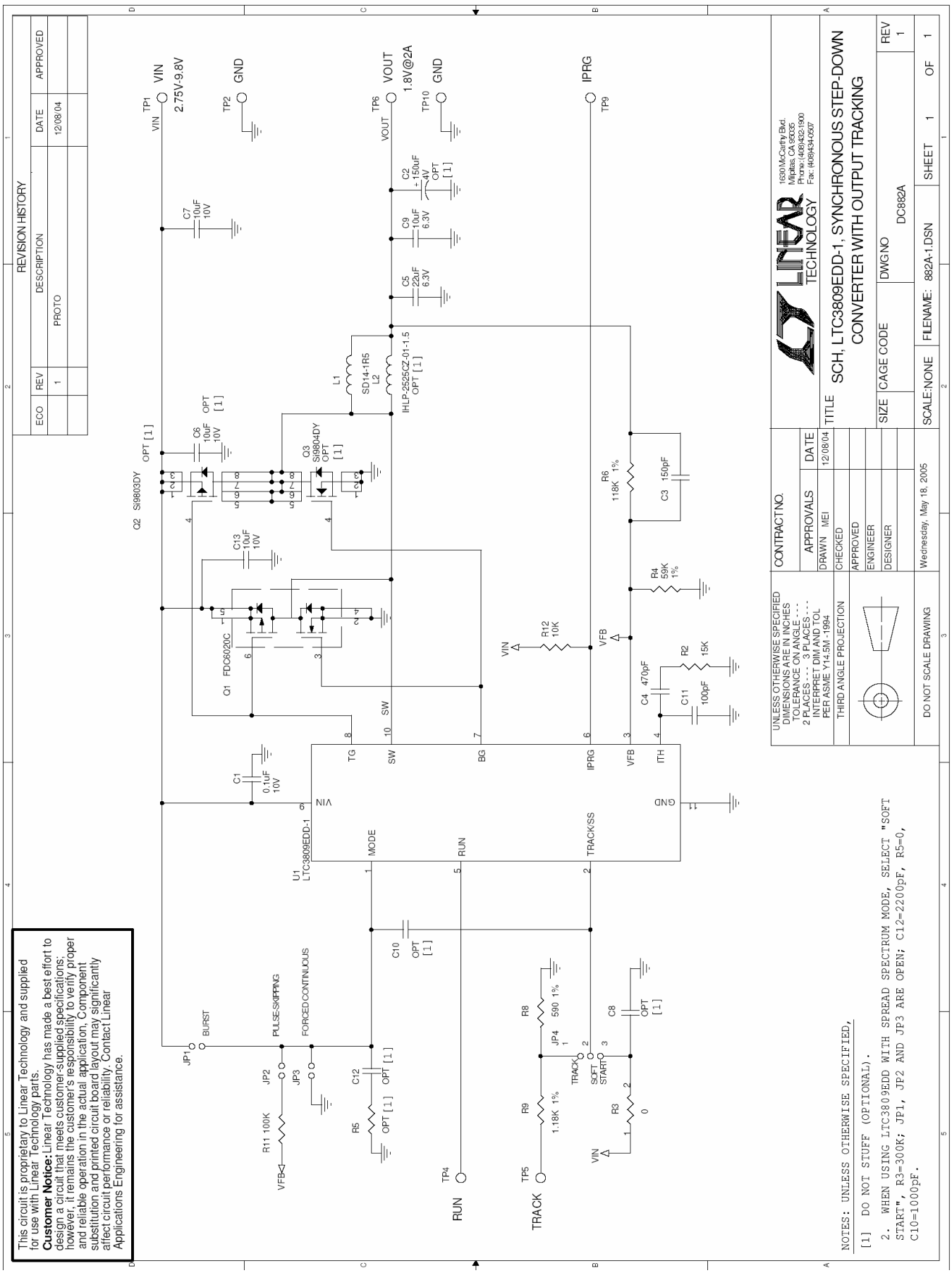


Figure 3. Efficiency and Loss vs Load Current (Burst Mode)


REVISION HISTORY
ECO
REV
DESCRIPTION
DATE
APPROVED
1
PROTO
12/08/04
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.
VIN
2.75V-9.8V
GND
VOUT
1.8V@2A
IPRG
RUN
TRACK
U1
LTC3809EDD-1
Q1 FDC6020C
Q2 Si9803DY
Q3 Si9804DY
L1 SD14-1R5 L2
IHLP-2525CZ-01-1.5
C1 0.1uF 10V
C2 150uF 4V
C3 150pF
C4 470pF
C5 22uF 6.3V
C6 10uF 10V
C7 10uF 10V
C8
C9 10uF 6.3V
C10
C11 100pF
C12
C13 10uF 10V
R2 15K
R3 0
R4 59K 1%
R5
R6 118K 1%
R8
R9 1.18K 1%
R11 100K
R12 10K
JP1 BURST
JP2 PULSE-SKIPPING
JP3 FORCED CONTINUOUS
JP4
SOFT START
TRACK
MODE
RUN
TRACK/SS
VFB
SW
TG
BG
IPRG
ITH
GND
TP1 VIN
TP2 GND
TP4 RUN
TP5 TRACK
TP6 VOUT
TP9 IPRG
TP10 GND
OPT [1]
NOTES: UNLESS OTHERWISE SPECIFIED,
[1] DO NOT STUFF (OPTIONAL).
2. WHEN USING LTC3809EDD WITH SPREAD SPECTRUM MODE, SELECT "SOFT START", R3=300K; JP1, JP2 AND JP3 ARE OPEN; C12=2200pF, R5=0, C10=1000pF.
CONTRACT NO.
APPROVALS
DRAWN MEI
CHECKED
APPROVED
ENGINEER
DESIGNER
DATE
12/08/04
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON ANGLE - - - 2 PLACES - - - 3 PLACES - - - INTERPRET DIM AND TOL PER ASME Y14.5M -1994
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING
Wednesday, May 18, 2005
SCALE:NONE
FILENAME: 882A-1.DSN
SHEET 1 OF 1
LINEAR TECHNOLOGY
1630 McCarthy Blvd.
Milpitas, CA 95035
Phone: (408)432-1900
Fax: (408)434-0507
TITLE
SCH, LTC3809EDD-1, SYNCHRONOUS STEP-DOWN CONVERTER WITH OUTPUT TRACKING
SIZE
CAGE CODE
DWG NO
DC882A
REV 1

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