

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 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 2A	$1.8\text{V} \pm 2.5\%$
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 _{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 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.

The block diagram illustrates the LTC3809EDD-1 synchronous step-down converter circuit. The circuit is powered by a **POWER SUPPLY** connected to the **VIN** pin (TP1) and **GND** (TP2). The input voltage range is specified as **2.75V-9.8V**. A voltmeter (V) is connected across the input, and an ammeter (A) is in series with the input line. The output is taken from the **VOUT** pin (TP6) and connected to a **LOAD**. The output voltage is **1.8V@2A**. A voltmeter (V) is connected across the output, and an ammeter (A) is in series with the output line. The circuit includes several test points (TP1, TP2, TP4, TP5, TP6, TP9, TP10) and components (C13, Q1, L1, R3, R8, R9, JP1, JP2, JP3, JP4). The LTC3809EDD-1 is a synchronous step-down converter with output tracking. The diagram also shows the **IPRG** and **RUN** pins. The LTC3809EDD-1 is a synchronous step-down converter with output tracking. The diagram also shows the **IPRG** and **RUN** pins. The LTC3809EDD-1 is a synchronous step-down converter with output tracking. The diagram also shows the **IPRG** and **RUN** pins.



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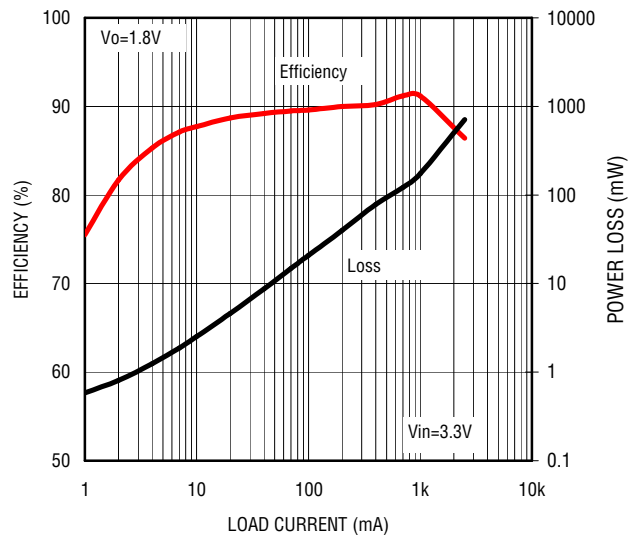


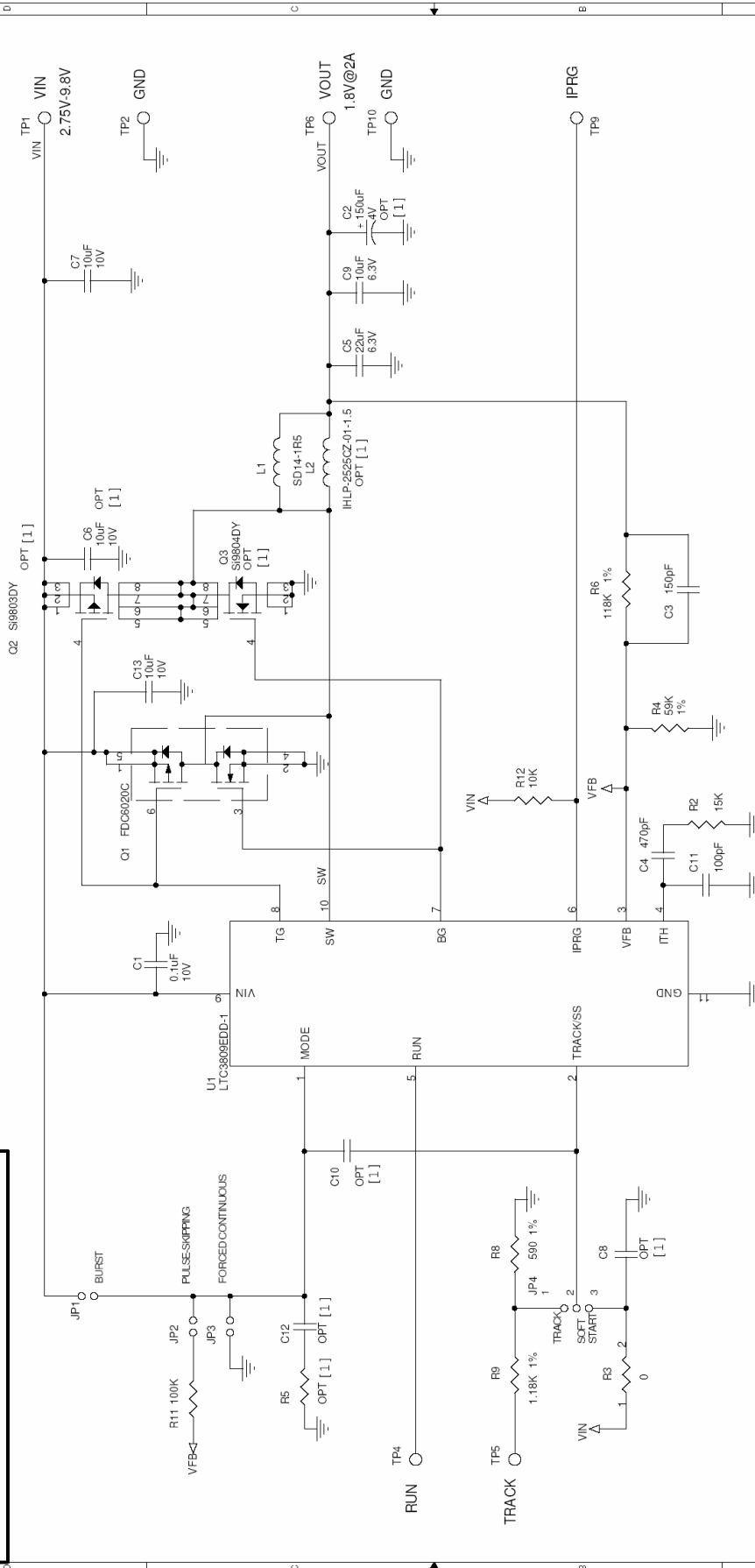
Figure 3. Efficiency and Loss vs Load Current (Burst Mode)

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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.



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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.