QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 802
LTC3828 DUAL 2-PHASE STEP DOWN CONVERTER WITH TRACKING

LTC3828EUH

DESCRIPTION

Demonstration circuit 802 features the dual-output, 2-phase synchronous buck regulator LTC3828EUH. The input voltage range of the demo board is 7V to 21V. The outputs are 5V/5A_{MAX} and 3.3V/5A_{MAX}. Depending on the setting of the optional resistors and jumpers, each output can track an external ramp voltage during start up or one output can track another output on the same board during start up. At light load, the supplies can operate in high efficiency mode or low output ripple mode depending on jumper selection.

The switching frequency is a jumper-selectable 250kHz or 550kHz, or one resistor can set the frequency anywhere in between. The supply can also be synchronized by an external clock signal. A CLOCKOUT pin provides an output clock signal to synchronize other supplies if needed. The LTC3828EUH regulator IC is in a small 5 mm x 5 mm package with exposed thermal pad for low thermal impedance.

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		7V-21V
Output Voltage V_{OUT1}	I_{OUT1} = 0A to 5A	5V ± 2%
Output Voltage V_{OUT2}	I_{OUT2} = 0A to 5A	3.3V ± 2%
Maximum Output Current	VIN = 7V-21V	5A Each Output
Switching frequency	FCB = CCM	Jumper selectable 250kHz or 550kHz
Full Load Efficiency	V_{IN} = 12V, V_{OUT1} = 5V, I_{OUT1} = 5A, fsw=550kHz	93% Typical
	V_{IN} = 12V, V_{OUT2} = 3.3V, I_{OUT2} = 5A, fsw=550kHz	91% Typical

QUICK START PROCEDURE

Demonstration circuit 802 is easy to set up to evaluate the performance of the LTC3828EUH. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

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. Following table should be the default jumper settings of the DC802A demo board:

JP1 PHSMD	JP2 FSET	JP3 FCB	JP4 RUN1	JP5 RUN2	JP6 TRACK2	JP7 TRACK1
0	550kHz	CCM	ON	ON	VOUT1	EXT1

With the above default setting, the supply runs at 550kHz forced continuous current mode.

Following tables show the assembly options for the tracking circuits for VOUT1 and VOUT2:

	VOUT1 TRACKING OPTIONS	TRACK2 JP6	R23	R25	C21
1*	Softstart W/O tracking	N/A	DNP	DNP	0.01uF
2	Track EXT1	EXT1	105K	20K	DNP
3	Track VOUT2	VOUT2	105K	20K	DNP

	VOUT2 TRACKING OPTIONS	TRACK1 JP7	R24	R26	C22
1	Softstart W/O tracking	N/A	DNP	DNP	0.01uF
2	Track EXT2	EXT2	95.3K	30.1K	DNP
3*	Track VOUT1	VOUT1	95.3K	30.1K	DNP

*With existing tracking circuit assembly, VOUT1 starts independently (option1). VOUT2 tracks VOUT1 during start up (option3). Figure 3 shows a typical start-up waveform with tracking.

2. With power off, connect the input power supply to VIN and GND. Connect the load between VOUT1 and GND, VOUT2 and GND. Preset the load current at 0A (minimum). Refer to Figure 1 for correct test set up.

3. Turn on the input power.

NOTE: Make sure that the input voltage does not exceed 21V.

4. Check for the proper output voltages. Vout1 = 4.90V-5.10V. Vout2 = 3.23V- 3.36V

NOTE: If there is no output, temporarily disconnect the load to make sure that the load is not set too high.

5. Once the proper output voltages are established, adjust the loads within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters.

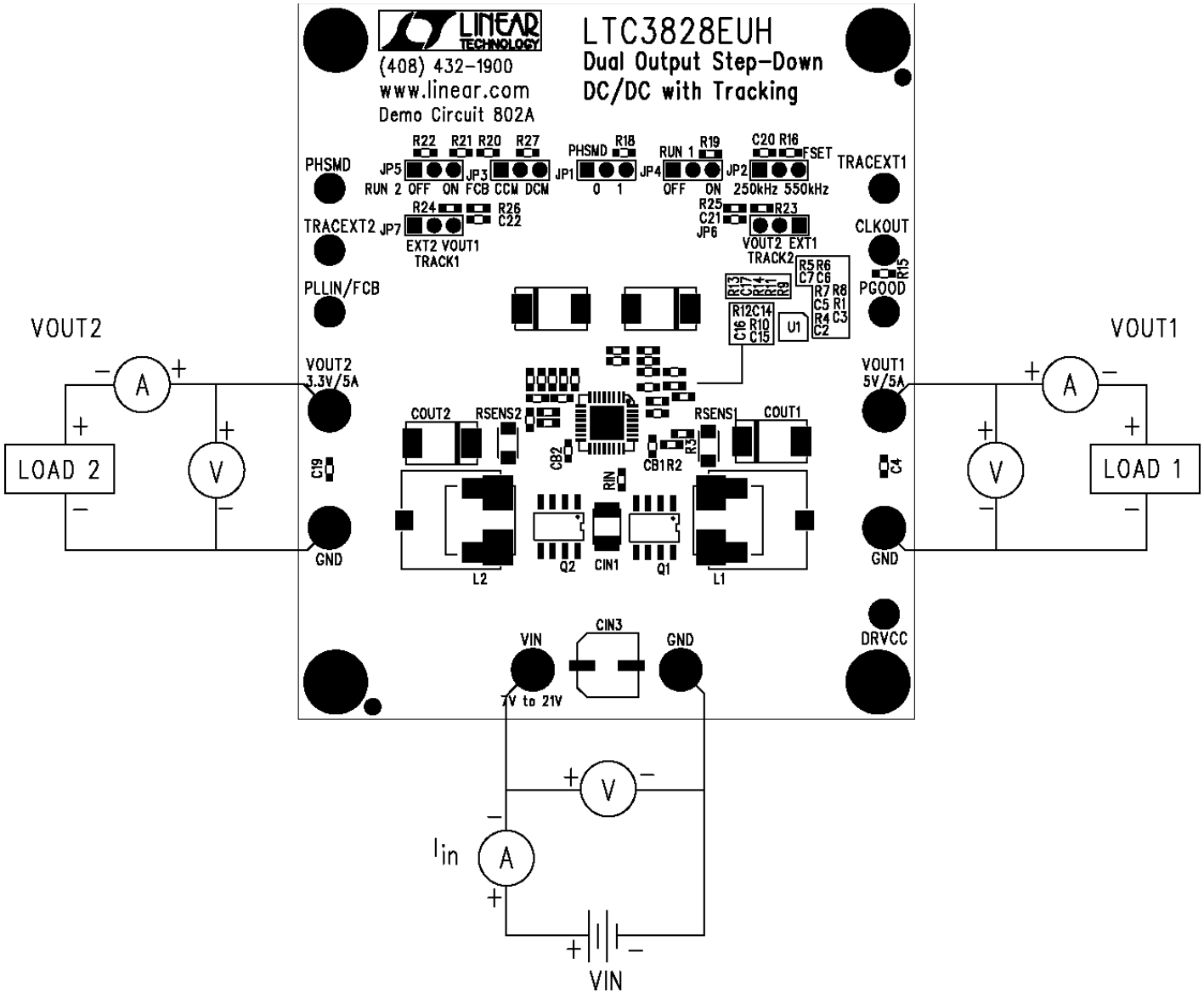


Figure 1. Proper Measurement Equipment Setup

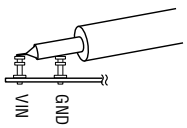


Figure 2. Measuring Input or Output Ripple

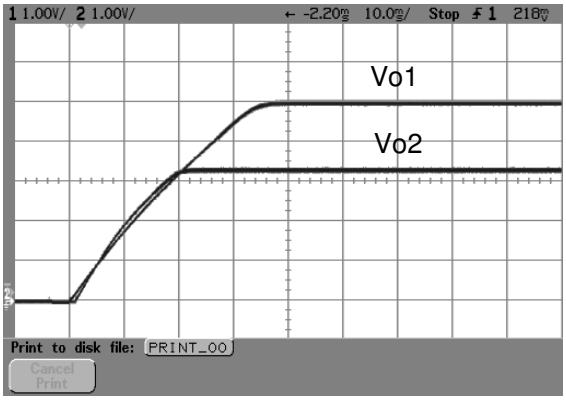
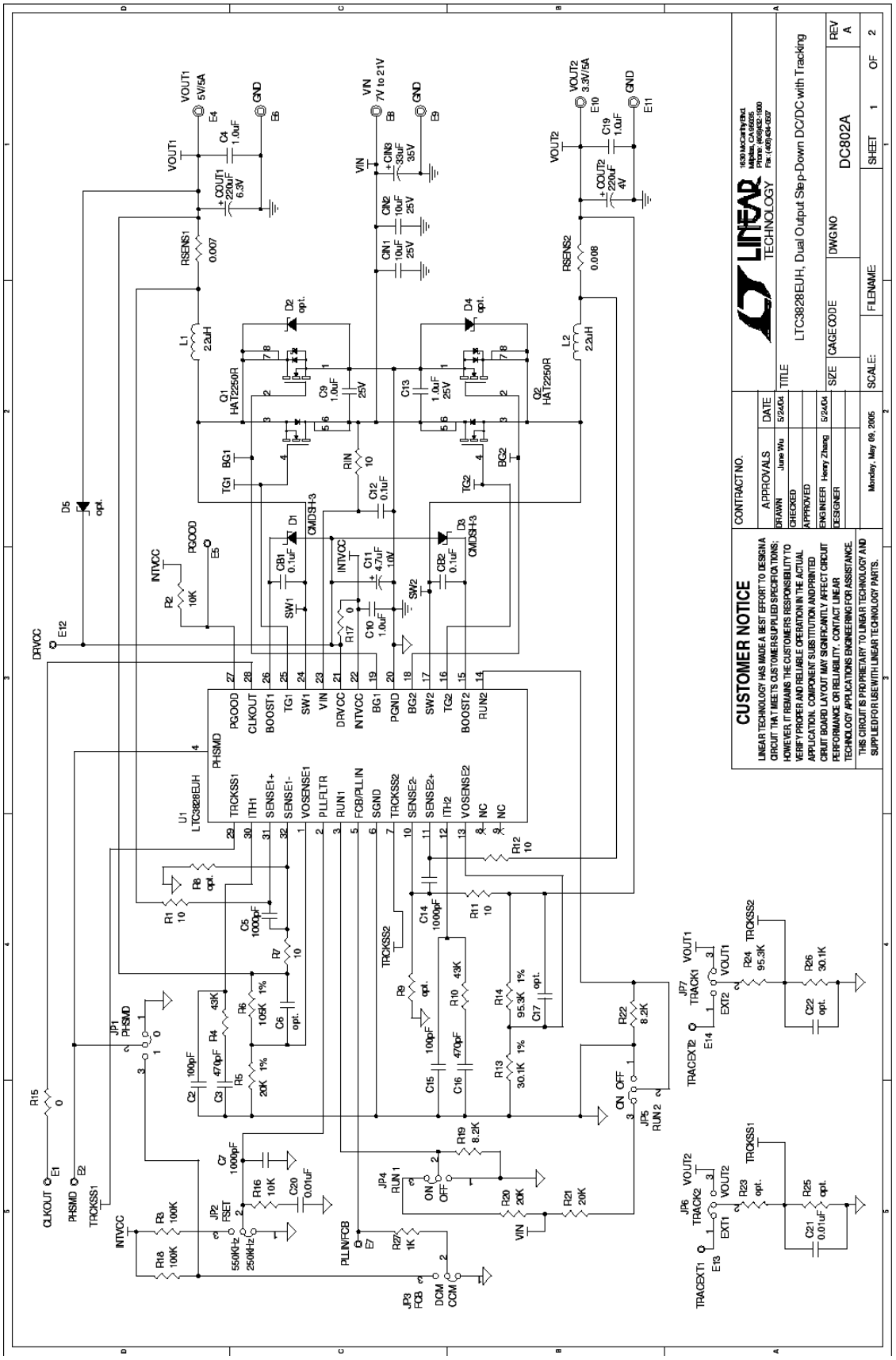


Figure 3. Typical Output Voltage Tracking Waveform during Start-Up


LTC3828EUH, Dual Output Step-Down DC/DC with Tracking
DC802A
REV A
SHEET 1 OF 2
Monday, May 09, 2005
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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 TECHNOLOGY APPLICATIONS ENGINEERING FOR ASSISTANCE.
THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.