

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1128

2.25MHZ DUAL-OUTPUT, 600MA, MONOLITHIC STEP-DOWN DC/DC REGULATOR

LTC3419EDD

DESCRIPTION

Demonstration circuit 1128A is a Dual channel Synchronous, 2.25MHz Step-Down DC/DC Regulator featuring the LTC3419. The DC1128A has an input voltage range of 2.5V to 5.5V. Both jumper selectable 3.3V/2.5V and 1.2V/1.5V/1.8V output are capable of delivering up to 600mA of output current. In Burst Mode™ operation, the LTC3419 requires only 40uA of quiescent current. As a result, the DC1128A provides good efficiency at light load currents. In Pulse Skip mode, the DC1128A provides lower output ripple voltage at light load currents than in Burst Mode. In either mode, the DC1128A can provide up to 95% efficiency and consumes less than 1uA in shutdown.

The LTC3419 comes in a small 10-Pin DFN package, which has an exposed pad on the bottom-side of the IC for good thermal performance. These features, plus the nominal operating frequency of 2.25MHz (allowing the exclusive use of low profile surface mount components), make the DC1128A demo board an ideal reference circuit for battery-powered, hand-held applications.

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
Minimum Input Voltage		2.5V
Maximum Input Voltage		5.5V
Output Voltage V_{OUT1}	$V_{IN} = 2.5\text{V to } 5.5\text{V}, I_{OUT1} = 0\text{A to } 600\text{mA}$	1.2V $\pm 2\%$ 1.5V $\pm 2\%$ 1.8V $\pm 2\%$
Typical Output Ripple V_{OUT1}	$V_{IN} = 5\text{V}, I_{OUT1} = 600\text{mA}$ (20MHz BW)	20mV _{p-p}
Output Regulation	Line	$\pm 1\%$
	Load	$\pm 1\%$
Output Voltage V_{OUT2}	$V_{IN} = 2.5\text{V to } 5.5\text{V}, I_{OUT2} = 0\text{A to } 600\text{mA}$	3.3V $\pm 2\%$ 2.5V $\pm 2\%$
Typical Output Ripple V_{OUT2}	$V_{IN} = 5\text{V}, I_{OUT2} = 600\text{mA}$ (20MHz BW)	20mV _{p-p}
Output Regulation	Line	$\pm 1\%$
	Load	$\pm 1\%$
Nominal Switching Frequency		2.25MHz

QUICK START PROCEDURE

Demonstration circuit 1128 is easy to set up to evaluate the performance of the LTC3419. 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. Connect the input power supply to the Vin and GND terminals on the left-side of the board. Connect the loads between the Vout and GND terminals on the right-side of the board. Refer to Figure 1 for the proper measurement equipment setup.
2. Before proceeding to operation, insert jumpers JP1 and JP2 into the OFF positions, jumper JP3 into the Vout1 voltage position of choice (1.2V, 1.5V, and 1.8V), and jumper JP4 into the desired mode of operation: Pulse Skip or Burst Mode.
3. Apply 4.0V at Vin. Measure both Vouts; they should read 0V. The supply current will be less than 1uA in shutdown mode.
4. Select Vout2 of 3.3V/2.5V by place **one** jumper at JP8 or JP7.
5. Select Vout1 of 1.8V/1.5V/1.2V by place **one** jumper at JP6 or JP5 or JP4.
6. Turn on Vout1 and Vout2 by changing jumpers JP1 and JP2 from the OFF position(s) to the ON position(s). The burst mode input current should be less than 115uA* in burst mode when input is at 4.0V. Vary the input voltage from 3.5V to 5.5V and adjust each load current from 0 to full load. Both output voltages should be regulating. The regulated error is less than 2% of rated voltage.
7. Set the load current of outputs between 25% to 100% load range, and measure both output ripple voltages; they should measure less than 20mV each. The switching frequencies should be between 1.8MHz and 2.7MHz (T = 0.555 us and 0.37 us)
8. Change Vout1 and Vout2 to other desired values. Repeat 6-7.
9. Set the jumper to default position after test:

JP3	JP2	JP1	JP8 (3.3V)	JP6 (1.8V)
Burst Mode	ON	ON	Vout2	Vout1

*Note: The 115uA is due to default load on sensing resistor. Using larger resistor value for voltage divider if less current is desired.

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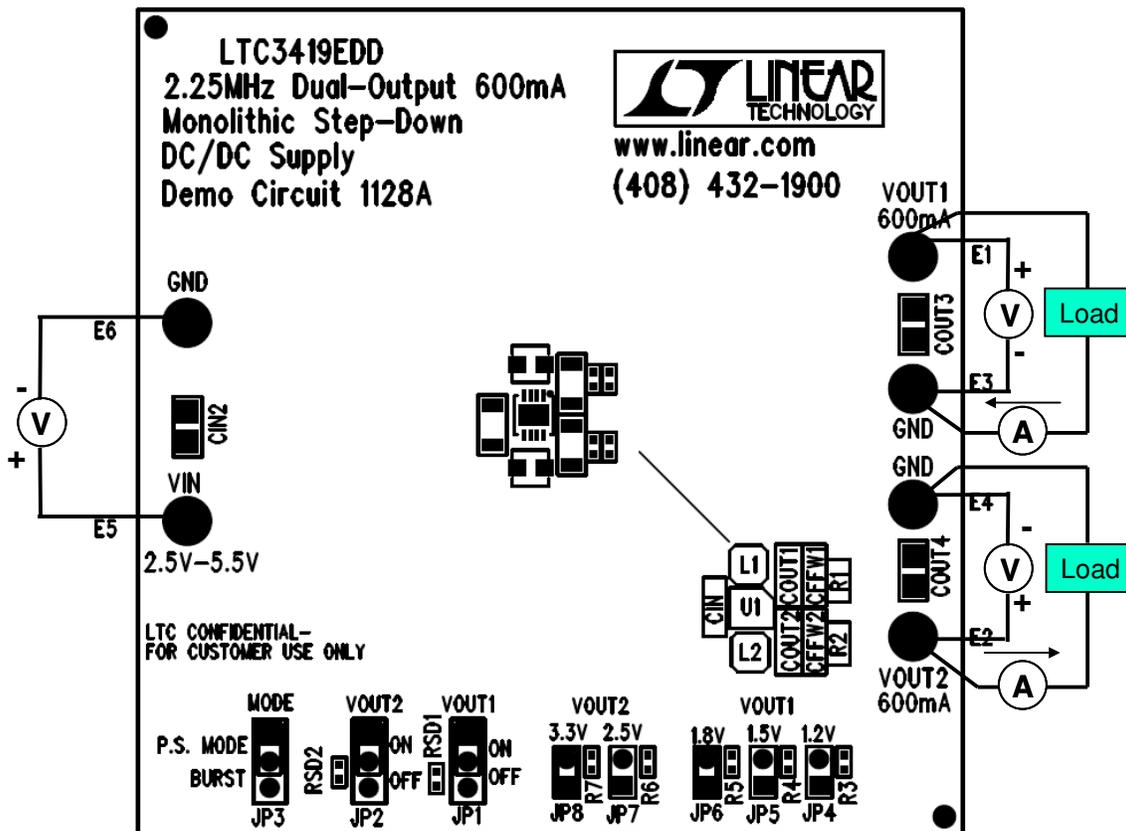


Figure 1. Proper Measurement Equipment Setup

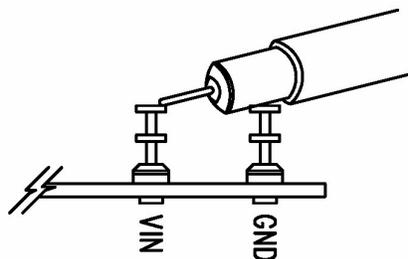
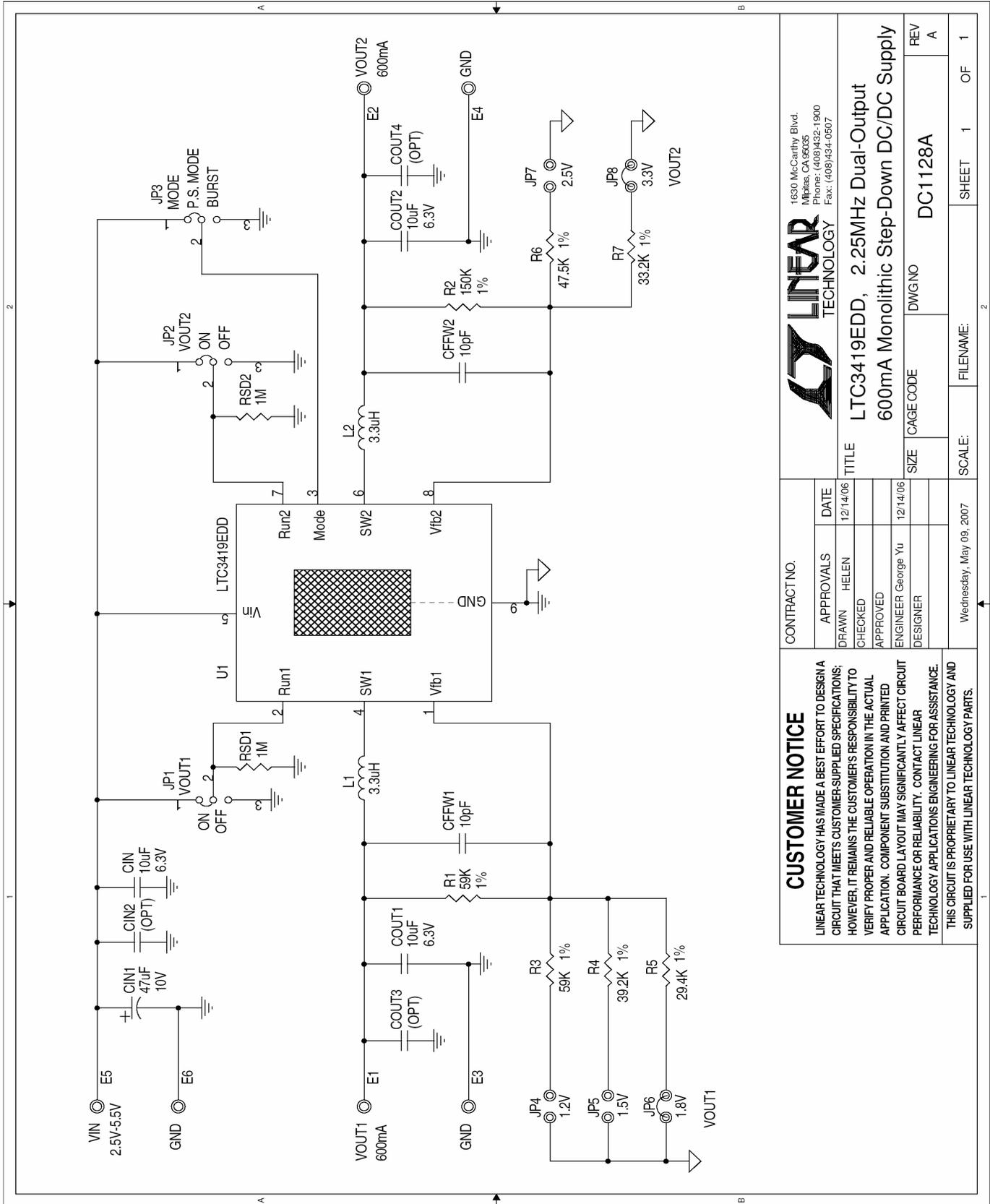


Figure 2. Scope Probe Placement for Measuring Input or Output Ripple

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APPROVALS	DATE	1630 McCarthy Blvd. Milpitas, CA 95035 Phone: (408)432-1900 Fax: (408)434-6507	
DRAWN HELEN	12/14/06	LINEAR TECHNOLOGY LTC3419EDD, 2.25MHz Dual-Output 600mA Monolithic Step-Down DC/DC Supply	
CHECKED			
APPROVED		SIZE	DWGNO
ENGINEER George Yu	12/14/06	CAGE CODE	DC1128A
DESIGNER		SCALE:	FILENAME:
Wednesday, May 09, 2007		SHEET	1 OF 1

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