

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 899

2-PHASE DUAL OUTPUT HIGH EFFICIENCY POWER SUPPLY

LTC3728LXCUH

DESCRIPTION

Demonstration circuit 899 is a high efficiency supply featuring the dual-output, 2-phase synchronous buck regulator LTC3728L. The input voltage range of the demo board as designed is from 4.5V to 13.2V, though the LTC3728L controller can take up to $30V_{MAX}$ V_{IN} . The outputs are 2.5V/5A and 3.3V/5A. The critical power components are on the top side of the PCB board and are within a 0.85" x 0.85" "drop-in" layout and the small signal components and IC are on the bottom side of the PCB board within a 0.75"x0.75" board space.

The supply can be synchronized by an external clock signal. The LTC3728LXCUH regulator IC is in a small 5 mm x 5 mm package with exposed thermal pad for low thermal impedance, with an integrated 5V bias LDO.

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	Typical	4.5V-13.2V (15V abs_max)
Output Voltage V_{OUT1}	$I_{OUT1} = 0\text{A to } 5\text{A}$	$2.5\text{V} \pm 2\%$
Output Voltage V_{OUT2}	$I_{OUT2} = 0\text{A to } 5\text{A}$	$3.3\text{V} \pm 2\%$
Maximum Output Current	$V_{IN} = 4.5\text{V}-13.2\text{V}$	5A Each Output
Switching Frequency	5V-12V $_{IN}$	400kHz
Full Load Efficiency	$V_{IN} = 12\text{V}$, $V_{OUT1} = 2.5\text{V}$, $I_{OUT1} = 5\text{A}$	89% Typical
	$V_{IN} = 12\text{V}$, $V_{OUT2} = 3.3\text{V}$, $I_{OUT2} = 5\text{A}$	91 % Typical

QUICK START PROCEDURE

Demonstration circuit 899 is easy to set up to evaluate the performance of the LTC3728LXCUH. 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 V_{IN} or V_{OUT} and GND terminals. See Figure 2 for proper scope probe technique.

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1. With power off, connect the input power supply to VIN and GND. Connect the load between VOUT1, VOUT2 and GND. Preset the load current at 0A (minimum). Refer to Figure 1 for correct test set up. The RUN/SS1 and RUN/SS2 jumpers should be at "on" position.

2. Turn on the input power.

NOTE: Make sure that the input voltage does not exceed 15V.

3. Check for the proper output voltages: V_{OUT1} : 2.45V-2.55V, V_{OUT2} : 3.23V – 3.37V.

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

4. 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.

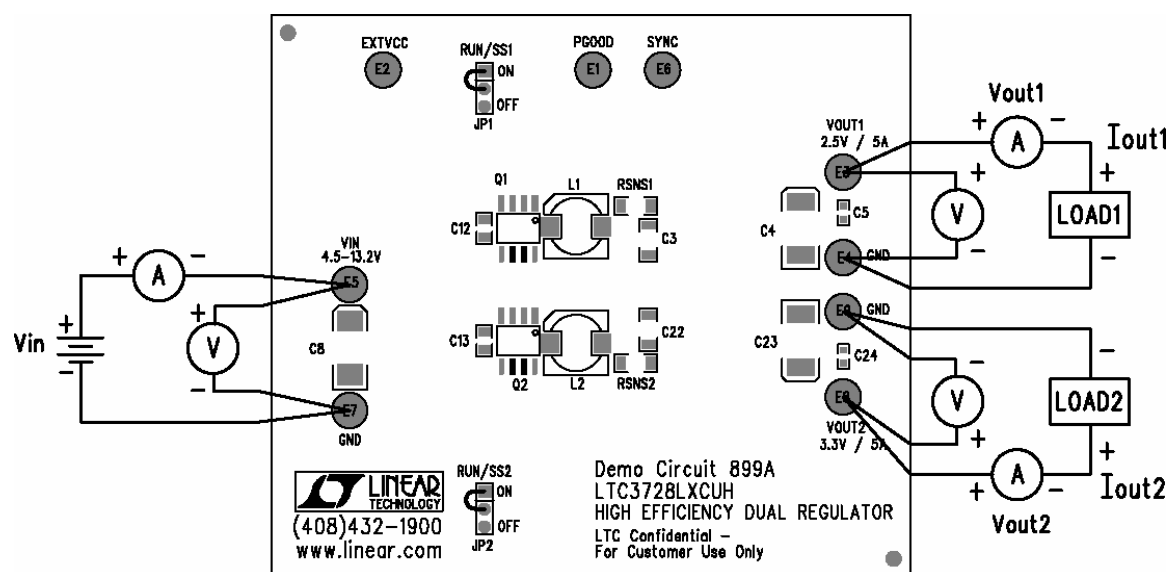


Figure 1. Proper Measurement Equipment Setup

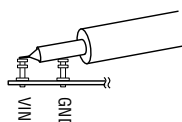


Figure 2. Measuring Input or Output Ripple

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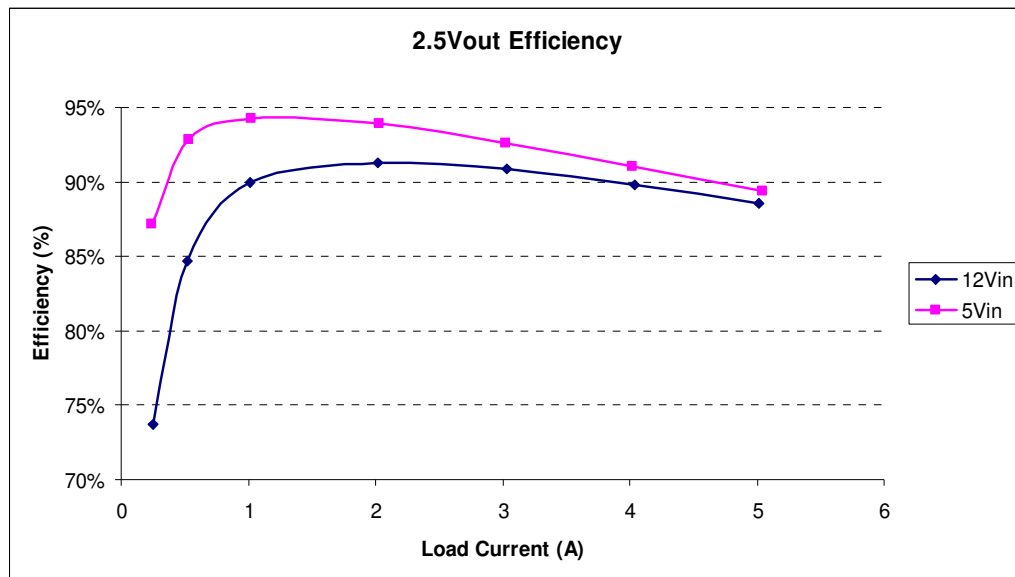


Figure 3. Typical Supply Efficiency vs Load Current of 2.5V Output

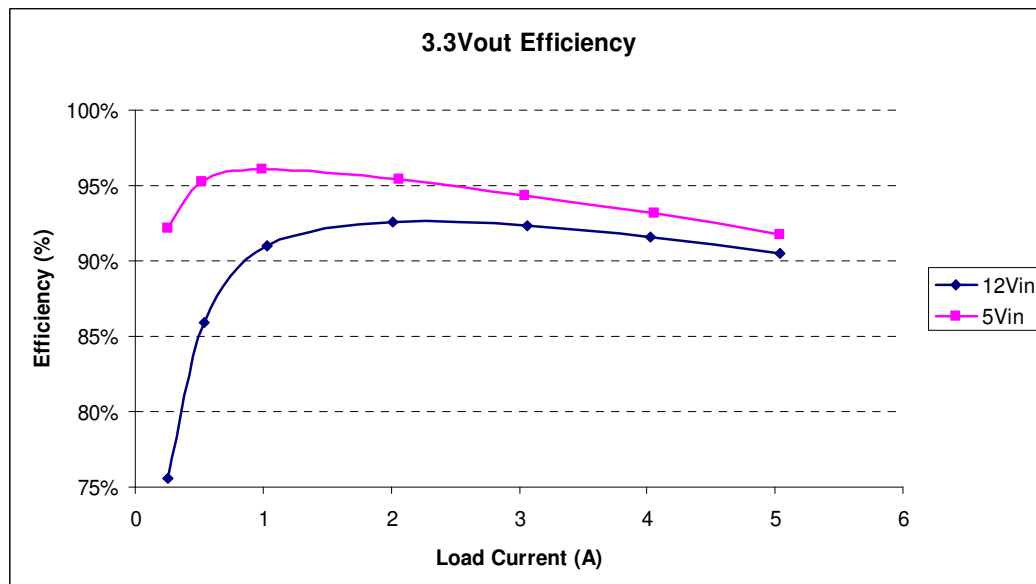
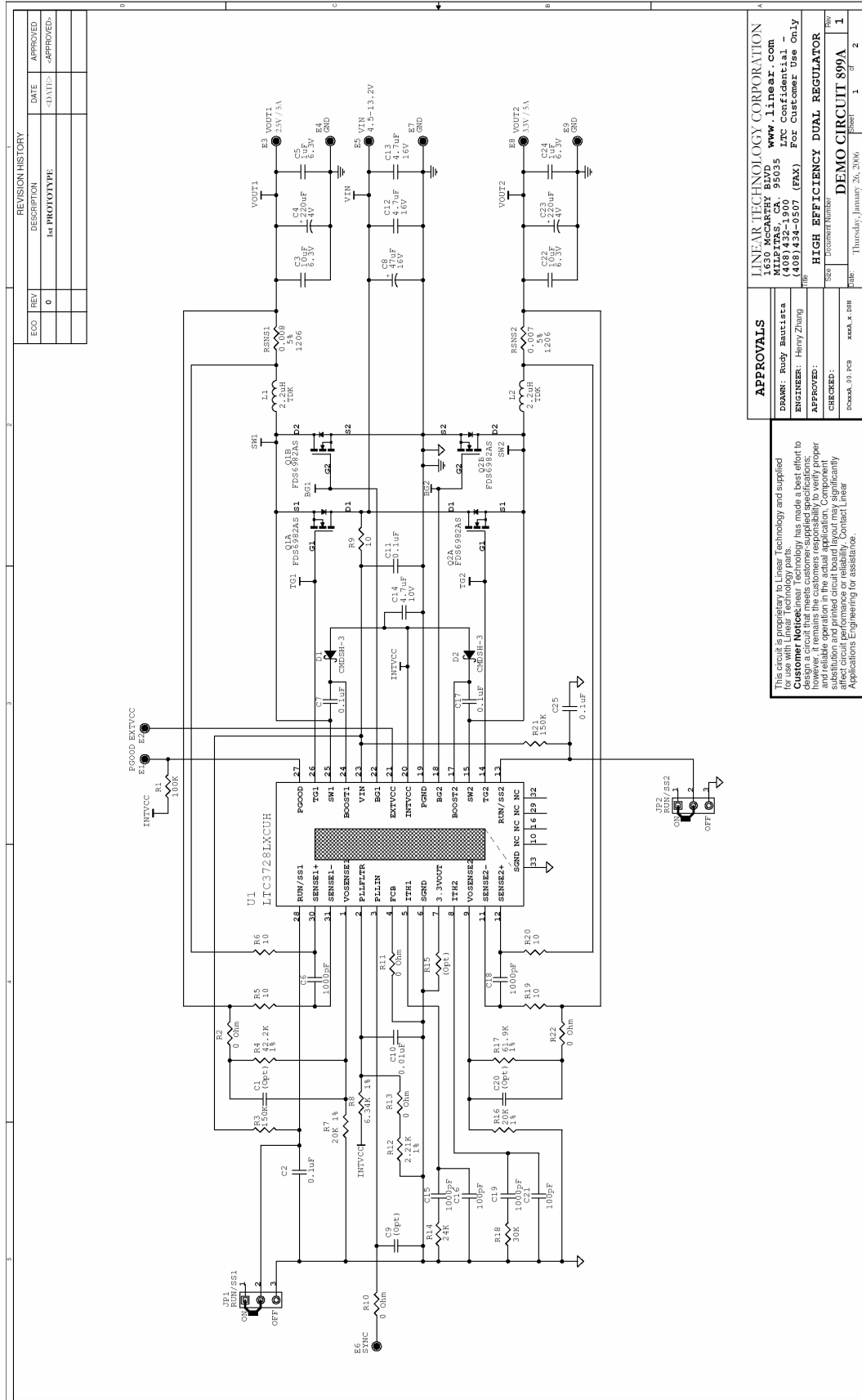


Figure 4. Typical Supply Efficiency vs Load Current of 3.3V Output

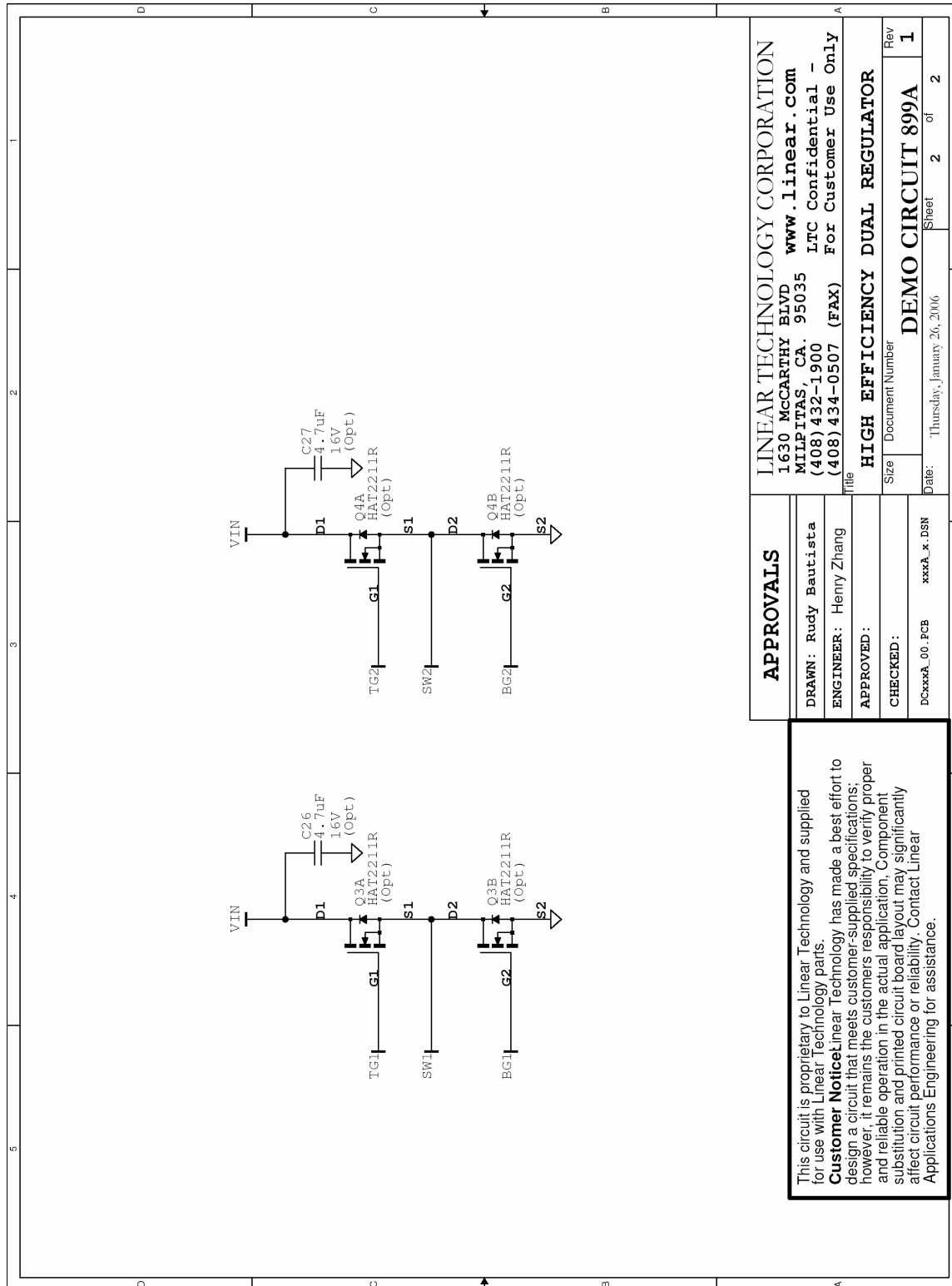
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APPROVALS		LINEAR TECHNOLOGY CORPORATION	
DRAWN: Rudy Bautista		1630 MCCARTHY BLVD	www.linear.com
ENGINEER: Henry Zhang		MILPITAS, CA. 95035	LTC Confidential -
APPROVED:		(408) 432-1900	(408) 434-0507 (FAX) For Customer Use Only
CHECKED:		HIGH EFFICIENCY DUAL REGULATOR	
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Sheet 2 of 2		DEMO CIRCUIT 899A	

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.