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 $30V_{MAX}$ Vin. 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.

Table 1. Performance Summary (T_A = 25°C)

PARAMETER	CONDITION	VALUE
Input Voltage	Typical	4.5V-13.2V (15V abs_max)
Output Voltage V_{OUT1}	I_{OUT1} = 0A to 5A	2.5V ± 2%
Output Voltage V_{OUT2}	I_{OUT2} = 0A to 5A	3.3V ± 2%
Maximum Output Current	VIN = 4.5V-13.2V	5A Each Output
Switching Frequency	5V-12Vin	400kHz
Full Load Efficiency	V_{IN} = 12V, V_{OUT1} = 2.5V, I_{OUT1} = 5A	89% Typical
	V_{IN} = 12V, V_{OUT2} = 3.3V, I_{OUT2} = 5A	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 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 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.

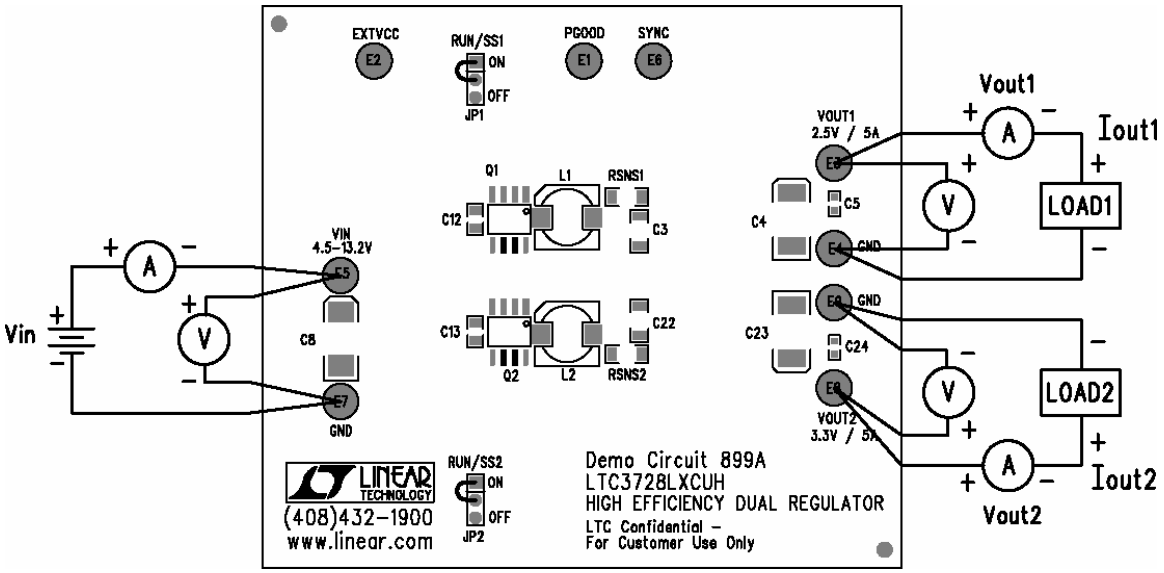


Figure 1. Proper Measurement Equipment Setup

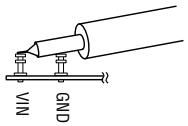


Figure 2. Measuring Input or Output Ripple

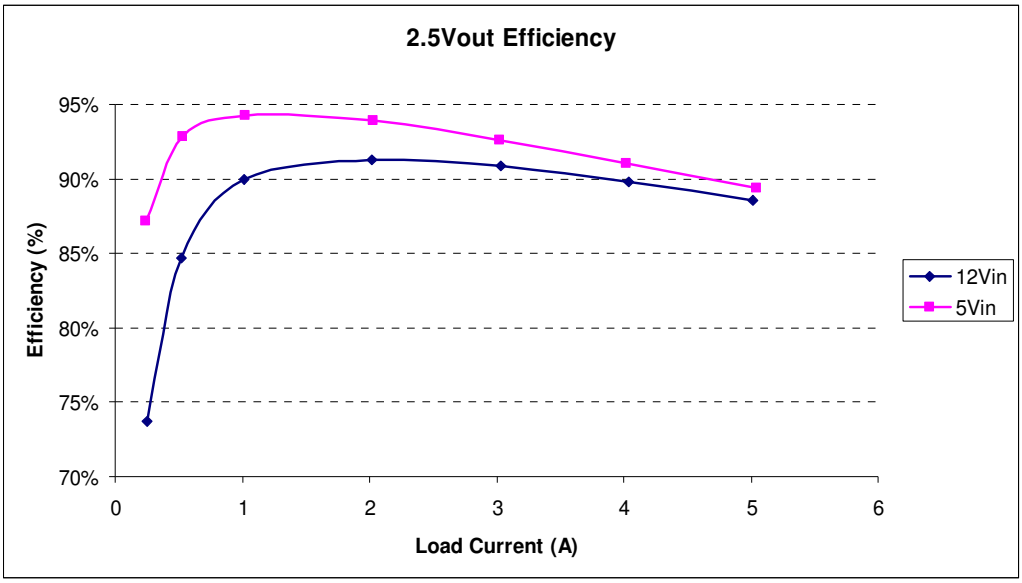


Figure 3. Typical Supply Efficiency vs Load Current of 2.5V Output

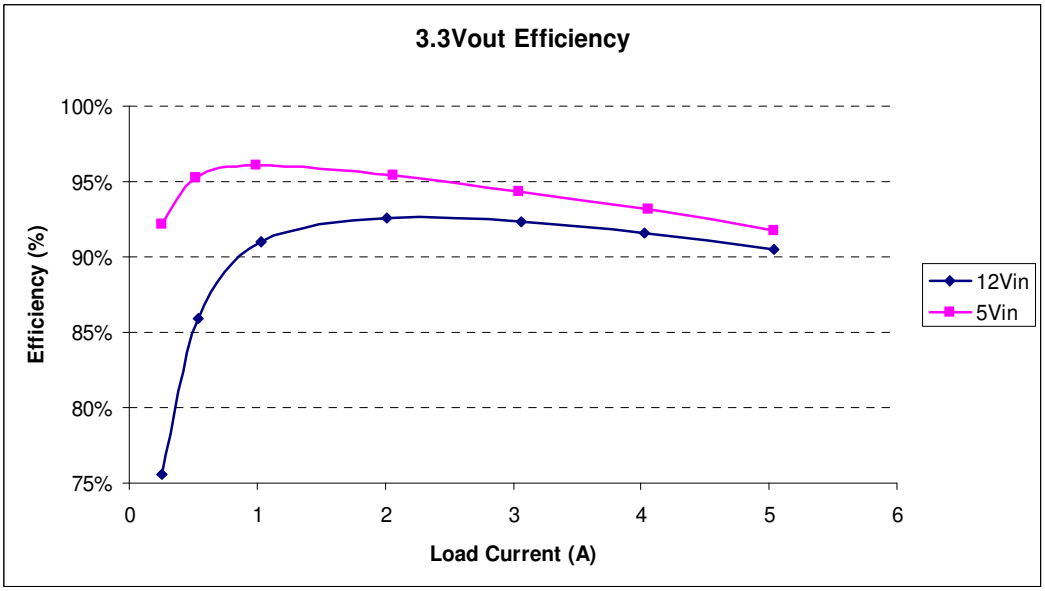
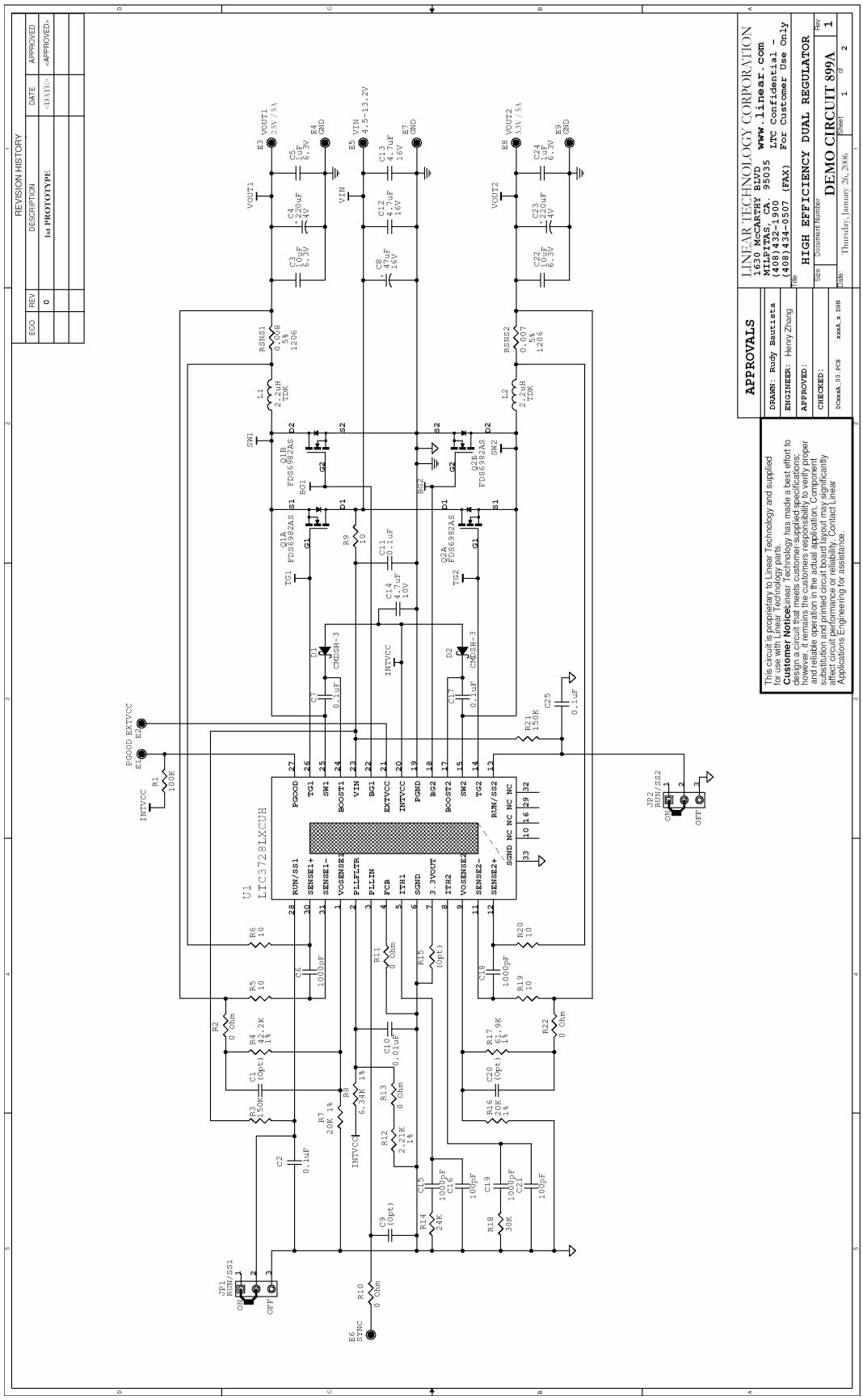


Figure 4. Typical Supply Efficiency vs Load Current of 3.3V Output


REVISION HISTORY
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HIGH EFFICIENCY DUAL REGULATOR
DEMO CIRCUIT 899A
Rev 1
Thursday, January 26, 2006
Sheet 1 of 2
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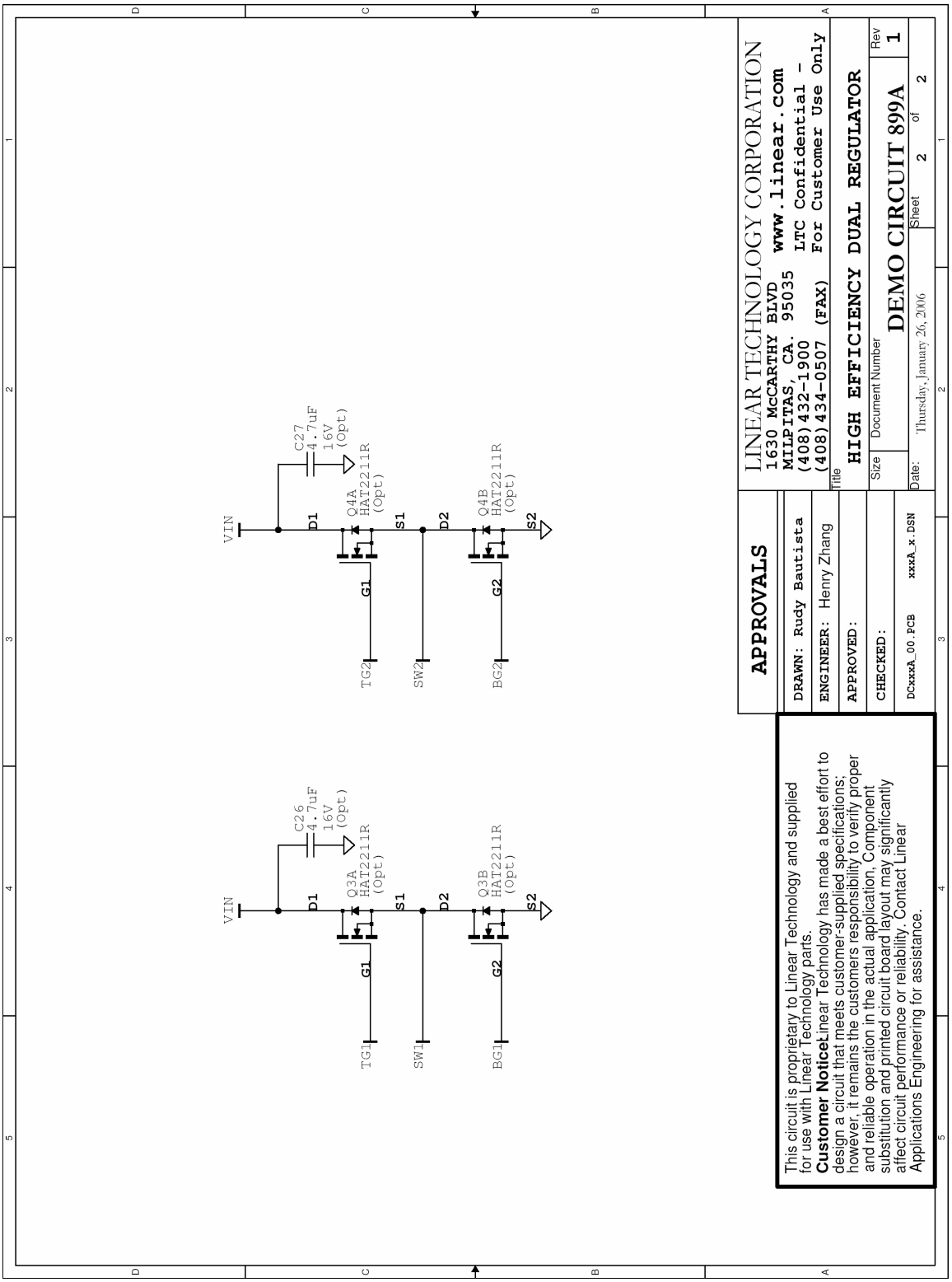
U1
LTC3728LXCUH
Q1A FDS6982AS
Q1B FDS6982AS
Q2A FDS6982AS
Q2B FDS6982AS
L1 2.2uH TDK
L2 2.2uH TDK
D1 CMDSH-3
D2 CMDSH-3
VOUT1 2.5V/5A
VOUT2 3.3V/5A
VIN 4.5-13.2V
INTVCC
PGOOD EXTVCC
SYNC
RUN/SS1
RUN/SS2
JP1 RUN/SS1
JP2 RUN/SS2
ON
OFF


VIN
C26
4.7uF
16V
(Opt)
Q3A
HAT2211R
(Opt)
Q3B
HAT2211R
(Opt)
D1
S1
D2
S2
G1
G2
TG1
SW1
BG1
C27
4.7uF
16V
(Opt)
Q4A
HAT2211R
(Opt)
Q4B
HAT2211R
(Opt)
TG2
SW2
BG2
APPROVALS
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ENGINEER: Henry Zhang
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