

DESCRIPTION

Demonstration circuit 922A is a 2-phase dual synchronous high efficiency step-down DC/DC converter with 2.75V to 8V input range. It has two outputs: 2.5V (6A MAX) and 1.8V (6A MAX). The demo circuit features the LTC®3736EUF-2 controller. The constant frequency current mode architecture with MOSFET V_{DS} sensing eliminates the need for sense resistors and improves efficiency. Out of phase operation significantly reduces input ripple current as well as the input capacitor size.

Switching frequency is internally set at 550KHz. For noise sensitive applications, the converter can be externally synchronized from 250KHz to 850KHz. The

frequency can also be selected with the PLLLPF pin. Tying the PLLLPF pin to GND selects 300KHz operation; tying the PLLLPF pin to VIN selects 750KHz operation.

The demo circuit has a tracking function, allowing V_{OUT2} to track V_{OUT1} during start-up.

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 8V
V_{OUT1}	$V_{IN} = 2.75\text{-}8\text{V}$, $I_{OUT1} = 0\text{A to }6\text{A}$, $I_{OUT2} = 0\text{A to }6\text{A}$	$2.5\text{V} \pm 2.5\%$
V_{OUT2}	$V_{IN} = 2.75\text{-}8\text{V}$, $I_{OUT1} = 0\text{A to }6\text{A}$, $I_{OUT2} = 0\text{A to }6\text{A}$	$1.8\text{V} \pm 2.5\%$
Typical Output Ripple V_{OUT1}	$V_{IN} = 3.3\text{V}$, $I_{OUT1} = 3\text{A}$ (20MHz BW)	22mV _{P-P}
Typical Output Ripple V_{OUT2}	$V_{IN} = 3.3\text{V}$, $I_{OUT2} = 3\text{A}$ (20MHz BW)	12mV _{P-P}
Typical Switching Frequency	PLLLPF Pin Floating	550kHz

QUICK START PROCEDURE

Demonstration circuit 922A is easy to set up to evaluate the performance of the LTC3736EUF-2. 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 (2.75V-8V) and GND (input return).
2. Connect the 2.5V load (Load 1 in Figure 1) between Vout1 and GND; connect the 1.8V load (Load 2 in Figure 1) between Vout2 and GND. (Initial loads: no load.)
3. Connect the DVMs to the input and outputs.
4. Turn on the input power supply and check for the proper output voltages. Vout1 should be 2.5V+/-2.5%. Vout2 should be 1.8V+/-2.5%.

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2-PHASE DUAL SYNCHRONOUS STEP-DOWN CONVERTER WITH OUTPUT TRACKING

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

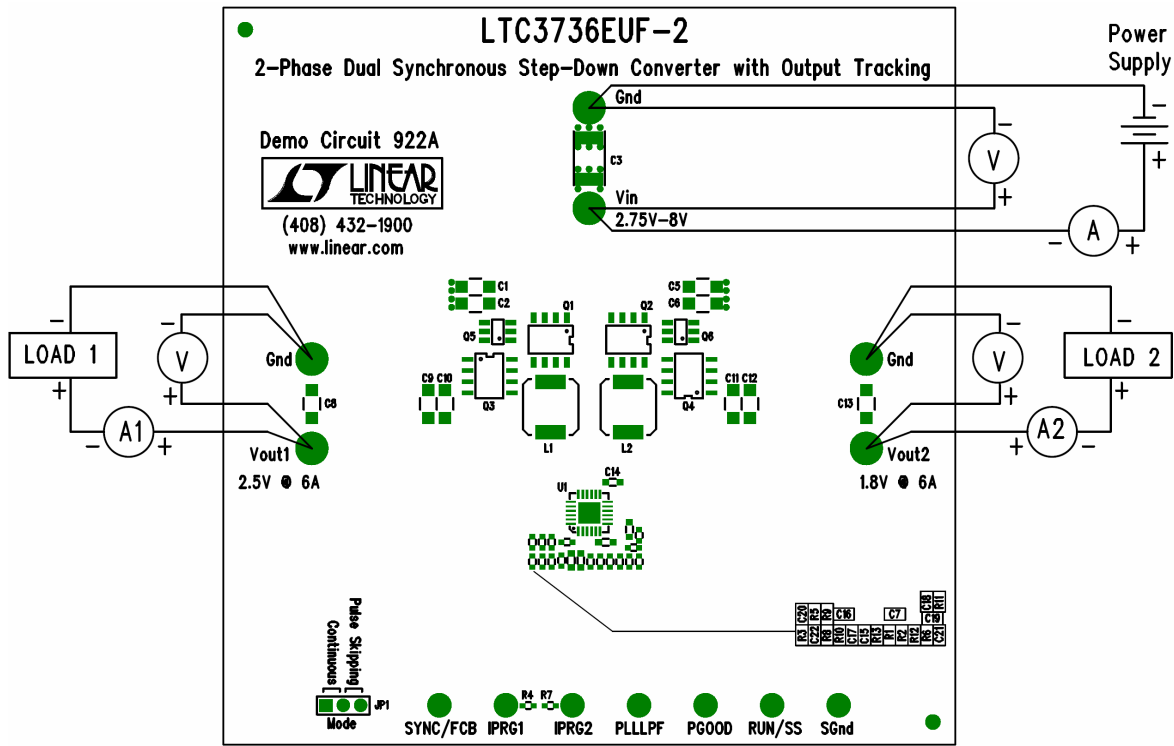


Figure 1. Proper Measurement Equipment Setup

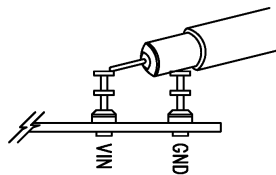


Figure 2. Measuring Input or Output Ripple

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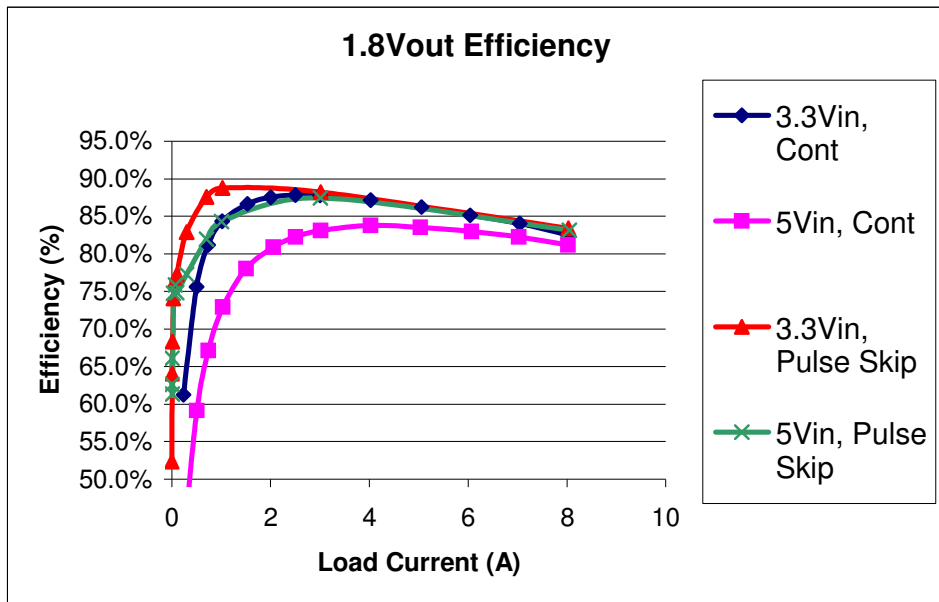
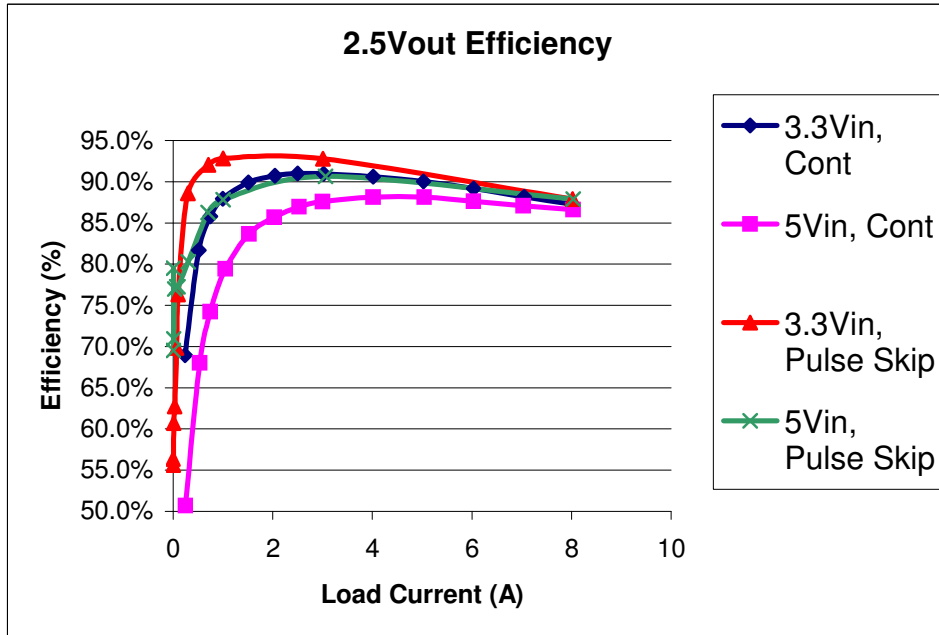
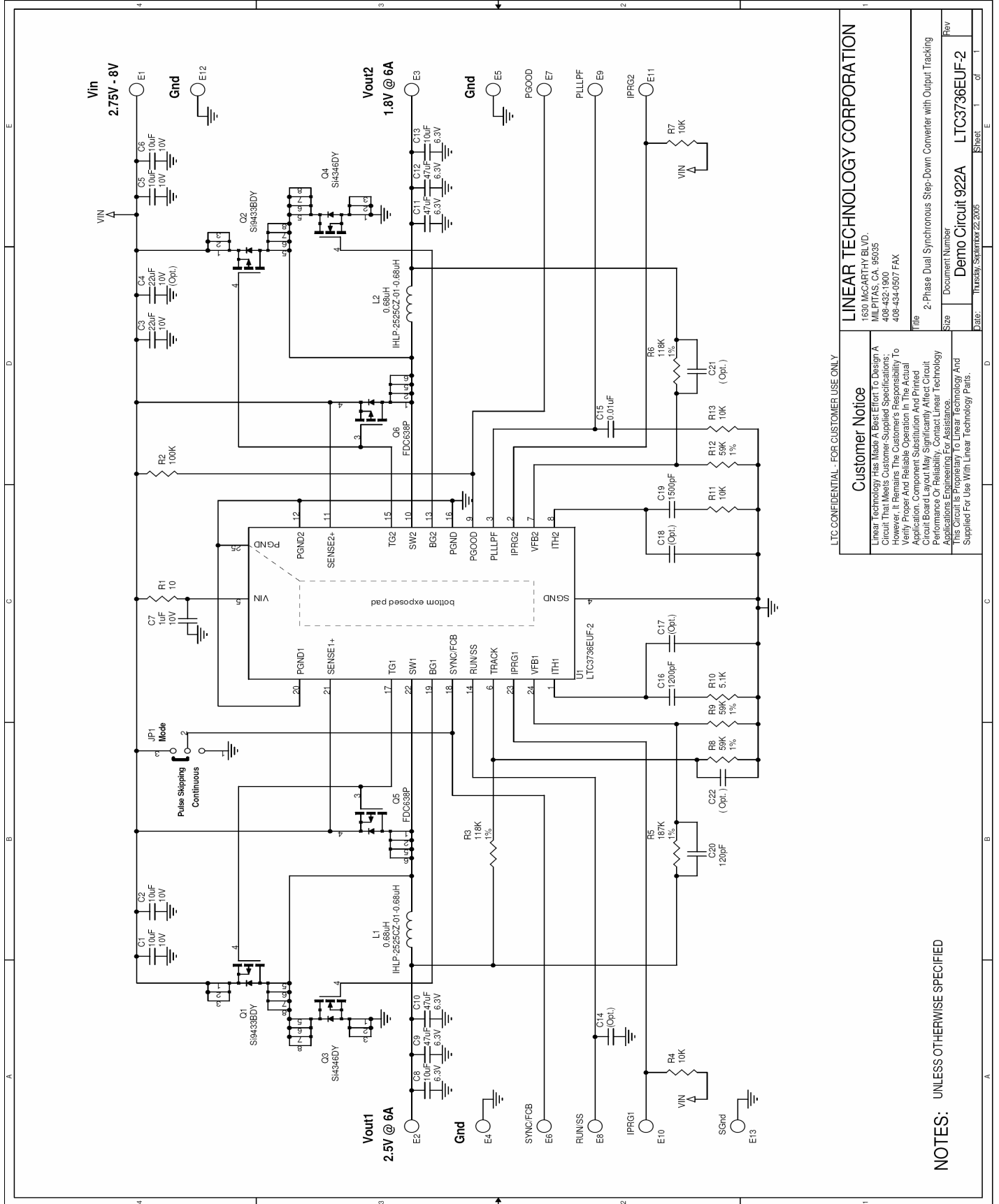


Figure 3. Efficiency vs load current (550KHz)

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NOTES: UNLESS OTHERWISE SPECIFIED