



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: [info@chipsmall.com](mailto:info@chipsmall.com) Web: [www.chipsmall.com](http://www.chipsmall.com)

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





# QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 803

## 2-PHASE DUAL SYNCHRONOUS STEP-DOWN CONVERTER WITH SPREAD SPECTRUM AND OUTPUT TRACKING

LTC3736EUF-1

### DESCRIPTION

Demonstration circuit 803 is a high efficiency 2-phase dual synchronous step-down DC/DC converter with 2.75V to 8V input range. It has two outputs: 2.5V (5A maximum at 5V input) and 1.8V (5A maximum at 5V input). The demo circuit features the LTC®3736EUF-1 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. The frequency can also be adjusted using FREQ pin (with spread spectrum operation disabled). Tying FREQ pin

to GND selects 300kHz operation; tying FREQ pin to VIN selects 750kHz operation.

The demo board can be selected to operate in spread spectrum mode (JP1: Enable) with significantly reduced peak switching noise. The board has tracking function too, allowing  $V_{OUT2}$  to track  $V_{OUT1}$  during start-up.

**Design files for this circuit board are available. Call the LTC factory.**

LTC is a trademark of Linear Technology Corporation

**Table 1. Performance Summary ( $T_A = 25^\circ\text{C}$ )**

PARAMETER	CONDITION	VALUE
Input Voltage Range		2.75V to 8V
$V_{OUT1}$	$V_{IN} = 2.75\text{--}8\text{V}$ , $I_{OUT1} = 0\text{A to } 5\text{A}$ , $I_{OUT2} = 0\text{A to } 5\text{A}$	2.5V $\pm 3\%$
$V_{OUT2}$	$V_{IN} = 2.75\text{--}8\text{V}$ , $I_{OUT1} = 0\text{A to } 5\text{A}$ , $I_{OUT2} = 0\text{A to } 5\text{A}$	1.8V $\pm 3\%$
Typical Output Ripple $V_{OUT1}$	$V_{IN} = 3.3\text{V}$ , $I_{OUT1} = 3\text{A}$ (20MHz BW)	20mV <sub>P-P</sub>
Typical Output Ripple $V_{OUT2}$	$V_{IN} = 3.3\text{V}$ , $I_{OUT2} = 3\text{A}$ (20MHz BW)	14mV <sub>P-P</sub>
Typical Switching Frequency	FREQ Pin Floating; Spread Spectrum: Disable	550kHz
Typical Spread Spectrum Frequency Range	Spread Spectrum: Enable	450kHz- 580kHz

### QUICK START PROCEDURE

Demonstration circuit 803 is easy to set up to evaluate the performance of LTC3736-1. 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. (it's recommended to

measure the output ripple directly at the main output capacitor).

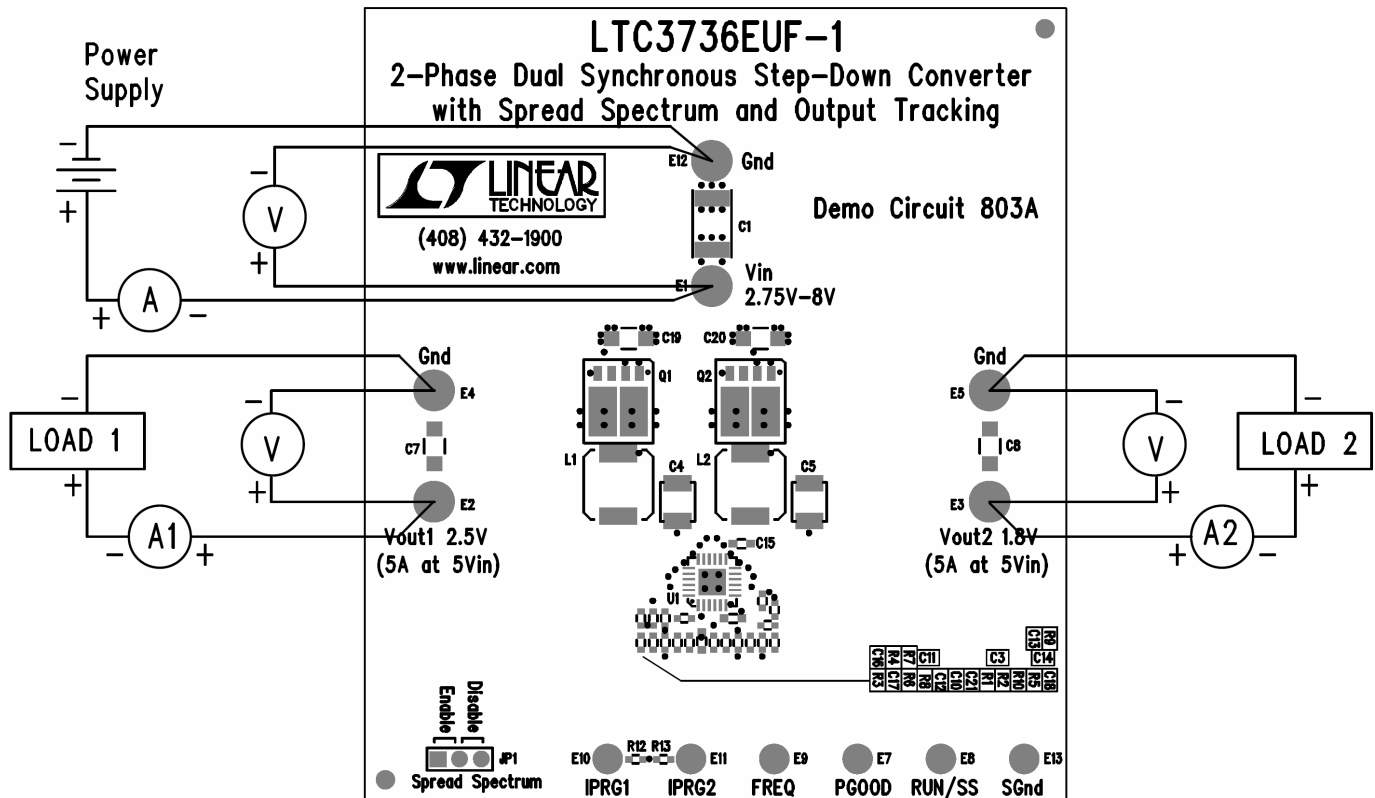
1. With power off, connect the input power supply to +Vin (2.75V-8V) and GND (input return).
2. Connect the 2.5V load (Load 1 in Figure 1) between Vout1 and GND; connect the 1.8V load (Load 2 in



# QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 803

## 2-PHASE DUAL SYNCHRONOUS STEP-DOWN CONVERTER WITH SPREAD SPECTRUM AND OUTPUT TRACKING

- Figure 1) between Vout2 and GND. (Initial loads: 0A)
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+/-3%. Vout2 should be 1.8V+/-3%.
  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.

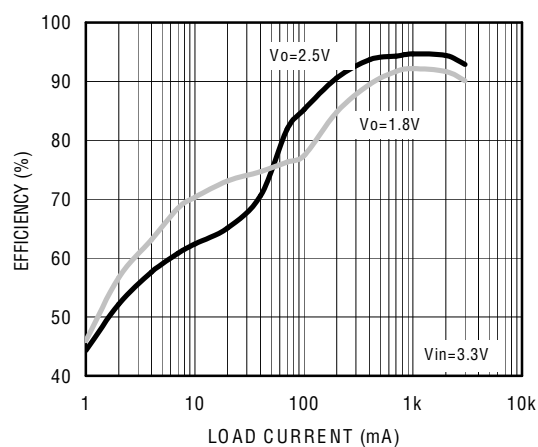




# QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 803

## 2-PHASE DUAL SYNCHRONOUS STEP-DOWN CONVERTER WITH SPREAD SPECTRUM AND OUTPUT TRACKING

---

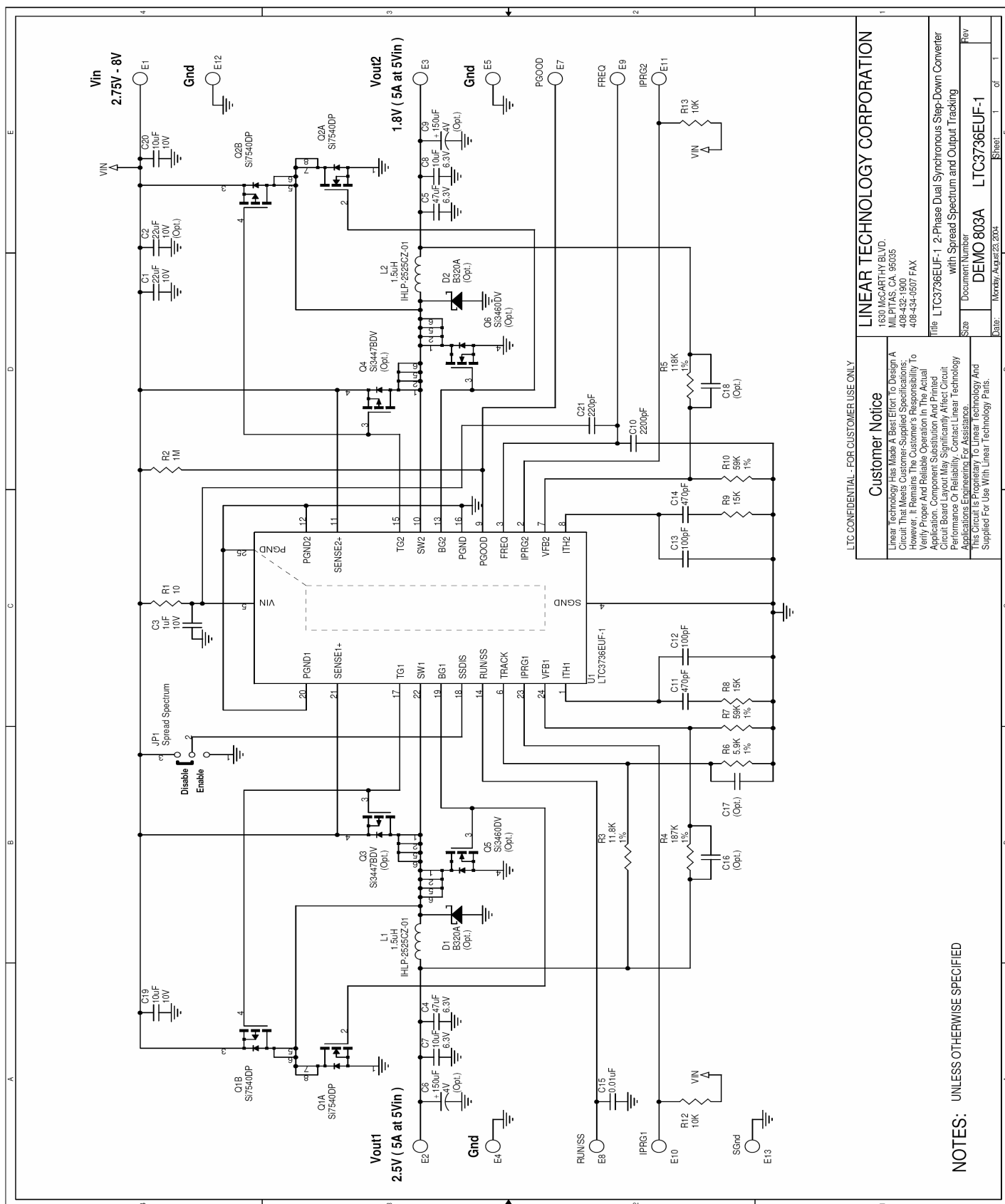


**Figure 2. Efficiency vs load current (550kHz)**



# QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 803

## 2-PHASE DUAL SYNCHRONOUS STEP-DOWN CONVERTER WITH SPREAD SPECTRUM AND OUTPUT TRACKING



LTC CONFIDENTIAL - FOR CUSTOMER USE ONLY

### LINER TECHNOLOGY CORPORATION

1630 McCARTHY BLVD.  
MILPITAS, CA 95035  
408-432-1900  
408-434-0507 FAX

Title LTC3736EUF-1 2-Phase Dual Synchronous Step-Down Converter  
with Spread Spectrum and Output Tracking

Size Document Number  
DEMO 803A LTC3736EUF-1  
Date: Monday, August 23, 2004 Sheet 1 of 1

### 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. Please Contact Our Linear Technology Applications Engineering For Assistance. This Circuit Is Proprietary To Linear Technology And Supplied For Use With Linear Technology Parts.

NOTES: UNLESS OTHERWISE SPECIFIED