

# LTC3525-3.3 and LTC3525-5 Micropower Synchronous Step-Up Converter with Output Disconnect

## DESCRIPTION

Demonstration circuit 879 is a Micropower Synchronous Step-Up Converter with Output Disconnect featuring the LTC3525-3.3 and LTC3525-5. The LTC3525 is a high performance Burst Mode operation only, synchronous boost converter. The LTC3525 incorporates a feature that maximizes efficiency by adjusting the peak and valley of the inductor current as a function of load. The demo board has two assembly versions: DC879A-A and DC879A-B. The DC879A-A offers fixed 3.3V output. The DC879A-B offers fixed 5V output. They offer a compact, high efficiency solution in single cell or dual cell alkaline

or Li-ion applications. Only three small external components are required.

The LTC3525 datasheet gives a complete description of the part, operation and application information. The datasheet must be read in conjunction with this quick start guide for demo circuit 879.

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

LT, LTC and LT are registered trademarks of Linear Technology Corporation. ThinSOT and PowerPath are trademarks of Linear Technology Corporation.

## PERFORMANCE SUMMARY

Specifications are at  $T_A = 25^\circ\text{C}$

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
$V_{IN}$	Input Supply Range	DC879A-A	1		3.2	V
$V_{IN}$	Input Supply Range	DC879A-B	1		4.5	V
$V_{OUT}$	Output Voltage Range	$1.8\text{V} < V_{IN} < 3.2\text{V}$ , $I_{LOAD} < 140\text{mA}$ (DC879A-A)	3.168	3.3	3.432	V
$V_{OUT}$	Output Voltage Range	$1\text{V} < V_{IN} < 3.2\text{V}$ , $I_{LOAD} < 60\text{mA}$ (DC879A-A)	3.168	3.3	3.432	V
$V_{OUT}$	Output Voltage Range	$3\text{V} < V_{IN} < 4.5\text{V}$ , $I_{LOAD} < 175\text{mA}$ (DC879A-B)	4.8	5	5.2	V
$V_{OUT}$	Output Voltage Range	$1\text{V} < V_{IN} < 4.5\text{V}$ , $I_{LOAD} < 40\text{mA}$ (DC879A-B)	4.8	5	5.2	V
$I_Q$	Quiescent Current at No Load	$V_{IN} = 2.4\text{V}$ (DC879A-A)		16		$\mu\text{A}$
$I_Q$	Quiescent Current at No Load	$V_{IN} = 3\text{V}$ (DC879A-B)		21		$\mu\text{A}$
$\eta$	Efficiency	$V_{IN} = 2.4\text{V}$ , $I_{LOAD} = 100\text{mA}$		83		%
$\eta$	Efficiency	$V_{IN} = 3\text{V}$ , $I_{LOAD} = 175\text{mA}$		86		%

## QUICK START PROCEDURE

Demonstration circuit 879 is easy to set up to evaluate the performance of the LTC3525-3.3 and LTC3525-5. 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.

1. Verify the jumper in the following position:

**JP1    ON**

# LTC3525-3.3 AND LTC3525-5

2. With power off, connect the input power supply to Vin and GND.

3. Turn on the power at the input.

NOTE. Make sure that the input voltage does not exceed 6V.

4. Check for the proper output voltages.  $V_{OUT} = 3.3V$  for DC879A-A and  $V_{OUT} = 5V$  for DC879A-B.

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

5. 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.

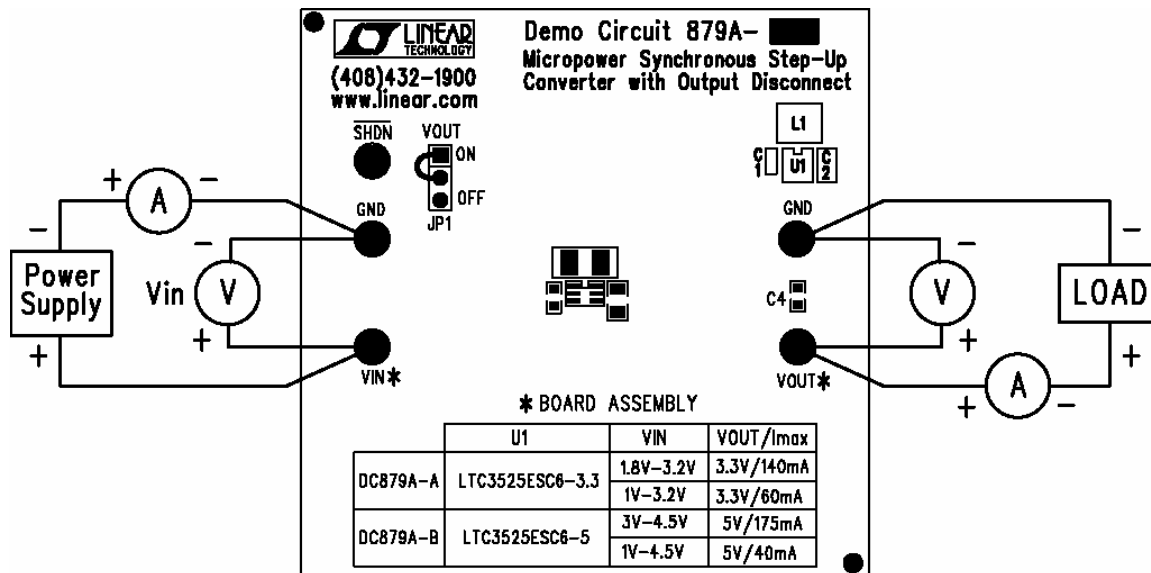


Figure 1. Proper Measurement Equipment Setup

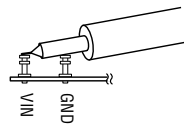
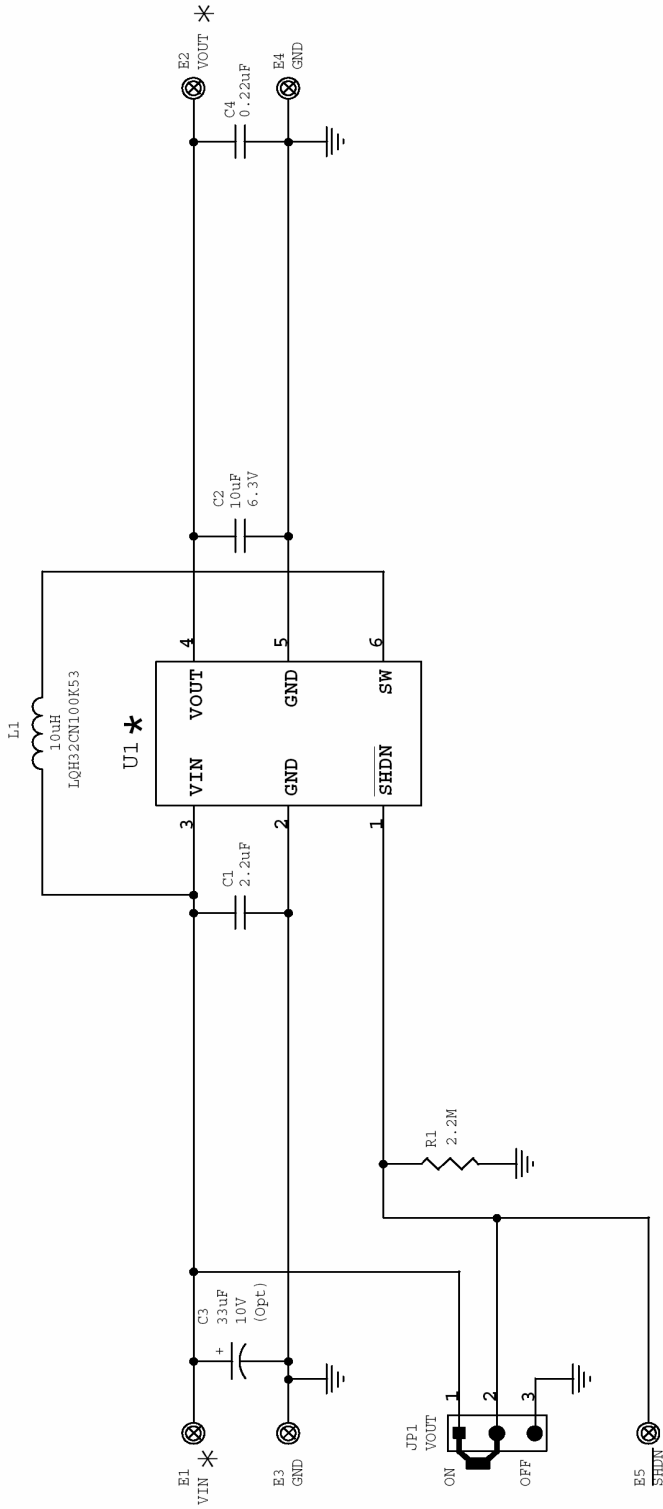


Figure 2. Measuring Input or Output Ripple

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.



\* BOARD ASSEMBLY

	U1	VIN	VOUT / I <sub>max</sub>
DC879A-A	LTC3525ESC6-3.3	1.8V-3.2V 1V-3.2V	3.3V/140mA 3.3V/60mA
DC879A-B	LTC3525ESC6-5	3V-4.5V 1V-4.5V	5V/175mA 5V/40mA

**Linear Technology Corp.** 1630 McCarthy Blvd., Milpitas, CA 95055-7417  
 Phone: (408)432-1900 Fax: (408)434-0507

Title: Micropower Synchronous Step-Up Converter with Output Disconnect  
 Document Number: **Demo Circuit 879A** Rev 1  
 Date: Monday, September 19, 2005 Sheet 1 of 1