

1.2A, 750kHz Step-down Switching Regulator in 2mm×3mm DFN

DESCRIPTION

Demonstration circuit 897 is a monolithic step-down DC/DC switching regulator featuring the LT3493. The demo board is designed for 3.3V output from a 4.5V to 36V input. The wide input range of the LT3493 allows a variety of input sources. The typical sources are automotive batteries, wall adaptors and industrial supplies. The 750kHz switching frequency allows the use of small, low cost inductor and ceramic capacitors, resulting in low, predictable output ripple. The current mode control scheme creates fast transient response and good loop stability. The internal compensation reduces the component count and solution size. The gate drive of the internal switch is boosted to a voltage that is higher than the V_{in} to ensure saturation of the switch. A charge pump consisting of diode and a capacitor on the demo board performs the boost function. The $S\overline{HDN}$ pin can be used to set the part in micropower shutdown mode, reducing

the supply current to less than 2 μ A. The $S\overline{HDN}$ pin can also be used to program soft start. In this mode, the $S\overline{HDN}$ pin is driven through an external RC filter to create a voltage ramp on this pin. The soft start function reduces the input current surge during start-up. Cycle by cycle current limit, frequency foldback and thermal shutdown provide protection against shorted outputs.

The LT3493 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 897.

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

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Performance Summary ($T_A = 25^\circ\text{C}$)

PARAMETER FOR LED DRIVER	CONDITION	VALUE
Minimum input voltage		4.5V
Maximum input voltage		36V
Output voltage V_{out}		3.3V +/- 4%
Maximum output current	$V_{in}=4.5\text{V}$	950mA
Maximum output current	$V_{in}=8\text{V}$	1.2A
Typical switching frequency		750kHz

QUICK START PROCEDURE

Demonstration circuit 897 is easy to set up to evaluate the performance of the LT3493. 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. Place JP1 on the RUN position:
2. With power off, connect the input power supply to V_{in} and GND.
3. Turn on the power at the input.
4. Check for the proper output voltages.

NOTE . Make sure that the input voltage does not exceed 36V.

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

LT3493

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.

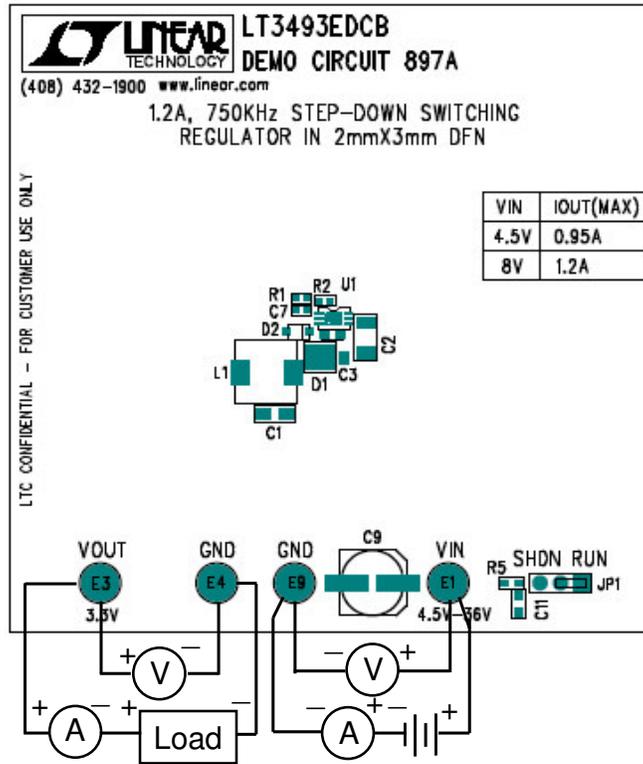


Figure 1. Proper Measurement Equipment Setup

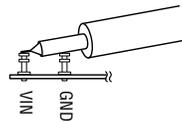
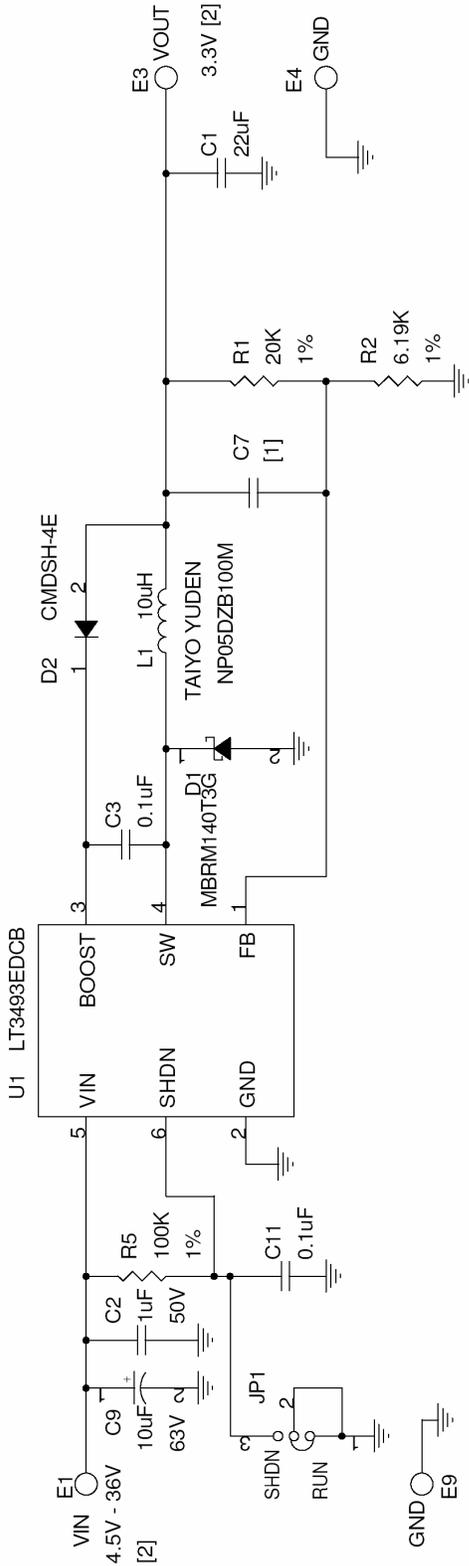


Figure 2. Measuring Input or Output Ripple

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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.



NOTES: UNLESS OTHERWISE SPECIFIED,
 [1] DO NOT STUFF.

VIN	IOUT (MAX)
4.5V	0.95A
8V	1.2A

[2]

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	APPROVED
	3	PROD	02/06/05	

		1630 McCarthy Blvd. Milpitas, CA 95035 Phone: (408)432-1900 Fax: (408)434-0507	
CONTRACT NO.		TITLE SCH, LT3493EDCB, 1.2A, 750KHz STEP-DOWN SWITCHING	
APPROVALS	DATE	REGULATOR IN 2mmX3mm DFN	
DRAWN MEI	03/21/05	SIZE	CAGE CODE
CHECKED		DWGNO	DC897A
APPROVED		SCALE	897A-3.DSN
ENGINEER		FILENAME	897A-3.DSN
DESIGNER		SHEET	1 OF 1
Tuesday, February 07, 2006		REV 3	