

DESCRIPTION

Demonstration circuit 627 features the LT3461 / LT3461A in a 12.0V output boost converter which operates from an input voltage of 3V to 6V. The maximum output current is 70mA when powered from a 5.0V input and 40mA when powered from a 3.3V input. A soft-start option is provided by the SHDN pin and can be configured with an on-board RC filter.

The internal schottky of the LT3461 / LT3461A reduces part count and the high switching frequency allows the use of a small SMT inductor and output capacitors. The small size of the circuit makes it ideal for space-sensitive applications.

The DC627A comes in two versions. The “-A” version uses the LT3461 and the “-B” version uses the LT3461A.

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	DC627A-A VALUE	DC627A-B VALUE
LT Part		LT3461ES6	LT3461AES6
Minimum Input Voltage		3V	3V
Maximum Input Voltage		6V	6V
Output Voltage V_{OUT}	$V_{IN} = 3\text{V to } 6\text{V}$	$12\text{V} \pm 4\%$	$12\text{V} \pm 4\%$
Maximum Output Current	$V_{IN} = 3.3\text{V}$	40mA	40mA
	$V_{IN} = 5.0\text{V}$	70mA	70mA
Typical Efficiency	$V_{IN} = 3.3\text{V}, I_{OUT} = 40\text{mA}$	79%	76%
	$V_{IN} = 5.0\text{V}, I_{OUT} = 70\text{mA}$	83%	81%
Typical Output Voltage Ripple (20MHz BW)	$V_{IN} = 3.3\text{V}, I_{OUT} = 40\text{mA}$	20mV _{P-P}	9mV _{P-P}
	$V_{IN} = 5.0\text{V}, I_{OUT} = 70\text{mA}$	28mV _{P-P}	12mV _{P-P}
Nominal Switching Frequency		1.3MHz	3.0MHz

QUICK START PROCEDURE

Demonstration circuit 627 is easy to set up to evaluate the performance of the LT3461 or LT3461A. Refer to Figure 1 for the proper measurement equipment setup and follow the procedure below:

1. Place jumper JP1 in the “ON” position if not already done.
2. With power off, connect the input power supply.
3. Turn on the input power source and set it to 3.3V. The output should be $12.0\text{V} \pm 4\%$ at no load.
4. Connect the load from V_{OUT} to GND and set to 40mA. The output should still be $12.0\text{V} \pm 4\%$.

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BOOST CONVERTER

5. Increase the input voltage to 5.0V and apply 70mA load and re-check regulation.
 6. Measure the DC input current at $V_{IN} = 5.0V$ and $I_{OUT} = 70mA$.
 - a. For the DC627A-A, the input current should be less than 215mA.
 - b. For the DC627A-B, the input current should be less than 225mA.
 7. Monitor the output voltage ripple. Refer to Figure 2 for the proper measurement technique.
 8. Measure the output ripple frequency.
- a. For the DC627A-A, the frequency should be between 1.0MHz and 1.7MHz.
- b. For the DC627A-B, the frequency should be between 2.1MHz and 3.9MHz.

NOTE: If this circuit will be used in a hot plug application, then be sure to measure the inrush current. The maximum non-repetitive surge current the internal schottky can handle is 1.5A. The inrush current can be monitored by measuring the current through the inductor when V_{IN} is initially applied. Refer to the data sheet for more details.

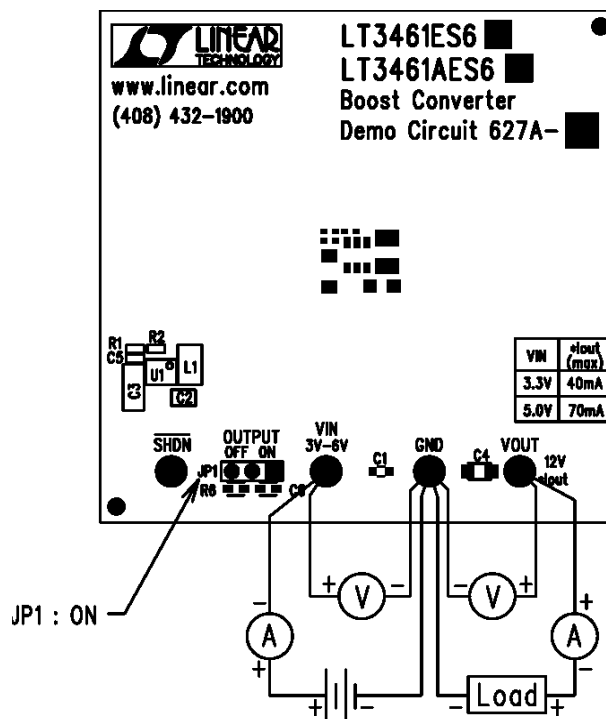


Figure 1. Proper Measurement Equipment Setup

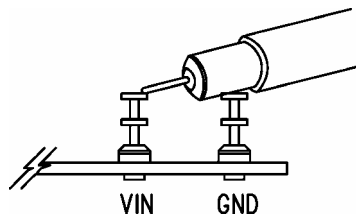


Figure 2. Measuring Input or Output Ripple

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