

DESCRIPTION

Demonstration circuit 613 is a 3A, 500kHz, step-down converter with 100uA quiescent current featuring the LT3435IFE. It produces 5V at 2A from an input range of 6.75V to 28V continuous, and can survive input transients up to 60V. The demonstration circuit includes a shutdown control, synchronization from 500kHz to 700kHz and a programmable power good indicator.

The LT3435 is a 500kHz monolithic buck switching regulator that accepts input voltages up to 60V. A high efficiency 3A, 0.1Ω switch is included on the die along with all the necessary oscillator, control and logic circuitry. Current mode topology is used for fast transient response and good loop stability.

Innovative design techniques along with a new high voltage process achieve high efficiency over a wide input range. Efficiency is maintained over a wide output current range by employing Burst Mode® operation at low currents, utilizing the output to bias the internal circuitry, and by using a supply boost capacitor to fully saturate the power switch.

For further information about the LT3435, please refer to the LT3435 data sheet.

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

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Table 1. Performance Summary (T_A = 25°C)

PARAMETER	CONDITION	VALUE
Minimum Turn On Input Voltage	V _{OUT} = 5VDC, I _{LOAD} = 2A	6.75VDC
Minimum Turn Off Input Voltage	V _{OUT} = 5VDC, I _{LOAD} = 2A	6.5V, typical
Maximum Input Voltage	Continuous	28VDC
	100mS transient	60VDC
Output Voltage V _{OUT}	V _{IN} = 6.75 to 28VDC, I _{LOAD} = 0 to 2A	5V ± 4%
Maximum Output Current	V _{IN} = 6.75 to 28VDC, V _{OUT} = 5VDC	2A
Nominal Switching Frequency		500kHz
Synchronization Frequency Range	V _{IN} = 6.75 to 28VDC, V _{OUT} = 5VDC	500 – 700 KHz

QUICK START PROCEDURE

Demonstration circuit 613 is easy to set up to evaluate the performance of the LT3435IFE. 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. While disconnected from the demonstration circuit, set the output of the input power source to its minimum positive value.
2. With power off, connect the input power supply to VIN and GND.
3. Connect the load.

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3A, 500KHZ, STEP-DOWN CONVERTER WITH 100UA QUIESCENT CURRENT

4. Turn on the power at the input, ensuring that the voltage applied to the demonstration circuit is less than 28VDC.
5. Check for the proper output voltages. The output VOUT should be 5VDC.

NOTE: If there is no output, temporarily disconnect the load to make sure that the load is not set too high.
6. 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.
7. Verify the shutdown by pulling the $\overline{\text{SHDN}}$ (TP4) terminal to a logic low level.
8. Verify the power good function by monitoring the timing and voltage levels of the output voltage and PGOOD terminal (TP7).
9. Verify the synchronization function by applying a square wave signal of the appropriate amplitude and frequency to the SYNC terminal (TP5).

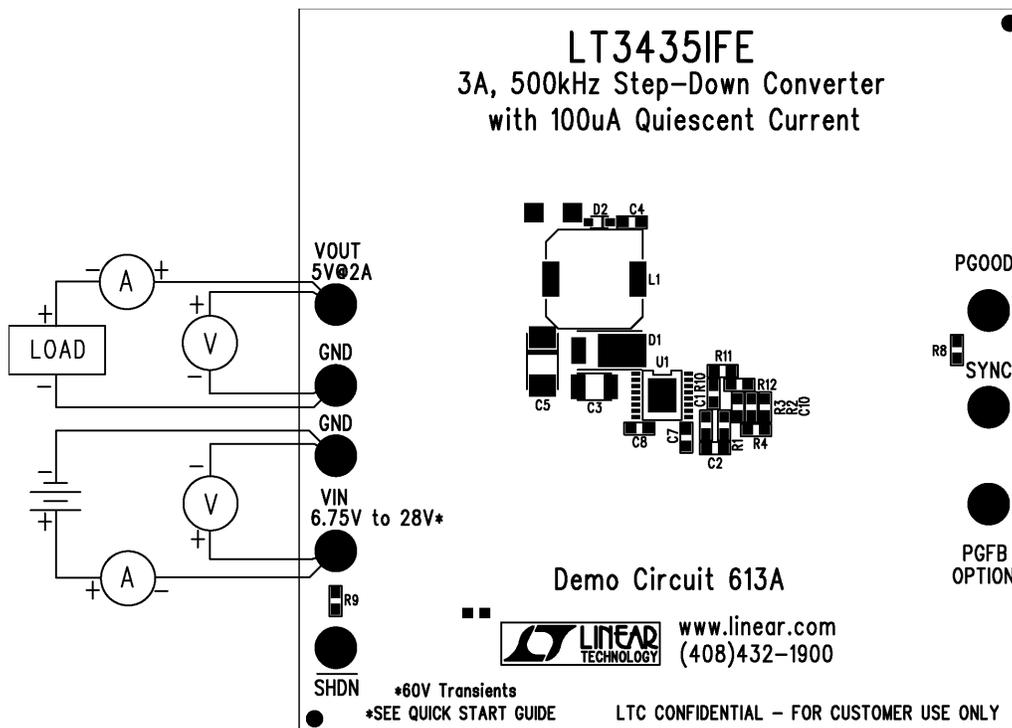


Figure 1. Proper Measurement Equipment Setup

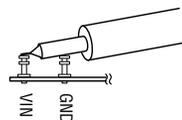
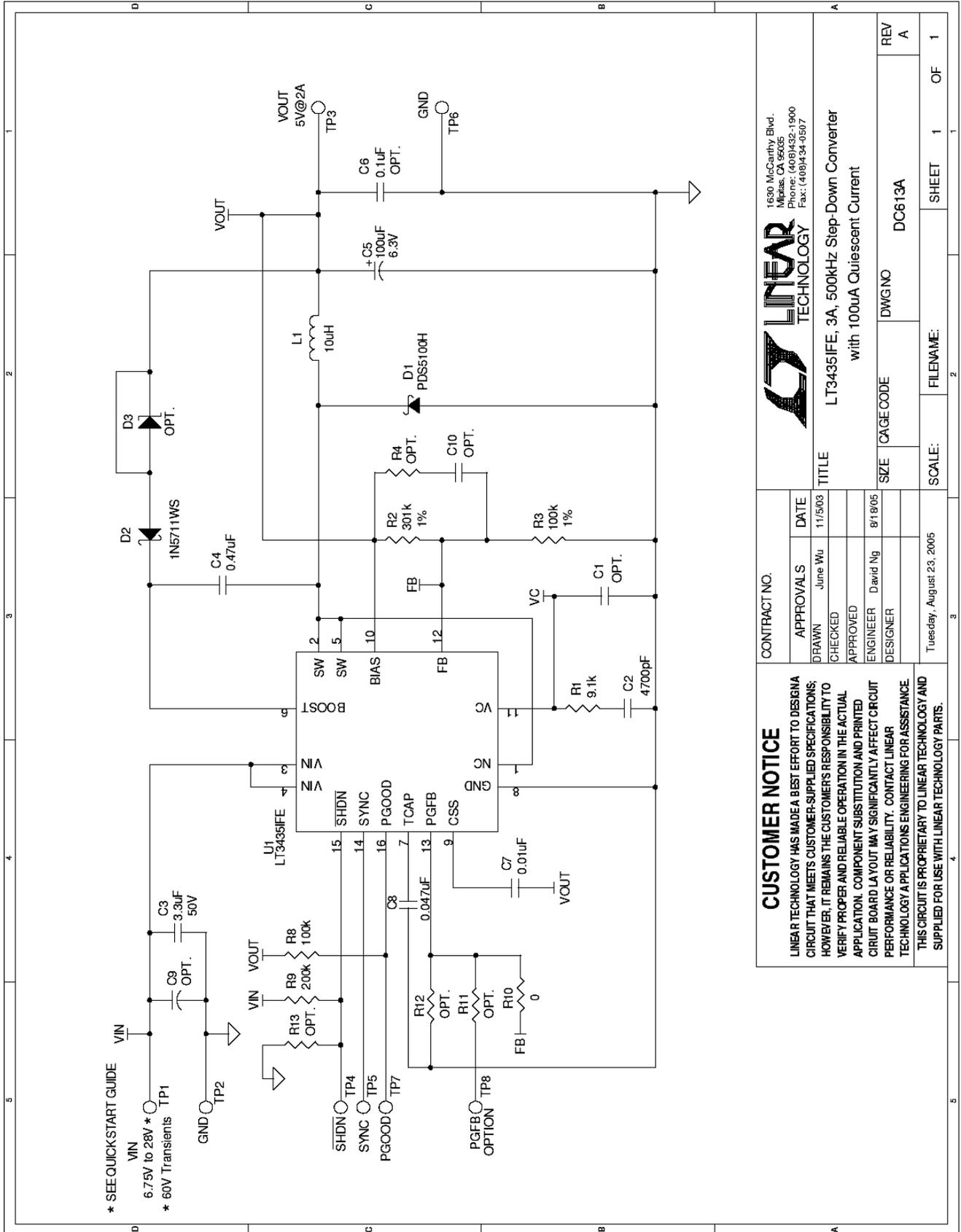


Figure 2. Measuring Input or Output Ripple

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 613

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* SEE QUICKSTART GUIDE
 VIN
 6.75V to 28V *
 * 60V Transients TP1
 * 60V Transients TP1

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THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.

CONTRACT NO.

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Tuesday, August 23, 2005

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TITLE
 LT3435IFE, 3A, 500kHz Step-Down Converter
 with 100uA Quiescent Current

SIZE CAGE CODE **DWG NO** DC613A **REV** A

SCALE: **FILENAME:** **SHEET** 1 **OF** 1