DEMO CIRCUIT 927
QUICK START GUIDE

LT3742
Dual, 2-Phase Step-Down Switching Controller

DESCRIPTION

Demonstration circuit 927 is a high density 5V/4A and 3.3V/4A step down converter featuring the LT3742. A 500kHz fixed frequency current mode architecture provides fast transient response with simple loop compensation components and cycle-by-cycle current limiting. An internal step-up regulator is used to generate the gate drive voltage, allowing the gate of the external high side N-channel MOSFET to be driven to full enhancement for the highly efficient operation. The dual channels operate 180° out of phase to reduce the input ripple current, minimizing the noise induced on the input supply, and allowing the use of less input capacitance. The device also includes individual shutdown and power-good output for each converter. The LT3742 is available in a small 4mm x 4mm QFN package.

The LT3742 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 927.

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

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Table1. Performance Summary (T_A = 25°C)

PARAMETER	CONDITION	VALUE
Minimum Input Voltage		5.5V
Maximum Input Voltage		28V (Note 1)
Output Voltage V_{OUT1}		5V +/-3%
Output Voltage V_{OUT2}		3.3V +/-3%
Maximum Output Current I_{OUT1}		4A
Maximum Output Current I_{OUT2}		4A
Typical Switching Frequency		500kHz

Note 1: See "Input Voltage Range" section in the datasheet for detail.

QUICK START PROCEDURE

Demonstration circuit 927 is easy to set up to evaluate the performance of the LT3742. 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. Place JP1 and JP2 on the RUN position:
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 the maximum input voltage.
4. Check for the proper output voltages.

   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.

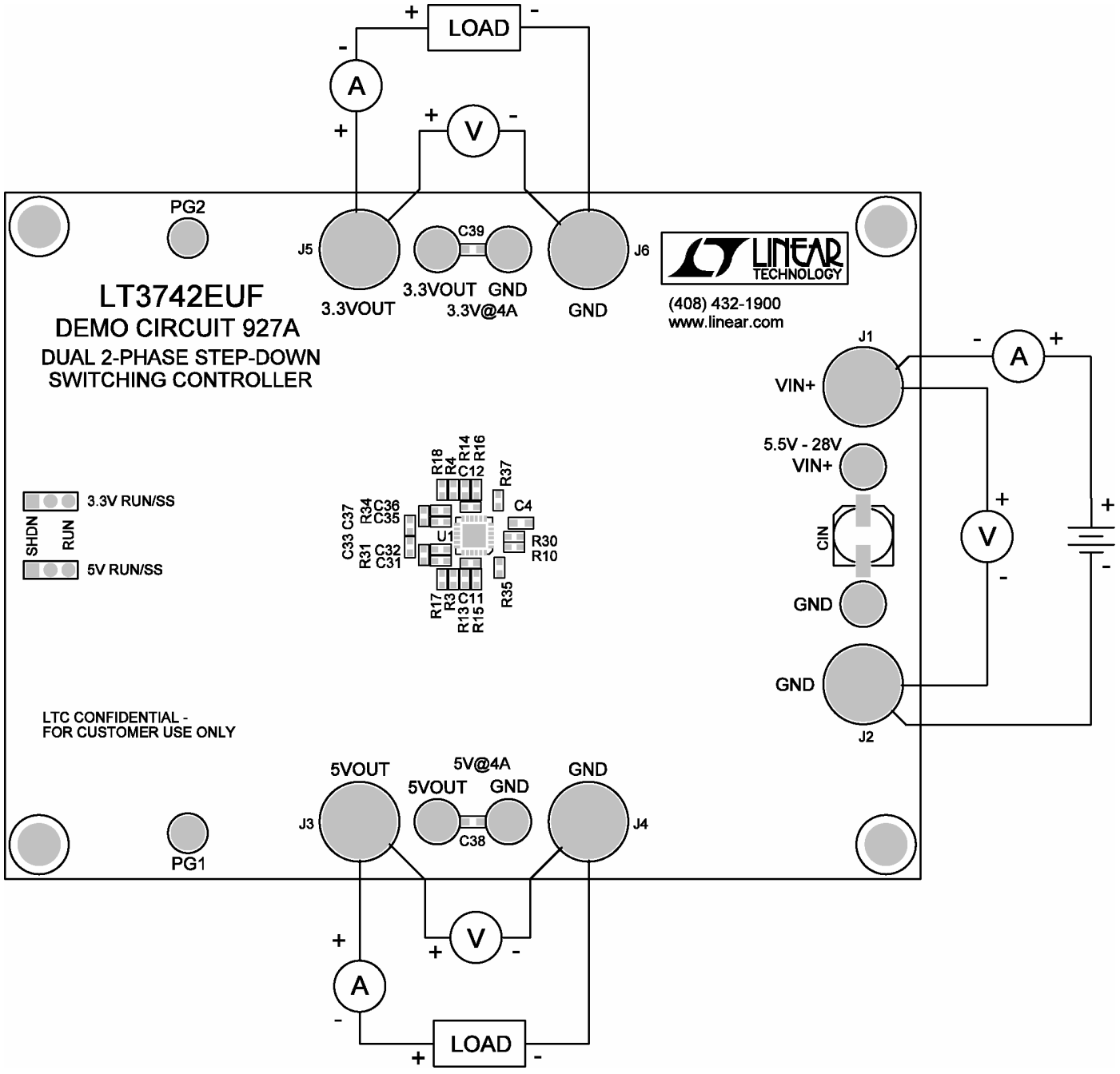


Figure 1. Proper Measurement Equipment Setup

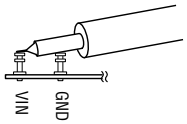
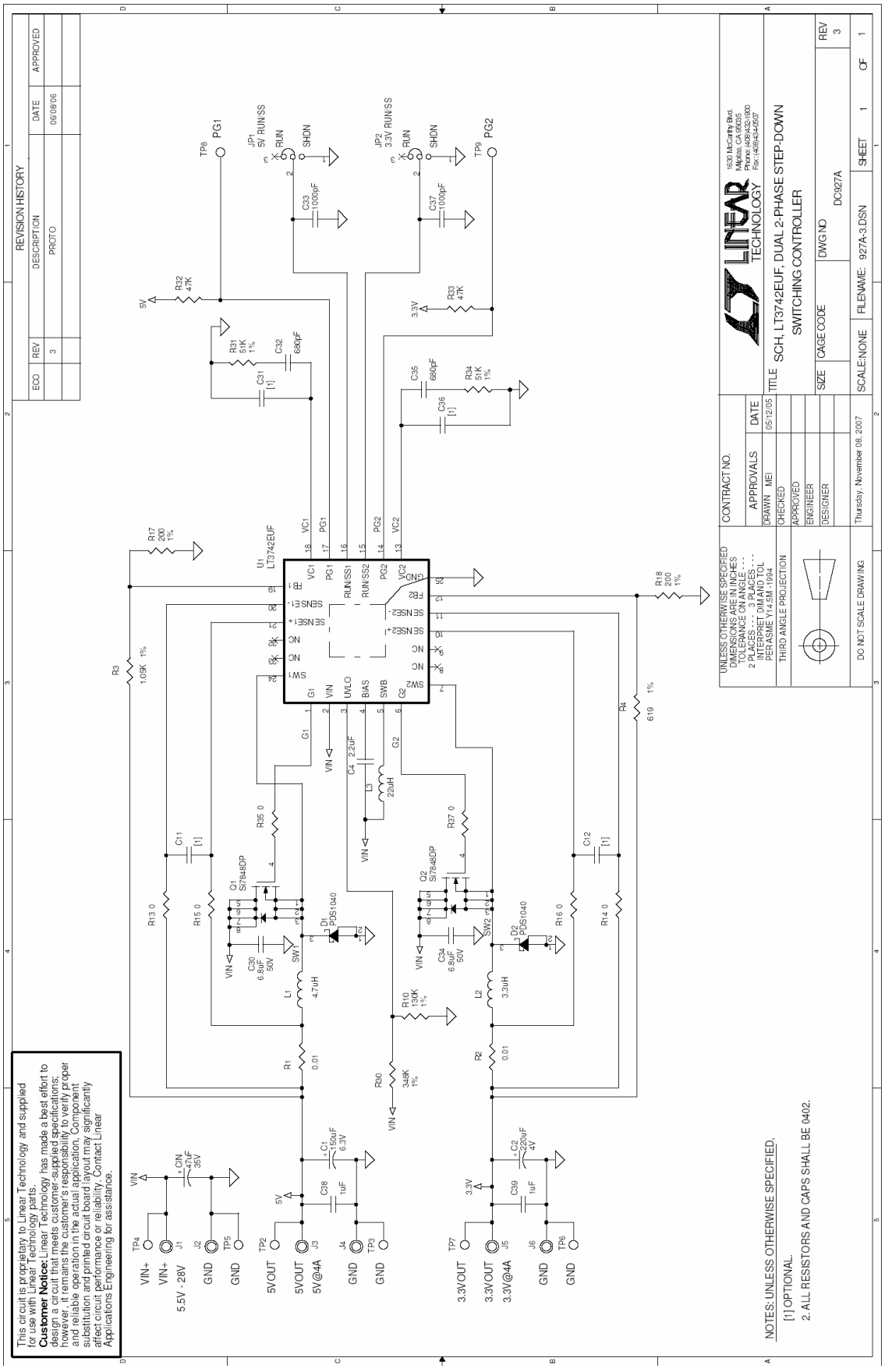


Figure 2. Measuring Input or Output Ripple


REVISION HISTORY
ECO
REV
DESCRIPTION
DATE
APPROVED
3
PROTO
06/08/06
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.
NOTES: UNLESS OTHERWISE SPECIFIED,
[1] OPTIONAL.
2. ALL RESISTORS AND CAPS SHALL BE 0402.
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CONTRACT NO.
APPROVALS
DATE
DRAWN MEI
05/12/05
CHECKED
APPROVED
ENGINEER
DESIGNER
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON ANGLE - - -
2 PLACES - - - 3 PLACES - - -
INTERPRET DIM AND TOL
PER ASME Y14.5M - 1994
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING
TITLE SCH, LT3742EUF, DUAL 2-PHASE STEP-DOWN SWITCHING CONTROLLER
SIZE
CAGE CODE
DWG NO
DC927A
REV 3
SCALE:NONE
FILENAME: 927A-3.DSN
Thursday, November 08, 2007
SHEET 1 OF 1
U1 LT3742EUF
JP1 5V RUN/SS
JP2 3.3V RUN/SS
RUN
SHDN
PG1
PG2
VIN
5V
3.3V
5VOUT
3.3VOUT
GND
VIN+
5.5V - 28V
5V@4A
3.3V@4A