DESCRIPTION

Demonstration circuit 559 is a high efficiency synchronous boost DC/DC converter with output disconnect, inrush current limiting and soft-start functions featuring the LTC3429. The board is capable of supplying 90mA from a single AA cell input or 250mA from a 2-cell input with a 3.3V output. The input range is from 1V to 3.3V. DC559 version A uses the LTC3429; version B uses the LTC3429B. The LTC3429 shifts automatically to power saving Burst Mode operation at light loads; whereas the LTC3429B operates at a fixed frequency for all loads with minimum output voltage ripple.

A switching frequency of 500KHz allows up to 95% efficiency with a tiny solution footprint. Typical applications include MP3 players, GPS receivers, digital cameras, PDAs, LCD bias supplies and wireless handsets.

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

Table 1. Performance Summary

PARAMETER	CONDITION	VALUE
Maximum Load Current, Min	Vout = 3.3V, Vin = 1.0V	90mA
Maximum Load Current, Min	Vout = 3.3V, Vin = 2.0V	250mA
Switching Frequency, Typ		500KHz
Efficiency, Typ	Vout = 3.3V, Vin = 2.8V, Iout = 100mA	95%
Output Ripple, Typ	Vout = 3.3V, V_{IN} = 1.5V, I_{OUT} = 100mA (20MHz BW)	20mV_{P-P}

QUICK START PROCEDURE

Demonstration circuit 559 is easy to set up to evaluate the performance of the LTC3429. 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 the jumper in the following position:

   JP1 On

2. With power off, connect the input power supply to Vin and GND. Connect the load to Vout and GND. Set initial load = 0A (no load).

3. Turn on the power at the input.

   NOTE: Make sure that the input voltage does not exceed 4.4V.

4. Check for the output voltage. Vout should be 3.3V±0.1V.
5. Once the proper output voltage is established, adjust the load within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters.

NOTE: If there is no output, temporarily disconnect the load to make sure that the load is not set too high. The available output current depends on the input voltage.

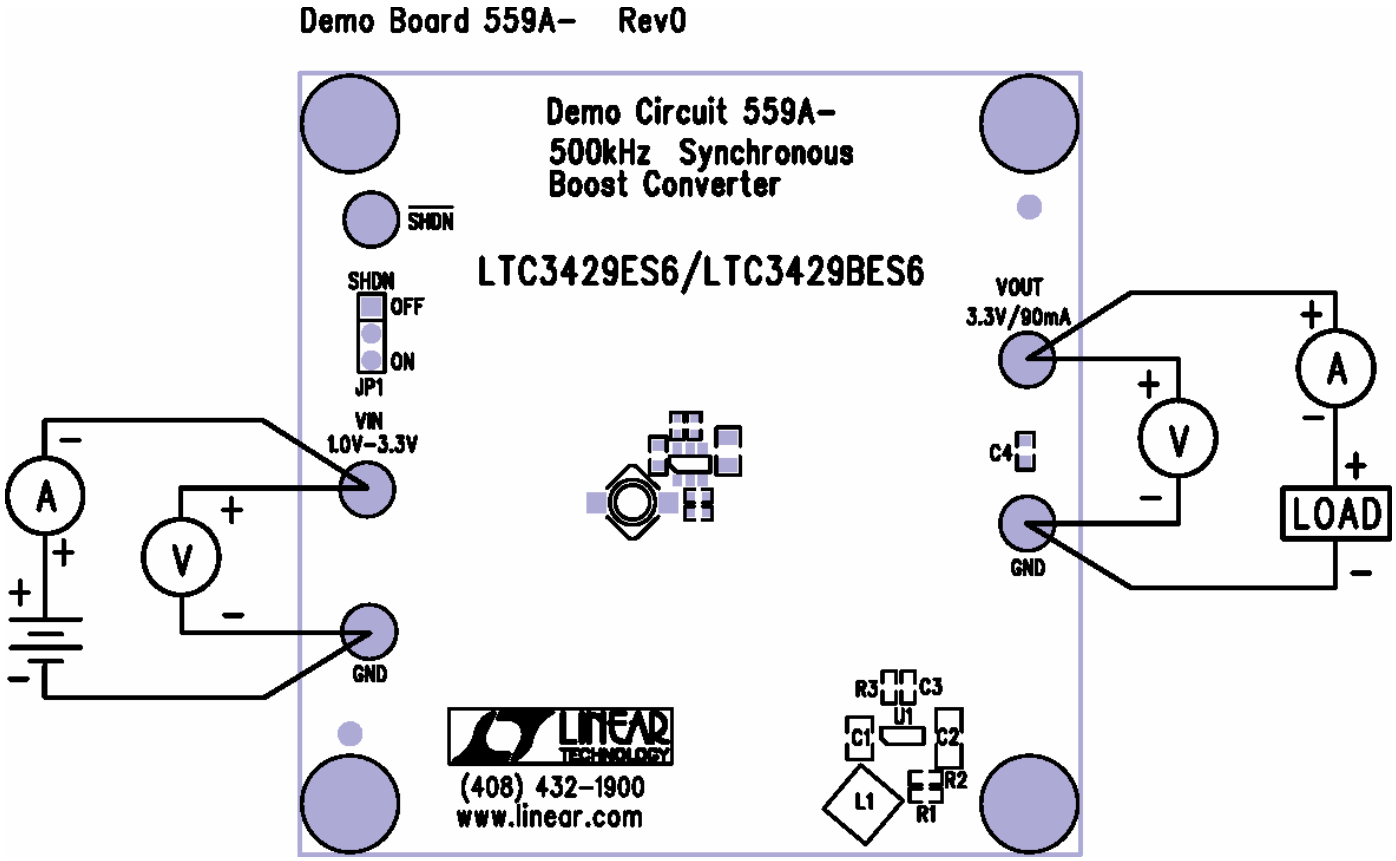


Figure 1. Proper Measurement Equipment Setup

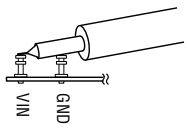


Figure 2. Measuring Input or Output Ripple

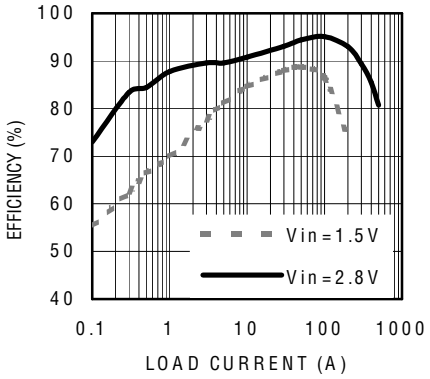
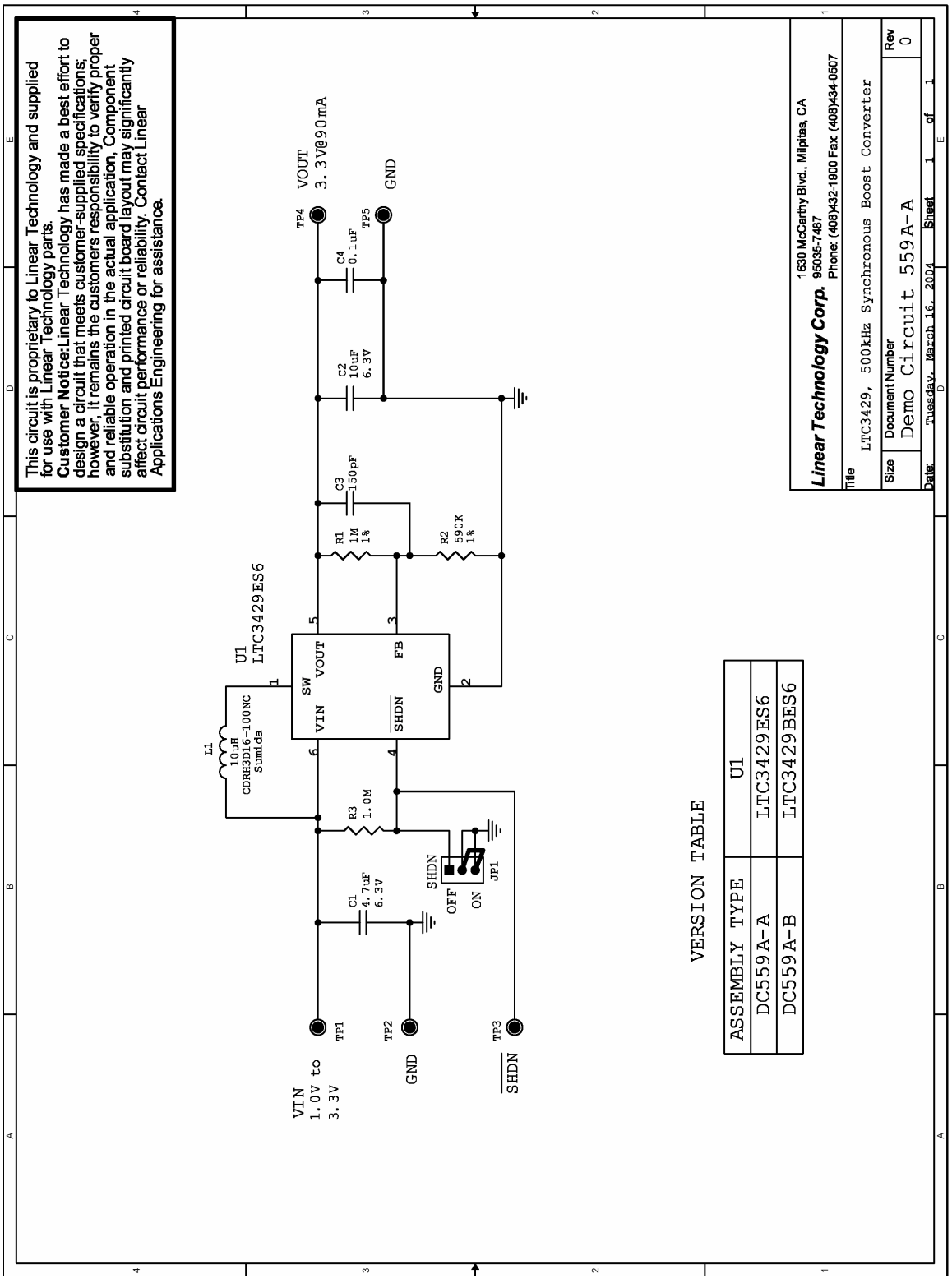


Figure 3. Efficiency curves: Vout=3.3V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Customer Notice: Linear Technology has made a best effort to design a circuit that meets customer-supplied specifications; however, it remains the customers responsibility to verify proper and reliable operation in the actual application. Component substitution and printed circuit board layout may significantly affect circuit performance or reliability. Contact Linear Applications Engineering for assistance.
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Title
LTC3429, 500kHz Synchronous Boost Converter
Size
Document Number
Demo Circuit 559A-A
Rev 0
Date: Tuesday, March 16, 2004
Sheet 1 of 1
U1
LTC3429ES6
L1
10uH
CDRH3D16-100NC
Sumida
SW
VOUT
VIN
SHDN
FB
GND
R1
1M
1%
R2
590K
1%
R3
1.0M
C1
4.7uF
6.3V
C2
10uF
6.3V
C3
150pF
C4
0.1uF
TP1
TP2
TP3
TP4
TP5
VIN
1.0V to
3.3V
GND
SHDN
VOUT
3.3V@90mA
GND
SHDN
OFF
ON
JP1
VERSION TABLE
ASSEMBLY TYPE
U1
DC559A-A
LTC3429ES6
DC559A-B
LTC3429BES6

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