

## DESCRIPTION

Demonstration circuits 1424A-A and 1424A-B feature the LT3581 in Boost/Inverting Regulator configurations. The Boost is designed to convert a 5V to 10V input source to 12V at 900mA, and the Inverter a 5V to 12V to -12V at 750mA. DC1424A-A is designed to survive output short circuit events with the external MOSFET installed at the output as default. The demo board includes an option to install the MOSFET at the input side. Install Q1 and R1 on the back of the board and refer to Figure 4 for other instructions. DC1424A-B can easily be converted into a SEPIC Converter by swapping L2 and D2 from their respective locations as shown in Figure 5. The LT3581 includes a 42V Master and Slave switch combination with 3.3A total current and can be used in many configurations such

as Boost, SEPIC, CUK and Flyback. It has a 2.5V to 22V operating input range, UVLO, soft-start, programmable switching frequency and many other popular features. The LT3581 is suitable for many applications, such as Local Bias Supplies, VFD, TFT-LCD Supplies and Automotive Engine Control Power. The LT3581 datasheet gives a complete description of the part, its operation and application information. The datasheet must be read in conjunction with this quick start guide for working on or modifying the demo circuit 1424A.

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

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## PERFORMANCE SUMMARY DC1424A-A

Specifications are at TA = 25°C

| SYMBOL           | PARAMETER FOR BOOST CONVERTER | CONDITIONS                                             | MIN   | TYP | MAX   | UNITS |
|------------------|-------------------------------|--------------------------------------------------------|-------|-----|-------|-------|
| V <sub>IN</sub>  | Input Supply Range            |                                                        | 5     |     | 10    | V     |
| V <sub>OUT</sub> | Output Voltage Accuracy       | V <sub>IN</sub> = 5V to 10V, I <sub>LOAD</sub> = 900mA | 11.60 | 12  | 12.30 | V     |
| Efficiency       |                               | V <sub>IN</sub> = 5V, I <sub>LOAD</sub> = 900mA        |       | 88  |       | %     |
| Ripple           |                               | V <sub>IN</sub> = 5V, I <sub>LOAD</sub> = 900mA        |       | 100 |       | mV    |
| F <sub>s</sub>   | Switching Frequency           |                                                        |       | 1.2 |       | MHz   |

## PERFORMANCE SUMMARY 1424A-B

Specifications are at TA = 25°C

| SYMBOL           | PARAMETER FOR CUK CONVERTER | CONDITIONS                                              | MIN    | TYP   | MAX    | UNITS |
|------------------|-----------------------------|---------------------------------------------------------|--------|-------|--------|-------|
| V <sub>IN</sub>  | Input Supply Range          |                                                         | 5      |       | 12     | V     |
| V <sub>OUT</sub> | Output Voltage Accuracy     | V <sub>IN</sub> = 5V to -12V, I <sub>LOAD</sub> = 750mA | -11.60 | -11.9 | -12.30 | V     |
| Efficiency       |                             | V <sub>IN</sub> = 5V, I <sub>LOAD</sub> = 750mA         |        | 81    |        | %     |
| Ripple           |                             | V <sub>IN</sub> = 5V, I <sub>LOAD</sub> = 750mA         |        | 20    |        | mV    |
| F <sub>s</sub>   | Switching Frequency         |                                                         |        | 1.2   |        | MHz   |

## QUICK START PROCEDURE

Demonstration circuit 1424A-A and 1424A-B is easy to set up to evaluate the performance of the LT3581. Refer to Figures 1 and 2 for proper measurement equipment setup and follow the procedure below:

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 jumper in the following position:

JP1 On

2. With power off, connect the input power supply to Vin and GND.

Apply 5V to input.

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.

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.

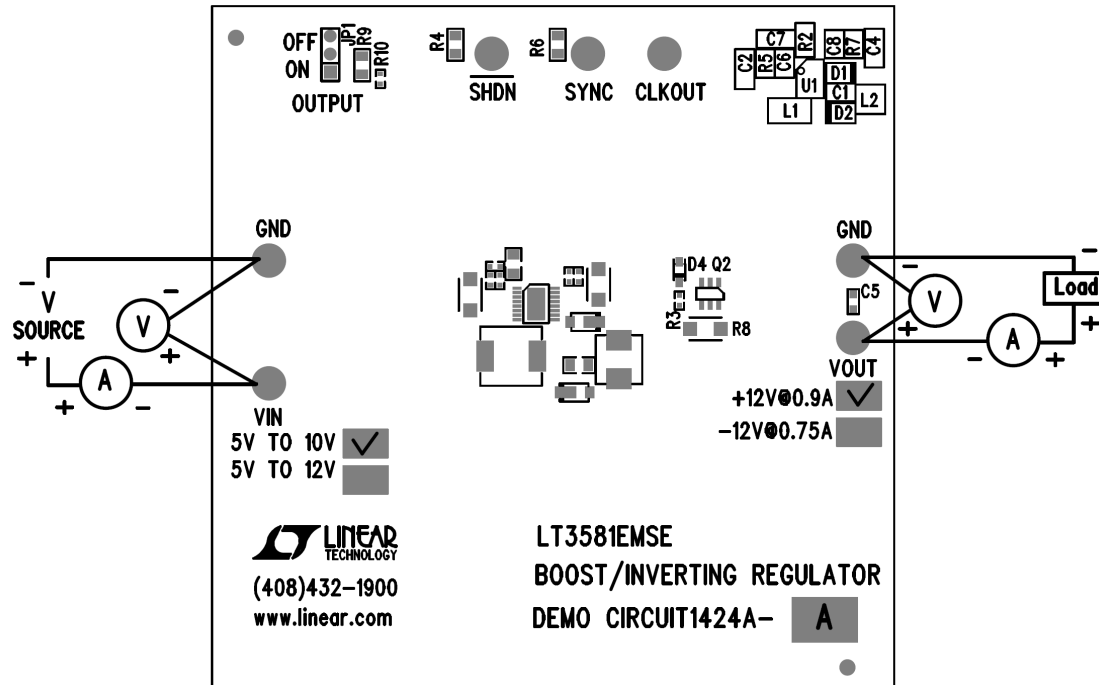


Figure 1. DC1424A-A Proper Equipment Setup

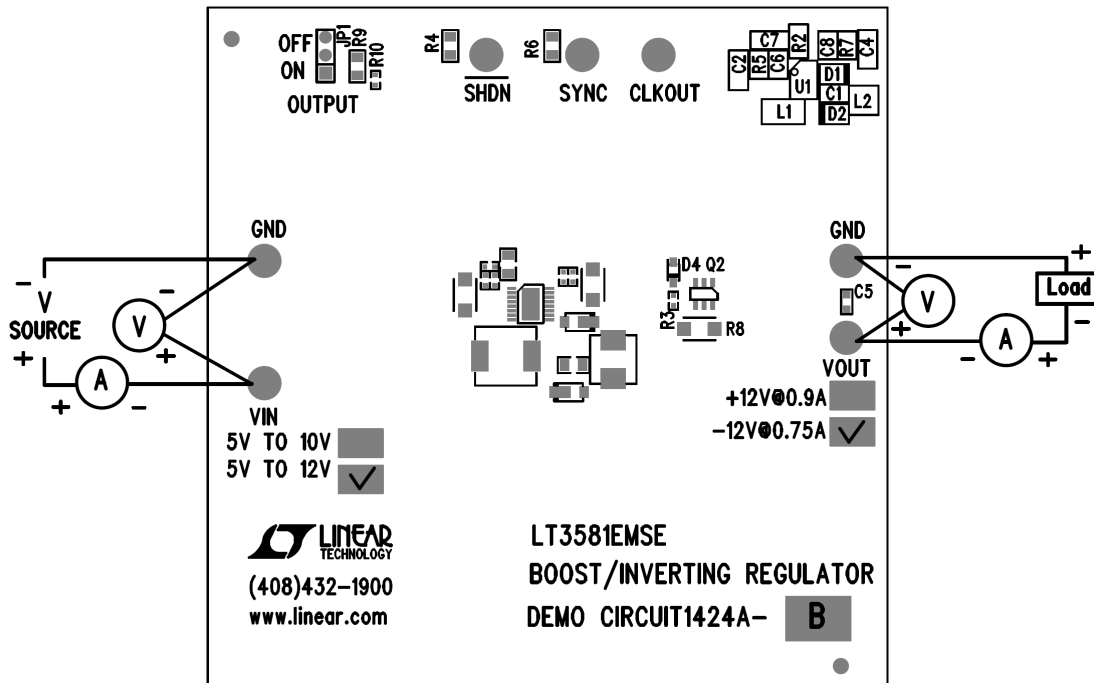


Figure 2. DC1424A-B Proper Equipment Setup

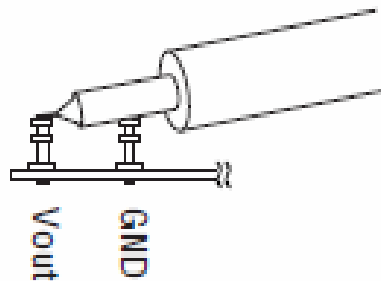
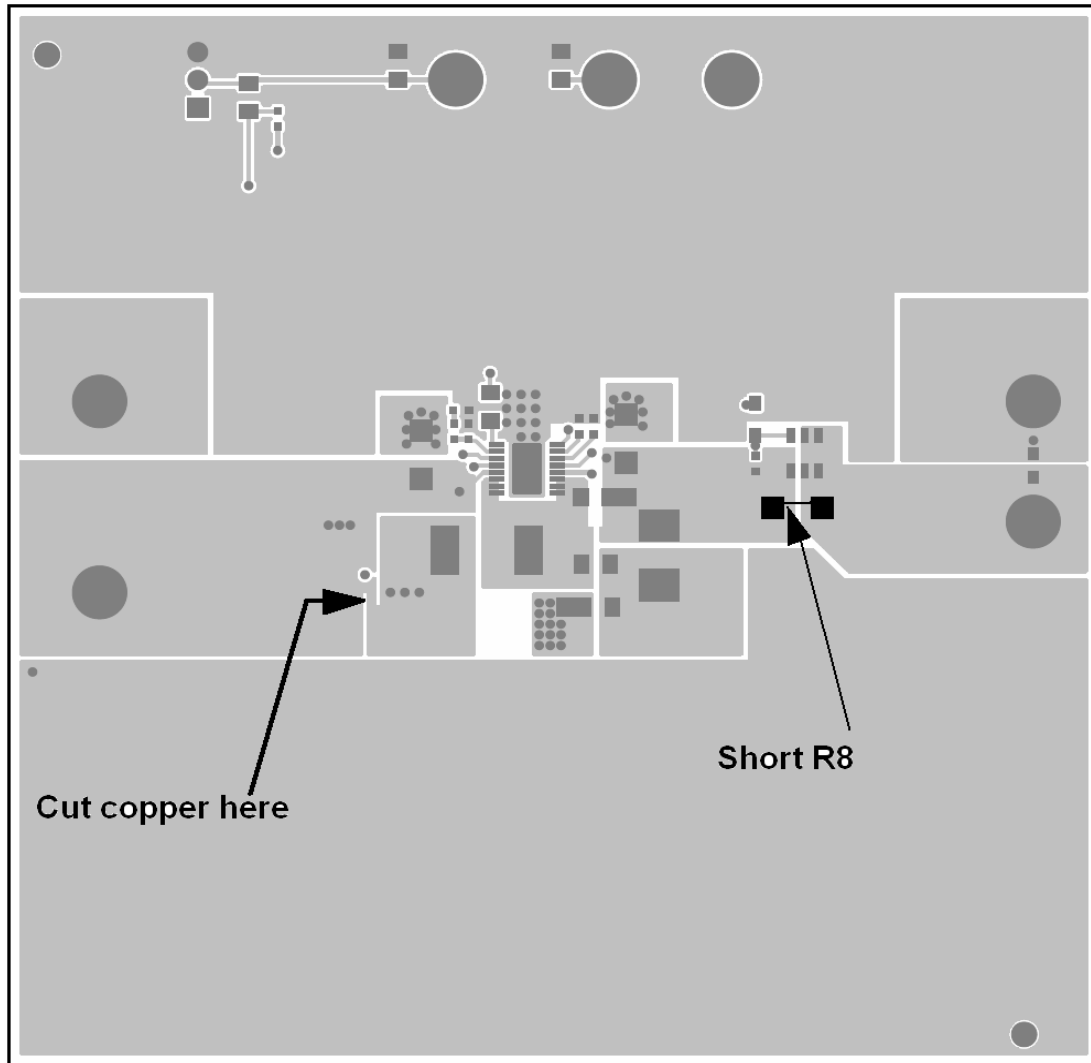


Figure 3. Proper Input/Output Ripple Measurement Technique



**Figure 4. Using Disconnect MOSFET at the Input Side**

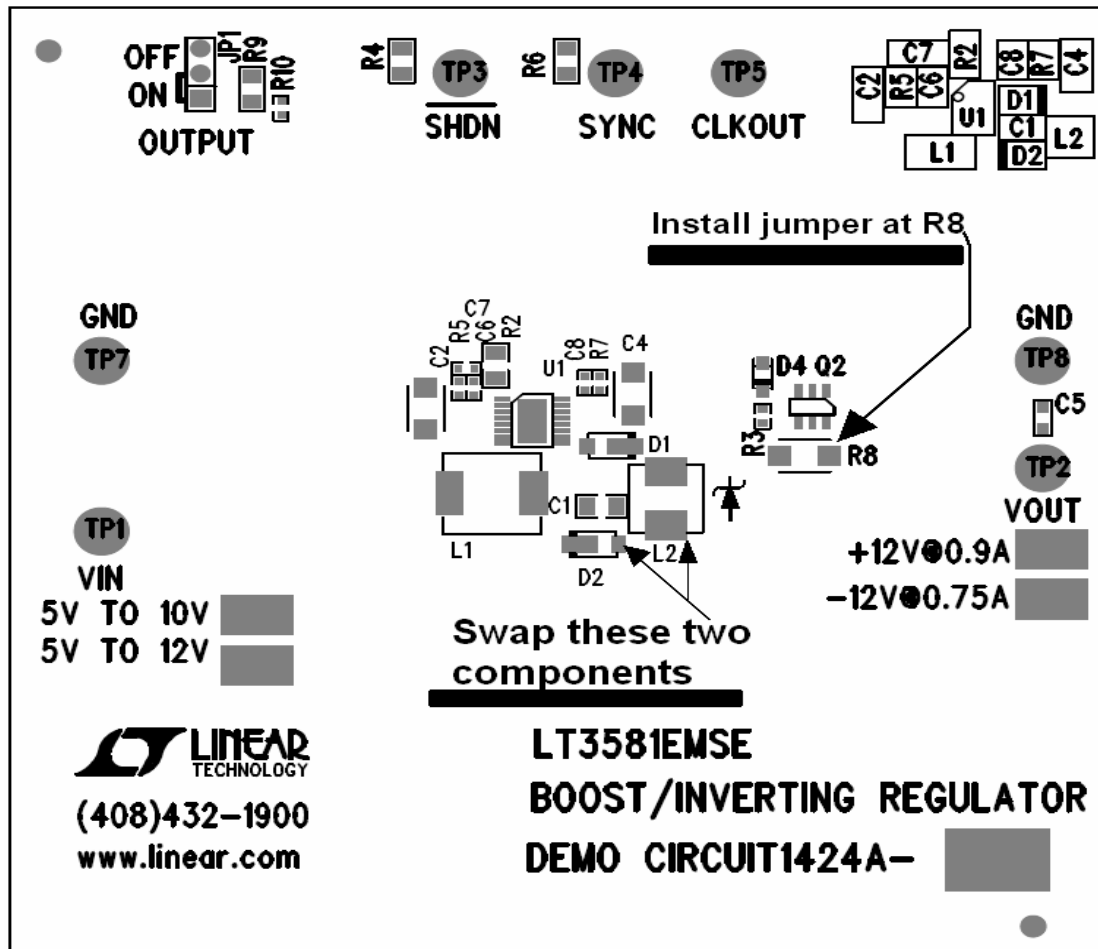
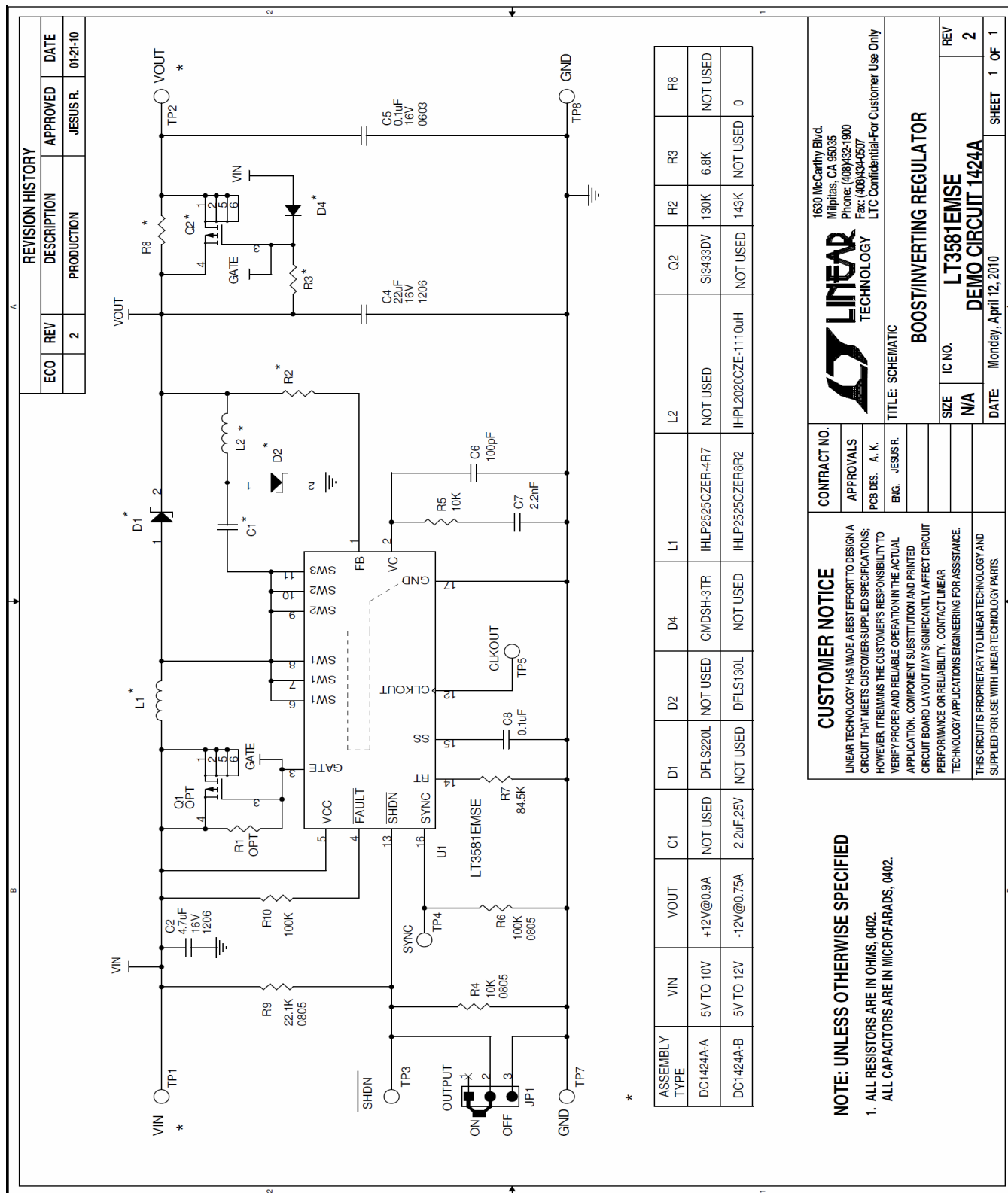


Figure 5. SEPIC Conversion Instructions



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



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### BOOST/INVERTING REGULATOR

TITLE: SCHEMATIC

| SIZE | IC NO.     | REV |
|------|------------|-----|
| N/A  | LT3581EMSE | 2   |

DATE: Monday, April 12, 2010



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