

DC394 – LT1619 Constant Frequency Boost Converters and SEPIC Converter

Description

Demonstration Circuit DC394 features three separate DC/DC converters demonstrating the versatility of the new LT1619 current-mode controller. It is increasingly common to need a high current, low voltage (3.3V or less) power supply as voltages drop, size requirements shrink, and power requirements increase. This 300kHz (synchronizable up to 500kHz) controller has an operating supply voltage of 1.9V to 18V and a separate boost pin for controlling the gate supply of the driven MOSFET since sub-logic FETs are not always easy to find.

The high efficiency of the LT1619 is demonstrated in the 5V to 12V general boost circuit using the typical SO8 package for simple debugging and customization. A 53mV current sense threshold limits the amount of power dissipated in the current sense resistor and further increases the efficiency of the converter. The MSOP 3.3V to 5V boost converter demonstrates the ability to create a low-voltage, high-efficiency converter in as little space as possible. Additionally, a 4V to 18V SEPIC with 5V output (1A maximum) demonstrates the versatility of the LT1619 and its use for automotive applications.

Typical Performance Summary ($T_A = 25C$)

Tiny Boost

V_{IN}	3.3V
V_{OUT}	5V
I_{out}	800mA(max)

General Boost

V_{IN}	5V
V_{OUT}	12V
I_{out}	1A(max)

SEPIC

V_{IN}	4V to 18V
V_{OUT}	5V
I_{out}	1A(max)

Quick Start Guide

Refer to Figure 1 for proper measurement equipment setup and follow the procedure outlined below:

Tiny Boost Circuit

1. Connect the 3.3V input power supply to the V_{IN} and GND terminals on the board.
2. Connect an ammeter in series with the input supply to measure input current.
3. Since this demoboard operates with low input voltages and up to 800mA output current, it is essential that the input voltage source be well regulated. If the input power supply is equipped with sense lines, connect Sense+ to V_{IN} and Sense- to the GND terminal on the board.
4. Connect either power resistors or an electronic load to the V_{OUT} and GND terminals on the board.
5. Connect an ammeter in series with output load to measure output current.
6. Connect a voltmeter across the V_{IN} and GND terminals to measure input voltage.
7. Connect a voltmeter across the V_{OUT} and GND terminal to measure output voltage.
8. After all connections are made, turn on input power and verify that the output voltage is 5V.

General Boost Circuit

1. Connect the 5V input power supply to the V_{IN} and GND terminals on the board.
2. Connect an ammeter in series with the input supply to measure input current.
3. Since this demo board operates with low input voltages and up to 1A output current, it is essential that the input voltage source be well regulated. If the input power supply is equipped with sense lines, connect Sense+ to V_{IN} and Sense- to the GND terminal on the board.
4. Connect either power resistors or an electronic load to the V_{OUT} and GND terminals on the board.
5. Connect an ammeter in series with output load to measure output current.
6. Connect a voltmeter across the V_{IN} and GND terminals to measure input voltage.
7. Connect a voltmeter across the V_{OUT} and GND terminal to measure output voltage.
8. Leave S/S floating to disable shutdown and synchronization.
9. After all connections are made, turn on input power and verify that the output voltage is 12V.

SEPIC Circuit

1. Connect the 4V to 18V input power supply to the V_{IN} and GND terminals on the board.
2. Connect an ammeter in series with the input supply to measure input current.
3. Since this demo board operates with low input voltages and up to 1A output current, it is essential that the input voltage source be well regulated. If the input power supply is equipped with sense lines, connect Sense+ to V_{IN} and Sense- to the GND terminal on the board.
4. Connect either power resistors or an electronic load to the V_{OUT} and GND terminals on the board.
5. Connect an ammeter in series with output load to measure output current.
6. Connect a voltmeter across the V_{IN} and GND terminals to measure input voltage.
7. Connect a voltmeter across the V_{OUT} and GND terminal to measure output voltage.
8. Leave S/S floating to disable shutdown and synchronization.
9. After all connections are made, turn on input power and verify that the output voltage is 5V.

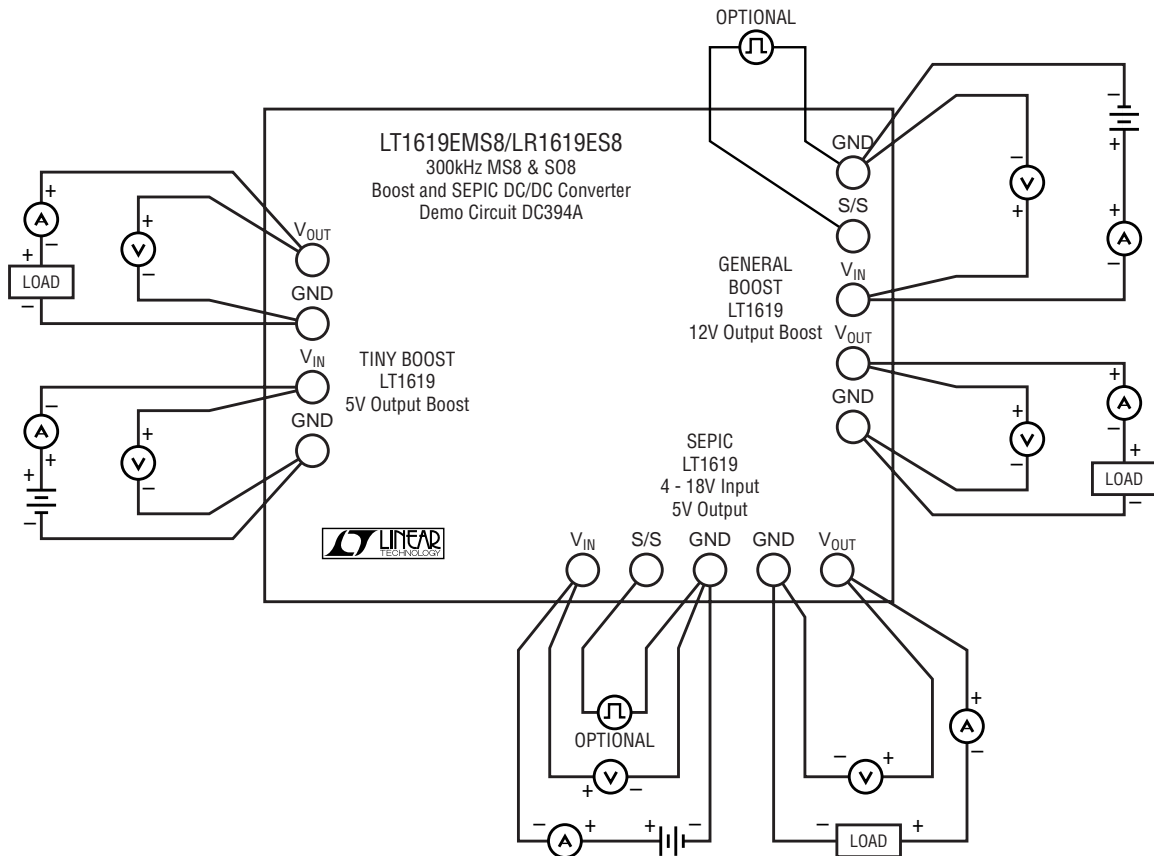


Figure 1. Proper Measurement Equipment Setup