

LTC3814-5

60V Current Mode Synchronous Step-Up Controller

DESCRIPTION

Demonstration circuit 1170 is a 60V Current Mode Synchronous Step-Up Controller featuring the LTC3814-5. The circuit is configured as a synchronous step-up regulator operating at 330kHz switching frequency. Output voltage is 24V at 5A maximum load. The input voltage range is 5V – 14V.

A Power Good output is provided. The PGOOD output is normally high, with a pull up resistor to VCC (5.5V). If

the output voltage is not within $\pm 10\%$ of nominal value the PGOOD signal will go low.

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

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PERFORMANCE SUMMARY

Specifications are at TA = 25°C

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V _{IN}	Input Supply Range		5		14	V
V _{OUT}	Output Voltage	V _{IN} = 12V, I _{LOAD} = 100mA		24		V
I _{OUT}	Output Current	V _{IN} = 12V	0		5	A
I _{IN}	V _{IN} Current (No Load)	V _{IN} = 12V, V _{FCB} = 0V, No Load		60		mA
Efficiency	Efficiency	V _{IN} = 12V, I _{OUT} = 5A		95.7		%

OPERATING PRINCIPLES

The LTC3814-5 is a synchronous step-up switching regulator controller that can directly step up voltages to a maximum output voltage of 60V, making it ideal for telecom and fan applications.

The LTC3814-5 uses a constant off-time peak current control architecture to deliver very high duty cycles with accurate cycle-by-cycle current limit without requiring a current sense resistor. The current limit is adjustable and

the operating frequency is selected by an external resistor.

The LTC3814-5 has a precise (0.5%) internal reference, a 25MHz error amplifier, large gate drivers, programmable softstart, a shutdown pin, a Power Good output, and a flexible bias regulator circuit that can be configured in many different ways depending on the application. The 5.5V bias regulator controls an external series transistor which reduces internal power dissipation.

EQUIPMENT

4 DMMs

1 DC Supply 0-14V capable of delivering at least 150W

1 Adjustable load 0-5A

QUICK START PROCEDURE

Demonstration circuit 1170 is easy to set up to evaluate the performance of the LTC3814-5. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Place jumpers in the following positions:

JP1 ON

2. With power off, connect the input power supply to Vin and GND.
3. Set the power supply to 12V and turn on the power at the input.

NOTE. Make sure that the input voltage does not exceed 14V.

4. Check for the proper output voltage. $V_{out} = 23.6V$ to $24.4V$.

NOTE. If the output voltage is too low, temporarily disconnect the load to make sure that the load is not set too high. Make sure that the power supply that is powering the input is not current limiting.

5. Once the proper output voltages are established, adjust input voltage and load within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters. Note that the circuit may not deliver full power if the input voltage is set below 10V.

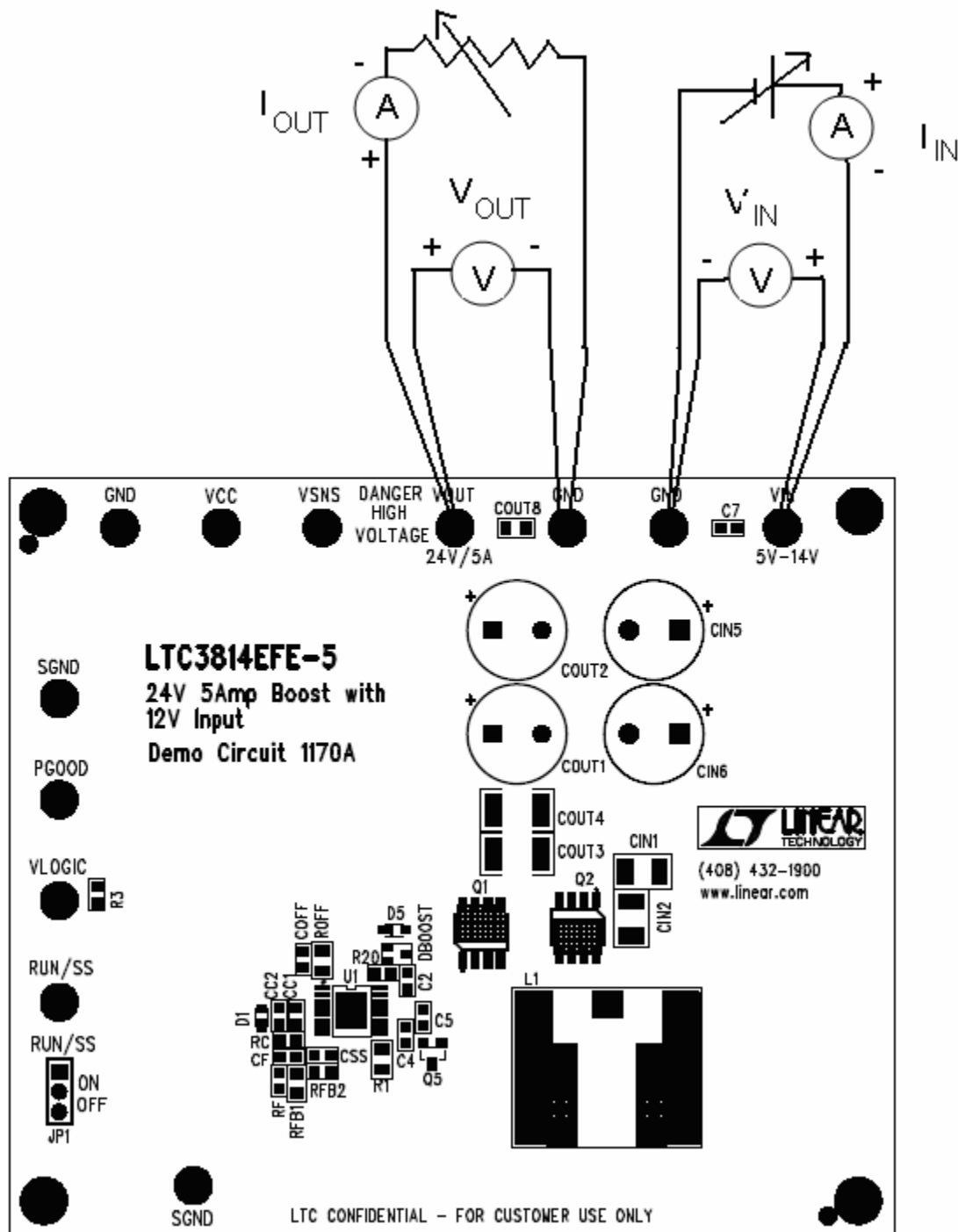
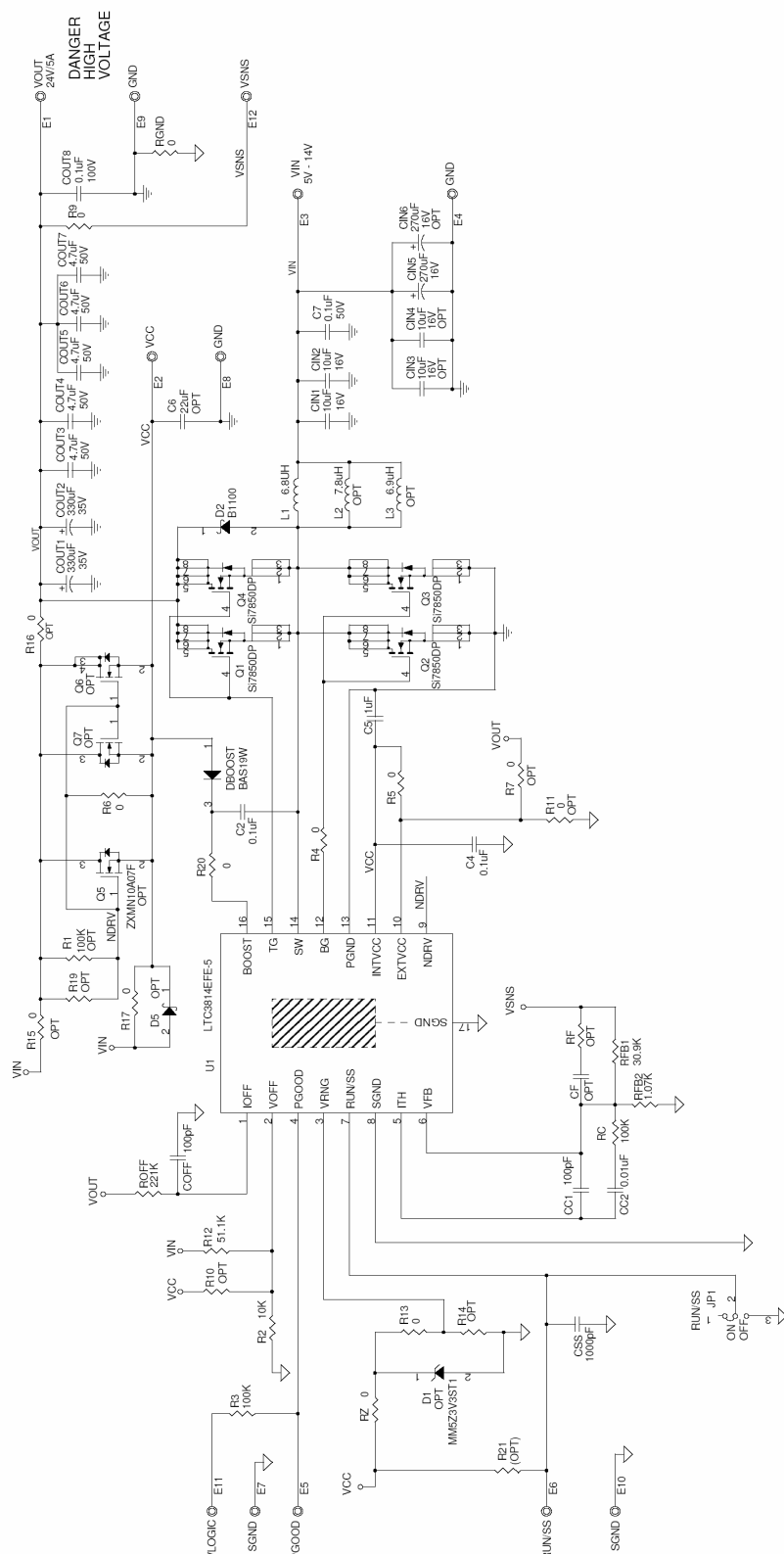


Figure 1. Proper Measurement Equipment



NOTES: UNLESS OTHERWISE SPECIFIED
ALL RESISTORS AND CAPACITORS ARE IN 0603

[illegible]