

DESCRIPTION

Demonstration circuit 1014A is a high efficiency synchronous step-down DC/DC converter featuring the LTC3822EMSE controller. The demo board is capable of providing 1.8V/10A from 2.75V to 4.5V input. The constant frequency current mode architecture with MOSFET V_{DS} sensing eliminates the need for a sense resistor and improves efficiency. The maximum peak current sense threshold can be easily selected with IPRG pin.

Switching frequency can be selected with JP1 to 300KHz, 550KHz or 750KHz.

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


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Table 1. Performance Summary ($T_A = 25^\circ\text{C}$)

PARAMETER	CONDITION	VALUE
Input Voltage Range		2.75V to 4.5V
V_{OUT}	$V_{IN} = 2.75\text{-}4.5\text{V}$, $I_{OUT} = 0\text{A to }10\text{A}$	1.8V $\pm 2\%$
Maximum load current I_{OUT}	$V_{IN} = 2.75\text{-}4.5\text{V}$, $V_{OUT} = 1.8\text{V}$	10A
Typical Output Ripple Voltage	$V_{IN} = 3.3\text{V}$, $I_{OUT} = 5\text{A}$, $F_s = 550\text{KHz}$ (20MHz BW)	10mV _{p-p}

QUICK START PROCEDURE

Demonstration circuit 1014A is easy to set up to evaluate the performance of LTC3822. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below: (Initial jumper position JP1: 550KHz)

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 V_{in} or V_{out} and GND terminals. See Figure 2 for proper scope probe technique.

1. With power off, connect the input power supply to V_{in} (2.75V-4.5V) and GND (input return).
2. Connect the 1.8V load between V_{out} and GND (Initial load: 0 A).

3. Connect the DVMs to the input and output.
4. Turn on the input power supply and check for the proper output voltage. V_{out} should be 1.8V $\pm 2\%$.
5. Once the proper output voltage is established, adjust the load within the operating range and observe the output voltage regulation, ripple voltage and other parameters.

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1014

LOW INPUT VOLTAGE SYNCHRONOUS STEP-DOWN CONVERTER

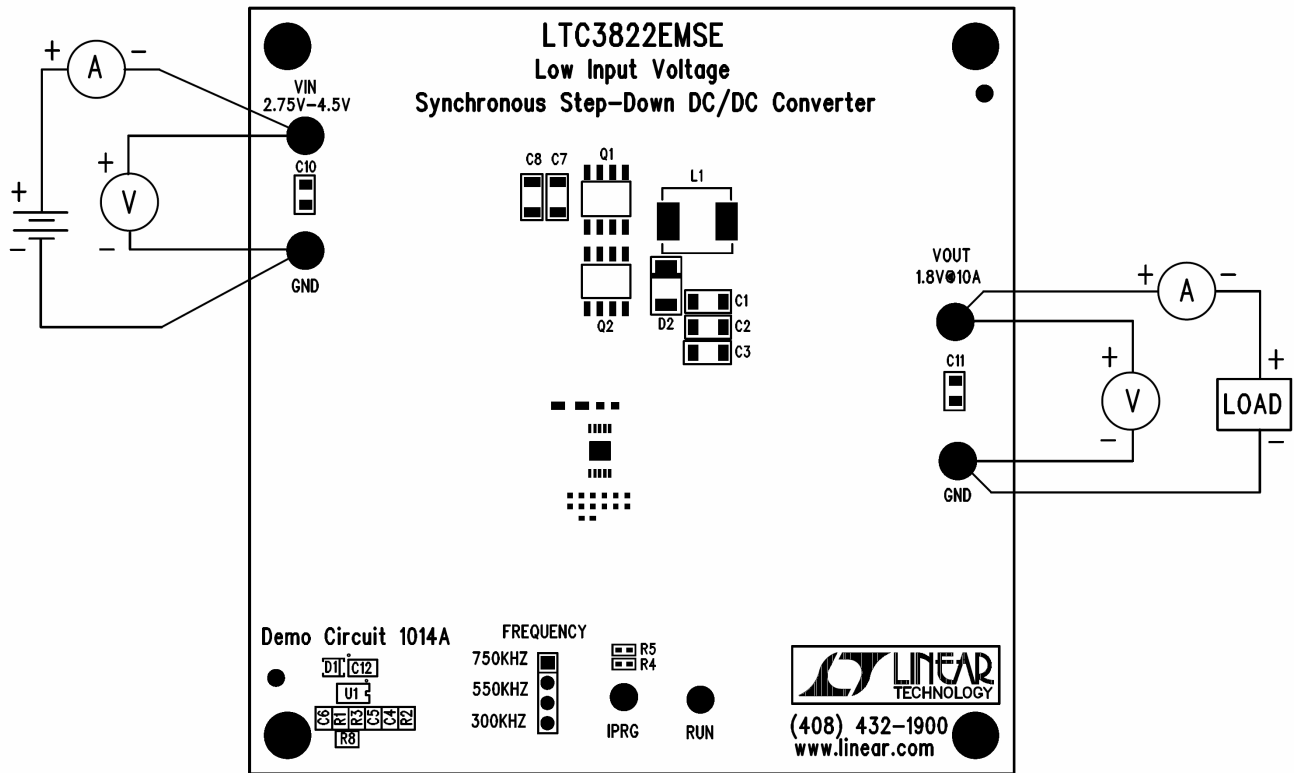


Figure 1. Proper Measurement Equipment Setup

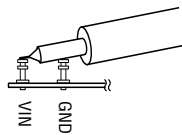


Figure 2. Measuring Input or Output Ripple

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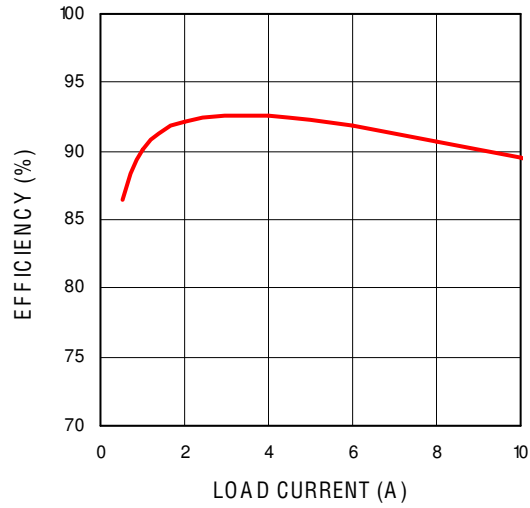
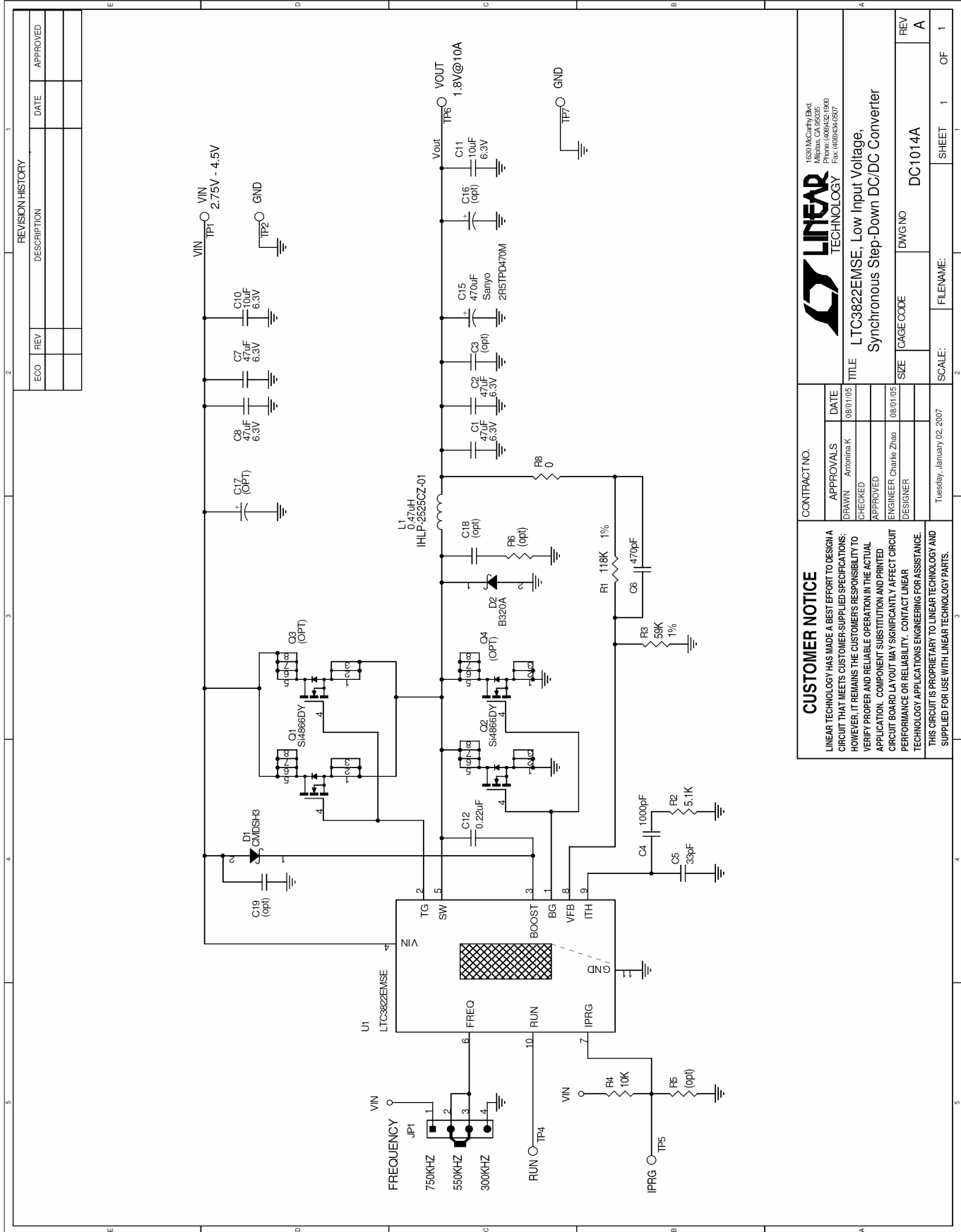


Figure 3. Efficiency vs load current ($V_{in}=3.3V$, 550KHz)

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LOW INPUT VOLTAGE SYNCHRONOUS STEP-DOWN CONVERTER



REVISION HISTORY		
ECO	REV	DESCRIPTION

		1630 McCarty Blvd. Fremont, CA 94538-1000 Phone: (415) 424-2000 Fax: (415) 424-2507	
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 TECHNOLOGY APPLICATIONS ENGINEERING FOR ASSISTANCE. THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.		CONTRACT NO. APPROVALS DRAWN: Antonina K DATE: 08/01/05 CHECKED: [Signature] APPROVED: [Signature] ENGINEER: Charlie Zhao DESIGNER: [Signature]	
TITLE LTC3822EMSE, Low Input Voltage, Synchronous Step-Down DC/DC Converter		SCALE: 1 OF 1 SHEET: 1 OF 1	
SIZE CAGE CODE: [Blank]		DWG NO: DC1014A REV: A	