QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1014
LOW INPUT VOLTAGE SYNCHRONOUS STEP-DOWN CONVERTER
LTC3822EMSE

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°C)

PARAMETER	CONDITION	VALUE
Input Voltage Range		2.75V to 4.5V
V_{OUT}	V_{IN} = 2.75-4.5V, I_{OUT} = 0A to 10A	1.8V ±2%
Maximum load current I_{OUT}	V_{IN} = 2.75-4.5V, V_{OUT} = 1.8V	10A
Typical Output Ripple Voltage	V_{IN} = 3.3V, I_{OUT} = 5A, Fs=550KHz (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 Vin or Vout and GND terminals. See Figure 2 for proper scope probe technique.

1. With power off, connect the input power supply to Vin (2.75V-4.5V) and GND (input return).
2. Connect the 1.8V load between Vout 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. Vout should be 1.8V+/-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.

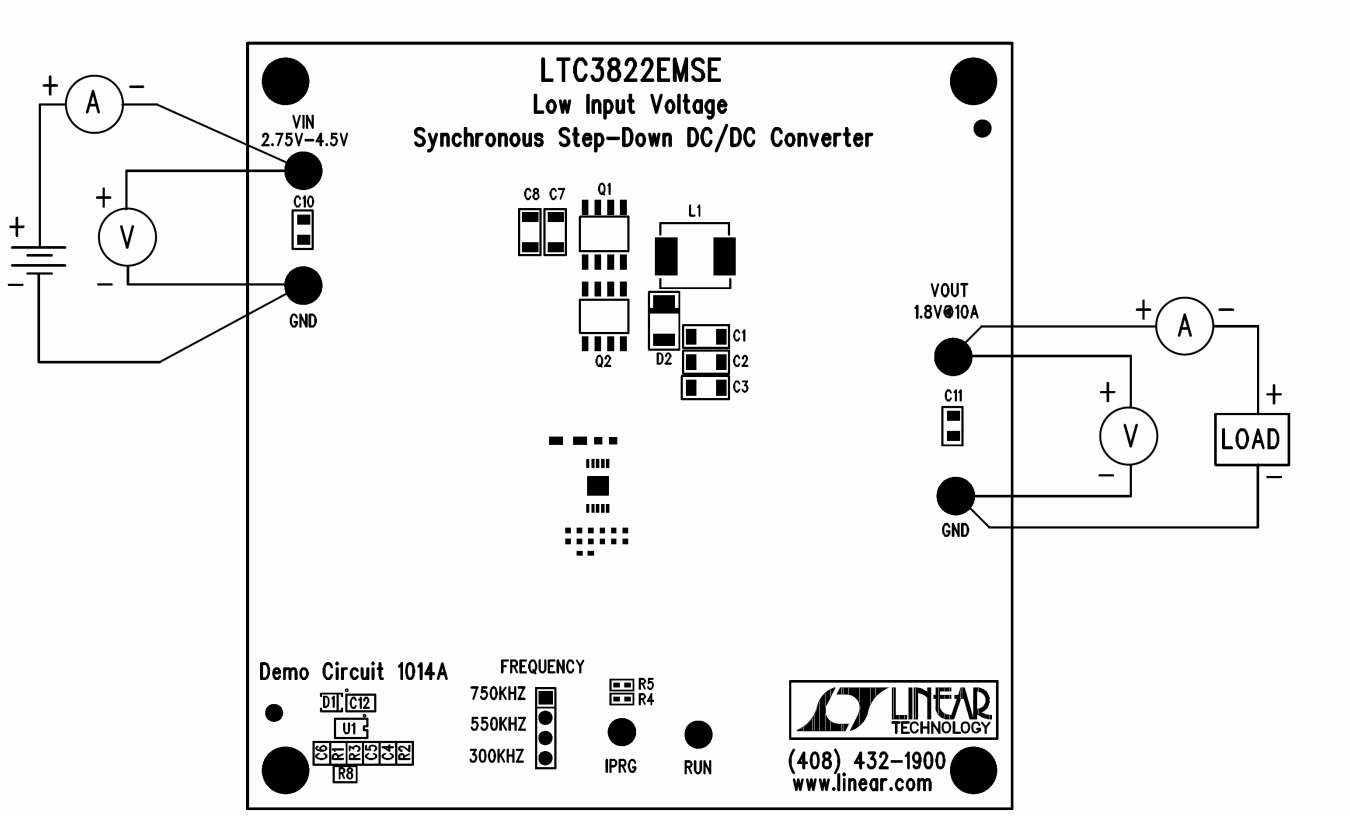


Figure 1. Proper Measurement Equipment Setup

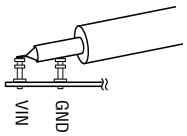


Figure 2. Measuring Input or Output Ripple

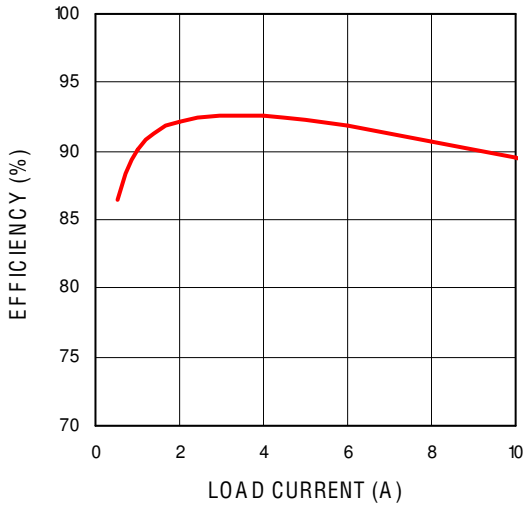
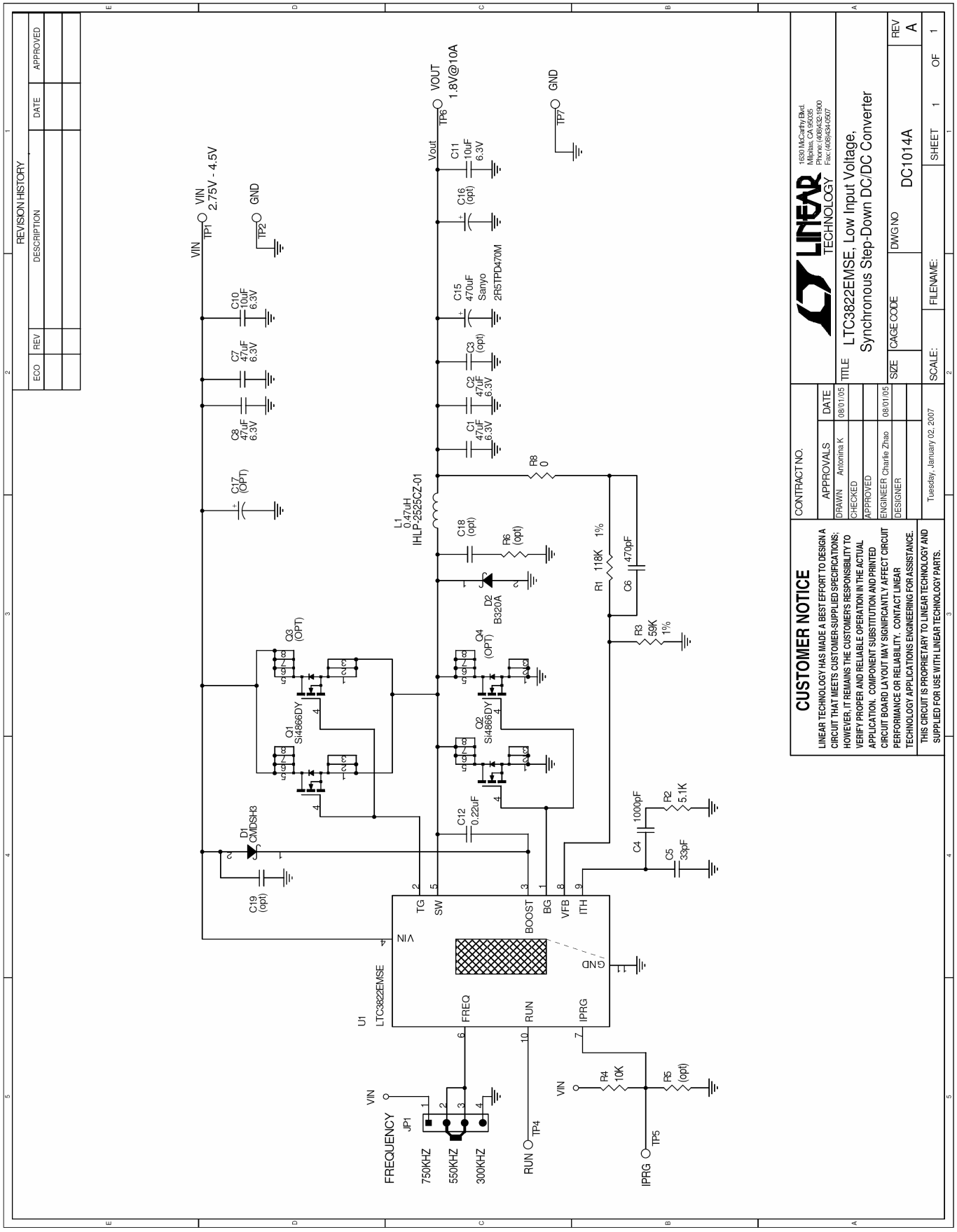


Figure 3. Efficiency vs load current (Vin=3.3V, 550KHz)


REVISION HISTORY
ECO
REV
DESCRIPTION
DATE
APPROVED
VIN
2.75V - 4.5V
TP1
GND
TP2
VOUT
1.8V@10A
TP6
GND
TP7
U1
LTC3822EMSE
VIN
TG
SW
BOOST
BG
VFB
ITH
FREQ
RUN
IPRG
GND
L1
0.47uH
IHLP-2525CZ-01
D1
CMDSH3
D2
B320A
Q1
Si4866DY
Q2
Si4866DY
Q3
(OPT)
Q4
(OPT)
C1
47uF
6.3V
C2
47uF
6.3V
C3
(opt)
C4
1000pF
C5
33pF
C6
470pF
C7
47uF
6.3V
C8
47uF
6.3V
C10
10uF
6.3V
C11
10uF
6.3V
C12
0.22uF
C15
470uF
Sanyo
2R5TPD470M
C16
(opt)
C17
(OPT)
C18
(opt)
C19
(opt)
R1
118K
1%
R2
5.1K
R3
59K
1%
R4
10K
R5
(opt)
R6
(opt)
R8
0
JP1
FREQUENCY
750KHZ
550KHZ
300KHZ
RUN
TP4
IPRG
TP5
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TITLE
LTC3822EMSE, Low Input Voltage,
Synchronous Step-Down DC/DC Converter
SIZE
CAGE CODE
DWG NO
DC1014A
REV
A
SCALE:
FILENAME:
SHEET 1 OF 1

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