

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1082

12-BIT/ 14-BIT, 3MSPS SIMULTANEOUS SAMPLING ADC

LTC1407

DESCRIPTION

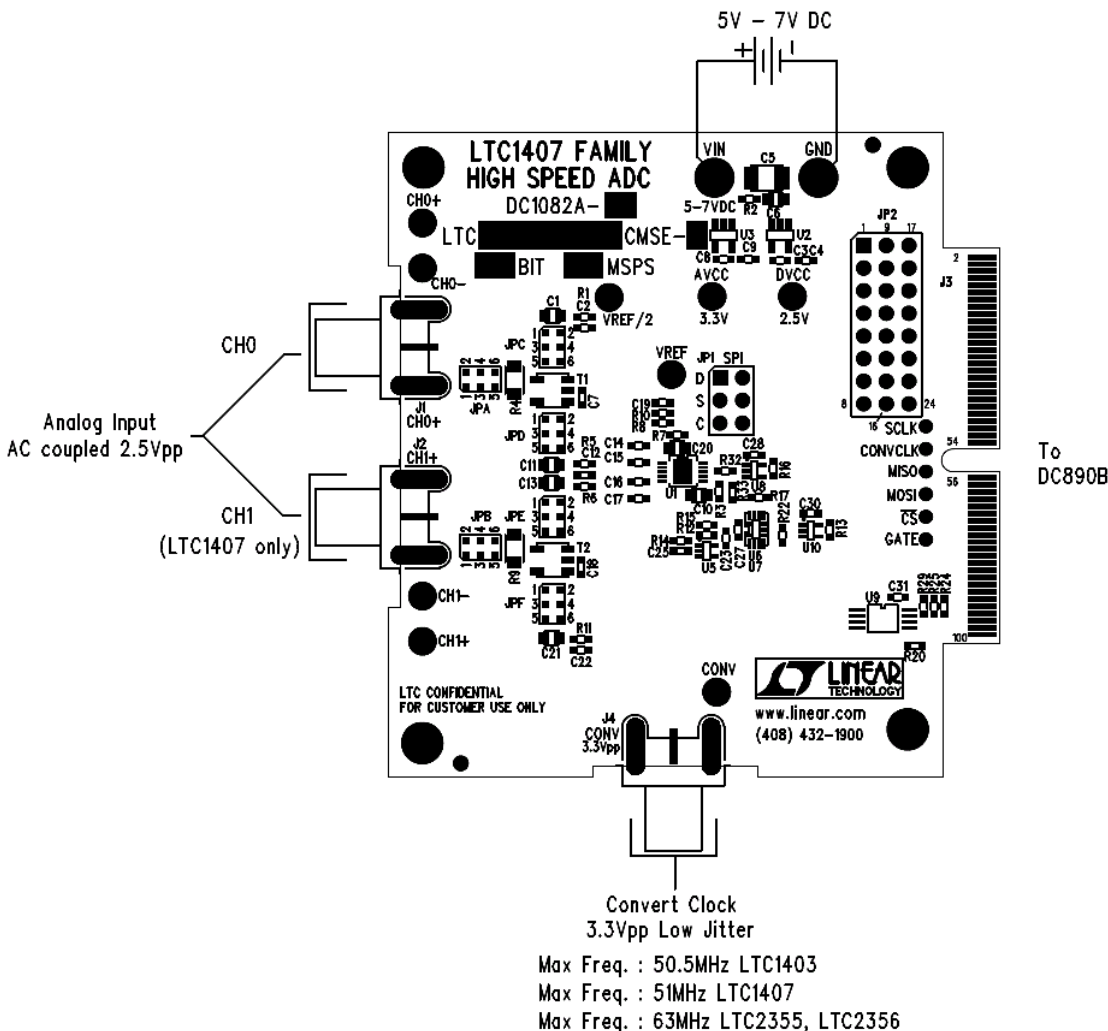
Demonstration circuit 1082 features the LTC1407 family of ADCs. This Quick Start Guide will focus on DC1082A-A which uses the LTC1407A-1, a bipolar, 2-channel, 14-bit, simultaneous sampling ADC. Total throughput is 3MSPS; 1.5MSPS per channel, with a typical channel-to-channel aperture skew of 200ps. Other family members have 12-bits (LTC1403, LTC1407, LTC2355-12, and LTC2356-12) or 1-channel (LTC1403, LTC1403A, LTC2355-14, and LTC2356-14). The LTC1407 family also has unipolar and bipolar versions. See Table 1 for the specific version of the DC1082A that best suits your

application. DC1082A demonstrates the AC performance of the LTC1407 family in conjunction with the DC890B Fast DAACS data collection board. Alternatively, by connecting the DC1082A into a customer application the performance of the LTC1407 family member can be evaluated directly in that circuit.

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

LTC is a trademark of Linear Technology Corporation

Figure 1. DC1082A connections



QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1082

12-BIT/ 14-BIT, 3MSPS SIMULTANEOUS SAMPLING ADC

Table 1. DC1082A Configuration Summary

VERSION	PART	# OF BITS	INPUT RANGE	SAMPLE RATE	# OF CHANNELS
DC1082A-A	LTC1407ACMSE-1	14	$\pm 1.25V$	3Msps(1.5Msps/Ch)	2
DC1082A-B	LTC1407ACMSE	14	0V-2.5V	3Msps(1.5Msps/Ch)	2
DC1082A-C	LTC1403ACMSE-1	14	$\pm 1.25V$	2.8Msps	1
DC1082A-D	LTC1403ACMSE	14	0V-2.5V	2.8Msps	1
DC1082A-E	LTC2356-14CMSE	14	$\pm 1.25V$	3.5Msps	1
DC1082A-F	LTC2355-14CMSE	14	0V-2.5V	3.5Msps	1

QUICK START PROCEDURE

Connect DC1082A to a DC890B USB High Speed Data Collection Board using connector J3. Connect DC890B to a host PC with a standard USB A/B cable. Apply 5V-7V DC to the VIN and GND terminals. Apply a low jitter signal source to J1(CH0) and J2(CH1) if applicable. Both J1 and J2 if included, are terminated with 50 ohms to ground. As a clock source, apply a low jitter 51MHz (50.5MHz for LTC1403, 63MHz for LTC2355 and LTC2356) 3.3Vp-p sine wave or square

wave to connector J4. Note that J4 has a 50-ohm termination resistor to ground. Run the QuickEval-II software (Pscope.exe version K46 or later) supplied with DC890B or download it from www.linear.com. Complete software documentation is available from the Help menu. Updates can be downloaded from the Tools menu. Check for updates periodically as new features may be added.

SOFTWARE CONFIGURATION

The Pscope software should recognize DC1082A and configure itself automatically. If using an older version of Pscope and updates are not possible, manual configuration will be necessary.

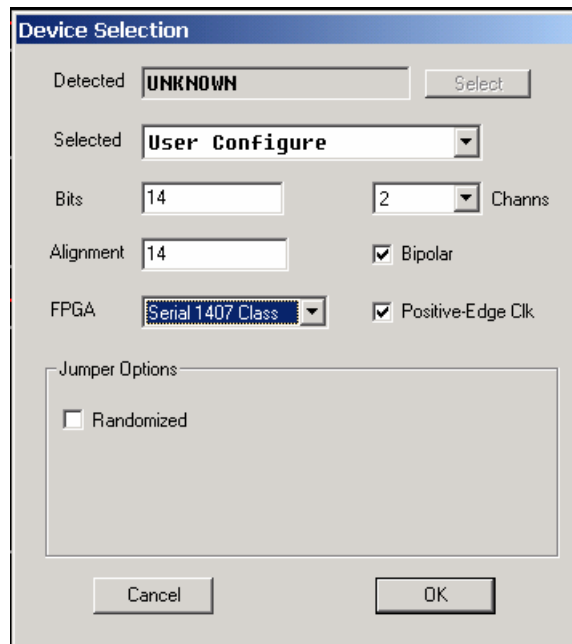
In the Configure menu deselect AutoConfigure and select DC890 Fast DAAQS Controller. Select Configure again and select Device. Select User Configure, 14-Bits, Alignment 14, Serial and 1- or 2-Channels depending on the version of DC1082A

being used. Check Positive-Edge Clk and if applicable, Bipolar. This is shown in Figure 2.

Click the Collect button (See Figure 3) to begin acquiring data. Depending on which board was previously used by Pscope it may be necessary to press Collect a second time. The Collect button then changes to Pause, which can be used to pause data acquisition.

Complete software documentation is available from the Help menu item, as new features may be added periodically.

Figure2. User Configure Menu



HARDWARE SET UP

SIGNAL CONNECTIONS

J1-J2 SMA connectors for CH0 and CH1 are differential inputs. These inputs have 50-ohm termination resistors. Limit input voltage swings to 2.5Vpp. For optimum performance the input should be bandlimited to the frequencies of interest. These signals are capacitively coupled to the ADC inputs as shipped from the factory. If the DC level of the signal applied is important JPC-JPF must be properly configured. See schematic for details.

J3 FastDAACS interface. Connect to DC890B.

J4 Conversion Clock Input. This input has a 50-ohm termination resistor, and is intended to be

driven by a low jitter, 3.3Vpp sine or square wave. To achieve full AC performance of this part, the clock jitter should be kept under 2ps. This input is capacitively coupled so that the input clock can be either 0V-3.3V or $\pm 1.65V$ so that level shifting is not required. To run at maximum conversion rate, apply a 51MHz signal for the LTC1407 or 50.5MHz signal for the LTC1403 to this input. For the LTC2355 and LTC2356 apply a 63MHz signal to achieve the maximum conversion rate.

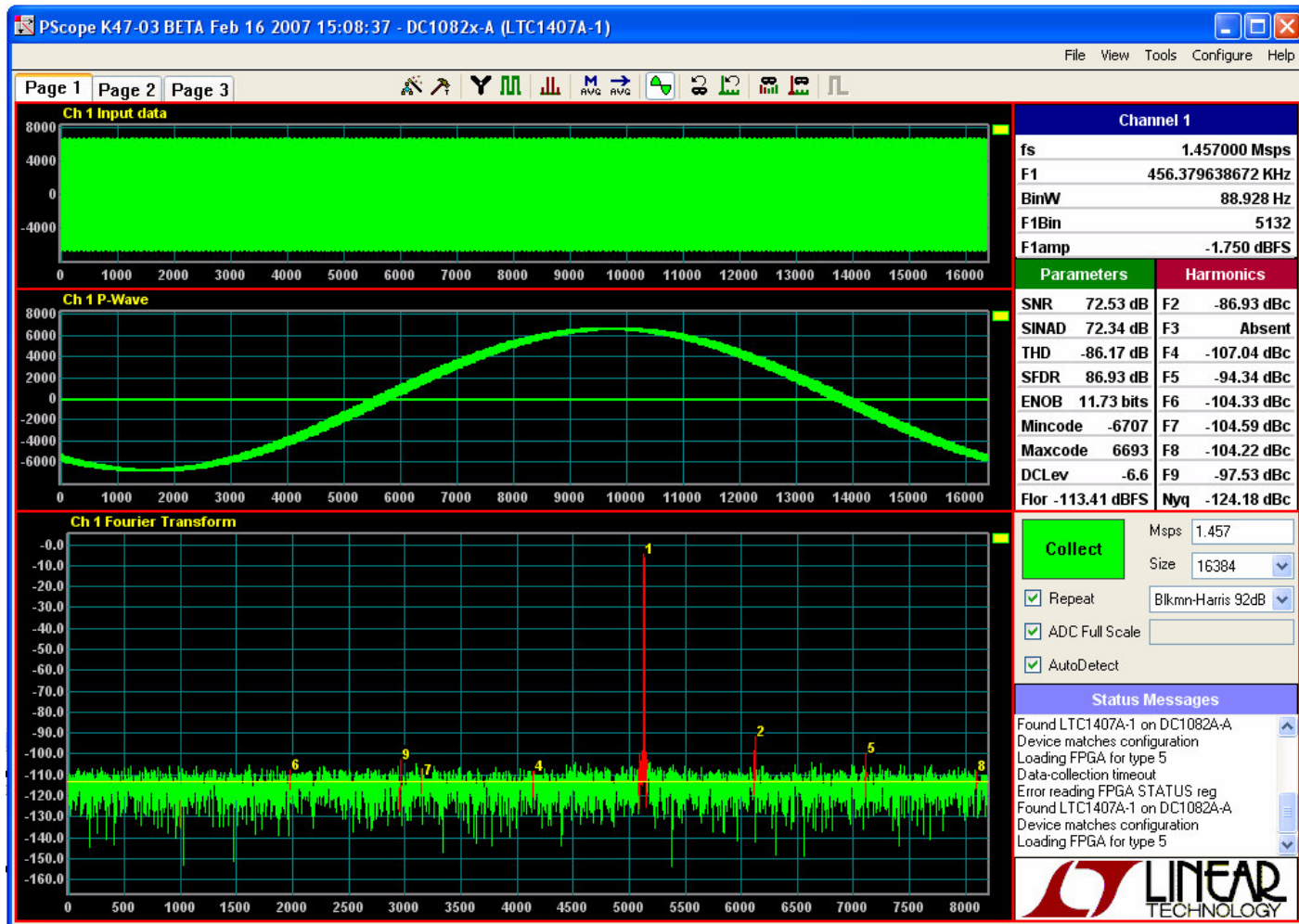
GROUNDING AND POWER CONNECTION

Connect a 5V to 7V power supply to the Vin and GND turret posts. For optimum performance, this supply should be floating with respect to any signal generators connected to the analog inputs (J1-J2).

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1082

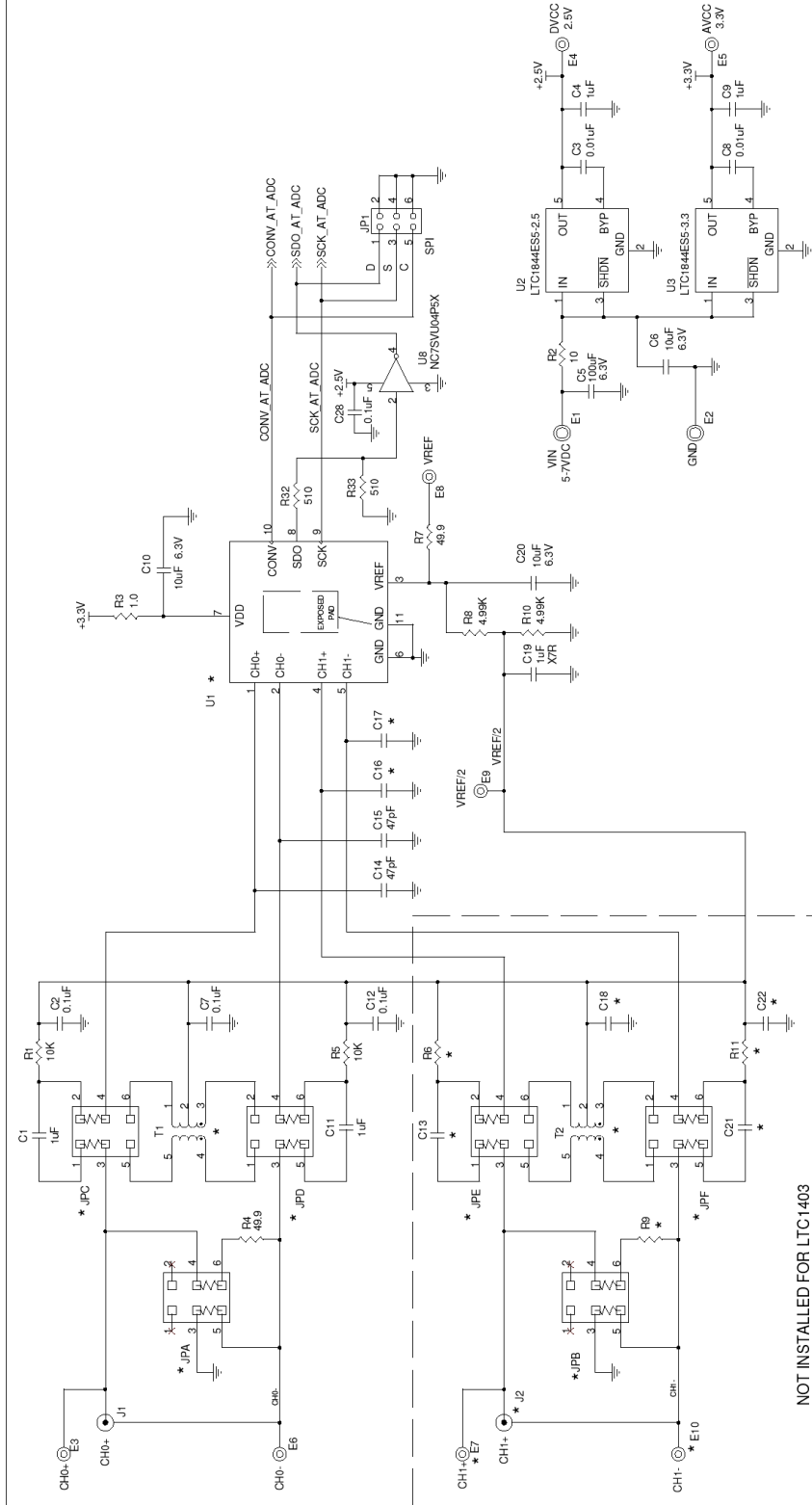
12-BIT/ 14-BIT, 3MSPS SIMULTANEOUS SAMPLING ADC

Figure3 DC1082A Screenshot



QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1082

12-BIT/ 14-BIT, 3MSPS SIMULTANEOUS SAMPLING ADC



* VERSION TABLE

Assembly Type	U1	Bits	Mbps	Input Range	Channels	JPA	JPB	JPC	JPD	JPE	JPF	J2	E7, E10	T1	T2	C13, C21	C16, C17	C18, C22	R5, R11	R9
DC1082A-A	LTC1407ACMSE-1	14	3Mbps (1.5Mbps/Ch)	+/-1.25V	2	3-5 4-6	3-5 4-6	1-3 2-4	3-5 4-6	1-3 2-4	3-5 4-6	Installed	Installed	MABAE0060	MABAE0060	1uF	47pF	0.1uF	10K	49.9
DC1082A-B	LTC1407ACMSE	14	3Mbps (1.5Mbps/Ch)	0V - 2.5V	2	3-5 4-6	3-5 4-6	1-3 2-4	3-4	1-3 2-4	3-4	Installed	Pin 8 to Pin 16	OPT.	OPT.					
DC1082A-C	LTC1403ACMSE-1	14	2.8Mbps	+/-1.25V	1	3-5 4-6	OPEN 2-4	1-3 2-4	3-5 4-6	OPEN 2-4	OPEN 2-4	Not Installed	Not Installed	MABAE0060	MABAE0060	Not Installed	0 OHM	Not Installed	Not Installed	Not Installed
DC1082A-D	LTC1403ACMSE	14	2.8Mbps	0V - 2.5V	1	3-5 4-6	OPEN 2-4	1-3 2-4	3-4	OPEN 2-4	OPEN 2-4	Not Installed	Not Installed	OPT.	OPT.					
DC1082A-E	LTC2356-14CMSE	14	3.5Mbps	+/-1.25V	1	3-5 4-6	OPEN 2-4	1-3 2-4	3-5 4-6	OPEN 2-4	OPEN 2-4	Not Installed	Not Installed	MABAE0060	MABAE0060	Not Installed	0 OHM	Not Installed	Not Installed	Not Installed
DC1082A-F	LTC2355-14CMSE	14	3.5Mbps	0V - 2.5V	1	3-5 4-6	OPEN 2-4	1-3 2-4	3-4	OPEN 2-4	OPEN 2-4	Not Installed	Not Installed	OPT.	OPT.					

Stuff 0 Ohm 9603 Resistors in Indicated Jumper Positions.

NOT INSTALLED FOR LTC1403

CUSTOMER NOTICE
 LINEAR TECHNOLOGY SHALL MAKE NO REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, REGARDING THE CIRCuits THAT MEETS CUSTOMER-SUPPLIED SPECIFICATIONS. HOWEVER, IT REMAINS THE CUSTOMER'S RESPONSIBILITY TO VERIFY PROPER AND RELIABLE OPERATION IN THE ACTUAL CIRCUIT BOARD LAYOUT. ANY SIGNIFICANT AFFECT CIRCUIT PERFORMANCE OR RELIABILITY. CONTACT LINEAR TECHNOLOGY APPLICATIONS ENGINEERING FOR ASSISTANCE.
 THIS DOCUMENT IS UNCLASSIFIED AND SUPPLIED UNDER THE LINEAR TECHNOLOGY PATENT.

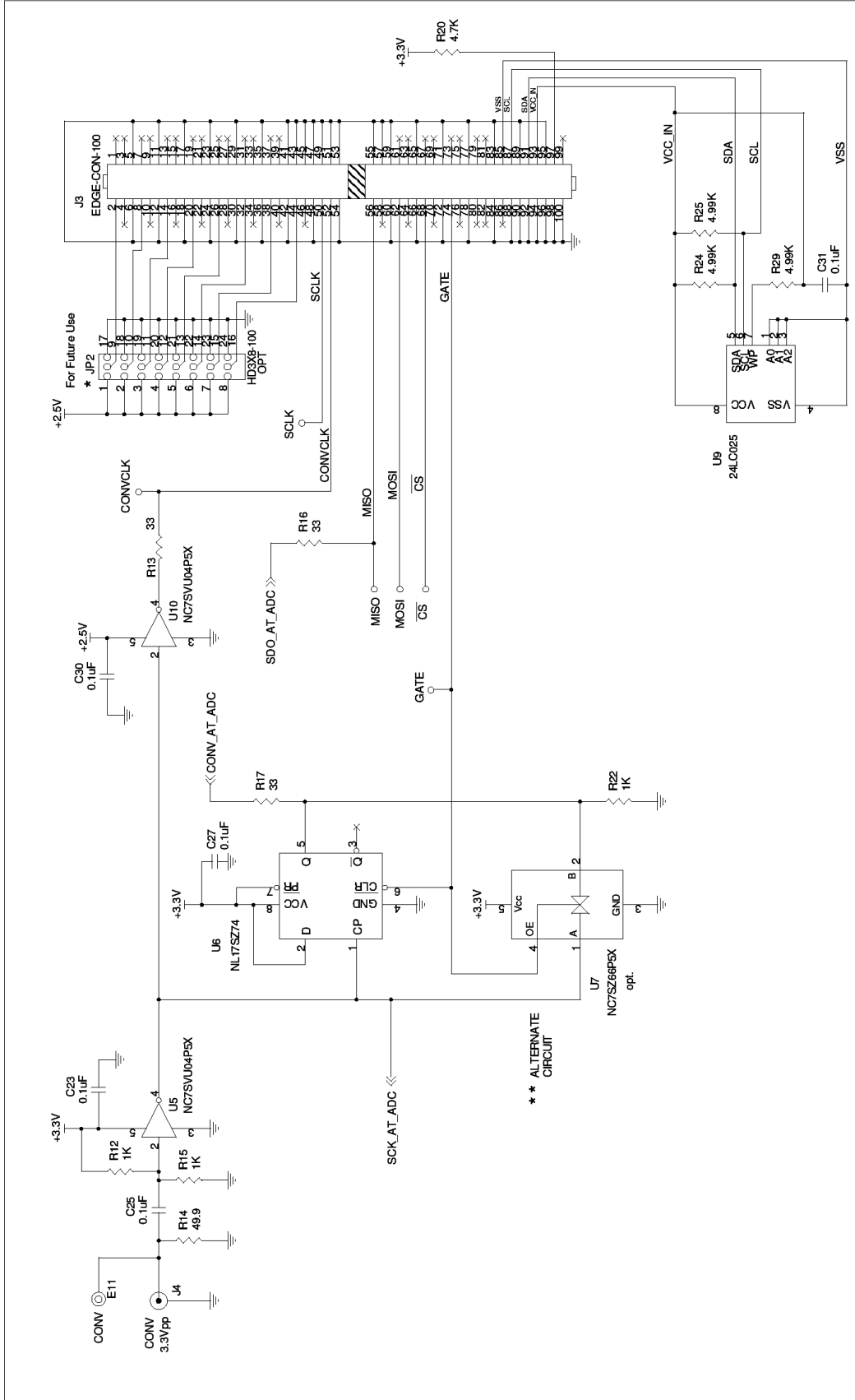
CONTRACT NO. _____
 APPROVALS: _____ DATE _____
 CHECKED: _____ JUN 04, 2008
 APPROVED: _____
 ENGINEER: GUY HOOKER 4708
 DESIGNER: _____

TITLE: _____
 SIZE: _____
 DWG NO: _____
 FILE NAME: _____
 SCALE: _____

REV A
 DC1082A
 SHEET 1 OF 2

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1082

12-BIT/ 14-BIT, 3MSPS SIMULTANEOUS SAMPLING ADC



CUSTOMER NOTICE		CONTRACTING	
<p>LINEAR TECHNOLOGY HAS MADE A BEST EFFORT TO DESIGN A BOARD THAT WILL OPERATE AS DESCRIBED. 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.</p>			
APPROVALS	DATE	TITLE	SCALE
DRAWN: June Wu	4/7/06	LTC1407 FAMILY HIGH SPEED ADC	
CHECKED:		DESIGNER: Guy Hoover	
APPROVED:	4/7/06	SIZE: DWGNO	FILENAME: lctdmy28.2006
DESIGNER:		DC1082A	SHEET 2 OF 2
REV: A			



LTC1407 FAMILY
HIGH SPEED ADC

DC1082A