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# Selectable 208sps/833sps 16-Bit, Single-Ended, $\Delta\Sigma$ ADC with SPI Interface

## DESCRIPTION

Demonstration circuit 1628A features the [LTC<sup>®</sup>2470](#), a 16-bit high performance  $\Delta\Sigma$  analog-to-digital converter (ADC) with an SPI interface. The input is unipolar with a range of 0V to 1.25V. The modulator's proprietary sampling technique reduces the average input current to less than 50nA—orders of magnitude lower than typical  $\Delta\Sigma$  ADCs.

DC1628A is a member of Linear Technology's QuikEval™ family of demonstration boards. It is designed to allow easy evaluation of the LTC2470 and may be connected directly to the target application's analog signals while using the

DC590 USB Serial Controller board and supplied software to measure performance. The exposed ground planes allow proper grounding to prototype circuitry. After evaluating with Linear Technology's software, the digital signals can be connected to the end application's processor/controller for development of the serial interface.

**Design files for this circuit board are available at <http://www.linear.com/demo/1628>**

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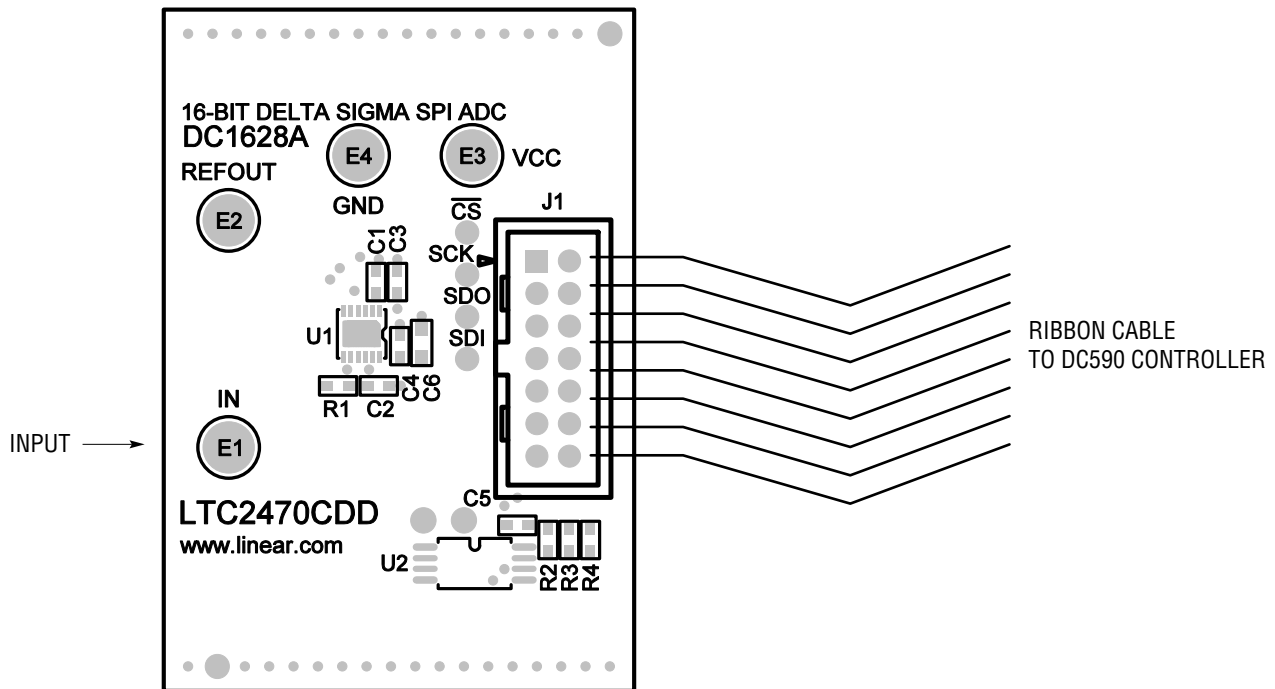


Figure 1. Proper Measurement Equipment Setup

## QUICK START PROCEDURE

Connect DC1628A to a DC590 USB Serial Controller using the supplied 14 conductor ribbon cable. Connect DC590 to host PC with a standard USB A/B cable. Run the evaluation software supplied with DC590 or downloaded from <http://www.linear.com/software>. The correct program will be loaded automatically. Click the COLLECT button to start

reading the input voltage. Details on software features are documented in the control panel's help menu.

Tools are available for logging data, changing reference voltage, changing the number of points in the strip chart and histogram, and changing the number of points averaged for the DVM display.

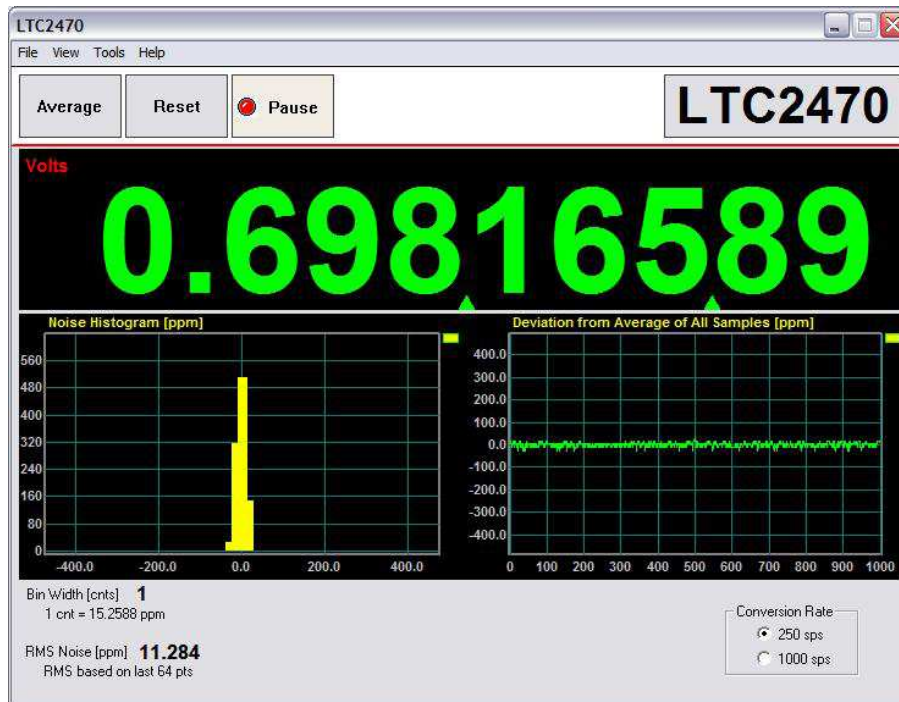


Figure 2. Software Screenshot



## HARDWARE SET-UP

### CONNECTION TO DC590 SERIAL CONTROLLER

J1 is the power and digital interface connector. Connect to DC590 serial controller with supplied 14 conductor ribbon cable.

### ANALOG CONNECTIONS

Analog signal connections are made via the row of turret posts along the edge of the board. Also, when connecting the board to an existing circuit the exposed ground planes along the edges of the board may be used to form a solid connection between grounds.

**GND:** This turret is connected directly to the internal ground planes.

**V<sub>CC</sub>:** This is the supply and reference voltage for the ADC. Do not draw any power from this point.

**IN:** This is the input to the ADC

**REFOUT:** This turret is connected to the LTC2470 REFOUT pin. This pin may be used to provide a reference voltage to an external circuit and can source up to 100 $\mu$ A. Do NOT drive this pin.

# DEMO MANUAL DC1628A

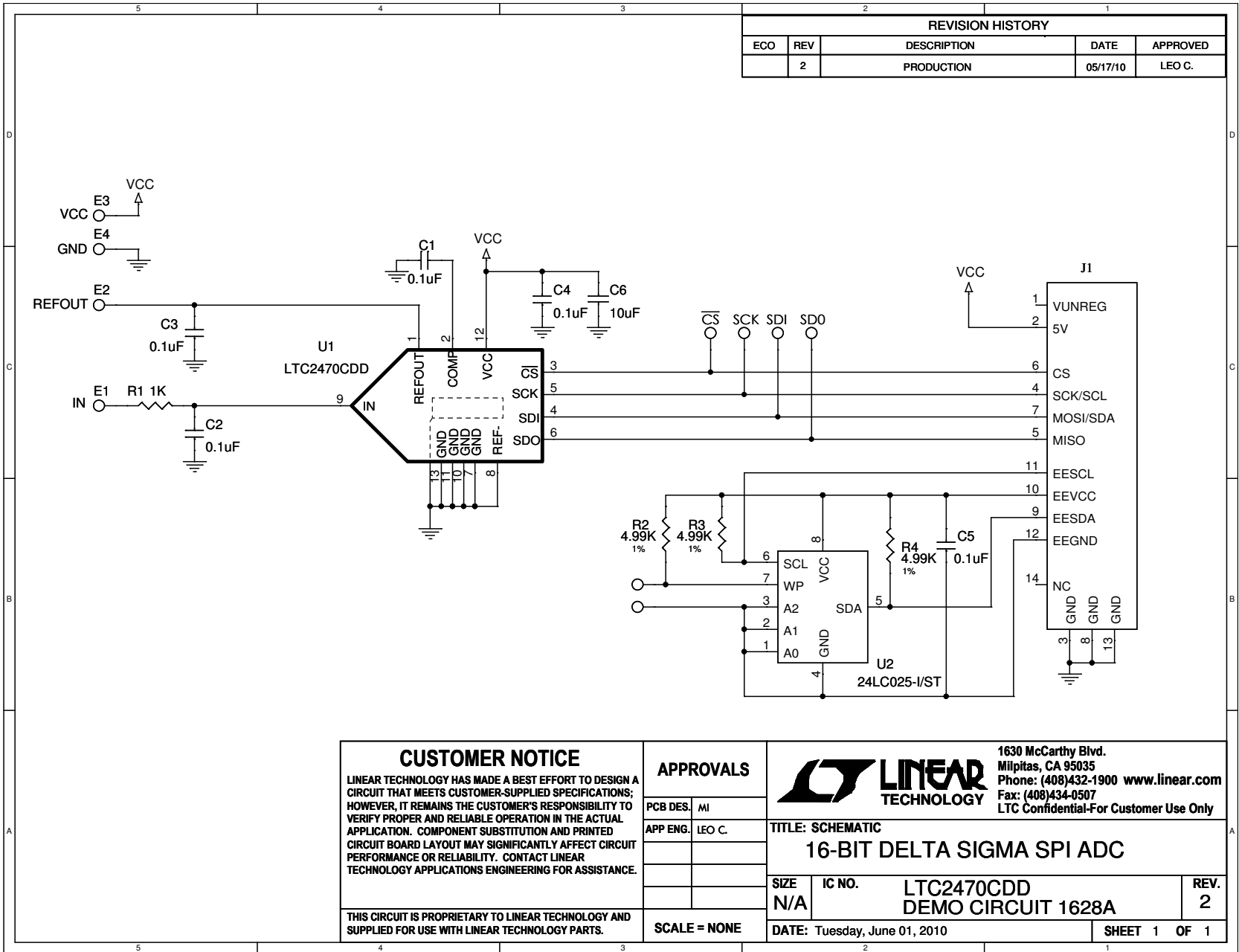
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## PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
1	5	C1, C2, C3, C4, C5	CAP, 0402, 0.1 $\mu$ F, 20%, 16V, X7R	TDK C1005X7R1C104M
2	1	C6	CAP, 0603, 10 $\mu$ F, 20%, 6.3V, X5R	TDK C1608X5R0J106M
	0	C6 - ALTERNATE	CAP, 0603, 10 $\mu$ F, 20%, 6.3V, X5R	Murata GRM188R60J106ME47D
3	4	E1, E2, E3, E4	TURRET	MILL MAX 2308-2
4	1	J1	HEADER, 2x7 2mm	MOLEX 878311420
5	1	R1	RES, 0402, 1k $\Omega$ , 5%, 1/16W	VISHAY CRCW0402102JNED
6	3	R2, R3, R4	RES, 0402, 4.99k $\Omega$ , 1%, 1/16W	VISHAY CRCW04024K99FKED
8	1	U1	IC, 16-BIT DELTA SIGMAADC w/INTEGRATED PRECISION REFERENCE	LINEAR TECH. LTC2470CDD
9	1	U2	IC, IC SERIAL EEPROM 2k	MICROCHIP TECH. 24LC025-I/ST

# SCHEMATIC DIAGRAM

# DEMO MANUAL DC1628A



# DEMO MANUAL DC1628A

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## DEMONSTRATION BOARD IMPORTANT NOTICE

Linear Technology Corporation (LTC) provides the enclosed product(s) under the following **AS IS** conditions:

This demonstration board (DEMO BOARD) kit being sold or provided by Linear Technology is intended for use for **ENGINEERING DEVELOPMENT OR EVALUATION PURPOSES ONLY** and is not provided by LTC for commercial use. As such, the DEMO BOARD herein may not be complete in terms of required design-, marketing-, and/or manufacturing-related protective considerations, including but not limited to product safety measures typically found in finished commercial goods. As a prototype, this product does not fall within the scope of the European Union directive on electromagnetic compatibility and therefore may or may not meet the technical requirements of the directive, or other regulations.

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**Please read the DEMO BOARD manual prior to handling the product.** Persons handling this product must have electronics training and observe good laboratory practice standards. **Common sense is encouraged.**

This notice contains important safety information about temperatures and voltages. For further safety concerns, please contact a LTC application engineer.

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