LTC2460: 16-Bit, Differential, ΔΣ ADC with SPI Interface

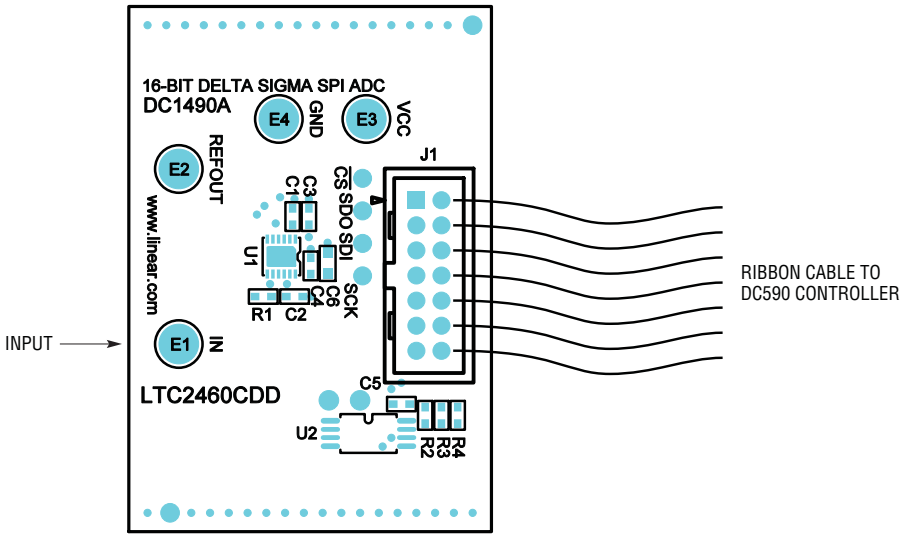
DESCRIPTION

Demonstration circuit 1490A features the LTC2460, a 16-bit high performance ΔΣ analog-to-digital converter (ADC) with an SPI interface. The input is unipolar with a range of 0-REF. The modulator's proprietary sampling technique reduces the average input current to less than 50nA – orders of magnitude lower than typical delta sigma ADCs.

DC1490A is a member of Linear Technology's QuickEval family of demonstration boards. It is designed to allow easy evaluation of the LTC2460 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 www.linear.com/demo.

Figure 1. Proper Measurement Equipment Setup

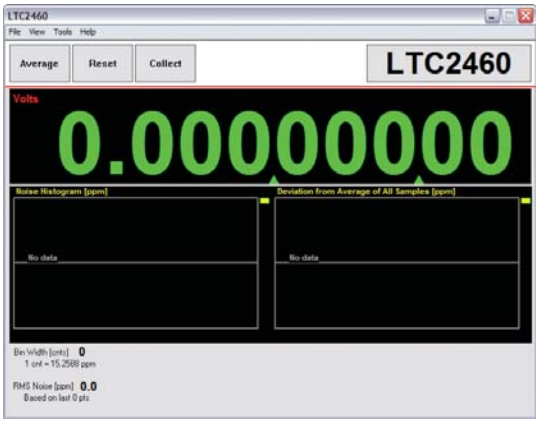


QUICK START PROCEDURE

Connect DC1490A 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_{CC}: This is the supply and reference voltage for the ADC. Do not draw any power from this point.

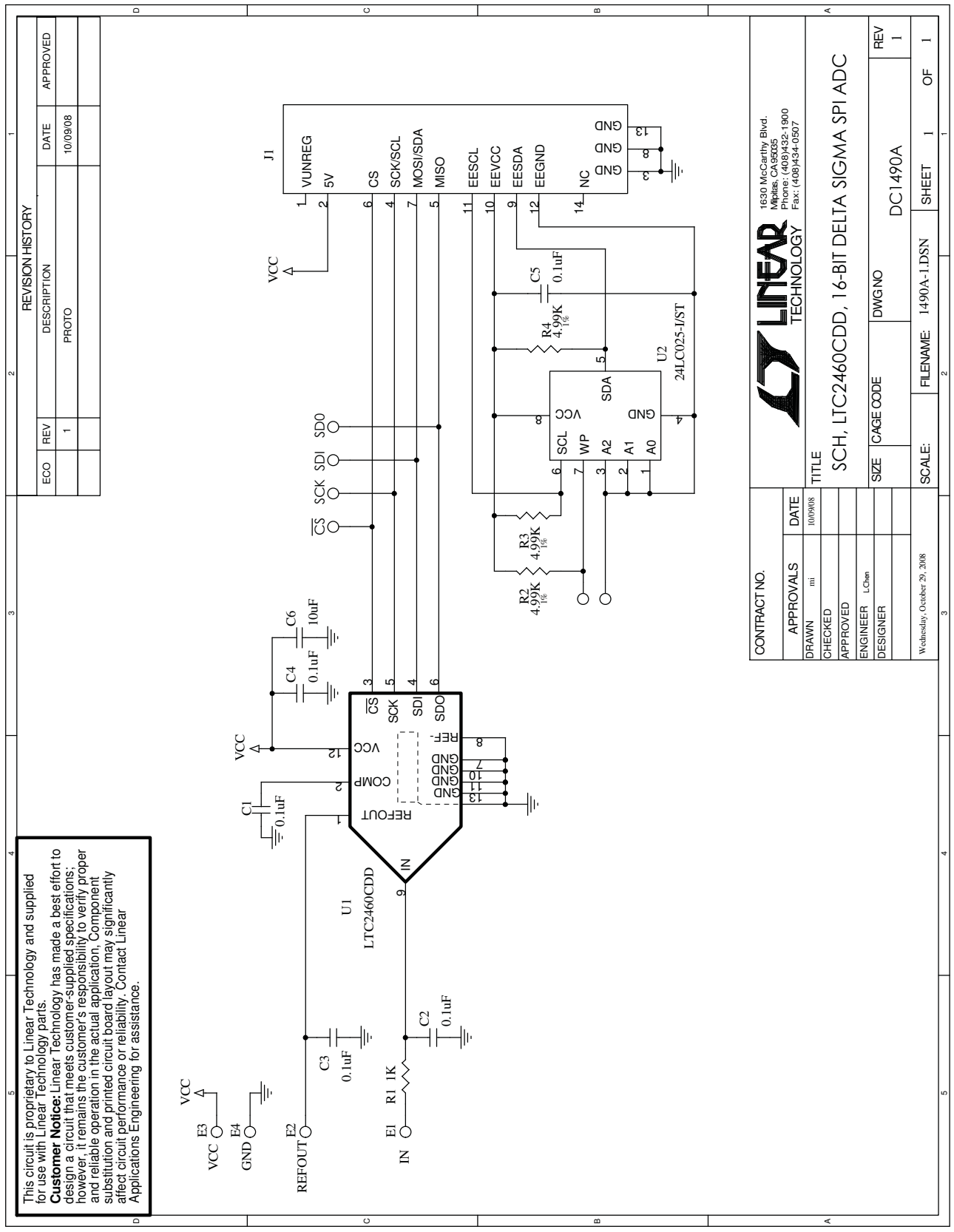
IN: This is the positive input to the ADC

REFOUT: This turret is connected to the LTC2460 REFOUT pin. This pin may be used to provide a reference voltage to an external circuit and can source up to 100µA. Do NOT drive this pin.

PARTS LIST

ITEM	QUANTITY	REFERENCE	PART DESCRIPTION	MANUFACTURERS PART NUMBER	KIT QTY	PACKAGE QTY	BALANCE	PARTS/ PURCH.
				Number Of Boards =	174			
1	5	C1, C2, C3, C4, C5	Capacitor, 0402 0.1µF 20% 16V X7R	TDK C1005X7R1C104M	870	1100	230	10%, pbf
2	1	C6	Capacitor, 0603 10µF 20% 6.3V X5R	Murata GRM188R60J106ME47D	174	400	226	pbf
3	4	E1, E2, E3, E4	Turret	Mill Max 2308-2	696	750	54	pbf
4	1	J1	Header, 2X7 2mm	Molex 87331-1420	174	190	16	(6tbs)pbf
5	1	R1	Resistor, 0402 1kΩ 5% 1/16W	Vishay CRCW0402102JNED	174	600	426	pbf
6	3	R2, R3, R4	Resistor, 0402 4.99kΩ 1% 1/16W	Vishay CRCW04024K99FKED	522	660	138	pbf
7	1	U1	IC, 16-Bit ADC with Integrated Precision Reference	Linear Tech. LTC2460CDD	174	242	68	IDD, pbf
8	1	U2	IC, IC Serial EEPROM 2k	Microchip Tech. 24LC025-I/ST	174	190	16	pbf
9	1		Fab, Printed Circuit Board	Demo Circuit #1490A	174	174	0	
10	1		Stencil	Stencil #1490A	1	1	0	

SCHEMATIC DIAGRAM



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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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