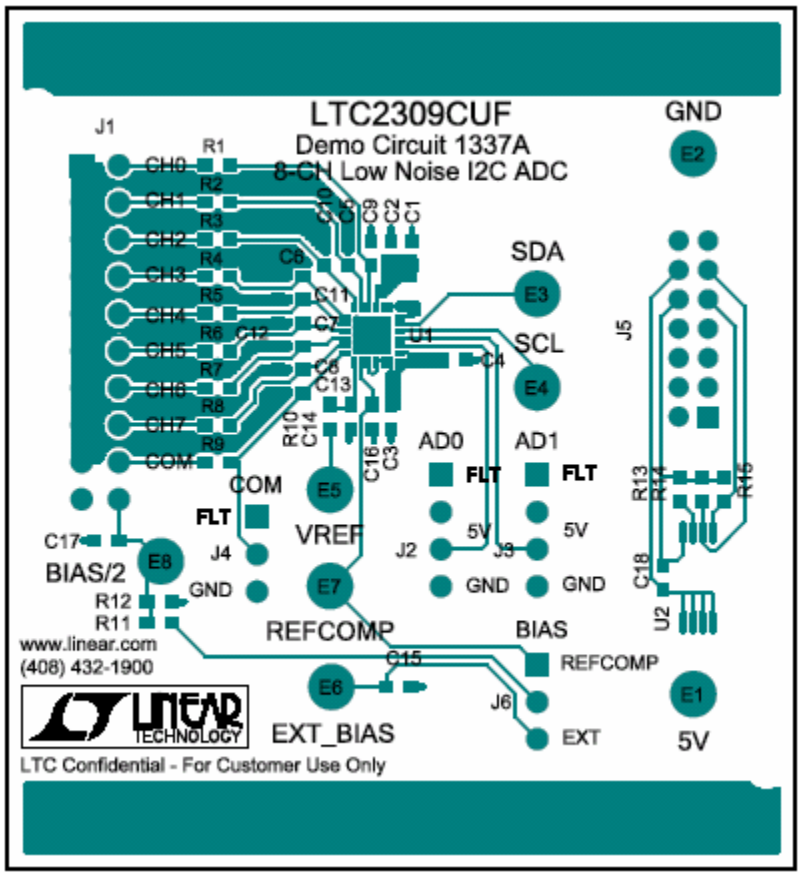
DESCRIPTION

Demonstration circuit 1337 features the LTC2309, a low noise, low power, 8-Channel, 12-Bit, successive approximation ADC with an I2C compatible serial interface. The LTC2309 is available in a 24-pin 4mm x 4mm QFN package. DC1337 demonstrates the DC performance of the LTC2309 in conjunction with the DC590B Quick Eval data collection board. Alternatively, by connecting the DC1337 into a customer application the performance of the LTC2309 can be evaluated directly in that circuit.

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

FIGURE 1. DC1337A



DC590B QUICK START PROCEDURE

Connect DC1337 to a DC590B USB serial controller using the supplied 14-conductor ribbon cable. **Make sure the VCCIO jumper of the DC590B is in the 5V position.** Connect DC590B to a host PC with a standard USB A/B cable. Apply analog input voltage to CH0-CH7 on connector J1. Run the evaluation software supplied with DC590B or download it from www.linear.com. The correct control panel will be loaded automatically. Click the COLLECT (Figure 2) button to begin reading the ADC Ch0-Ch3. Press the Page 1 Button to toggle to Page 2. This displays Ch4-Ch7. This button toggles between the two displays.

The Help menu contains information on Data Logging the ADC results. The Tools menu has the Data Logging option as well as options for changing the number of points displayed, the number of points in an average and whether the data is displayed in LSBs or Volts. The View menu can be used to access the LTC2309 product page.

If the Quick Eval program is started without the demo board attached to DC590B, the Tools menu can be used to check for updates and automatically install them. DC 1337 requires at least version K71 of the Quick Eval software.

HARDWARE SET UP

SIGNAL CONNECTIONS

See Figure 1 for locations.

J1 Connector for CH0-CH7, COM and BIAS/2. Limit input voltage swings to GND-AV_{DD}. For optimum performance, the input should be bandlimited to the frequencies of interest.

J2 AD0 I^2C address line. Set to GND for operation with supplied software.

J3 AD1 I^2C address line. Set to GND for operation with supplied software.

J4 COM Common pin for single ended ADC conversions. Can be set to GND or left floating so that COM can be driven by J1.

J5 DC590 interface connector. Provides power and I2C interface to DC1337.

J6 BIAS Selects between Refcomp and an external bias voltage to drive the Bias/2 line. Bias/2 is designed to set a center point for the minus input during bipolar operation.

EXT_BIAS External Bias connection. This can be used to drive the BIAS/2 line through a 2:1 divider. To use this pin put jumper J6 in the EXT position and apply desired bias voltage.

5V Five volt supply line for DC1337. Use this line only if DC590 is not used

GND Ground line for DC1337

SDA I^2C bidirectional data line. Controlled by DC590B if connected.

SCL I^2C clock line. Controlled by DC590B if connected.

VREF Connected to ADC Vref pin.

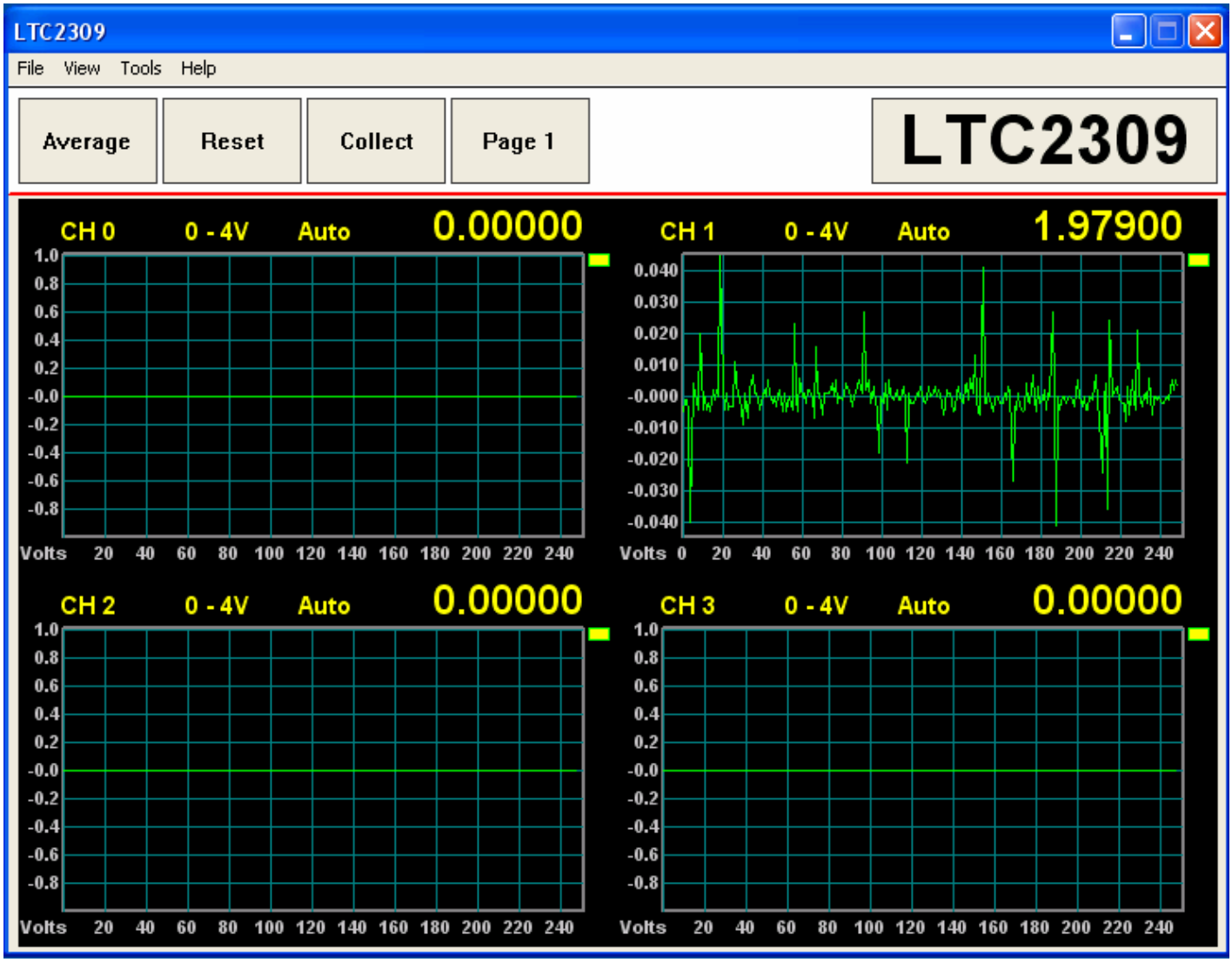
REFCOMP Connected to ADC Refcomp pin.

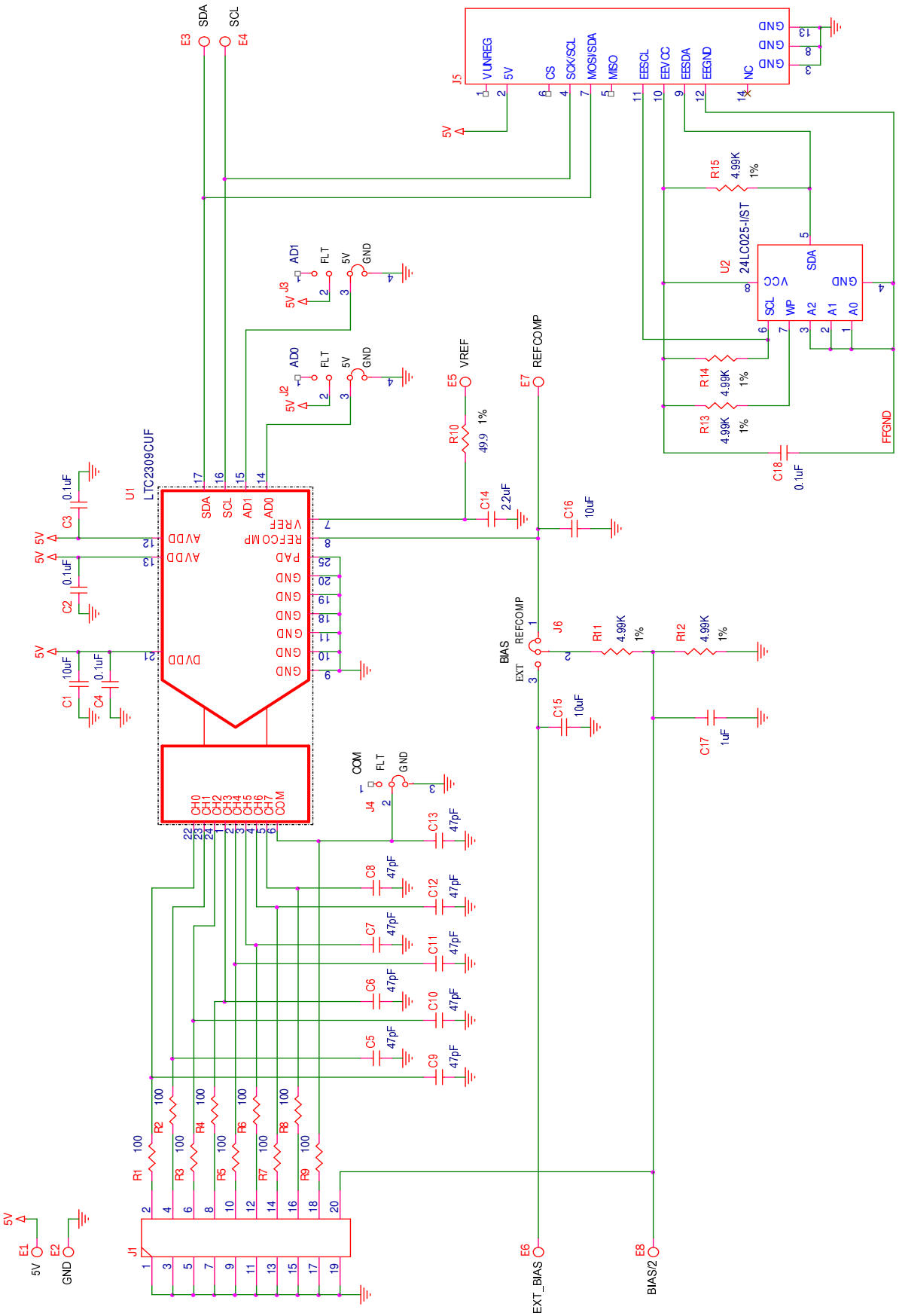
BIAS/2 Bias voltage/2 (Refcomp or Ext)

USING DC1337 WITHOUT DC590

Interface signals SDA and SCL and power are normally provided to DC1337 by DC590. If you use this board without DC590, it is the users responsibility to connect a 5V power supply and ground as well as generating SDA and SCL. These signals can be provided through the 14-pin ribbon cable connector. See schematic for pinout See LTC2309 Data Sheet for information on driving SDA and SCL.

Figure 2. DC1337 Quick Eval Screenshot




E3 SDA
E4 SCL
J5
VUNREG
5V
CS
SCK/SCL
MOSI/SDA
MISO
EESCL
EEVCC
EESDA
EEGND
NC
GND
R15 4.99K 1%
U2 24LC025-I/ST
SDA
SCL
WP
VCC
GND
A2
A1
A0
R14 4.99K 1%
R13 4.99K 1%
FFGND
C18 0.1uF
J3 AD1
J2 AD0
FLT
GND
E5 VREF
R10 49.9 1%
E7 REFCOMP
U1 LTC2309CUF
C14 2.2uF
C16 10uF
C3 0.1uF
C2 0.1uF
C1 10uF
C4 0.1uF
BIAS
EXT
J6
R11 4.99K 1%
R12 4.99K 1%
C15 10uF
C17 1uF
J4 COM
C13 47pF
C8 47pF
C12 47pF
C7 47pF
C11 47pF
C6 47pF
C10 47pF
C5 47pF
C9 47pF
R1 100
R2 100
R3 100
R4 100
R5 100
R6 100
R7 100
R8 100
R9 100
J1
E1 5V
E2 GND
E6 EXT_BIAS
E8 BIAS/2