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LTC2387/LTC2386/LTC2385
18-/16-Bit, 15Msps/10Msps/5Msps, High Speed SAR ADCs

DESCRIPTION

Demonstration circuit 2588A features the LTC®2387 family driven by a pair of ADA4899-1 driver amplifiers. With up to 15Msps, these differential input, single channel, 18-/16-Bit, serial, high speed successive approximation register (SAR) ADCs are available in a 32-Pin QFN package. The LTC2387 family has an internal 20ppm/°C reference and a serial LVDS interface. The following text refers to the LTC2387 but applies to all members of the family, the only difference being the sample rate and the number of bits. The DC2588A demonstrates the AC performance of the LTC2387 in conjunction with the DC718 data collection board. The amplifiers simplify the task of driving the LTC2387 with a signal source.

Design files for this circuit board are available at http://www.linear.com/demo/DC2588A

BOARD PHOTO

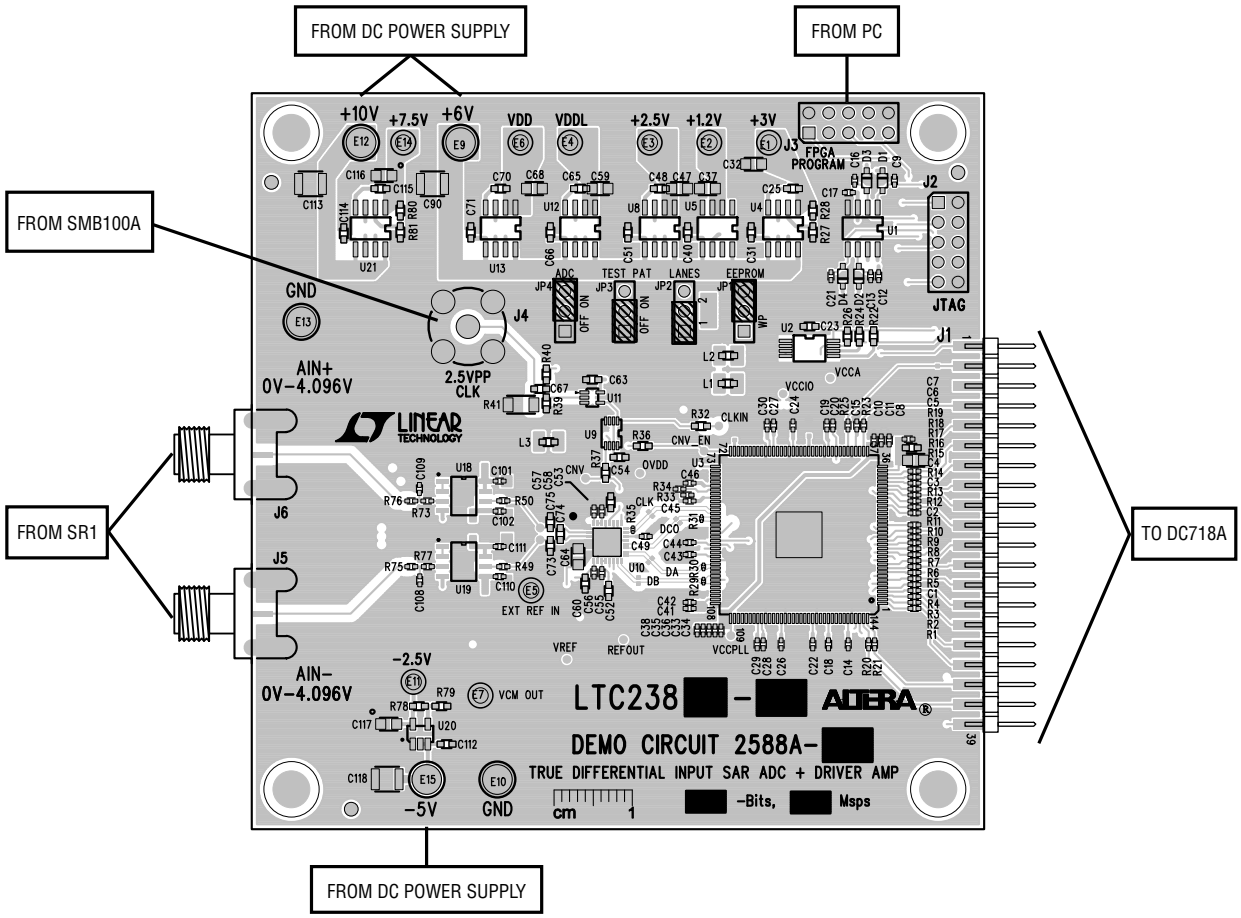

Figure 1. DC2588A Connection Diagram

DC718 QUICK START PROCEDURE

Connect the +10V, +6V and –5V DC power supplies to the turrets as shown in Figure 1. Note the onboard LDO outputs are available on the –2.5V, +1.2V, +2.5V, +3V, +7.5V, V_{DD} and V_{DDL} turrets. Connect the DC2588A to a DC718 USB High Speed Data Collection Board using edge connector J1. Connect the DC718 to a host PC with a standard USB A/B cable. Apply a low noise differential signal to J6 (A_{IN}^+) and J5 (A_{IN}^-). Note that the DC2588A requires a differential input signal of approximately 8.192V peak-to-peak to reach 0dBFS. If a differential signal source of this amplitude is not available use one of the recommended differential amplifier demo boards available to increase the signal level. For a clock source, apply a low jitter 10dBm sine wave or square wave to connector J4. See Table 1 for maximum clock frequencies. Note that J4 has a 50Ω termination resistor to ground. Run the PScope™ software (Pscope.exe version K73 or later) supplied with DC718 or download it from www.linear.com/software. 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. The PScope software should recognize the DC2588A and configure itself automatically. Click the Collect button (Figure 2) to begin acquiring data. The Collect button then changes to Pause, which can be used to stop data acquisition.

Table 1. DC2588A Assembly Options

VERSION	U1 PART NUMBER	MAX CONVERSION RATE	# OF BITS	MAX CLOCK FREQUENCY
DC2588A-A	LTC2387CUH-18#PBF	15Msps	18	15MHz
DC2588A-B	LTC2387CUH-16#PBF	15Msps	16	15MHz
DC2588A-C	LTC2386CUH-18#PBF	10Msps	18	10MHz
DC2588A-D	LTC2386CUH-16#PBF	10Msps	16	10MHz
DC2588A-E	LTC2385CUH-18#PBF	5Msps	18	5MHz
DC2588A-F	LTC2385CUH-16#PBF	5Msps	16	5MHz

HARDWARE SETUP

SIGNAL CONNECTIONS

J2: JTAG. Factory use only.

J3: FPGA Program. Factory use only.

J4: CLK IN. This input has a 50Ω termination resistor, and is intended to be driven by a low jitter, 10dBm sine or square wave. To achieve full AC performance of this part, the clock jitter should be kept under $2ps_{RMS}$. This input is capacitively coupled so that the input clock can be either 0V to 3.3V or ±1.65V. This eliminates the need for level shifting. To run at the maximum conversion rate, apply the frequency specified in Table 1.

J5: A_{IN}^- Input. This is the negative signal input.

J6: A_{IN}^+ Input. This is the positive signal input.

JUMPERS

JP1: EEPROM. Factory use only.

JP2: Lanes. Use this jumper to select either single lane or two lane data output mode from the LTC2387. The default setting is 1. The 1 setting clocks out all data on pin DA of the LTC2387. The 2 setting clocks out data alternately on pins DA and DB of the LTC2387.

JP3: Test Pattern. Use this jumper to deliver a fixed repeating test pattern from the LTC2387. The default setting is OFF. The output data will be –97796 if the jumper is in the ON position in 1 lane mode, and will be –52996 in 2 lane mode.

JP4: ADC ON. Use this jumper to enable or disable the ADC. The default setting is ON.

HARDWARE SETUP

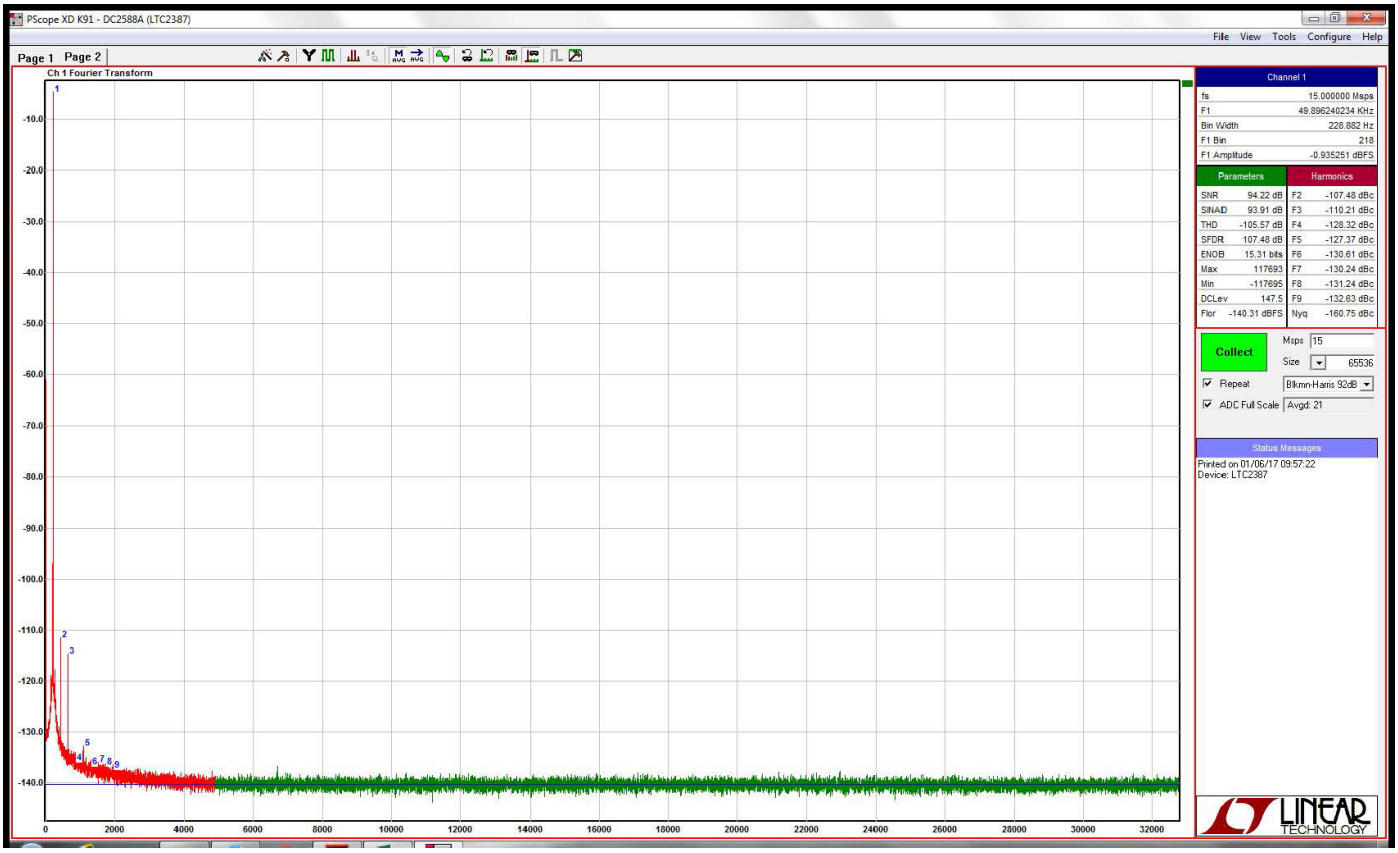

Figure 2. DC2588A PScope Screenshot

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