High Speed ADC Signal Source

DESCRIPTION

Demonstration circuit 1164 is a signal source to use to demonstrate high speed ADCs. Each assembly will include a 70.56MHz crystal which can be used with any high speed ADC as a clean signal source.

Functionally, the DC1164 uses a crystal oscillator as a precision clock source. The output of the crystal is then directed through a signal chain which provides proper filtering to produce a low distortion, low noise signal tone signal for high speed ADCs. A programmable step attenuator allows for 32dB of dynamic range on the output signal.

By replacing a few components and a jumper, this demo board becomes a complete IF strip for use with spread spectrum signals. By feeding this board with an external spread spectrum signal, the signal chain becomes a means to provide a clean low noise signal, with programmable amplitude, to the ADC.

This circuit also is a model for designing complex IF strips which require SAW filtering and multiple amplifiers. **Design files for this circuit board are available. Call the LTC factory.**

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Table 1. Performance Summary (T$_A$ = 25°C)

PARAMETER	CONDITION	VALUE
Supply Voltage	The board has LT1763 LDOs to provide power to the various parts of the circuit.	6V-9V
Crystal frequency		70.56MHz
Saw Filter Bandwidth		20MHz
Saw Filter Center Frequency		70MHz

QUICK START PROCEDURE

Demonstration circuit 1152 is easy to set up to evaluate the performance of most members of the LTC2246H family of A/D converters. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

SETUP
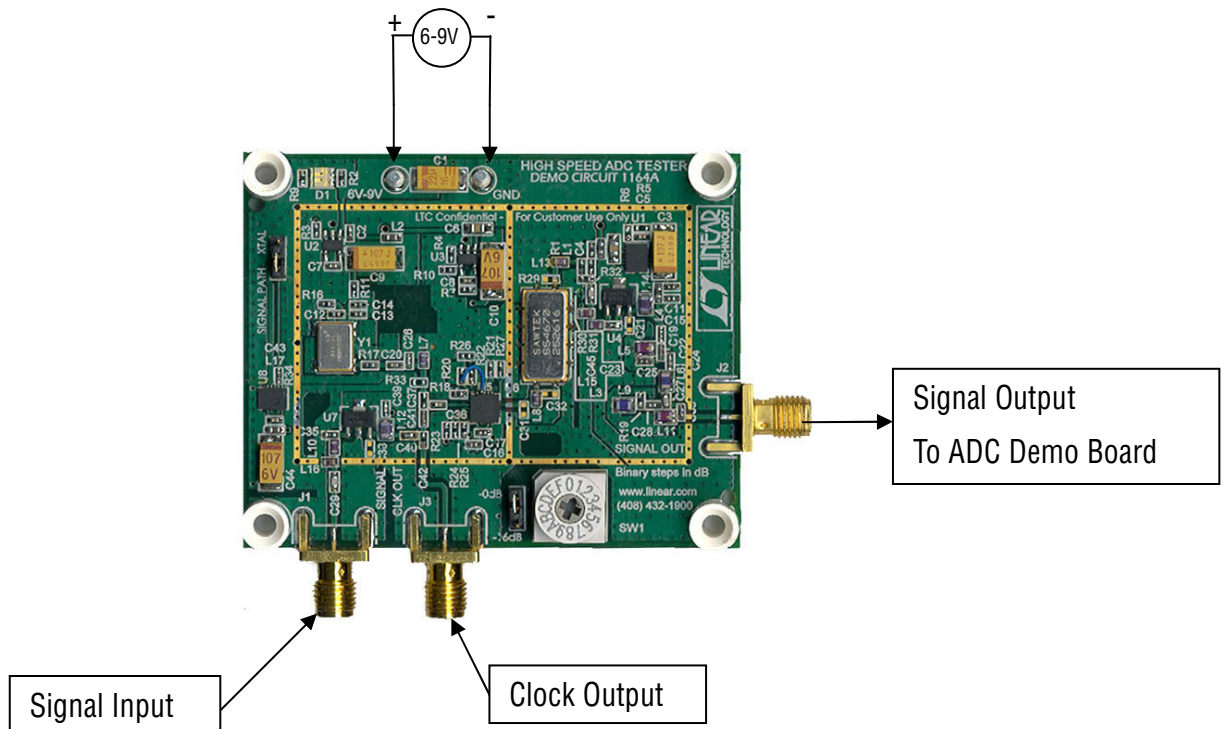
JUMPERS:

Signal Path/Xtal – Selects which element is active. Xtal supplies the crystal with 5 volts, producing a 70.56MHz signal at the output. Signal path removes the 5 volts on the crystal and redirects it to the gain block to amplify the external signal presented at J1.

-0dB/-16dB – Provides an additional 16dB of attenuation. Selecting 0dB provides attenuation from 0dB to 16dB, and -16 provide attenuation from16dB to 32dB.

SW1 - A rotary switch that controls attenuation in 1 dB steps. The "0" setting is 0dB of attenuation, and "F" is 16dB of attenuation.

PORTS:

J1: Signal input – When using the DC1164 as an IF strip J1 is where to input the signal

J2: Signal Output – Outputs the filtered signal. Connect this port to the analog input of the ADC demo board.

J3: Clock Output – For applications where a clock signal is required, use this port as a reference clock. This is not to be used as a clock for the ADC.

POWER

The DC1164 requires a voltage between 6 and 9 volts. This voltage is then post regulated to provide for all other required voltages on the board. The power supply used should be able to provide 500mA. If power is applied a green LED should illuminate. If power is applied in reverse the LED will be red.

70.56MHZ SIGNAL SOURCE

In standard operation J2 should provide a 70.56MHz signal to the demo board. The only connections required in this mode are power, and the output SMA (J2) connected to ADC demo board. The signal amplitude should be close to full scale and the signal amplitude can be controlled by SW1 and the adjacent jumper. The switch has 16 positions corresponding with 1 dB steps in attenuation of the signal. Zero "0" being no attenuation, and "F" being 16 dB of attenuation. The jumper adjacent to the switch can provide an additional 16 dB of attenuation added to the switch setting. This gives a maximum of 32 dB of attenuation on the signal.
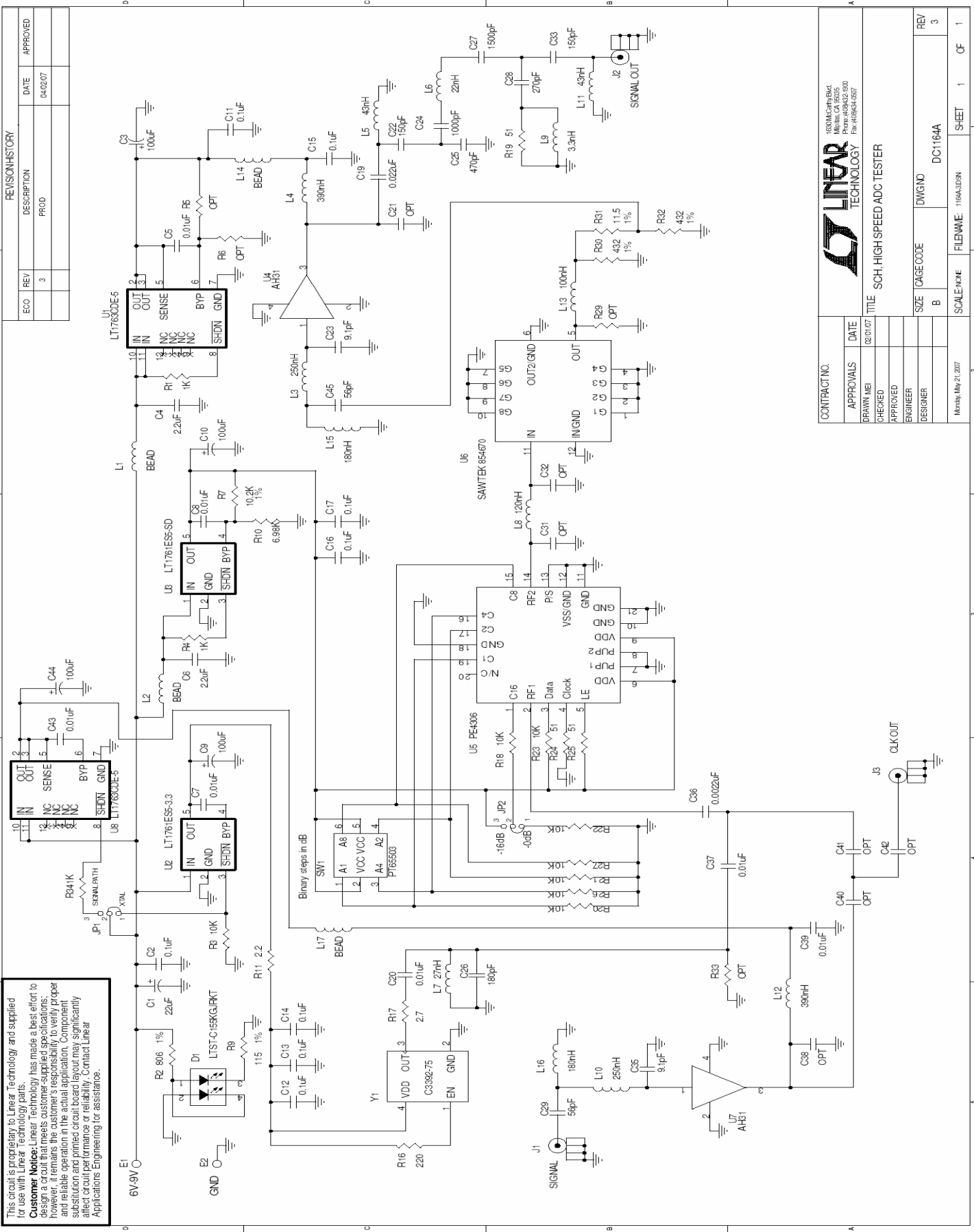
By removing C37, stuffing C40 and C41 and moving the jumper Xtal to Signal Path, the DC1164 becomes an IF strip which can provide low distortion spread spectrum signals to an ADC demo board. Connect an external spread spectrum source to J1, and connect the DC1164 to a ADC demo board.

The DC1164 has a signal path that has been matched and optimized for signals from 60MHz to 80MHz. The center frequency of the SAW filter is 70MHz and it has a 20MHz bandwidth. All of the amplifiers used are also tuned for frequencies between 60MHz and 80MHz.

The input signal can be attenuated to a spefic power level by using SW1 and the adjacent jumper. For SW1 Zero "0" causes no attenuation, and "F" is 16dB of attenuation. Turning the switch clockwise causes 1dB steps of attenuation up to 16dB. The adjacent jumper gives an additional 16dB of attenuation when moved from 0dB to -16dB.

IF STRIP

Schematic diagram: SCH. HIGH SPEED ADC TESTER

DWG NO: DC1164A
FILENAME: 1164A.3.DSN
TITLE: SCH. HIGH SPEED ADC TESTER
SIZE: B
SCALE: NONE
REV: 3
SHEET: 1 OF 1

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REVISION HISTORY

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