

FEATURES

- 8 channels of LNA, VGA, AAF, ADC, and digital demodulator/decimator**
- Low power: 150 mW per channel, TGC mode, 40 MSPS;**
65 mW per channel, CW mode; <30 mW at power-up
- 10 mm × 10 mm, 144-ball CSP-BGA**
- TGC channel input-referred noise: 0.8 nV/√Hz, maximum gain**
- Flexible power-down modes**
- Fast recovery from low power standby mode: <2 μs**
- Low noise preamplifier (LNA)**
- Input-referred noise: 0.78 nV/√Hz, gain = 21.6 dB**
- Programmable gain: 15.6 dB/17.9 dB/21.6 dB**
- 0.1 dB compression: 1.00 V p-p/.75 V p-p/.45 V p-p**
- Flexible active input impedance matching**
- Variable gain amplifier (VGA)**
- Attenuator range: 45 dB, linear-in-dB gain control**
- Postamp gain (PGA): 21 dB/24 dB/27 dB/30 dB**
- Antialiasing filter (AAF)**
- Programmable second-order LPF from 8 MHz to 18 MHz or**
13.5 MHz to 30 MHz and HPF
- Analog-to-digital converter (ADC)**
- SNR: 75 dB, 14 bits up to 125 MSPS**
- Configurable serial LVDS**
- CW mode harmonic rejection I/Q demodulator**
- Individual programmable phase rotation**
- Dynamic range per channel: >160 dBc/√Hz**
- Close-in SNR: 156 dBc/√Hz, 1 kHz offset, -3 dBFS**
- Digital demodulator/decimator**
- I/Q demodulator with programmable oscillator FIR**
decimation filter: 16 taps per decimation factor

GENERAL DESCRIPTION

The AD9670 is designed for low cost, low power, small size, and ease of use for medical ultrasound. It contains eight channels of a variable gain amplifier (VGA) with a low noise preamplifier (LNA), a CW harmonic rejection I/Q demodulator with programmable phase rotation, an antialiasing filter (AAF), an analog-to-digital converter (ADC), and a digital demodulator and decimator for data processing and bandwidth reduction.

Each channel features a maximum gain of up to 52 dB, a fully differential signal path, and an active input preamplifier termination. The channel is optimized for high dynamic performance and low power in applications where a small package size is critical.

The LNA has a single-ended-to-differential gain that is selectable through the SPI. Assuming a 15 MHz noise bandwidth (NBW) and a 21.6 dB LNA gain, the LNA input SNR is 94 dB. In CW Doppler mode, each LNA output drives an I/Q demodulator that has independently programmable phase rotation with 16 phase settings.

Power-down of individual channels is supported to increase battery life for portable applications. Standby mode allows quick power-up for power cycling. In CW Doppler operation, the VGA, AAF, and ADC are powered down. The ADC contains several features designed to maximize flexibility and minimize system cost, such as a programmable clock, data alignment, and programmable digital test pattern generation. The digital test patterns include built-in fixed patterns, built-in pseudorandom patterns, and custom user-defined test patterns entered via the serial port interface. This product is protected by a U.S. patent.

For more information about the AD9670, email

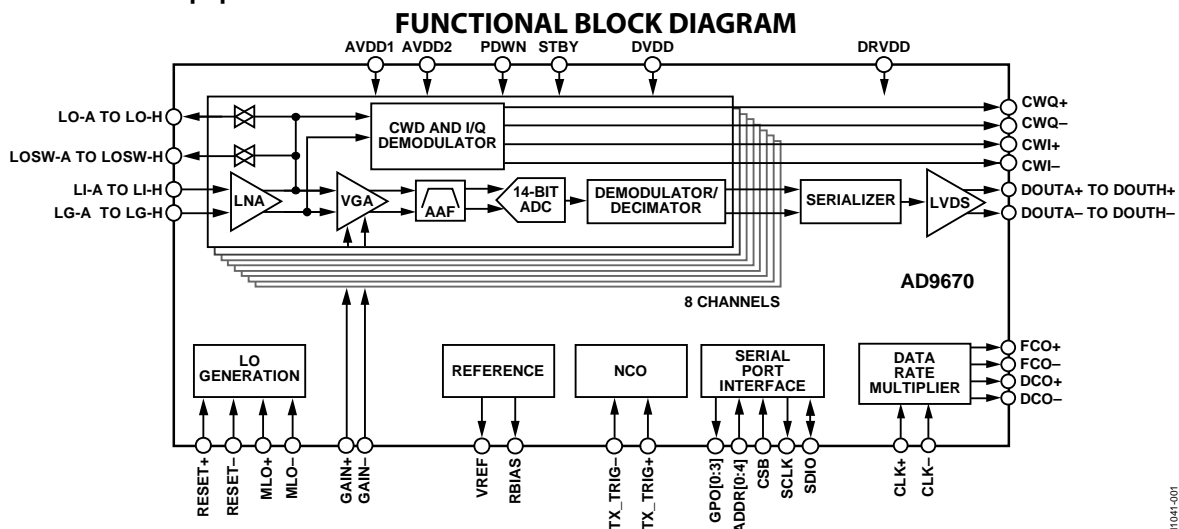


Figure 1.

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