

Octal LNA/VGA/AAF/ADC and Crosspoint Switch

AD9272

FEATURES

8 channels of LNA, VGA, AAF, and ADC Low noise preamplifier (LNA) Input-referred noise voltage = $0.75 \text{ nV}/\sqrt{\text{Hz}}$ (gain = 21.3 dB) @ 5 MHz typical SPI-programmable gain = 15.6 dB/17.9 dB/21.3 dB Single-ended input; V_{IN} maximum = 733 mV p-p/ 550 mV p-p/367 mV p-p **Dual-mode active input impedance matching** Bandwidth (BW) > 100 MHz Full-scale (FS) output = 4.4 V p-p differential Variable gain amplifier (VGA) Attenuator range = -42 dB to 0 dBSPI-programmable PGA gain = 21 dB/24 dB/27 dB/30 dB Linear-in-dB gain control Antialiasing filter (AAF) Programmable 2nd-order low-pass filter (LPF) from 8 MHz to 18 MHz Programmable high-pass filter (HPF) Analog-to-digital converter (ADC) 12 bits at 10 MSPS to 80 MSPS SNR = 70 dBSFDR = 75 dB Serial LVDS (ANSI-644, IEEE 1596.3 reduced range link) Data and frame clock outputs Includes an 8 × 8 differential crosspoint switch to support continuous wave (CW) Doppler Low power, 195 mW per channel at 12 bits/40 MSPS (TGC) 120 mW per channel in CW Doppler Flexible power-down modes Overload recovery in <10 ns Fast recovery from low power standby mode, <2 µs 100-lead TQFP

APPLICATIONS

Medical imaging/ultrasound Automotive radar

GENERAL DESCRIPTION

The AD9272 is designed for low cost, low power, small size, and ease of use. It contains eight channels of a low noise preamplifier (LNA) with a variable gain amplifier (VGA); an antialiasing filter (AAF); and a 12-bit, 10 MSPS to 80 MSPS analog-to-digital converter (ADC).

Each channel features a variable gain range of 42 dB, a fully differential signal path, an active input preamplifier termination, a maximum gain of up to 52 dB, and an ADC with a conversion rate of up to 80 MSPS. The channel is optimized for 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. The LNA input-referred noise voltage is typically 0.75 nV/ \sqrt{Hz} at a gain of 21.3 dB, and the combined input-referred noise voltage of the entire channel is 0.85 nV/ \sqrt{Hz} at maximum gain. Assuming a 15 MHz noise bandwidth (NBW) and a 21.3 dB LNA gain, the input SNR is about 92 dB. In CW Doppler mode, the LNA output drives a transconductance amp that is switched through an 8 × 8 differential crosspoint switch. The switch is programmable through the SPI.

For more information about the AD9272, contact Analog Devices, Inc., at highspeed.converters@analog.com.

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 One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106, U.S.A.

 Tel: 781.329.4700
 www.analog.com

 Fax: 781.461.3113
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