

## **Dual, 16-Bit, 1.25-GSPS, Digital-to-Analog Converter IC Incorporates a JESD204 Serial Input to Simplify the FPGA Interface**



Analog Devices, Inc. ([ADI \[1\]](#)) today introduced the AD9128, a performance-leading 16-bit, 1.25-GSPS transmit D/A converter (DAC) with integrated complex digital modulation functionality, and featuring a JESD204A-compatible serial input. The AD9128's high-speed serial interface greatly simplifies and improves the data connection between the DAC and the FPGA in a typical system implementation.

High-performance FPGAs are increasingly being utilized as processors in many data-centric wireless and wired communications, radar, avionics, and medical imaging applications. FPGAs are gaining favor due to their inherent advantages of easier system development, reduced time-to-market, higher processing speed, and on-the-fly programmability. However for higher-resolution, 1-GSPS+ data converter applications, data transfers in and out of an FPGA have traditionally been a design bottleneck because of interface bit-rate limitations, interconnect layout complexity, and parallel interface board space requirements. JESD204 was specifically developed to remedy these constraints by defining a robust high-speed serial interface that is scalable and accommodates data rates in the multiple Gbps range. ADI is committed to embracing this standard in its ultra-high-speed data-converter technology, and FPGA manufacturers are actively integrating this protocol into their high-performance platforms.

The JESD204A-compliant AD9128 offers high sampling rate and high dynamic range, enabling multicarrier generation up to the Nyquist frequency, and includes features such as an on-chip 32-bit NCO (numerically-controlled oscillator), allowing flexible

placement of the IF (intermediate frequency), complex digital modulation, and gain and offset compensation. A 4-wire serial port interface provides for programming and read-back of many of the device's internal parameters and functions. The AD9128 supports GSM, WCDMA, TD-SCDMA, CDMA2000, WiMAX, and LTE wireless communications standards.

View the AD9128 D/A converter product page, order samples, and download the data sheet:

[www.analog.com/AD9128](http://www.analog.com/AD9128) [2]

The AD9128 DAC is available on a standardized FMC evaluation board for direct connectivity with Xilinx FPGA development platforms. For more information visit [AD9128FMC](#).

## AD9128 Dual 16-bit D/A Converter for Transmit Signal Chain IF Synthesis

- 1.25 GSPS capability supports IF bandwidths up to 500 MHz
- Excellent dynamic range: 80 dBc @  $f_{DAC} = 200$  MSPS,  $f_{OUT} = 50$  MHz 72 dBc @  $f_{DAC} = 800$  MSPS,  $f_{OUT} = 70$  MHz
- Single-carrier W-CDMA ACLR = 82 dBc @ 122.88 MHz IF • Novel  $2\times/4\times/8\times$  interpolator/complex modulator allows carrier placement anywhere within the DAC's bandwidth
- Analog output: adjustable 8.7 mA to 31.7 mA,  $R_L = 25\ \Omega$  to  $50\ \Omega$
- 4 lanes of high-speed JESD204A serial links (each capable of 3.125 Gbps)

The AD9128 high-speed D/A converter's analog outputs are optimized to interface seamlessly with analog quadrature modulators, such as ADI's [ADL537x](#) [3] F-MOD series, and the [ADCLK914](#) [4] clock/data buffer that drives the AD9128 D/A converter with clock input jitter performance of 110 fs. Other complementary parts include the ADRF6702 quadrature modulator and [ADRF6602](#) [5] Rx mixer.

Get support at ADI's EngineerZone™ online technical support community:

[http://ez.analog.com/community/data\\_converters/high-speed\\_dacs](http://ez.analog.com/community/data_converters/high-speed_dacs) [6]

[www.analog.com](http://www.analog.com) [1]

Posted by Sara Cohen, Editorial Intern

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**Links:**

[1] <http://www.analog.com/en/index.html>

[2] <http://www.analog.com/en/digital-to-analog-converters/high-speed-da-converters/ad9128/products/product.html>

[3] <http://www.analog.com/en/rfif-components/modulatorsdemodulators/adl5371/products/product.html>

[4] <http://www.analog.com/en/clock-and-timing/clock-generation-and-distribution/adclk914/products/product.html>

[5] <http://www.analog.com/en/rfif-components/mixersmultipliers/adrf6602/products/product.html>

[6] [http://ez.analog.com/community/data\\_converters/high-speed\\_dacs](http://ez.analog.com/community/data_converters/high-speed_dacs)