



16-bit, 105Msps Serial Output ADC Conserves FPGA I/O Pins

MILPITAS, CA – April 14, 2008 – Linear Technology Corporation announces a 16-bit, 105Msps ADC that establishes a simple, new benchmark for digital communication between high speed ADCs and FPGAs. The LTC2274's new high speed 2-wire serial interface greatly reduces the number of data input/output (I/O) lines required between a 16-bit ADC and the FPGA from 16 CMOS or 32 LVDS parallel data lines to a single, self-clocking, differential pair communicating at 2.1Gbps, freeing up valuable FPGA pins.

Serial data communications offers simplified layout, and requires less board area for routing, while providing the flexibility to route across analog and digital boundaries. In noise sensitive applications, the serial interface provides an effective isolation barrier between digital and analog circuitry and serves to eliminate coupling between the digital outputs and analog inputs to reduce digital feedback.

The LTC2274 output data is serialized according to the JEDEC serial interface specification for data converters (JESD204) using 8b10b encoding, and is compatible with many FPGA high speed interfaces including Xilinx's Rocket IO, Altera's Stratix II GX I/O and Lattice's ECP2M I/O. At 2.1Gbps, the LTC2274 offers the fastest high speed serial interface of any ADC on the market today. Applications such as leading edge communications equipment, multi-channel systems, space-constrained designs, and instrumentation all benefit from the LTC2274's unique interface and feature set.

The LTC2274 offers several unique features to improve overall system design. For high-sensitivity receiver applications, the LTC2274 provides an internal transparent dither circuit that improves the ADC's SFDR response well beyond 100dBc for low level input signals. To avoid any interference from the serial digital outputs, an optional data scrambler is available to randomize the spectrum of the serial link. Serial test patterns are also incorporated to facilitate testing of the serial interface. While the LTC2274 may be operated at a maximum sampling rate of 105Msps, the internal PLL may be configured to lock at one of three different sample rate ranges. An on-chip clock duty cycle stabilizer circuit has been implemented to facilitate non-

50% clock duty cycles. Separate shutdown pins for the analog and digital sections are provided to conserve power.

The LTC2274 maintains Linear's high performance advantages, offering excellent signal to noise ratio (SNR) performance of 77.5dB and spurious free dynamic range (SFDR) of 100dB at baseband. Ultra-low jitter of 80fs_{RMS} enables undersampling of input frequencies up to 500MHz with excellent noise performance. The LTC2274 consumes 1.3W from a 3.3V analog supply.

The LTC2274's serial output allows it to fit in a 6mm x 6mm QFN-40 package, less than half the size of similar 16-bit ADCs with parallel outputs. In addition to the 16-bit, 105Msps LTC2274, pin-compatible 80Msps and 65Msps versions will be releasing this summer. Production quantities of the LTC2274 will be available in July in both commercial and industrial temperature grades. The device is competitively priced at \$68.00 each in 1,000-piece quantities. Demonstration boards and samples are available online at www.linear.com/2274.

The following table summarizes Linear's entire 16-bit high-speed ADC family. All parts can be ordered in optional lead-free packages for RoHS compliance. More details can be found at <http://www.linear.com/ad/highspeedADC.jsp>


Part Number	Resolution	Speed	Power	SNR	I/O	Package
LTC2209	16-bit	160Msps	1450mW	77.1dB	CMOS/LVDS	9x9 QFN
LTC2208	16-bit	130Msps	1250mW	77.7dB	CMOS/LVDS	9x9 QFN
LTC2274	16-bit	105Msps	1300mW	77.5dB	Serial	6x6 QFN
LTC2217	16-bit	105Msps	1190mW	81.2dB	CMOS/LVDS	9x9 QFN
LTC2207	16-bit	105Msps	850mW	77.9dB	CMOS	7x7 QFN
LTC2273	16-bit	80Msps	1080mW	77.5dB	Serial	6x6 QFN
LTC2216	16-bit	80Msps	970mW	81.3dB	CMOS/LVDS	9x9 QFN
LTC2206	16-bit	80Msps	640mW	77.9dB	CMOS	7x7 QFN
LTC2272	16-bit	65Msps	880mW	77.5dB	Serial	6x6 QFN
LTC2215	16-bit	65Msps	700mW	81.5dB	CMOS/LVDS	9x9 QFN
LTC2205	16-bit	65Msps	450mW	79.0dB	CMOS	7x7 QFN
LTC2204	16-bit	40Msps	350mW	79.1dB	CMOS	7x7 QFN
LTC2203	16-bit	25Msps	220mW	81.6dB	CMOS	7x7 QFN
LTC2202	16-bit	10Msps	150mW	81.6dB	CMOS	7x7 QFN

Photo Caption: 16-Bit, 105Msps High Performance Serial Output ADC**Summary of Features: LTC2274 Family**

- High Speed Serial Interface (JESD204)
- Sample Rate: 105Msps/80Msps/65Msps
- 77.7dB Noise Floor, 100dB SFDR
- PGA Front End (2.25Vp-p or 1.5Vp-p Input Range)
- 700MHz Full Power Bandwidth S/H
- Internal Transparent Dither
- Data Scrambler
- Serial Test Patterns
- Single 3.3V Supply
- Power Dissipation: 1.3W
- Separate Analog and Digital Shutdown Pins
- Clock Duty-Cycle Stabilizer
- 40-pin, 6mm x 6mm QFN Package

About Linear Technology

Linear Technology Corporation, a manufacturer of high performance linear integrated circuits, was founded in 1981, became a public company in 1986 and joined the S&P 500 index of major public companies in 2000. Linear Technology products include high performance amplifiers, comparators, voltage references, monolithic filters, linear regulators, DC-DC converters, battery chargers, data converters, communications interface circuits, RF signal conditioning circuits, uModule™ products, and many other analog functions. Applications for Linear Technology's high performance circuits include telecommunications, cellular telephones, networking products such as optical switches, notebook and desktop computers, computer peripherals, video/multimedia, industrial instrumentation, security monitoring devices, high-end consumer products such as digital cameras and MP3 players, complex medical devices, automotive electronics, factory automation, process control, and military and space systems. For more information, visit www.linear.com.

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