



## **Lowest Power, 16-Bit, 80Msps ADC Reduces Noise in Data Conversion Systems**

MILPITAS, CA – March 30, 2010 – Linear Technology Corporation introduces a low-power 16-bit no missing codes, 80Msps analog-to-digital converter (ADC) that dissipates only 89mW, less than half the power of competing 16-bit solutions. The LTC2259-16 provides a pin-compatible upgrade to the existing LTC2259-14 family of 14-bit low power ADCs, offering the lowest power dissipation for a single 16-bit ADC with double data rate (DDR) CMOS/LVDS outputs. In addition to offering significantly lower power, the LTC2259-16 integrates two useful features for reducing digital feedback, including alternate bit polarity (ABP) mode and a data output randomizer. These features, in combination with low power, ease the task of designing with high speed ADCs in a wide variety of applications, including HD broadcast cameras, IMO radar, Ethernet testers, portable test and instrumentation, software-defined radios and cellular basestations.

Digital feedback occurs when energy from ADC outputs couples back into the analog section, causing interaction that appears as odd shaping in the noise floor and spurs in the ADC output spectrum. The worst situation is at mid-scale, where all outputs are changing from ones to zeroes, or vice versa, generating large ground currents that couple back into the input.

To combat this effect, the LTC2259-16's proprietary alternate bit polarity (ABP) mode inverts all of the odd bits before the output buffers to equalize the number of ones and zeroes switching. This method effectively cancels the large ground plane currents that contribute to

digital feedback. In addition to the alternate bit polarity mode, an optional data output randomizer is also available for reducing interference from the digital outputs. The randomizer decorrelates the digital output to reduce the likelihood of repetitive code patterns that couple back into the ADC input, causing unwanted tones in the output spectrum. Both digital feedback reduction techniques improve spurious free dynamic range (SFDR) performance by 10-15dB.

Operating from a low 1.8V analog supply, the LTC2259-16 offers signal to noise ratio (SNR) performance of 73.1dB and SFDR of 88dB at baseband. Ultralow jitter of 0.17pS<sub>RMS</sub> allows undersampling of IF frequencies with excellent noise performance. The LTC6406 is a recommended rail-to-rail ADC driver for maintaining LTC2259-16's AC performance.

The LTC2259-16's digital outputs can be set to full rate CMOS, DDR CMOS, or DDR LVDS. Double data rate digital outputs allow data to be transmitted on both the rising edge and the falling edge of the clock, reducing the number of data lines needed by half. A separate output power supply allows the CMOS output swing to range from 1.2V to 1.8V.

Offered in a 6mm x 6mm QFN package, the LTC2259-16 includes a clock duty cycle stabilizer circuit to facilitate non-50% clock duty cycles, programmable digital output timing, programmable LVDS output current and optional LVDS output termination. These features combine to make the data transmission between the ADC and the digital receiver more flexible.

The LTC2259-16 joins a family of pin-compatible 14 and 12-bit ADCs, with sampling rates ranging from 25Msps to 150Msps, and power dissipation of 35mW to 149mW, respectively. LTC2259-16 is in full production with pricing starting at \$35.00 each in 1,000-piece quantities. Demonstration boards and samples are available online at [www.linear.com](http://www.linear.com). The complete product family can be found at: [www.linear.com/ad/highspeedADC.jsp](http://www.linear.com/ad/highspeedADC.jsp)


**Photo Caption:** Alternate Bit Polarity Mode on the LTC2259-16

## Summary of Features: LTC2259-16

- 16-bit No Missing Codes ADC
- 73.1dB SNR
- 88dB SFDR
- Low Power: 89mW
- Single 1.8V Supply
- CMOS, DDR CMOS or DDR LVDS Outputs
- Selectable Input Ranges:  $1V_{P-P}$  to  $2V_{P-P}$
- 800MHz Full-Power Bandwidth S/H
- Optional Data Output Randomizer
- Optional Clock Duty Cycle Stabilizer
- Shutdown & Nap Modes
- Serial SPI Port for Configuration
- Pin Compatible 14-Bit & 12-Bit Versions
- 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<sup>®</sup> 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.

LT, LTC, LTM, uModule and  are registered trademarks of Linear Technology Corp. All other trademarks are the property of their respective owners.

### Press Contacts:

#### North America / Worldwide

John Hamburger, Director Marketing  
Communications  
[jhamburger@linear.com](mailto:jhamburger@linear.com)  
Tel 408-432-1900 ext 2419

Doug Dickinson, Media Relations Manager  
[ddickinson@linear.com](mailto:ddickinson@linear.com)  
408-432-1900 ext 2233

#### UK & Nordic

Alan Timmins  
[alan@ezwire.com](mailto:alan@ezwire.com)  
Tel: +44-1-252-629937