Tiny 16-Bit ADC Integrates 2ppm/°C Reference for Space-Constrained Sensor Applications

MILPITAS, CA – May 13, 2009 – Linear Technology introduces the LTC2460 and the LTC2462, a pair of 16-bit delta sigma ADCs that integrate a precision reference in a tiny 3mm x 3mm DFN package. The integrated reference (2ppm/°C Typ, 10ppm/°C Max) allows precise measurements and alleviates the need for an external reference, a key benefit for space-constrained applications. Both ADCs guarantee 16-bit no missing code resolution. This makes the LTC2460 and LTC2462 a complete solution for remote sensor battery-powered applications and industrial sensors monitoring temperature or pressure.

Operating from a single 2.7V to 5.5V supply, these ADCs are designed to measure single-ended (LTC2460) or differential (LTC2462) sensors via an SPI serial interface. With its internal 1.25V reference, the LTC2460 can measure a single-ended input from 0V to 1.25V, while the LTC2462 is capable of measuring a differential input up to ±1.25V.

The versatile LTC2460/LTC2462 achieve excellent 16-bit DC performance of 1LSB (Typ) integral nonlinearity error, 2.2uV$_{RMS}$ transition noise and 0.25% gain error (max). These ADCs have an internal oscillator, another space-saving feature. They operate up to 60 conversions per second, making it easy to measure temperature, pressure, voltage, or other low-frequency sensor signals.

The LTC2460/LTC2462 draw 2.5mA (max) supply current at the 60Hz maximum sample rate with the internal reference active. After each conversion, the ADC enters a shutdown mode,

reducing supply current to less than 1.5mA (max). Supply current can be further reduced to less than 2uA (max) in sleep mode. The LTC2460/LTC2462 also incorporate a proprietary input sampling network that reduces the dynamic input current to less than 50nA, making possible a wide range of external input filter and protection circuits.

The LTC2460 and LTC2462 join a family that includes the previously released LTC2450 (single-ended input, V_{CC} used as the reference) and LTC2452 (differential input, external reference required). The LTC2450/LTC2452 ADCs should be used for applications that need to measure input signals greater than 1.25V.

The LTC2460 and LTC2462 are each offered in 12-pin ultra-tiny 3mm x 3mm DFN and MSOP packages. They are available today in both commercial and industrial temperature grade versions. Pricing begins at $1.65 each in 1,000-piece quantities. For more information, visit www.linear.com.

Ultra-Tiny ADC Family

Part Number	Input	Input Range	Output Rate	I/O	V_{REF}
LTC2450	Single-Ended	0V to V_{CC}	30Hz	SPI	$V_{CC} = V_{REF}$
LTC2450-1	Single-Ended	0V to V_{CC}	60Hz	SPI	$V_{CC} = V_{REF}$
LTC2451	Single-Ended	0V to V_{REF}	60Hz	I^2C	External
LTC2452	Differential	$\pm V_{REF}$	60Hz	SPI	External
LTC2453	Differential	$\pm V_{REF}$	60Hz	I^2C	External
LTC2460	Single-Ended	0V to V_{REF}	60Hz	SPI	Internal 1.25V
LTC2462	Differential	$\pm V_{REF}$	60Hz	SPI	Internal 1.25V

Photo Caption: 16-Bit ADC with 2ppm/°C Internal Reference in 12-Pin 3mm x 3mm DFN and MSOP Packages

Summary of Features: LTC2460/LTC2462

- 16-Bit Resolution, No Missing Codes
- Internal Reference, (10ppm/°C max)
- Single-Ended (LTC2460) or Differential (LTC2462) Input
- 2LSB Offset Error
- 0.01% Gain Error
- 60 Conversions Per Second
- Single Conversion Settling Time for Multiplexed Applications
- Single-Cycle Operation with Auto Shutdown:
    - 1.5mA (typ) Supply Current
    - 2uA (max) Sleep Current
- Internal Oscillator—No External Components Required
- SPI Interface
- Tiny 12-Lead 3mm × 3mm DFN & MSOP Packages

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.

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