

## ***LTC News Release***

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### **16- to 24-Bit $\Delta\Sigma$ ADC Family with Easy Drive Input Current Cancellation Simplifies Front-End Signal Conditioning**

MILPITAS, CA – June 13, 2005 – Linear Technology introduces the LTC2480 series of delta-sigma analog-to-digital converters (ADCs), featuring a novel front-end design that is able to directly digitize a wide range of sensors. The LTC2480's Easy Drive™ technology results in zero average differential input current, simplifying the design of front-end signal conditioning circuits and allowing the ADC to be driven directly from bridges, RTDs, thermocouples and other high impedance sensors. The LTC2480 is the first device to directly and accurately measure high impedance input sources without the use of an internal buffer, eliminating the drawbacks of on-chip buffering. Linear Technology pioneered ease of use by incorporating an internal oscillator, transparent auto calibration and a wide input range that extends beyond the supply rails, by eliminating the need for initialization and calibration registers and invalid data associated with digital filter settling delays.

The input stage of traditional delta-sigma ADCs use a switched capacitor network that rapidly switches between input, reference and ground at rates up to 10MHz as function of the input signal level. Each time these capacitors are switched to the ADC input, significant charge/discharge current pulses are generated, making it difficult for the preceding op amp to drive. It also severely limits the time constant of input RC networks favored by designers for additional signal filtering. With the LTC2480 series, charge/discharge current pulses are balanced, and when summed over the entire conversion cycle, the total differential input current is zero, independent of the differential input voltage, common mode input voltage, reference voltage, or output code. For the first time, external RC networks with large time constants may be placed directly in front of high resolution delta-sigma ADCs without degrading their DC accuracy.

The LTC2480 provides 16-bit resolution and features exceptional accuracy with 2ppm INL, 1ppm offset and 15ppm full-scale errors. The device features an internal temperature sensor and programmable gain up to 256, making the device suitable for temperature compensation of low level sensors. Linear Technology also offers a version without the internal temperature sensor and programmable gain (LTC2482) as well as a 24-bit version with the temperature sensor, but without programmable gain (LTC2484). The entire family

features no latency conversions for simple multiplexing, highly accurate internal oscillators with guaranteed line frequency rejection, precise DC specifications and the ease-of-use common to all of Linear Technology's LTC2400 ADC converters.

All three parts are pin-compatible in the 3mm x 3mm 10-pin DFN package and are screened for both the commercial and industrial temperature ranges. Pricing begins at \$1.85 each for the LTC2480, \$1.65 each for the LTC2482 and \$2.45 each for the LTC2484. All prices are based on 1,000-piece quantities.

### Summary of Features: LTC2480 Family

- Easy Drive Technology Enables Rail-to-Rail Inputs with Zero Differential Input Current
- Directly Digitizes High Impedance Sensors with Full Accuracy
- Programmable Gain from 1 to 256
- Integrated Temperature Sensor
- GND to  $V_{CC}$  Input/Reference Common Mode Range
- Programmable 50Hz, 60Hz or Simultaneous 50Hz/60Hz Rejection Mode
- 2ppm (0.25LSB) INL, No Missing Codes
- 1ppm Offset and 15ppm Full-Scale Error
- Selectable 2x Speed Mode (15Hz Using Internal Oscillator)
- No Latency: Digital Filter Settles in a Single Cycle
- Single Supply 2.7V to 5.5V Operation
- Internal Oscillator
- Available in a Tiny (3mm x 3mm) 10-Lead DFN Package

**COMPANY BACKGROUND:** Linear Technology Corporation was founded in 1981 as a manufacturer of high performance linear integrated circuits. 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, 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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