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Rail-to-Rail Single-Ended to Differential Amplifier Drives High Speed 16- to 18-bit SAR ADCs

MILPITAS, CA – January 25, 2010 – Linear Technology introduces the LT6350, a 33MHz, low noise, rail-to-rail input and output ADC driver that settles to 16-bits in just 350ns. It is suitable for driving the latest highest performance SAR ADCs such as the LTC2393-16. The LT6350 incorporates two op amps and matched resistors to create a differential output from a single-ended high impedance input. As a result, a differential gain of 2 is achieved with no external feedback resistors, and higher gain can be obtained by using feedback resistors. Each of the two internal op amps achieve a low 1.9nV/√Hz input-referred noise density, resulting in a total output-referred noise of just 8.2nV/√Hz. The LT6350 enables high performance ADCs to achieve better than 110dB SNR over a 1MHz bandwidth.

The input op amp is trimmed for constant low differential input-referred voltage offset over the input range to prevent V_{OS} steps from degrading distortion. At 100kHz, the LT6350 can typically achieve -102/-97dBc HD2/HD3.

The LT6350 provides rail-to-rail input and output range. With a single 5V supply, the outputs can swing 0.055V to 4.945V, and by using a negative supply, the outputs can each swing from 0V to 4.945V. The LT6350 operates on 2.7V to 12V total supply. The LT6350 consumes 4.8mA supply current and has a shutdown mode that allows the system to reduce power consumption during periods of inactivity.

Fully specified commercial (0°C to 70°C), industrial (-40°C to 85°C) and extended (-40°C to 125°C) temperature range versions of the LT6350 are available in 8-lead MSOP and 3mm x 3mm DFN packages. Prices start at $2.59 each in quantities of 1,000 pieces. For more information, visit www.linear.com.

Photo Caption: ADC Driver: Rail-to-Rail Single-Ended Input to Rail-to-Rail Differential Output

Summary of Features: LT6350

- Rail-to-Rail Input & Outputs
- Fast Settling Time: 240ns, 0.01%, $8V_{P-P}$ Output Step
- 1.9nV/√Hz Input-Referred Op Amp Noise
- High Impedance Input
- No External Gain-Resistors Required
- 2.7V to 12V Supply Operation, 4.8mA Supply Current
- Low Power Shutdown
- Low Distortion (HD2/HD3): –102dBc/–97dBc at 100kHz, $V_{OUTDIFF} = 4V_{P-P}$
- High DC Linearity: <±1LSB, 16-Bit, $8V_{P-P}$
- 3mm × 3mm 8-Pin DFN & 8-Lead 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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