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## **High Performance uModule Receiver Subsystem Bridges the Gap Between RF & Digital Worlds**

MILPITAS, CA – February 4, 2008 – Linear Technology introduces the LTM9001, the first in a series of System in a Package (SiP) signal chain receiver modules, leveraging Linear's breakthrough uModule™ packaging technology. This new family of integrated receiver subsystems is intended to bridge the expertise gap between the RF world and digital domain to provide ease of use and shortened time to market. The LTM9001 is a semi-customizable IF/baseband receiver subsystem that includes a high performance 16-bit Analog-to-Digital converter (ADC) sampling up to 160Msps, an anti-aliasing filter, and fixed gain differential ADC driver. The LTM9001 harnesses years of applications design experience to offer integration, ease of use with guaranteed high performance to enhance system performance in many communications and instrumentation applications.

Sampling high dynamic range signals in RF applications requires extensive experience to maximize the full capabilities of the analog-to-digital converter. An intimate knowledge of the amplifier output stage and ADC front end is required to match the impedances, while careful attention to layout is required to minimize coupling of the digital outputs into the sensitive analog input. Degraded ADC performance can in many cases be attributed to bad layout. These considerations can challenge the engineer whose expertise lies in the RF or digital worlds. The LTM9001 transfers this burden of component selection, input impedance matching, filter design and layout from designer to device, shortening overall design time, system troubleshooting and ultimately improving time to market.

The beauty of the LTM9001 lies in its semi-customization (customization requires minimum order quantity). Using pin-compatible product families, the LTM9001 can be configured for various sampling rates and the differential ADC driver can be substituted for fixed gain versions ranging from 8dB up to 26dB. The anti-aliasing filters can also be configured as Low-Pass or Bandpass filter versions, accepting input frequencies as high as 300MHz.

The LTM9001 is packaged in a space-saving 11.25mm x 11.25mm LGA package, utilizing a multi-layer substrate that shields sensitive analog lines from the digital traces. The LGA pads are positioned on the bottom of the package so that input and clock signals are separated from the digital outputs, simplifying the layout for the designer. Bypass capacitance is placed inside the module and close to the die, providing a space, cost and, more significantly, a performance advantage over traditional packaging. With no external capacitance required, the LTM9001 consumes approximately half the space of the discrete implementation.

The LTM9001 is available in production volumes today and is priced at \$82.00 each in 1,000 piece quantities. Demonstration circuits and samples are available at [www.linear.com/LTM9001](http://www.linear.com/LTM9001).


## **Photo Caption: 16-Bit, 130Msps ADC + Drive uModule™ Subsystem**

### **Summary of Features: LTM9001**

- Integrated 16-Bit, High Speed ADC, Passive Filter & Fixed Gain Differential Amplifier
- Up to 300MHz IF Range
  - Low Pass & Bandpass Filter Versions
- Low Noise, Low Distortion Amplifier
  - Fixed Gain: 8dB, 14dB, 20dB, 26dB
  - Noise Figure as Low as 5.9dB
  - 50ohm, 200ohm or 400ohm Input Impedance
- 72dB SNR, 82dB SFDR
- Integrated Bypass Capacitance, No External Components Required
- Optional Internal Dither
- Optional Data Output Randomizer
- LVDS or CMOS Outputs
- 3.3V Single Supply
- Power Dissipation: 1.65W
- Clock Duty Stabilizer
- 11.25mm x 11.25mm LGA 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](http://www.linear.com).

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