



**OPTICHRON**

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**Optichron's Breakthrough Turbolinear™ Signal Processing Technology Reduces Nonlinear Distortion by More Than 90% in Analog-to-Digital Converters**

*New Class of "Linearized" Data Conversion Modules Improves System Performance in Communications and Industrial Applications*

**FREMONT, Calif. June 6, 2005** – Optichron Inc., a pioneer in advanced nonlinear signal processing, today introduced the first products incorporating its proprietary Turbolinear™ technology that reduces nonlinear distortion by more than 90 percent in high-speed pipelined data converters. This innovation provides system design engineers with the ability to overcome nonlinear distortion — a naturally occurring phenomenon that degrades signal fidelity within signal paths and results in suboptimal system performance. The first products incorporating this technology are a new class of small form factor, "linearized" analog-to-digital converter (ADC) modules designed for improved linearity which will enable significantly more efficient, high-performance communications and industrial system architectures. These new modules will benefit applications such as multi-channel/multi-mode receivers, base stations and medical imaging equipment.

*"Optichron's Turbolinear™ technology is the first of its kind to transform nonlinear signal processing from the realm of pure science into a practical engineering language uniquely suited to address the pervasive problem of nonlinear distortion," said Roy Batruni, CEO of Optichron. "Turbolinear™ technology allows engineers to utilize versatile filter architectures that eliminate nonlinear distortion in a way that is both cost-effective and easy to implement in low-power semiconductor products."*

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## **Turbolinear™ Signal Processing Technology**

Turbolinear™ signal processing technology is Optichron's proprietary approach to solving the nonlinear distortion problem that occurs in communications channels and mixed-signal environments. It is scalable, allowing engineers to enable or disable filter blocks to meet their specific design needs. It is also adaptive and optimizes filter parameters to track changes in the properties of the transmission medium. The technology can be applied to all types of nonlinear distortion (static, dynamic, continuous, discontinuous, distortion with memory effects) that degrade the performance of data conversion and communications system architectures. Turbolinear™ technology significantly improves overall system design and, through reduced component count and more efficient operation, lowers cost and power consumption to achieve a generation leap in system performance.

## **Linearized Analog-to-Digital Converter Modules – Technical Details**

The first products from Optichron include two “linearized” ADC modules (Part numbers: OM1400A-105; OM1400T-125), each powered by Turbolinear™ technology and available in a small form-factor BGA hybrid package. Each module features three main components including Optichron's “Linearizer” chip, the industry's first integrated circuit to embody Turbolinear™ technology and the primary differentiating component in Optichron's ADC module product family. The other two components are a buffer amplifier and a high-performance analog-to-digital converter. Each ADC module offers 14-bit resolution and a sampling rate of either 105 or 125 Mega Samples per Second (MSPS). Of particular importance in both modules is the unparalleled improvement in Spurious Free Dynamic Range (SFDR) — up to 25 decibels (dB) over ADCs that are not powered by Turbolinear™ technology.

The OM1400A-105 ADC module, incorporating Optichron's Linearizer, an AD6645 ADC and an AD8351 amplifier, has a Signal-to-Noise Ratio (SNR) of 70 dB with a frequency input ( $f_{IN}$ ) of 150 Megahertz (MHz) and a Spurious Free Dynamic Range (SFDR) of 90 dB with a frequency input ( $f_{IN}$ ) of 150 MHz.

The OM1400T-125 ADC module, incorporating Optichron's Linearizer, an ADS5500 ADC and an AH22S amplifier, has an SNR of 70 dB with a frequency input ( $f_{IN}$ ) of 150 MHz and an SFDR of 90 dB with a frequency input ( $f_{IN}$ ) of 150 MHz.

*Page 3: Optichron's Breakthrough Turbolinear™ Signal Processing Technology Reduces Nonlinear Distortion by More Than 90% in Analog-to-Digital Converters*

*"The key component in Optichron's modules, the Linearizer, powered by Turbolinear™ technology, removes nonlinear distortion present in the ADC as well as the amplifier," said Suresh Ram, director of Product Marketing for Optichron. "As a result, these modules offer engineers flexibility in design and enable advanced architectures with unprecedented improvements in linearity, performance, system efficiency and cost."*

**Availability**

The OM1400A-105 is currently available in samples. Volume production is expected in Q4 2005. The OM1400T-125 will be available in samples in Q3 2005 with volume production expected in Q1 2006.

***Industry Analysts Comment on Turbolinear™ Technology***

*Morry Marshall, Vice President-Strategic Technologies, Semico Research*

Designers have struggled for years to reduce nonlinear distortion, often with limited success. Optichron's Turbolinear™ technology is an ingenious solution to this problem, a landmark achievement that can transform signal processing. The improvement in Signal-to-Noise Ratio that the technology provides offers a significant performance boost and cost savings in many applications.

*Allen Noguee, Principal Analyst-Wireless Technology, In-Stat*

Wireless communications base stations have always experienced impeded performance due to nonlinear distortion. Optichron's Turbolinear™ technology has the capacity to greatly improve Spurious Free Dynamic Range (SFDR) and, therefore, takes a huge step towards eliminating the boundaries in mixed-signal processing that have historically prevented the achievement of higher resolution and improved data conversion.

*Will Strauss, President and Principal Analyst, Forward Concepts*

Signal processing has classic limitations due to its inability to accurately and efficiently address the distortion caused by system nonlinearities. Turbolinear™ technology, with its ability to effectively model and remove nonlinear distortion, holds promise as a much-needed solution to a ubiquitous problem, especially valuable within the high-performance data conversion space.

**About Optichron**

Optichron is a fabless semiconductor company that leverages its proprietary Turbolinear™ signal processing technology to develop high-performance precision integrated circuits that target data conversion for communications and other signal processing applications. Turbolinear™ technology, the foundation for all Optichron products, uses advanced nonlinear signal processing techniques in order to restore signal integrity in mixed-signal environments previously degraded by nonlinear distortion. The company was founded in January 2003 by CEO Roy Batruni and closed Series A funding in June 2003, followed by \$17 million of Series B funding in March 2005, from four venture capital firms: US Venture Partners, TL Ventures, Venture Tech Alliance, and Battery Ventures.

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