

# Hirose and eTopus Technology Develop Combined PCIe Gen6 64Gbps PAM4 Interconnect Solution for AI Training Applications

*Complete bench setup using Hirose mezzanine/card edge connectors and eTopus SerDes IP will be demonstrated at DesignCon in San Jose*

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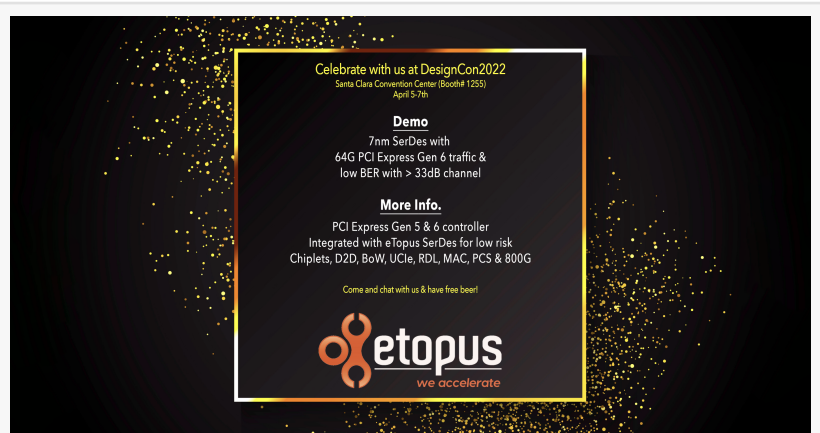
/EINPresswire.com/ -- Hirose Electric Co., Ltd., a global leader in [connector technology](#), its design, and manufacturing, and eTopus Technology, a pioneer of ultra-high-speed ADC/DSP-based [SerDes](#) for wireline applications including data

center, cloud, edge, and 5G base stations, today announced the development of a 64Gps PCIe Gen6 interconnect technology built on their products. This combined solution is ideally suited for linking graphics processing units (GPUs) into a fully connected mesh for artificial intelligence (AI) and machine learning (ML) applications. The interconnects use 64Gbps four-level pulse amplitude modulation (PAM4) technology to pack the maximum possible bandwidth into each communication channel.

“

We were pleased to collaborate with eTopus ... our latest connector technology can reliably communicate using advanced SerDes technology. This combination will be valuable to many of our customers.”

*Mr. Tsutomu Matsuo*



Hirose Connector & eTopus SerDes IP Demo at DesignCon 2022

The bench setup demonstrating this solution features the eTopus 64Gbps PAM4 PCIe Gen 6 [ePHY™](#) SerDes IP evaluation board (EVB) with transmit (TX) and receive (RX) pairs connecting to Hirose’s IT9 or IT12 connector paddle cards via Huber+Suhner connectors and cables, mimicking the full data path of a networking system. Four channels are connected with the worst-case crosstalk configuration using three near-end crosstalk (NEXT) aggressors most

adjacent to the victim pins in the connector. Pseudo-random bit stream (PRBS) data traffic is generated at the TX and FIR (finite impulse response) conditioned signals are then sent through Hirose's interconnect system (with additional insertion loss from the eTopus breakout board). At the EVB RX, analog to digital converters (ADCs) digitize the incoming bit stream, fully adaptive digital signal processing (DSP) equalizes the signal levels, and finally the clock and data recovery (CDR) realizes the data stream. PRBS errors are registered in the error counter and error statistics is used for pre-FEC (forward error correction) and post-FEC bit error rate (BER) analysis.

Hirose is a major supplier to Tier-1 network, system, and cloud providers. Its products include connectors and connectivity solutions for a wide range of applications. The project with eTopus uses a formally-released next-generation connector (IT9 or IT12) to leverage state-of-the-art technology. To meet a wide range of different system design requirements, Hirose's IT9 and IT12 interface connectors offer both a R/A or cardedge interface, which allows module/daughter card system design to optimize its mechanical and airflow/thermal designs.

eTopus is a provider of serializer/deserializer (SerDes) IP for high-speed communications applications. The eTopus high-speed transceiver architecture substantially enhances system BER performance and CDR robustness while reducing system cost and power consumption for networking, storage, and 5G applications. Their industry-leading technology provides excellent BER for long-reach applications, excellent post-FEC with minimal decision feedback equalizer (DFE) error propagation for medium to long reach with crosstalk, and low-latency FEC, suitable for AI types of interconnects.

Combining eTopus' 64Gbps PCIe Gen6 ePHY advanced SerDes architecture with Hirose's interconnects, the channel impairments induced correlated errors are minimized without observable bursty symbol errors. This characteristic is critical for the forward error correction (FEC) decoder to correctly recover any erroneous codeword and to reduce the frame loss rate even with FLIT cheme of PCIe Gen 6 to maintain data integrity at 64Gbps operation.

"We were pleased to collaborate with eTopus on this project," said Mr. Tsutomu Matsuo, General Manager of Hirose's High-Speed Interconnect Division. "We were able to demonstrate that our



eTopus - we accelerate



Hirose Electric Co., Ltd.

latest connector technology can reliably communicate using advanced SerDes technology. This combination will be valuable to many of our customers.”

“When developing high-speed IP solutions, it is important to test them in a real-world environment,” said Harry Chan, founder & CEO of eTopus. “The Hirose connector allowed us to build a bench setup using our IP in a fully connected mesh. We appreciate their support on this project.” The bench configuration built using the combined interconnect solution will be demonstrated at DesignCon in Santa Clara Convention Center on April 5-7th. The demonstration showcases its revolutionary ePHY SerDes IP.

About Hirose Electric Co., Ltd.

Hirose is a global leader in the design and manufacturing of connectors with a wide customer base spanning consumer electronics, industrial equipment, automotive, high-speed networking and storage industries. Hirose specializes in a variety of connector solutions: RF coaxial, board-to-board, board-to-FPC, high speed, power, and automotive to name a few.

Since the inception of Hirose in 1937, the company has developed and introduced thousands of new connectors for numerous applications. The company continues to broaden the scope of its business activities, keeping pace with market advances and satisfying the changing connector needs of companies in Europe, Asia and North America. Hirose's vigorous international strategy rests on three pillars: strong capital investment, a highly skilled labor force, and close contact with the product development divisions of client manufacturers throughout the world.

With the technical knowledge gained from this contact and backed by the company's own human and financial resources, Hirose is dedicated to meeting connector demand world-wide and to contribute meaningfully to progress in connector technology.

For more information, please visit [www.hirose.com](http://www.hirose.com).

About eTopus Technology Inc.

eTopus is an innovator and technology leader in high-performance, DSP-based, mixed-signal, ultra-high-speed semiconductor interconnect solutions. Our ultra-high-speed SerDes IP is adopted by global Tier-1 players to be used in networking, storage, 5G, and AI applications.

eTopus is a VC-backed startup headquartered in the center of Silicon Valley where our innovations and advanced architectures are developed. Multiple locations are set up globally in USA, Europe and Greater China to provide sales, design and customer support. Our investors include SK Telecom, HK-X, corporate VCs, and cross-border funds. For more information, please visit [www.eTopus.com](http://www.eTopus.com)

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