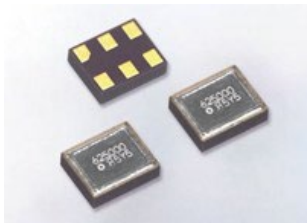


PRESS RELEASE

Shattering the Noise Barrier for AI Data Centers: River Eletec Unveils World-Class 12fs Ultra-Low Jitter Oscillator for 1.6T Optical Transceivers

Patented "KoT Cut®" technology achieves 625 MHz fundamental oscillation without PLLs, defining a new standard for signal purity in next-gen optical interconnects.



NIRASAKI, JAPAN – December 11, 2025— RIVER ELETEC CORPORATION (TSE: 6666), a pioneer in advanced crystal device technology, today announced the launch of the **KCRO-05**, a strategic ultra-low phase noise crystal oscillator designed specifically for the rigorous demands of AI servers and 1.6T optical transceivers.

KCRO-05 (2.5 mm×2.0 mm×0.85 mm Max.)

The Critical Bottleneck in AI Infrastructure As Generative AI (e.g., ChatGPT) drives an explosive increase in data center traffic, the industry is racing to deploy 800G and 1.6T (OSFP-XD) optical interconnects. However, as speeds increase, signal integrity becomes the critical bottleneck. Traditional timing solutions, often reliant on PLL (Phase Locked Loop) circuitry to multiply frequencies, introduce phase noise and jitter that can lead to fatal bit errors in these hyper-scale environments.

The "KoT Cut®" Breakthrough: Pure Fundamental Frequency The KCRO-05 solves this challenge by leveraging River Eletec's patented KoT Cut® and OPAW®*1 technology. Unlike conventional oscillators that use PLLs to synthesize high frequencies, the KCRO-05 achieves a **direct fundamental oscillation at 625 MHz**.

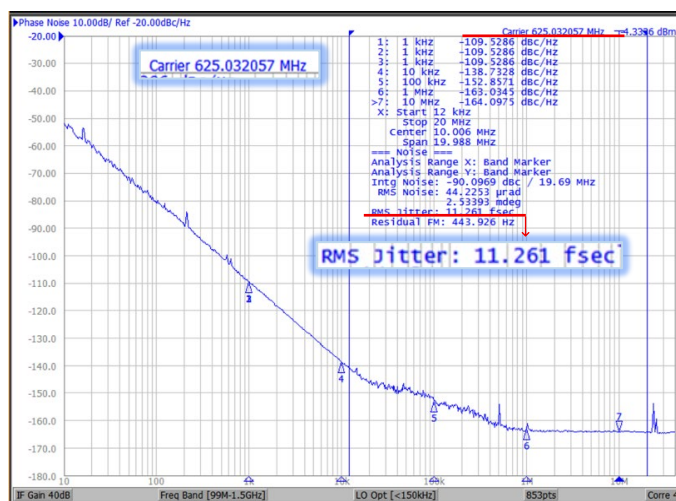


By eliminating the PLL and multiplier circuits, the KCRO-05 removes the primary sources of noise, achieving a groundbreaking typical phase jitter of just **12 femtoseconds (fs*2)**. This level of signal purity allows optical transceiver manufacturers to maximize throughput and minimize Bit Error Rates (BER) in next-generation networks.

Optical transceiver connected to AI server (image)

Key Technical Highlights

- **World-Class Low Jitter:**
 - Delivers Typ. 12fs / Max. 20fs (12kHz to 20MHz offset @ 625MHz), enabling the performance required for 1.6T (OSFP-XD^{*3}) and 800G (QSFP-DD800) standards.
- **PLL-Free Architecture:**
 - Utilizes proprietary KoT Cut[®] (Kerfed Orthogonal Plate Waves for Zero Temperature Coefficient) technology to generate high frequencies fundamentally, ensuring a lower noise floor compared to MEMS or PLL^{*4}-based alternatives.
- **High-Density Compact Design:**
 - Housed in a 2520 package, reducing the footprint by approximately 40% compared to standard 3225 units to support high-density optical modules.



Jitter and phase noise performance
(LVDS, 12 kHz to 20 MHz, @625 MHz)

Executive Commentary "The transition to AI-driven infrastructure requires a fundamental rethink of timing devices," said Yoshihisa Hagihara, President of RIVER. "With the KCRO-05, we are not just improving specs; we are removing the noise barrier entirely. Our KoT technology provides the clean heartbeat that next-generation AI data centers need to operate at full capacity."

The KCRO-05 is currently sampling to key strategic partners in the optical transceiver market. Mass production is

scheduled to commence in 2026, with production capacity aggressively scaling to meet the forecasted demand of 20 million units/year for the optical transceiver market by 2028^{*5}.

About River Eletec RIVER ELETEC CORPORATION is a leading manufacturer of crystal devices, dedicated to "Connecting to the Future" through innovative timing solutions. Headquartered in Yamanashi, Japan, the company specializes in high-stability, high-frequency crystal oscillators for the computing, communication, and industrial sectors.

For more details and sample requests, visit the RIVER website (<https://www.river-ele.co.jp/ev/>) or contact our sales department. RIVER continues to pioneer unseen technologies, delivering cutting-edge solutions and contributing to industry advancement.

Standard Specifications

Item	Specifications	Conditions / Remarks
Nominal frequency	625 MHz	Supports up to 1 GHz
Operating temperature	-55~105 °C	Frequency tolerance options customized upon request.
Frequency tolerance	±50 ppm	
Output waveform	LVDS, LVPECL	
Supply voltage	3.3 V, 2.5 V, 1.8 V (LVDS)	
Current consumption	40 mA Max (LVDS) 80 mA Max (LVPECL)	
Phase jitter	12 fs Typ. 20 fs Max.	12 kHz to 20 MHz offset @625 MHz, LVPECL

*¹ Oscillation technology that utilizes a new crystal vibration mode that our company has independently developed and holds worldwide patents. Achieves high frequency and highly stable characteristics.

KoT Cut[®] : Kerfed orthogonal plate waves for zero Temperature coefficient (Trademark Registration No. 6489253)

OPAW[®] : Orthogonal Plate Acoustic Waves (Trademark Registration No. 6489254)

*² fs (femtosecond): 1/1000 trillionth of a second. A unit that expresses jitter (temporal fluctuation of a signal); the smaller the value, the better the performance.

*³ OSFP-XD: Standard name for next-generation ultra-high-speed optical transceivers (communication modules) used in AI data centers, etc. In order to support extremely high-speed communications of 1.6Tbps, the electronic components installed must have the highest level of performance and miniaturization.

*⁴ PLL: An electronic circuit that artificially creates a specific frequency according to the input signal. Although high frequencies can be produced inexpensively, there is a problem in that signal fluctuations (noise) are likely to occur during the circuit processing process. KoT cut crystal products are PLL-less, so noise is extremely low.

*⁵ Based on our estimates.

Global Sales Offices

Region/Country	Company	Address	Tel	Fax
United States Europe Canada Latin America Middle East Oceania	River Electronics (Singapore) Pte. Ltd.	49 Jalan Pemimpin #04-03 Aps Industrial Building Singapore 577203	65-6258-7874	
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Taiwan	Taiwan River Co., Ltd.	3F, NO.14 LANE128, SEC.1, JUNG SHING RD. WU-GU DIST. NEW TAIPEI CITY TAIWAN R.O.C.	886-2-8988-2811	886-2-2983-4785
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	RIVER ELETEC CORPORATION (Osaka)	Moriguchi-Fuji Bldg. 3F 1-3-2 Keihan-Hondoori Moriguchi-Shi Osaka 570-0083, Japan	81-6-6998-4888	81-6-6998-4899
Web	https://www.river-ele.co.jp/ev/ https://www.river-ele.co.jp/ja/products-post/kcro-05/kcro-05.jpg (Download pictures)			

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