

Quantum eMotion Makes Major Advances in Creating Its First-Generation Quantum Random Number Generator Microchip

written by Raj Shah | February 21, 2024

February 21, 2024 ([Source](#)) – Quantum eMotion Corp. (TSXV: QNC) (OTCQB: QNCCF) (“QeM” or the “Company”), proudly announces significant progress in the creation of its inaugural Quantum Random Number Generator (QRNG) on a chip, marking a pivotal advancement in quantum communication technology. This achievement represents a significant step forward in the field, aiming to compactly integrate QRNG technology into a single, streamlined package, thereby transforming the design and application of quantum-based security elements.

QeM’s research and development team has explored two promising solutions to achieve this ambitious objective:

- First, by incorporating crucial components such as tunnel junctions, amplifiers, Analog-to-Digital Converters (ADC), and Digital Signal Processing (DSP) units into a microchip through the use of a standard Complementary Metal-Oxide-Semiconductor (CMOS) process.
- Secondly, by creating a System-in-Package (SIP) solution that merges tunnel junctions with a CMOS die, encompassing all necessary functionalities in a cohesive integrated package.

These approaches are poised to culminate in the production of integrated circuits that encompass a complete QRNG within an area of less than 1 cm². Moreover, the first solution offers the potential to sell design cores, enabling integrated circuit (IC) vendors such as TI, Intel, and IBM to incorporate QRNG functionality directly into their products, thereby broadening the applicability and accessibility of quantum-based security technologies.

Francis Bellido, CEO of QeM, praised the initial prototype designed by Ecole Technologies Supérieure (ETS) in Montreal, in partnership with CMC and manufactured by Taiwan Semiconductor Manufacturing Company (TSMC). Delivered at the end of 2023 and tested at ETS, the prototype demonstrated excellent performance in critical functions. Despite the need for some adjustments and enhancements to refine the design, the team expects to be ready for the next production cycle, aiming to deliver a functional QRNG IC by fall 2024.

The integration of QRNG technology into a miniaturized chip opens up possibilities for embedding quantum-enhanced security features directly into medical devices, consumer electronics, IoT devices, and other digital systems, further broadening the applications and impact of quantum-based security technologies.

The market for QRNG technologies has seen significant growth and is projected to continue expanding. In 2022, the QRNG market was valued at approximately 50 million U.S. dollars. A forecast by IQT Research predicts that this market could rise to 4 billion U.S. dollars by 2030. This growth reflects the increasing demand for secure communication technologies and the expected adoption of quantum computing and cryptography technologies across various industries.

About QeM

The Company's mission is to address the growing demand for affordable hardware and software security for connected devices. QeM has become a pioneering force in classical and quantum cybersecurity solutions thanks to its patented Quantum Random Number Generator, a security solution that exploits the built-in unpredictability of quantum mechanics and promises to provide enhanced protection for high-value assets and critical systems.

The Company intends to target highly valued Financial Services, Healthcare, Blockchain Applications, Cloud-Based IT Security Infrastructure, Classified Government Networks and Communication Systems, Secure Device Keying (IOT, Automotive, Consumer Electronics) and Quantum Cryptography.

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