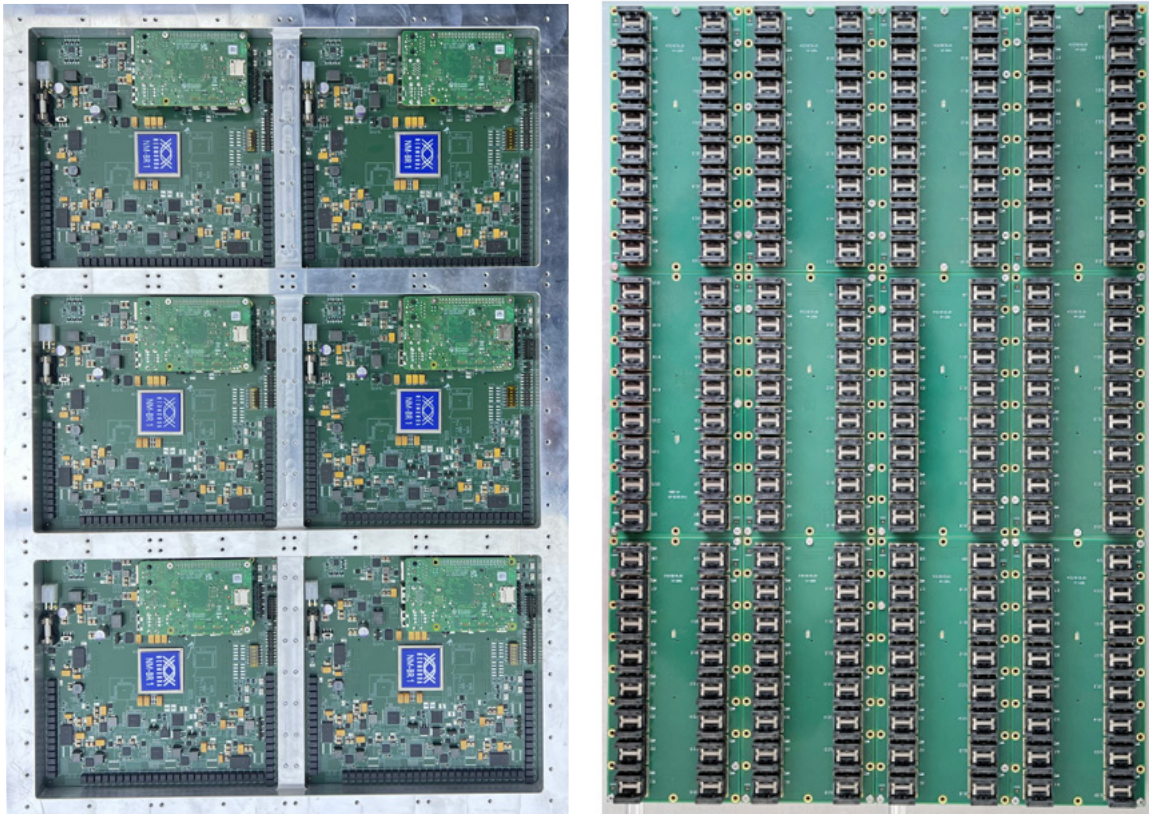# DRAM TESTING

NEUMONDA'S REVOLUTIONARY APPROACH

Neumonda Technology is the IP and innovation arm of the NEUMONDA Group, which aims to combine the most comprehensive memory application expertise under one roof. It was founded in 2021 by former Qimonda employees that hold several patents in DRAM memory and testing, with the aim to provide memory and storage solutions to worldwide customers, especially targeting the industrial and specialty market segments.

Qualification and testing of semiconductor components is one of the most expensive and complicated parts in the manufacturing of memory ICs. Due to the size, complexity and costs of the equipment, only few companies can afford to implement test capabilities. And those who do, need to test high volumes to recoup the investment, which means that test times need to be short and smaller volume customer requirements cannot be served.

NEUMONDA Technology addresses this pain point with its revolutionary DRAM Rhinoe tester that combines the sturdiness of rugged industrial applications with German engineering know-how. The Rhinoe DRAM Tester from Neumonda has won an Elektra Award in the category Test Product of the Year 2023.

NEUMONDA's Revolutionary Approach to DRAM Testing

The Neumonda Rhinoe DRAM Tester is a proprietary semiconductor memory test equipment system designed to perform industry-standard DRAM burn-in test, as well as complete memory cell array test at full application speed where Rhinoe will drastically reduce the efforts of DRAM testing.

With its versatile state-of-the-art Rhinoe Controller Chipset, hardware and software capabilities, Rhinoe can test a variety of memory solutions such as DDR3, DDR4, DDR5 and LPDDR4 / LPDDR4x, LPDDR5 /LPDDR5x components as well as DDR3, DDR4 and DDR5 modules. These configurations are all tested with JEDEC standard electrical AC and DC requirements using our proprietary Rhinoe Controller Chipset. The tester can sort out defective as well as weak DRAM memory devices with accurate fault coverage as effectively as any traditional tester that is commonly used in most backend factories today. Compared to traditional testers, Rhinoe consumes considerably less power, which directly translates to reduced testing costs, and it is effectively more environmentally friendly.

Product Highlights:

- All-in-one, single board Burn-in, Array and Speed Tester, which supports max. **192ea** DRAM ICs or **12** DIMM modules

- Compact footprint, lightweight, low power, and easy for manual or automated environments

- Support commercial and industrial grade Temperature (-40C to 95C) and low voltage (1.35+/- 10% V) corner testing capabilities

- Support DDR3 DRAM x4, x8, x16 IC components with different package sizes, along with standard JEDEC DIMM memory modules

- DDR3 testing capability of up to 1866Mbps

- Programmable Timing Parameters: (tCKE, tFAW, tMRD, tRAS, tRCD, tREFI, tRFC, tRP, tRRD, tRTP, tWR, tWTR, tXPR, tZQCS, tZQINIT, CAS latency, CAS Write latency, and burst length)

- Jitter and noise injection for stability function check

- Support error injection to None ECC DIMM configuration for functionality check, and to ensure DDR module accuracy and reliability

- Variant Voltage setting for DC / Margin Testing and Shmoo Plotting

- Variant Test Mode and customized test pattern

- Linear, Bank Jump, Row Hammer, Butterfly, March, and other industries well known DRAM memory test patterns or custom test pattern via Rhinoe GUI

- Failure analysis tools help reveal Bit Failure Mapping, locating defective Device location, failure DQ, Address, etc.

- Error result data logging system for data analysis and trackability

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