

The background of the slide shows a row of large, white industrial test chambers or environmental test equipment. Each unit has a control panel with a digital display, buttons, and indicator lights. The AEHR logo is visible on the top of each unit. The central unit has its door open, revealing internal components. The overall setting appears to be a laboratory or manufacturing facility.

AEHR **TEST SYSTEMS**

**Setting the Test Standard for
Tomorrow**

October 2024

Nasdaq: AEHR

Forward Looking Statements

This presentation contains forward-looking statements that involve risks and uncertainties relating to projections regarding industry growth and customer demand for the Company's products. Actual results may vary from projected results. These risks and uncertainties include without limitation, acceptance by new customers of the FOX™ wafer level burn-in and test system, world economic conditions, the Company's ability to maintain sufficient cash to support operations, and the potential emergence of alternative technologies, which could adversely affect demand for the Company's products in fiscal year 2025. See the Company's recent 10-K and 10-Q reports filed with the SEC for a more detailed description of the risks facing the Company's business. The Company disclaims any obligation to update information contained in any forward-looking statement to reflect events or circumstances occurring after the date of this presentation.

Presenting Today



Gayn Erickson
CEO, Aehr Test Systems

Aehr Test Systems Company Overview

Semiconductor Test & Burn-in for over 45 Years!

- World-wide leader in wafer-level test and burn-in systems
- Unique full-wafer test and burn-in systems and contactors
- Technology leader in massively parallel and high-power test and burn-in systems



High Power Multi-Wafer
Test & Burn-In System

SONOMA



High Power
Test & Burn-In System



Single Wafer Stepping
Test & Burn-In System

TAH-E



Medium Power
Test & Burn-In System

AEHR
TEST SYSTEMS

Worldwide Customer Base

Aehr Test Headquarters,
Fremont California



**Aehr has been a leader in burn-in test solutions for over 45 years
with thousands of systems shipped worldwide**



(Partial Customer List)

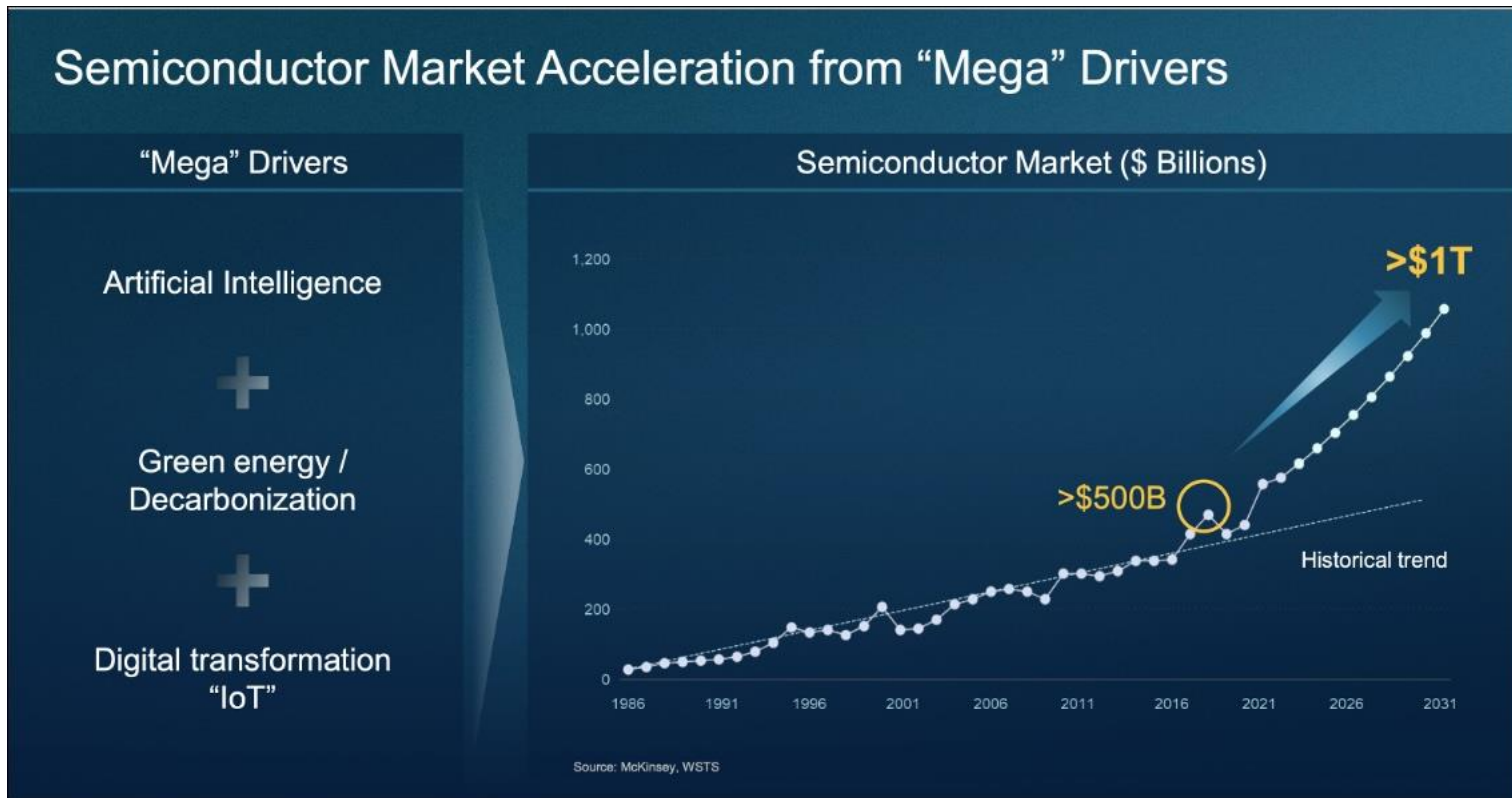
Aehr Test Systems Market Drivers

Need for cost-efficient wafer level, singulated die, and packaged part burn-in, stabilization, & testing are creating significant revenue opportunities for Aehr Test in the following key markets

- **Artificial Intelligence Processors and Processing Infrastructure** driving explosive spend in data center processing, edge processors, communication infrastructure, and power conversion infrastructure drives AI processors, memory, data storage, Silicon Photonics I/O, and power conversion semiconductors like Silicon Carbide & Gallium Nitride
- **Electric Vehicle & Electrification of Transportation Infrastructure** driving motor control, charging infrastructure, and power conversion using Silicon Carbide & Gallium Nitride semiconductors
- **Electrification of the World's Power Infrastructure and Shift to Clean Energy** driving efficient and economical electrical power conversion using Silicon Carbide & Gallium Nitride semiconductors
- **Data Center Infrastructure and unstoppable growth in Data Storage** driving Silicon Photonics, Flash Memory Solid State Data Storage, and new Photonics Assisted Hard Disk Drive Storage
- **Worldwide 5G Infrastructure** build out using Silicon Photonics fiber optic transceivers and new Optical Network Switches
- **Heterogeneous Integration of semiconductors and 3D fabrication and stacking** driving technology and cost roadmaps pushing known good die with test and burn-in of device in wafer form prior to packaging



Aehr Market Growth Drivers



Aehr Test Systems Market Growth Drivers

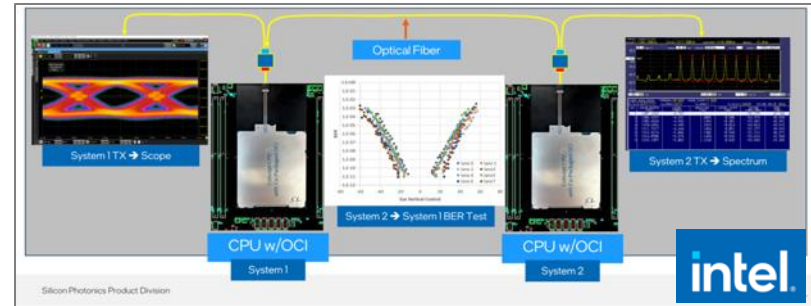
- **Reliability test needs to grow with or ahead of the market as**
 - Semiconductors are getting less reliable
 - ✓ Larger die size and therefore more likely to have defects
 - ✓ Smaller geometries
 - ✓ More compound semis (SiC and GaN for power, and optical for communication)
 - Semiconductors going into more applications where quality, long term reliability, safety, and security are critical
 - ✓ Autos / EVs (reliability more financially impactful, out of warranty recalls, processing, communication, ADAS, autonomous driving, power train, BMS, charging)
 - ✓ Electrification of WW infrastructure (charging, power storage, power transmission and conversion, efficiency in data centers, industrial)
 - ✓ Semi content increasing in value in non consumer applications (AI, data center, Autos/EVs)
- **Semiconductors packaged as modules, Heterogeneous Integration, packages optics due to more than Moore, Huang's Law**
 - Data and power density, drives greater spend in package test and burn-in, reliability qualification and wafer and die level test and burn in



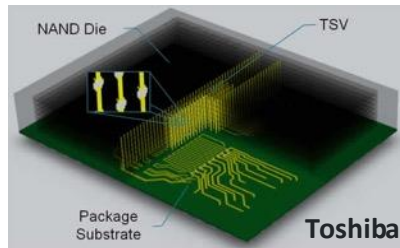
Multi-Die Packages Drive Wafer Level Test & Burn-in



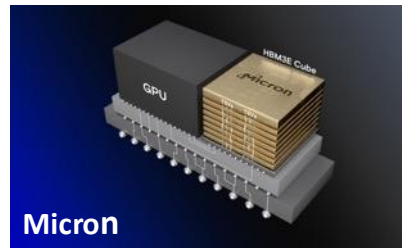
**EV Traction Inverters
(24-die module for Power)**



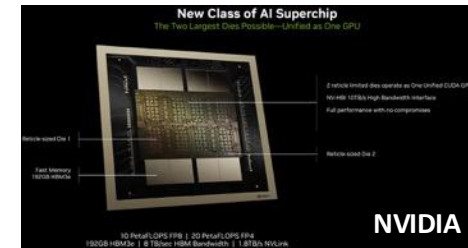
Intel Co-Packaged Optics Demo at OFC 2024



**16-die NAND flash memory
for Enterprise Data Storage**



**HBM3E 8 Die DRAM Stack
for AI and Supercomputing**



Blackwell AI MCM announced at GTC 2024

Key Trends Driving Wafer Level Burn-in

Decreasing Semiconductor Reliability

- *Smaller Geometries*
- *Larger Die Sizes*
- *Compound Semiconductors*
- *Optical Semiconductors*

Increasing Reliability Needs

- *Electric Vehicles*
- *Automotive Electronics*
- *Electrification Infrastructure*
- *Data Communication & Storage Infrastructure*
- *Mobile Electronics Devices*
- *Artificial Intelligence Processing / Processors*

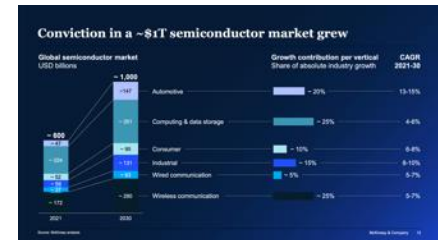
Increasing Known Good Die

- *Heterogeneous Integration (Extends Moore's Law)*
- *Multi-Die Modules (Power Density / Efficiency)*
- *Photonics Integration (Extends Data Rates)*
- *Stacked Die Packaging (Density and Cost)*

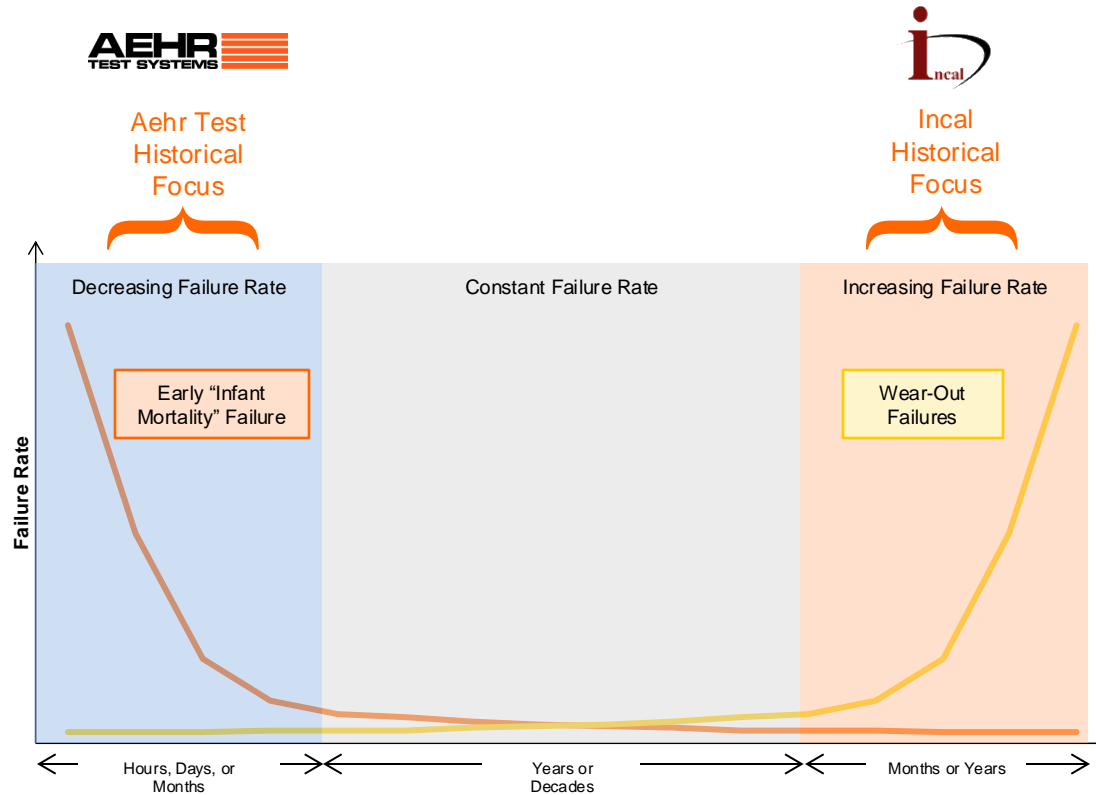
Aehr Test Systems Strategic Focus

Semiconductor Production Test, Reliability Burn-in and Screening

- **FY24 TAM Focus on Wafer Level Test and Burn-in (WLTBI)**
 - SiC for EV, chargers, storage and power conversion
 - Silicon Photonics semiconductors for optical I/O and data transceivers
- **FY25 TAM Expansion in WLTBI and Package Part Test and Burn-in (PPTBI)**
 - WLTBI of GaN semiconductors for data centers, solar, and automotive
 - WLTBI of hard disk drive head components for data storage in data centers
 - PPTBI of AI, GPU, and Network processors (Incal Acquisition)
 - WLTBI of AI processors
- **FY25 Development Activities for Future TAM Expansion**
 - WLTBI of NAND Memories
 - WLTBI of DRAM Memories

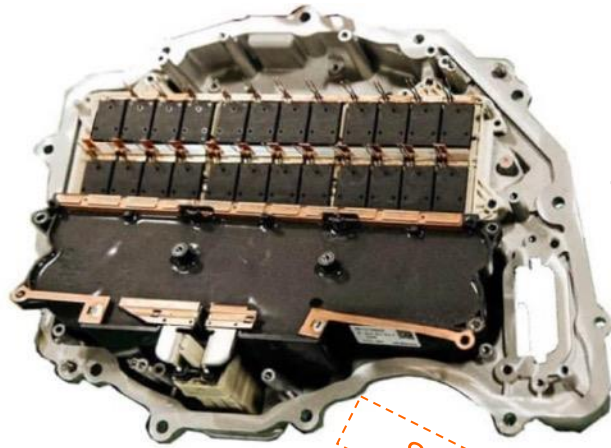


Burn-in Testing – The Bathtub Curve



- Burn-in: A functional test in which electronic components are subject to elevated voltages and/or temperatures for a duration of time (2 – 48 hours) to screen for reliability and early failure
- Burning-in components exposes them to a high-stress level and screens out "Infant Mortality" failure in electronic components prior to the components making it into a module

SiC and Multi-Die Packages / Modules



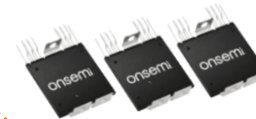
Tesla Traction Inverter
with 24 2-die modules



Lucid Traction Inverter
with 3 10-die modules

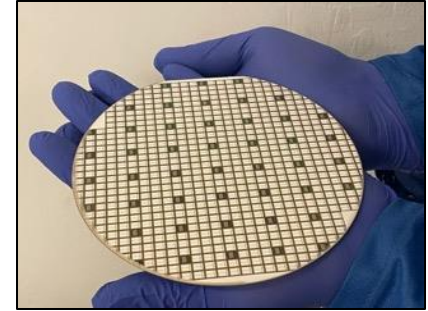


Onsemi Traction Inverter
with 1 24-die module



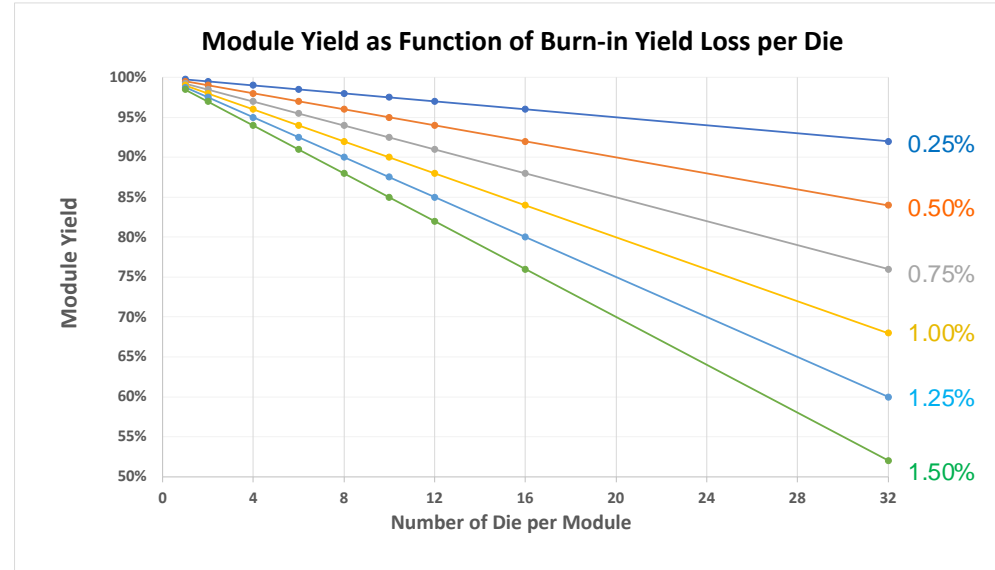
Onsemi Traction Inverter
with 3 8-die modules

Package/Module yield loss
cost much greater than cost
of wafer level burn-in



Silicon Carbide 3-Phase EV Traction Inverter Integration

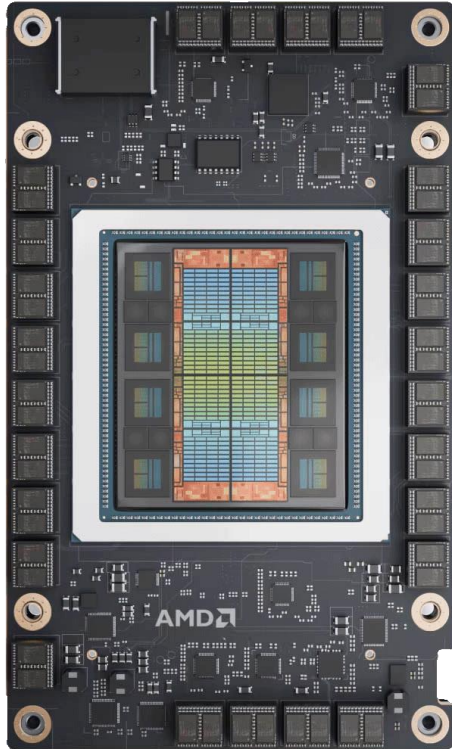
SiC and Multi-Die Packages / Modules



- Infant Mortality Yield loss of Modules linear with yield loss per die times number of die per module
- Cost of yield loss much greater than cost of burn-in test
- This is why the industry is driving to Wafer Level Burn-in

AI Accelerator Example of Multi-Chip Packaging

AMD Instinct™ MI325X Accelerator



- Multiple Compute Chiplets
- 8 12-Die HBM3 DRAM Stacks
- Single OAM Substrate
- Roadmap for new Chiplet Architecture Accelerators each year from 2023 to 2026
- 8 MI325X Cluster:



Higher Reliability Needed in AI Processing?

Meta article from July 2024: *The Llama 3 Herd Models*:

Component	Category	Interruption Count	% of Interruptions
Faulty GPU	GPU	148	30.1%
GPU HBM3 Memory	GPU	72	17.2%
Software Bug	Dependency	54	12.9%
Network Switch/Cable	Network	35	8.4%
Host Maintenance	Unplanned Maintenance	32	7.6%
GPU SRAM Memory	GPU	19	4.5%
GPU System Processor	GPU	17	4.1%
NIC	Host	7	1.7%
NCCL Watchdog Timeouts	Unknown	7	1.7%
Silent Data Corruption	GPU	6	1.4%
GPU Thermal Interface + Sensor	GPU	6	1.4%
SSD	Host	3	0.7%
Power Supply	Host	3	0.7%
Server Chassis	Host	2	0.5%
IO Expansion Board	Host	2	0.5%
Dependency	Dependency	2	0.5%
CPU	Host	2	0.5%
System Memory	Host	2	0.5%

Table 5 Root-cause categorization of unexpected interruptions during a 54-day period of Llama 3 405B pre-training. About 78% of unexpected interruptions were attributed to confirmed or suspected hardware issues.

<https://ai.meta.com/research/publications/the-llama-3-herd-of-models/>

Aehr Wafer Level Test & Burn-in Patents



- WaferPak temperature control methods
- Vacuum & pressure-based WaferPaks
- Maintaining probe contact over temperature
- Electrical components in WaferPak
 - Individual DUT power supplies
 - Per Die Current Protection
 - Redundant power supplies
- Portable WaferPaks
- And more . . .

Proprietary Wafer Level Enabling Technology

- Aehr's FOX-XP is capable of both functional burn-in and test solutions – leverages proprietary aligner and contactor technology
- Multi-wafer technology enables customers to achieve an overall decrease in test equipment cost and fab footprint – while increasing die yield and throughput

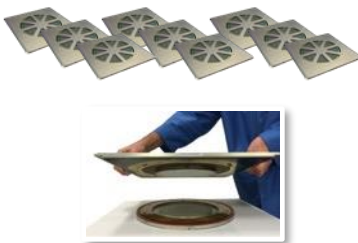
MULTI-WAFER TESTER



*FOX-XP Multi-Wafer
Test System*

- May be configured with up to 18 Blades, enabling 18 wafers to be tested in parallel – driving cost efficiency and throughput
- High performance thermal chucks allow uniform temperature control of the wafers
- Footprint similar to single wafer automated test equipment – reducing lab test space

CONTACTOR



FOX-XP WaferPaks

- Houses the wafer and distributes signals and power to the wafer itself
- The WaferPak contactor is capable of over 50,000 contacts in a single touchdown on up to 300mm wafers
- Consumable input into the test system driving recurring revenue from the installed base

ALIGNER



*FOX WaferPak
Aligner*

- Integral piece of test cell as it loads the wafer in the WaferPak at immense levels of precision
- By perfectly setting the wafer in a cartridge it ensures perfect contact
- Performs wafer alignment “offline” which eliminates the need for one wafer prober per wafer during long burn-in and test times

FOX-XP Multi-Wafer Production Test & Burn-In System



**FOX-XP 18 Wafer Test & Burn-In System
configured for SiC Production**

- **9 / 18 Wafer System for High Volume Production**
 - Configurable for high power test for AI and Optical I/O
 - Configurable for Gate, Drain, and Body Diode Stress tests
 - Integrated standard 20°C to 150°C thermal control unit
- **FOX WaferPak Contactors**
 - Robust full wafer contactor with >> 100,000 cycle life
 - Very high compliance / robust micro pogo pins
 - Offline or online wafer alignment via Aehr proprietary WaferPak aligners

Aehr's New Fully Automated WaferPak Aligner

- Available in stand-alone as well as fully integrated with FOX-XP System configurations
- Provides customers fully hands-free operation up to lights out SECS/GEM factory automation and integration
- Both stand-alone and integrated configurations have now shipped to customers and are released into production
- Support for 100mm to 300mm Wafers
- Expands Aehr markets & opportunities



FOX-XP with Integrated WaferPak Aligner
(Shown with 150mm/200mm Wafer Cassettes)

Sonoma High Power Reliability Test of AI xPUs

- High-power test & burn-in for reliability qualification and life-time tests
- Up to 88 processors with independent test resources and high-power liquid cooling per device
- Qualification and Production configurations
- Shipping in volume with multiple systems installed at most test houses today



SONOMA

High Power Test &
Burn-in System

AEHR
TEST SYSTEMS

Testing without Compromise

Reliability, Stress, and DFT Testing without compromise

- Solutions for **package parts, modules, panels, or wafers** allow testing at optimal process point
- **Confirm** which devices received desired test with **per device measurements, monitoring, & feedback**
- **100% traceability** with die location (wafer) or device ID read back (module) and electronic tracking ensures knowledge of “good” devices
- Thermal range, uniformity, and capacity permit **reduced test times & confidence** in target **test conditions**
- Vast system resources allow for minimal sharing (**higher sample size, higher yields, fewer hostage failures**)
- **Economical solutions and customizations** allow required testing to be performed at the **lowest cost**

AI Accelerator/Processor WLTBI Opportunity

- Aehr working with an AI Accelerator company to move their AI processor system level test and burn-in to wafer level
- Our proprietary WaferPaks and new high-power FOX-XP system allow delivery of precise voltages at extremely high currents up to thousands of amperes
- Our proprietary WaferPaks and new high-power FOX-XP system thermally control thousands of watts of power per wafer while also delivering signals required to determine functionality of good and bad devices.
- There are significant benefits of production test and burn-in of their AI accelerators while still in wafer form before they are integrated into the end application product, which would prove to be more cost effective and significantly more scalable than doing this screening later in their manufacturing process.



FOXXP

**High Power Multi-Wafer
Test & Burn-In System**
(Shown with Integrated
WaferPak Aligner)

Flash Memory WLTBI Opportunity

- Aehr has been engaged with multiple Flash memory companies related to our FOX wafer level test and burn in systems for their high-volume production
- Aehr has now secured a commitment from one of the major Flash memory suppliers to evaluate the FOX-XP system with our proprietary WaferPak full wafer contactors for their flash devices
- This application is for 100% test and burn-in of devices to be used in mission critical applications such as enterprise storage
- We see this as a multi-year program but expect to have preliminary results and feedback during our FY25 which ends May 30, 2025
- We see the NAND Flash market as a key new market opportunity for our systems and WaferPaks with long term potential to also move into DRAM wafer level test and burn-in



FOX-XP

**Multi-Wafer
Test & Burn-In System**
(Shown with Integrated
WaferPak Aligner)

Optical I/O is Coming...

- “It was never about just ... transceivers, it was about the learning curve because we knew that, down the road, optics needed to be co-packaged with Ethernet switches. And it will eventually be integrated with the CPU or XPU as well.” – Robert Blum, Senior Director of New Business and Marketing, Intel, May 2021
- “Intel announces silicon photonics advancement towards optical I/O” – Venturebeat, June ‘22
- “Nvidia and TSMC working on multi-GPU solutions based on silicon photonics, latency data transmissions and significantly reduced signal loss” – notebookcheck.net, September 2022
- “Optical communication is a key area that we think is very, very important for us to reach anything like zettascale type of computing capability.” “AMD is working with DARPA on packaging optics solutions into chips” – Dr. Lisa Su, CEO, AMD March 2023 (HPCwire)
- “Interoperability of AMD Versal adaptive SoCs with the co-packaged Odin® 800G direct-drive optical engine and third party 800G DR8+ retimed pluggable modules” announced – RANOVUS, March 2023
- “Performance metrics in applications like machine learning could ultimately pave the way for high-density integration and optical I/O to connect GPUs.” – Vivek Raghuraman, Director of R&D, Broadcom, March 2023
- “In-package optical I/O technology to accelerate data movement and enable future AI” – Yole Group, April 2023



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