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Hprobe Confirms its Leadership Position and Expands Its Portfolio with a Powerful New Magnetic Instrument for Testing TMR Sensors

Designed to meet the testing needs of next-generation TMR sensors used in automotive electrification, industrial automation, mobile devices, and robotics

Grenoble, France – October 28, 2025 – Hprobe, a Mycronic company and the leader in magnetic test equipment (ATE) for the semiconductor industry, announces the introduction of its new magnetic test instrument dedicated to wafer-level testing of the latest generation of TMR (Tunnel Magnetoresistance) sensors under 3D magnetic field conditions. The H3DM-XLL sets a new benchmark in magnetic field strength and control, delivering unprecedented performance for the development and production of advanced TMR sensors. The growing demand for TMR sensors driven by automotive electrification, industrial automation, mobile devices, and robotics is creating new testing challenges that this system is uniquely positioned to address. Hprobe has already received initial customer orders for this disruptive test capability.

Meeting the Testing Needs of Advanced TMR Sensors
Magnetic sensor ICs have become essential to modern electronics, enabling accurate detection of position, speed, current, and orientation. Among them, TMR sensors stand out for their high sensitivity, low power consumption, and seamless CMOS compatibility. Over the past decade, they have moved from research prototypes to large-scale adoption. Their growing complexity requires precise wafer-level control of 3D magnetic fields in terms of orientation, magnitude, and uniformity, creating new technical and throughput challenges for sensor manufacturers and test equipment suppliers.

As TMR sensor designs evolve toward higher performance and greater sensitivity, they require testing up to magnetic saturation along all spatial directions, a capability that existing wafer-level systems have been unable to provide until now. The H3DM-XLL addresses this need by combining extreme magnetic field capability with precise and quick 3D vector control, ensuring reliable and repeatable characterization across the full operating range of today's advanced TMR devices.

A New Breakthrough for the Industry

"With this new product, Hprobe is making a major breakthrough in magnetic field capabilities for wafer-level testing of magnetic sensors," said Dr. Siamak Salimy, Founder and CTO of Hprobe. *"This development is the result of close collaboration with TMR sensor manufacturers. Several technical challenges have been resolved to tailor this new 3D magnetic generator specifically for the most advanced TMR sensor technologies."*

Unmatched Magnetic Field Performance

As the newest member of Hprobe's 3D magnetic generator family, the H3DM-XLL enables vectorial magnetic field generation above 200 millitesla (mT) in any direction of space, reaching over 500 mT in-plane and more than 250 mT out-of-plane, on a large uniform area. These capabilities make it the only commercial solution providing such high field strength and full 3-axis vector control for wafer-level testing and characterization of magnetic sensors.

Additional key features include:

- High throughput testing with magnetic field sweep rates up to 2 Tesla per second
- Precise field calibration and repeatability for accurate wafer-level characterization
- Compatibility with standard probers and ATEs, enabling easy adoption in existing test lines
- Support for 200 mm and 300 mm wafers for both R&D and production environments

Direct docking with wafer probers and seamless communication with external ATEs through dedicated control commands and trigger signals for synchronous operation. This new system is compatible with both standard and custom ATEs and integrates effortlessly into existing test setups, ensuring smooth deployment in semiconductor environments.

Extending Hprobe's Leadership

The H3DM-XLL extends Hprobe's portfolio of magnetic test heads, following the successful H3DM and H3DM-XL models already used in research, development and production by leading semiconductor manufacturers worldwide. It further reinforces Hprobe's leadership in magnetic testing instruments for wafer-level characterization of MRAM and magnetic sensor devices.

About Hprobe: Founded in March 2017 and headquartered in Grenoble, France, Hprobe is a business line of Mycronic's Global Technologies division. Building on years of advanced research in magnetic testing as a spin-off from SPINTEC—one of the world's leading spintronics research laboratories—the company delivers cutting-edge solutions for the semiconductor industry and is recognized today as the global leader in magnetic test equipment for the semiconductor industry. The company designs, manufactures, and markets automated wafer-level testing solutions for magnetic devices such as MRAM and magnetic sensors, serving major semiconductor foundries, IDMs, and research institutes worldwide. Its patented 3D magnetic field generator technology enables precise and repeatable testing under fully controlled magnetic conditions, covering all magnetic testing needs from R&D to high-volume production. With systems deployed across consumer, industrial, automotive, and communication markets, Hprobe continues to set the standard for precision, throughput, and overall performance in magnetic device testing.

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