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News

Group4 Labs Announces Gallium-Facing Gallium Nitride-on-Diamond Wafer

Group4 Labs, LLC, an extreme materials developer and supplier, announces a Gallium (Ga)-facing version of its recently introduced world's first gallium nitride (GaN)-on-diamond semiconductor wafer. The new wafer product features a single GaN layer that is atomically attached to a synthetic diamond substrate such that it exhibits unprecedented high temperature resilience for very high-power, high-frequency electronic, solid-state white lighting, military and photonics applications. The wafer is part of the company's template wafer family, Xero Wafers™, which was introduced last month; it is initially available in 10mm x 10mm square pieces. This wafer is ideal for

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use in the conventional epitaxial growth of GaN and its aluminum and indium-based alloys.

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Group4 Labs' breakthrough technology enables the GaN layer to be atomically attached to a freestanding, proprietary polycrystalline chemical-vapor-deposited (CVD) diamond substrate (25-microns thick). The GaN surface exposed is an atomically smooth surface finish with a Ga facing surface that is epi-ready for further epitaxial deposition. The wafer is shipped freestanding or optionally on a disposable, silicon wafer mount to permit easy handling during wafer processing.

The GaN-on-Diamond wafer addresses the classic heat problem plaguing the high power and high-speed transistor industry: excessive heat build-up inside the chip's engine that ultimately leads to device failure. The new wafer offers a unique solution by extricating heat from the chip's core almost at the instant that it is generated. This is due to the sub-nanometer proximity of the chip's active region to diamond, a nearly perfect thermal conductor. CVD diamond's thermal conductivity is about 3X to 30X more than that of conventional semiconductors. Just a 3X improvement in the thermal conductivity of a transistor array's substrate could boost the array's power-density by 10X to 100X depending on device configuration. Group4 Labs' scientists have for the first time, successfully attached a compound semiconductor such as GaN to the tough-to-handle diamond.

According to Group4 Labs' CEO, Felix Ejeckam, "This wafer features a Gallium-facing surface rather than the Nitrogen-facing surface which we introduced last month". He continues, "Unlike the optional N-facing version, this new surface resembles the conventional crystallographic structure that many of our customers are accustomed to using."

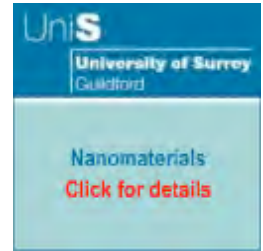
The new 10mm x 10mm GaN-on-Diamond wafers are currently sold for \$550-\$600 per unit (depending on quantity) through the company's online store (www.Group4Labs.com/Products).

Group4 Labs, LLC (Menlo Park, CA) is an extreme materials company founded in April 2003. The privately-held company develops and manufactures unusual semiconductor materials for a wide variety of applications in the advanced electronics and photonics industries.

<http://www.Group4Labs.com>

Posted 5th April 2006

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