

ASX Announcement ([ASX: AXE](#))

7 November 2024

Archer validates miniaturised Biochip gFET design to improve foundry readiness and reduce fabrication cost

Highlights

- Archer Materials' Netherlands-based foundry partner, Applied Nanolayers, has fabricated the miniaturised Biochip graphene field effect transistor ("gFET") design.
 - The miniaturised gFET's size has been reduced by 97% decreasing the cost of fabrication, along with improving its foundry readiness.
 - The miniaturised chips have completed wafer dicing and assembly at Archer's outsourced semiconductor assembly and testing partner, AOI Electronics in Japan.
 - Archer intends to integrate the new gFET designs with other parts of the Biochip for at home testing of chronic kidney disease.
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Archer Materials Limited ("Archer", the "Company", "ASX: AXE"), a semiconductor company advancing the quantum computing and medical diagnostics industries, has designed and fabricated a miniaturised version of its Biochip graphene field effect transistor ("gFET") at its commercial foundry partner in the Netherlands, Applied Nanolayers ("ANL").

The new gFET chip design has been significantly reduced in size in comparison to the earlier designs of 10mm x 10mm to 1.5mm x 1.5mm (Image 1), or by 97% (see ASX announcement on 11 March 2024). The chip was fabricated on a whole four-inch wafer with 1,375 gFET chips, compared to the 45 gFET chips produced using earlier designs in previous four-inch wafer fabrication runs.

The miniaturised gFET chip design reduces the fabrication cost per chip produced by whole wafer runs and aims at improving foundry readiness.

The wafer has been diced and assembled at Archer's outsourced semiconductor assembly and testing ("OSAT") partner, AOI Electronics in Japan. The OSAT process includes moulding, dicing, and lead frame design for this dedicated wafer assembly. These new capabilities are key in advancing the Biochip development to interfacing and integration with miniaturised gFET chip sensor designs.

The assembled chips are currently undergoing testing at Archer.

The Archer Biochip contains a sensing region of which the gFET is the core component. Each gFET chip contains multiple gFETs, each of which is a transistor, which acts as a sensor. Archer has miniaturised the total chip size by redesigning the layout of the circuits creating gFET transistors.

The team is currently undertaking experiments with its Biochip gFET for at home testing of chronic kidney disease (“CKD”) and these miniaturised gFET sensors will be used for this functionality (see ASX announcement on 27 August 2024).

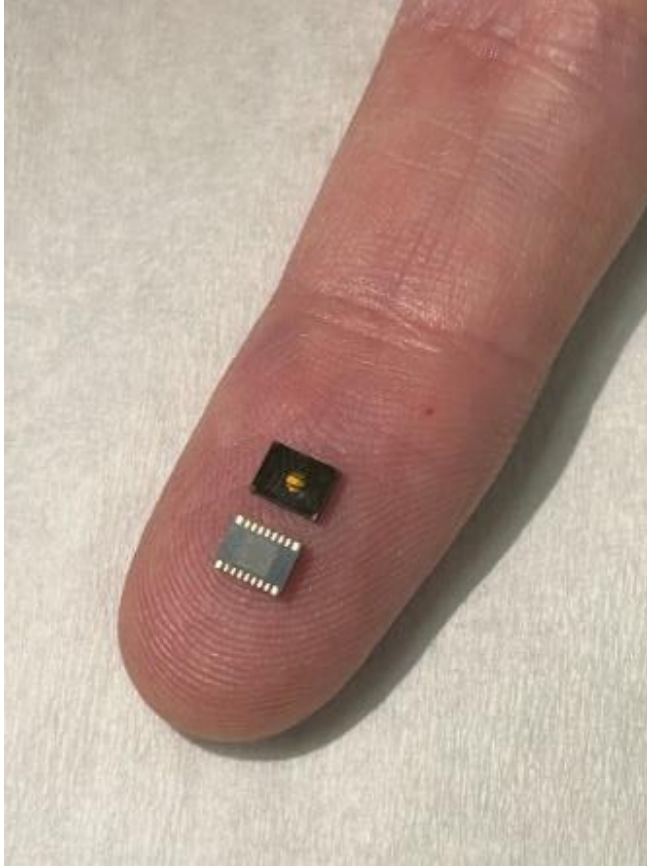


Image 1: Example of assembled miniaturised gFET (front side and back side), a 1.5mm x 1.5mm gFET chip is assembled inside

Commenting on the miniaturisation of the Biochip gFET chip design, Greg English, Executive Chair of Archer, said

“Archer is proactively reducing device fabrication costs and paving the way for a wafer-scale run of over a thousand miniaturised gFET chips. The team has been able to achieve this significant step by applying its know-how in gFET chip design.

“By working with Applied Nanolayers and AOI Electronics on the miniaturised gFET chips, we have successfully proved the fables commercial model to support development of the Biochip and strengthen our relationships with semiconductor supply-chain partners.”

The Board of Archer authorised this announcement to be given to ASX.

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About Archer

Archer is a technology company that operates within the semiconductor industry. The Company is developing advanced semiconductor devices, including chips relevant to quantum computing and medical diagnostics. Archer utilises its global partnerships to develop these technologies for potential deployment and use across multiple industries.
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