

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

17 June 2024

Archer Biochip gFET design fabricated on a six-inch wafer by foundry partner in Spain

Highlights

- Archer Materials has advanced its Biochip gFET design fabrication testing through its foundry partner in Spain, Graphenea.
 - Graphenea fabricated an Archer Biochip gFET design through a six-inch whole wafer run, producing 145 chips with 8 gFET devices on each chip.
 - The fabrication is the first six-inch wafer run for Archer, representing an intermediary wafer size test run between the typical four-inch R&D test bed wafers and commercial-scale eight- and twelve-inch wafers.
 - The gFET designs include advances over previous chip features to address technology challenges in maintaining device stability required for potential sensing applications.
 - Archer continues to work with several foundries in Europe to develop its Biochip gFETs, with a miniaturised chip design undergoing whole-wafer fabrication in parallel and is expected to be completed in a few weeks.
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Archer Materials Limited (“Archer”, the “Company”, “ASX: AXE”), a semiconductor company advancing the quantum technology and medical diagnostics industries, has fabricated one of its Biochip graphene field effect transistor (“gFET”) designs through a six-inch whole wafer run by its foundry partner in Spain, Graphenea.

Archer had sent the Biochip gFET design to Graphenea for fabrication through a whole wafer run in Dec 2023¹. The gFETs are designed with structures suitable for liquid multiplexing, with advances in chip design features, including in gating design and materials, to address technological challenges in maintaining graphene device stability from chip-to-chip.

The process run was performed on a six-inch whole wafer, making it the first six-inch wafer run for Archer. The fabrication produced 145 chips with 8 gFET devices on each chip. Archer confirmed the gFETs performed as expected electronically, with the required stability observed in the Dirac point within the desired testing measurements’ voltage range.

This latest achievement builds on earlier gFET design fabrication milestones, including a multi-project wafer run with a German foundry (ASX ann. 9 Nov 2023), and a whole four-inch wafer run at a foundry in the Netherlands (ASX ann. 14 Sept 2023). Archer also recently advanced its Biochip gFET chip design with a significant reduction in size, with the miniaturised chip designs sent for fabrication to a foundry partner in the Netherlands (ASX ann. 11 Mar 2024).

¹ See the Company’s ASX Announcement 11 Dec 2023. The process was initially planned for a four-inch wafer, but it was switched to a six-inch wafer after Graphenea introduced a new six-inch graphene wafer on all its standard substrates.

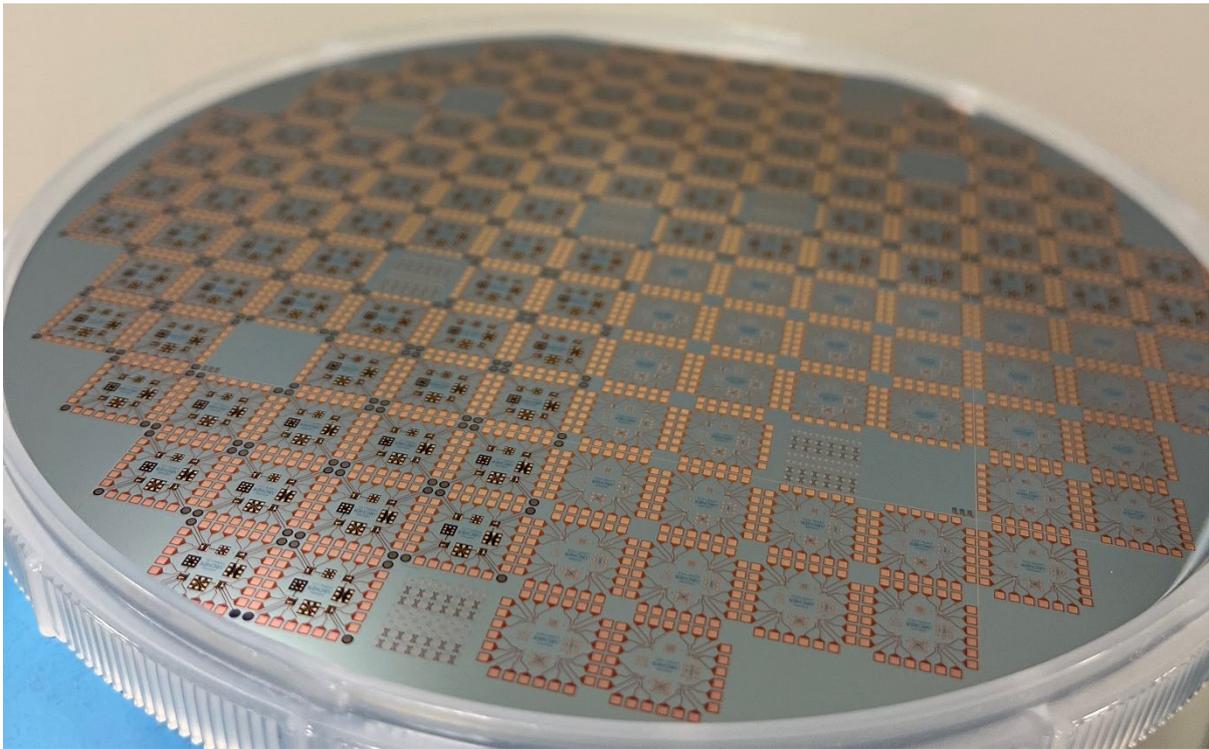


Image 1. Archer’s gFET chips fabricated on a whole six-inch wafer by Graphenea. The fabrication of Archer’s specialised gFET designs on a six-inch wafer is an advancement in the context of Archer’s Biochip research and development progress, representing an intermediary, gradual scaling, in the potential fabrication capacity and efficiency over the typical four-inch wafers used by Archer in its Biochip technology development.

Commenting on the gFET fabrication, Dr Mohammad Choucair, CEO of Archer, said,

“Archer has demonstrated its specialised gFET designs can be fabricated through a whole six-inch wafer run. By performing these types of wafer runs, including in Graphenea’s commercial graphene foundry, Archer aims to optimise its gFET designs, performance, and readiness for compatibility with the advanced fabrication processes and equipment needed to potentially produce gFET chips at scale.”

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. www.archerx.com.au