



2D Generation

Enabling the Future of Semiconductors



Semiconductor Conference 2025

May 2025





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Who is Adisyn

Adisyn Ltd is publicly listed on the the Australian Securities Exchange (ASX) under the ticker AI1

Field of activity

1. Through 2D Generation (a fully owned subsidiary) – development of novel technologies and methods to produce high-quality graphene, in a low-temperature process, targeting semiconductors interconnect and other applications.
2. Original activity of building and deploying IT solutions, disaster recovery solutions, and end-to-end cyber security solutions.

Corporate Snapshot

- Share Price (A\$)*: 0.049
- Market Cap (A\$)*: 35.4M
- Enterprise Value (A\$): 25.9M
- Cash (A\$)^: 9.5M

Board of Directors

- Kevin Crofton – Chairman
- Arye Kohavi – Director, CEO of 2D Generation
- Dominic O'Hanlon – Non-Executive Director
- Blake Burton - Managing Director of Adisyn

*As at market close 5 May 2025

^As at 31 March 2025



2D Generation

Kevin Crofton

Non-Executive Chairman

Kevin has 3 decades of Semiconductor industry experience. He has held significant management and leadership positions at Lam Research Corporation (Nasdaq:LRCX, US\$96B market cap), KLA Corporation (Nasdaq:KLAC, US\$91B market cap), Comet Holdings AG (SIX: COTN, CHF1.9B market cap), Newport Corporation (acquired for US\$980M), NEXX Systems (acquired by Tokyo Electron) and Aviza Technology.

- In 2006, Mr. Crofton led a P/E backed buyout of Aviza Technology UK to create what became SPTS Technologies, where he was President and Managing Director from 2006 to 2020, and created a GBP£500M turnover, highly profitable, market leading company. SPTS was bought by Orbotech, which was later acquired by KLA for \$3.4B.
- From 2020 through 2022, Kevin was CEO of Comet AG, a listed company on the Swiss SIX exchange. Achieved 60% revenue growth to CHF\$600m (A\$1.06B), nearly doubling EBITDA performance, and delivered Market Cap growth from 0.8B to 2.2B CHF (~US\$2.4 B).
- Mr Crofton served on the board of SEMI, the international industry association, for 8 years including as Vice Chair and Chair.
- He was advisor to Senator Mark Warner on US CHIPS Act and Gov. Glen Youngkin on Virginia's Semiconductor Initiative.
- Throughout his career, Mr Crofton has been recognized for his contributions to the semiconductor industry. He is a published author of numerous technical papers, a sought-after semiconductor industry speaker, and winner of numerous awards including the MEMS Industry CEO of the year (2013) and the Queens Award for innovation, technology and export in 2008, 2014 and 2018.
- Mr. Crofton holds an MBA in International Business from American University and a BS Degree in Aerospace Engineering from Virginia Tech.



2D Generation

Arye Kohavi

CEO of 2D Generation, Director at Adisyn

Arye is an Israeli entrepreneur and innovator. He was the founder, president & Co-CEO of Water-Gen, which develops water-from-air and air dehumidification technologies. Kohavi holds a MBA (Finance) and a BA in Economics and Accounting, both from the Hebrew University in Jerusalem.



Awards:

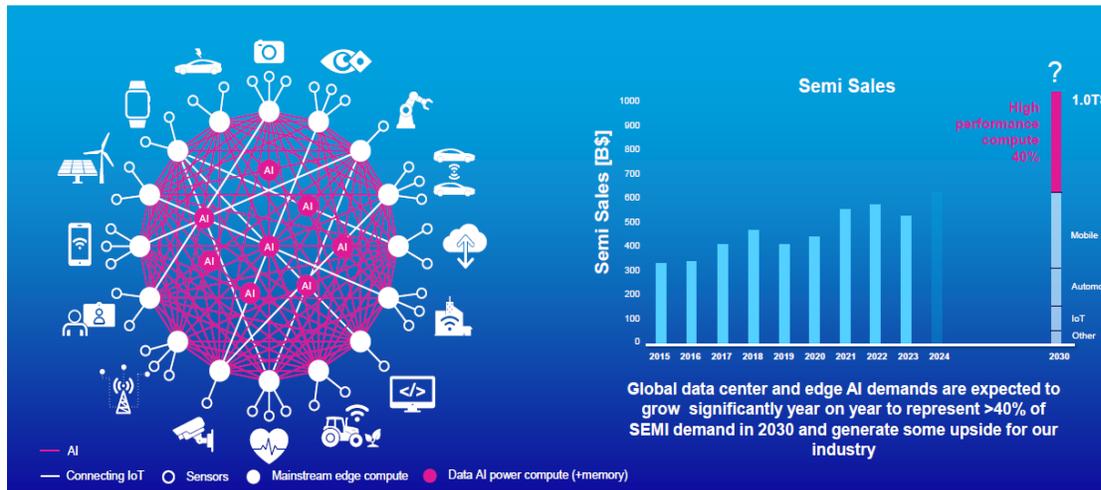
- Arye has been chosen as one of the world's 100 Leading Global Thinkers, and one of the world's top innovators, by “Foreign Policy” magazine.
- Water-Gen, founded by Arye, was chosen as one of the World's 50 Most Innovative Companies, by “Fast Company” magazine.
- As part of Israel's 70th anniversary celebrations, the Israeli Ministry of Economy and Ynet readers chose Water-Gen as one of the “Nine Greatest Israeli Inventions of All Times”.
- Water-Gen's Genny was chosen as one of the world's 100 Best Inventions, by TIME magazine.



High Performance Computing's Primary Need (e.g., AI) Is The Quest for Speed...

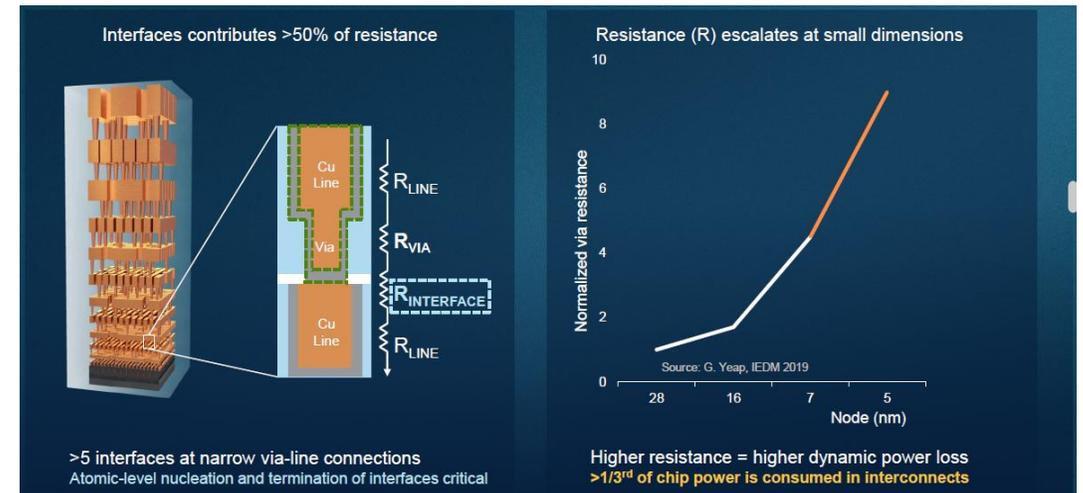
...But limited by the ability to “shrink” design rules

AI opens endless opportunities, expected to generate >6T\$ value by 2030 across several industries



ASML *Source: Kevin Zhang, TSMC, Semiconductor Industry: Present and Future, IEEE solid state Circuit Conference, Feb 2024
*Source: WSTS and Gartner

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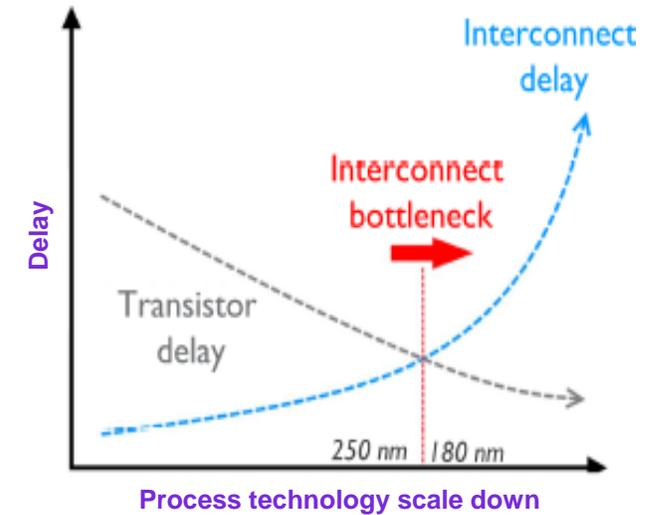
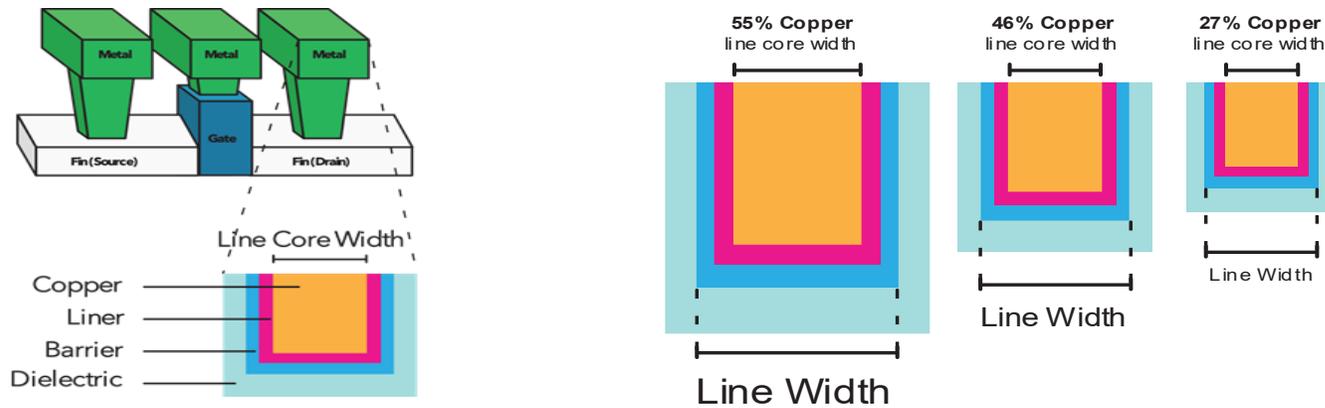


AMAT ITPC November 2024



The Copper Interconnect Dilemma...

- Smaller and smaller design rules equals more transistors per chip – which means faster performance
- But the inherent resistance increases to the point that processing speed is ultimately limited by physics

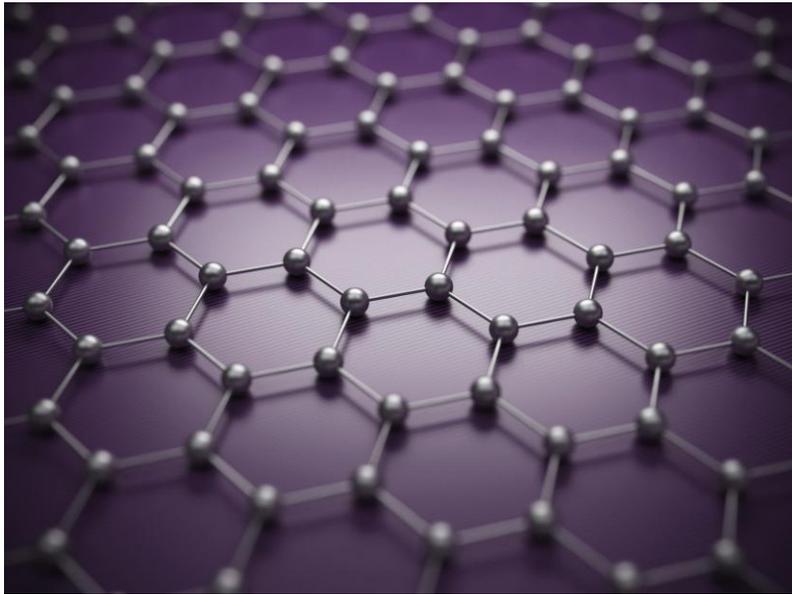


* Yosi Shacham-diamand, Tetsuya Osaka, Madhav Datta, and Takayuki Ohba. (Book) "Advanced Nanoscale ULSI Interconnects". 2009.





Why Graphene



Graphene is a unique carbon structure. It consists of a single atom layer of carbon atoms arranged in a honeycomb lattice and is the world's first two-dimensional (2D) material. Graphene boasts exceptional properties, highly valuable to the semiconductor industry, including:

- ✓ **Superior Electrical Conductivity:** outperforms copper and other traditional materials - ideal for high-speed interconnects
- ✓ **Remarkable Thermal Conductivity:** dissipates heat more efficiently than any other known material, making it essential for managing heat in high-performance electronic devices.
- ✓ **Exceptional Strength and Flexibility:** stronger than steel and incredibly flexible, opening possibilities for new types of flexible electronics, wearable devices, and other innovative products.
- ✓ **High Transparency:** is nearly transparent, making it suitable for applications like displays, touchscreens, and solar cells.



The Challenge

- **For advanced process nodes, the Interconnect is a bottleneck:**

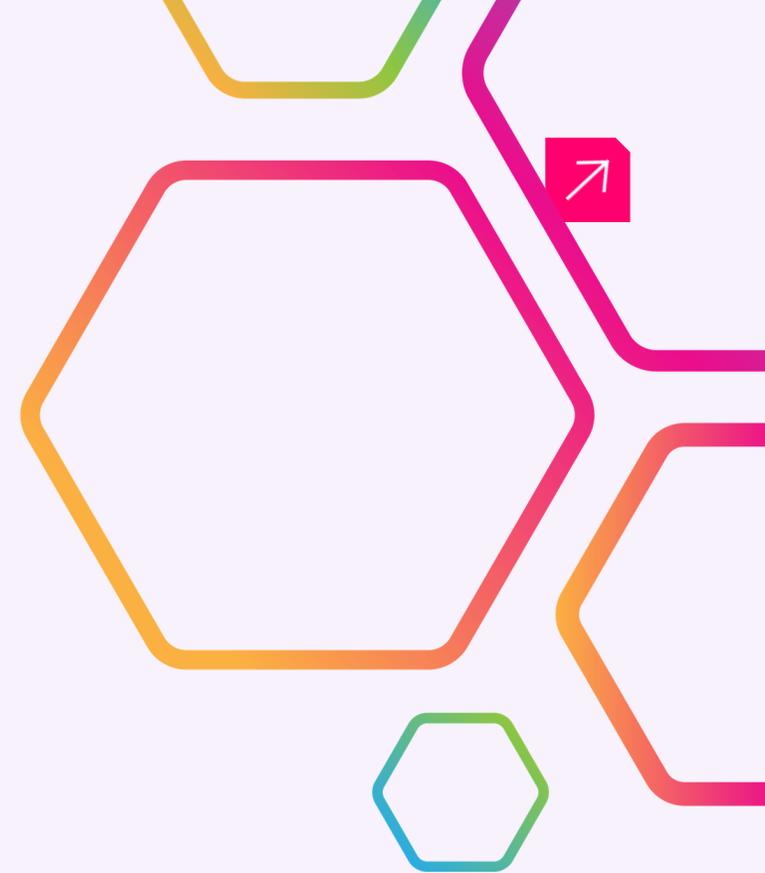
- ❑ Limiting clock and data transfer rates
- ❑ Consumes a lot of power
- ❑ Major source of heat generation

- **Graphene based solutions for the interconnect are well defined, but no suitable industrial process has been identified yet**

- **From imec's paper* on Graphene for interconnects:**

“While this study focuses on graphene transfer, a more ‘elegant’ way of depositing graphene would be direct growth on the metal template of interest. Growing high-quality graphene requires however high growth temperatures (900-1000°C) and can as such not be applied on interconnect-type of metals.”

*<https://www.imec-int.com/en/articles/promise-hybrid-graphenemetal-structures-advanced-interconnects>

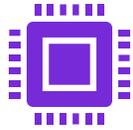


2D Generation's Process

- ALD-based
- Unique and patented process
- Forming graphene directly on the wafer
- Use of patented precursors
- Low-temperature process
- Compatible with current manufacturing limitations
- Can be applied using existing industrial processes and equipment



Graphene-Coated Interconnects: Unlocking the Future of AI



Breakthrough in Semiconductor Interconnects

- Graphene-coated interconnects significantly outperform copper in speed and efficiency.
- Up to 200x higher electron mobility, enabling faster data transfer across chip architectures.
- Reduced resistive heating and minimal signal degradation at nanoscale geometries.



Implications for Artificial Intelligence

- Accelerates AI training and inference by increasing data bandwidth within chips.
- Enhances energy efficiency, a critical factor in AI data centres and edge AI applications.
- Enables denser, more complex chip designs at 3nm and below.
- Supports real-time AI on compact devices with minimal power and thermal footprint.



Strategic Relevance

- Positioned at the intersection of AI growth and next-generation semiconductor innovation.
- Addresses the critical bottleneck of interconnect performance in AI hardware stacks.
- Opens pathways for faster, greener, and more scalable AI systems globally.





Beneq ALD Machine

State-of-the-Art Atomic Layer Deposition

- Procured highly specialised Atomic Layer Deposition (ALD) machine from Beneq, allowing full process development
- ALD machines deposit extremely thin layers (down to the atomic layer) of material on to chips
- All advanced semiconductor fabs around the globe use ALD
- **Installation expected in May. The team is already in training at Beneq in Finland.**



Imec Collaboration



Imec is the world's leading semiconductor industry R&D hub

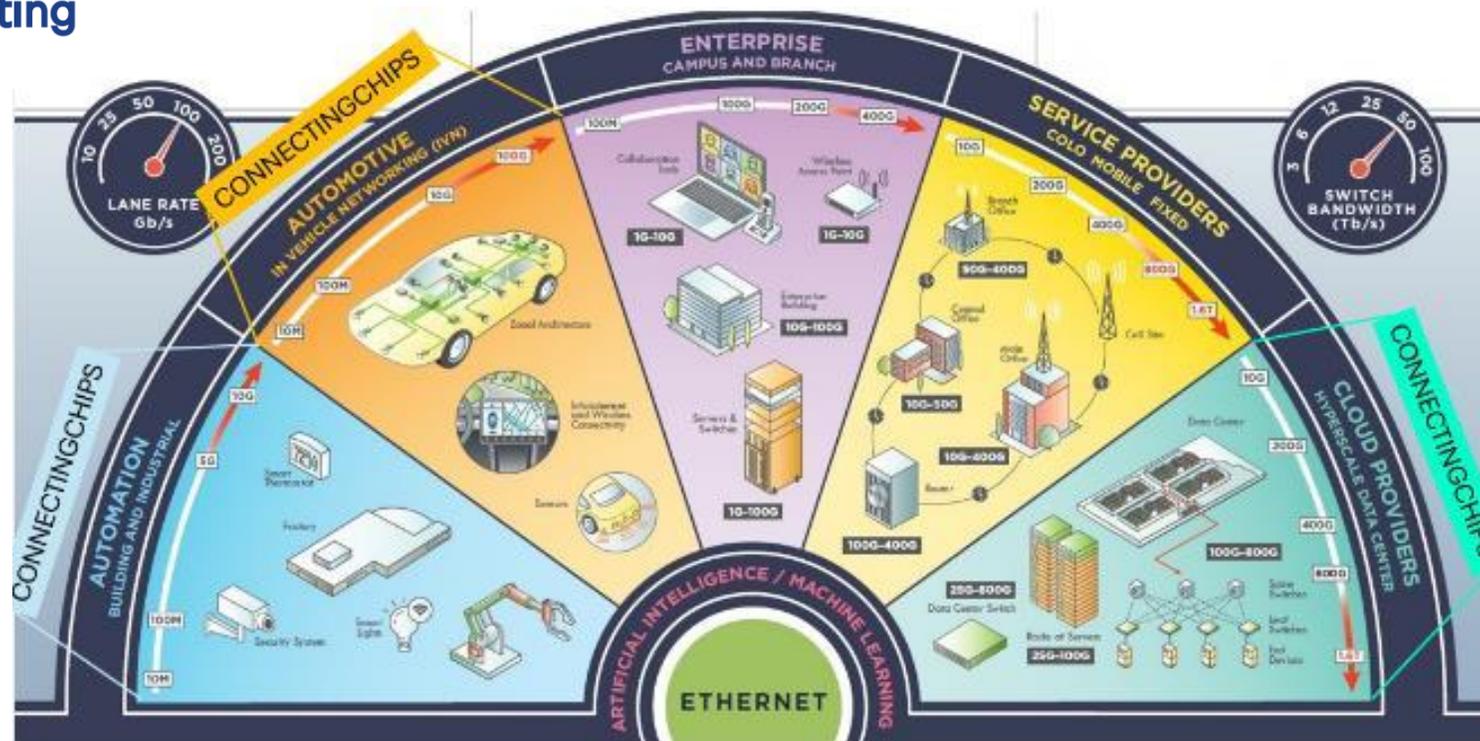
- ❑ 5,000 researchers from more than 95 countries
- ❑ 2.5 billion Euro infrastructure, 300mm leading edge semiconductor pilot line
- ❑ 940M Euro in revenue, a public-private funded entity
- ❑ Partnered with the world's leading semiconductor designers, fabricators, and suppliers

2D Generation has a strategic cooperation agreement with imec to validate the company's technology:

1. Simulation to explore the benefits of the technology in a relevant context for product applications.
2. Physical tests of the graphene coating of several materials (metals and non-metals) and several usages (surfaces, structured wafers, and diffusion barrier).



Building the Future Together: Partnership Opportunities



ConnectingChips – EU Undertaking



Why is the Project significant?

- The Project is focused on developing and integrating electronic, photonic, power, and RF devices within System in Package (SiP) modules for applications in **data centres, high-performance computing, Artificial Intelligence, autonomous vehicles and digital industries.**
- The Project aims to improve heat dissipation, optimize data transmission, implement thermal control for dense SiP modules and advance integration enhance device performance and efficiency.

2DG's role in the Project

Leveraging graphene's exceptional properties through pioneering low-temperature ALD techniques, this technology improves semiconductor performance in interconnects, coatings, capping layers by addressing impedance, resistivity, and heat dissipation challenges.

What will it mean for 2DG to be part of the project?

- **The industry largest players validate 2DG's innovative approach and establishes its role in the semiconductor industry.**
- Provides a platform for collaboration and technological advancement.



Strategic Partnership with Tel Aviv University Nano Center



The Centre's state-of-the-art facilities, including an 800-square-meter cleanroom, advanced imaging tools, and over 40 fabrication instruments, provide an unparalleled environment for academic and industrial research. The center has collaborated with a diverse range of major multinational companies, including General Electric, Samsung and NVIDIA.

- ✓ **Strategic Partnership:** An agreement was signed in March 2025 to accelerate the development of the company's technology.
- ✓ **Access to World-Class Facilities:** Access to advanced equipment. Immediate use of TAU's Beneq TFS 200 Atomic Layer Deposition (similar to AI1's system , former generation).
- ✓ **Double ALD capacity:** The partnership grants the team access to an additional ALD system to perform parallel development.





2DG Intellectual Property

Four patent families are directed to the technology of the Company and each patent is composed of our unique production methods and materials:

- 1** **GRAPHENE COATED NON-METALLIC SURFACES, DEVICES AND METHOD THEREOF** – directed to the technologies used for conductive diffusion barrier, and other applications
- 2** **GRAPHENE COATED METALLIC SURFACES, DEVICES AND METHOD OF MANUFACTURE THEREOF** – directed to the technologies used for conductive capping layer, and other applications
- 3** **METHOD OF MANUFACTURE OF GRAPHENE COATED SURFACES BY ATOMIC OR MOLECULAR LAYER DEPOSITION** – directed to graphene manufacture by ALD
- 4** **GRAPHENE METAL COMPOSITE** – directed to graphene layers interlayered with metal layers including coatings of patterned surfaces





Investment Highlights

Adisyn's wholly-owned subsidiary 2D Generation is developing graphene-based interconnects for the next-generation of semiconductors



Opportunity to transform a global market

Semiconductor sales expected to almost double by 2030 to ~US\$1Tn¹



Partnerships to drive development

Collaboration with the world's leading semiconductor research institute imec and selected for the EU's Connecting Chips Joint Undertaking potentially collaborating with NVIDIA, Valeo and Applied Materials



Major early-mover advantage

Substantial knowledge and intellectual property developed on graphene deposition over the past four years, offering a significant early-mover advantage



Landmark agreement augments core research

Partnership with Tel Aviv University Nano Center gives access to a second ALD machine to perform parallel development



World-leading process

Unique, patented low-temperature processing method unmatched by any peer of whom the Company is aware, globally



Strong leadership

World-renowned semiconductor and technology leaders represented on the Board to drive success

¹ Kevin Zhang, TSMC, Semiconductor Industry: Present and Future, IEEE solid state Circuit Conference, Feb 2024



2D Generation

Enabling the Future of Semiconductors



Thank you

CONTACT DETAILS



Blake Burton – Managing Director, A11
investors@adisyn.com.au

Arye Kohavi – CEO, 2D Generation
2DGeneration.com

David Tasker – IR / PR
dtasker@chapteroneadvisors.com.au

Michael Shaw-Taylor – Corporate Advisor
mst@sandtoncapital.com.au