



# 4DS and imec TECHNICAL RESULTS AND INTERNATIONAL CAPITAL RAISE

June 2020

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# COMPANY HIGHLIGHTS.

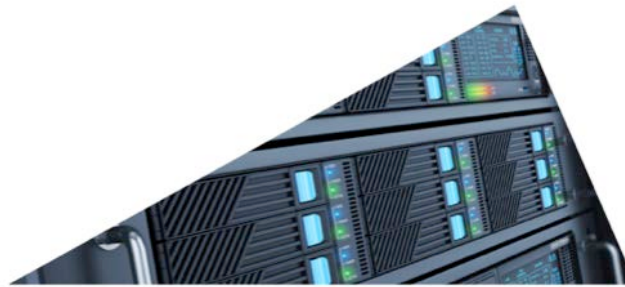


- + **World-leading** Silicon Valley based Interface Switching ReRAM developer
- + Completed Additional Wafers Lot of 300mm wafers, **most successful to date**
- + **Demonstrated record improvement in speed and endurance**
- + 4DS is the most **advanced Interface Switching ReRAM**
- + **The most promising Interface Switching ReRAM cell for Storage Class Memory**
- + **Joint development agreement** with Western Digital subsidiary HGST since 2014
- + **Strategic collaboration with imec** signed in November 2017
- + **23 granted US patents** wholly owned and 9 pending or filed
- + Completed **A\$4.5 mil placement**, launched **A\$2.5 k SPP mil**

# THE CHALLENGE.

DRAM and NAND Flash are the main technologies utilized today.

Both are US\$95-56 billion annual markets – and growing.

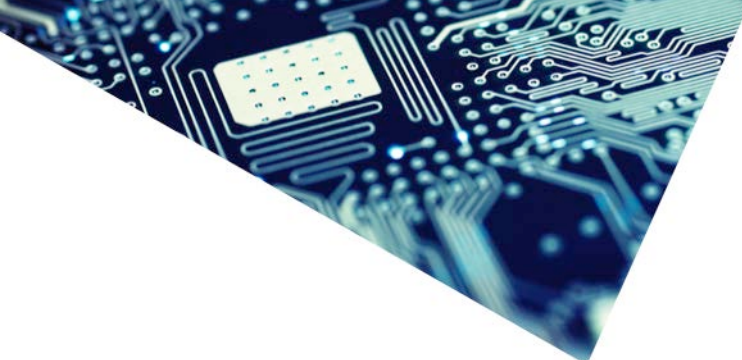


+ DRAM is super-fast, has exceptional endurance but is expensive and volatile



+ NAND Flash is slow, has limited endurance but is cheap and non-volatile

A new innovation is needed and the industry refers to it as **Storage Class Memory** - over time this is predicted to have a market size as large as DRAM and NAND Flash



# STORAGE CLASS MEMORY.

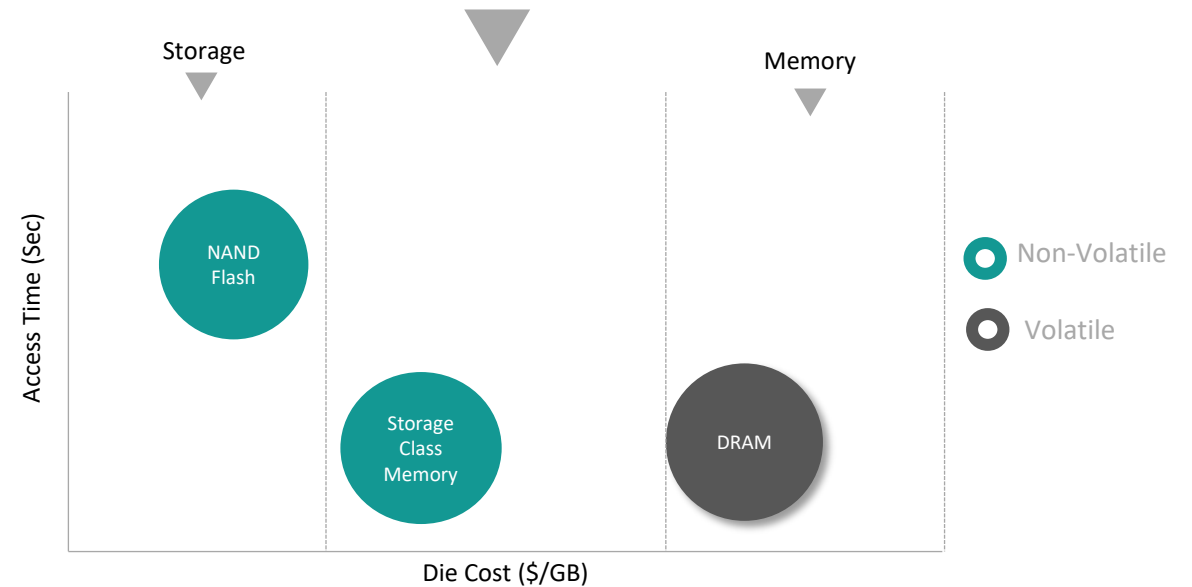
Storage Class Memory is emerging as the leading new category to extend the memory hierarchy.

4DS Interface Switching ReRAM will not be a “me too” technology in the embedded and NAND Flash sectors.

Interface Switching ReRAM is a unique ReRAM being developed specifically for Storage Class Memory applications.

## STORAGE CLASS MEMORY

Attempts to combine the best characteristics of DRAM and NAND Flash



Battleground for next generation memory technology.

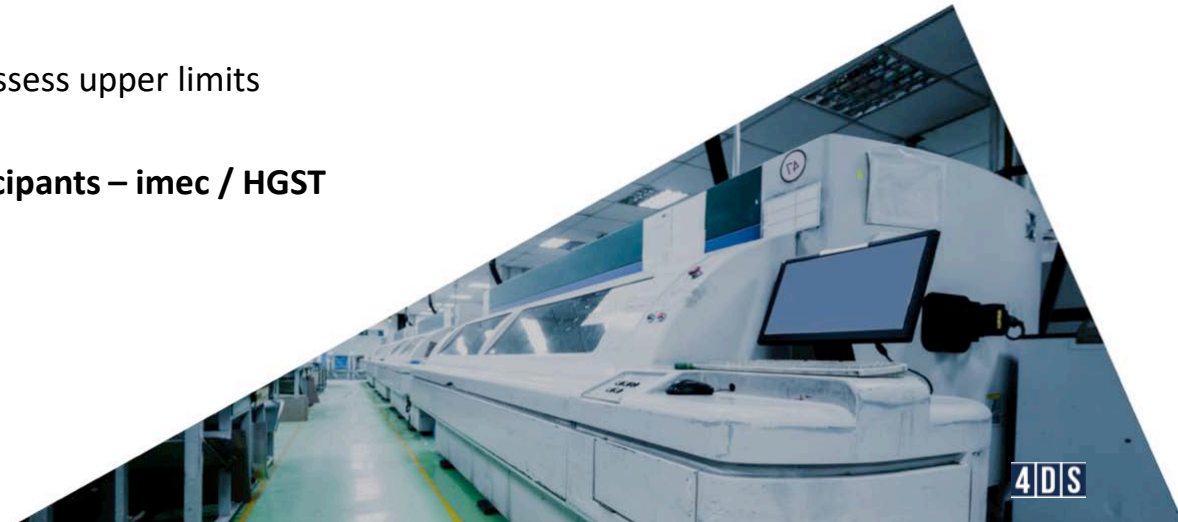
- + **Faster** – DRAM-like read speed
- + **Cheaper** – NAND Flash-like costs
- + **Non-volatile** – Retains data when power is off



# BEST DATA SET RECORDED BY 4DS.

**4DS Interface Switching ReRAM** has now shown record achievements in relevant Storage Class Memory categories

- + Best endurance data recorded – two to three times better than previously reported
- + Highest recorded speed near DRAM speed – **an area-based ReRAM first – US patents now granted**
- + No need for speed crippling error correction – **a ReRAM first – US patents now granted**
- + Retention data recorded – additional studies to be completed to assess upper limits
- + Data validated by two of the worlds leading semiconductor participants – imec / HGST



# SEVEN YEAR PARTNERSHIP WITH HGST.

HGST, is a subsidiary of Western Digital Corporation (US\$13.5 billion market cap), one of the largest global leaders in digital storage

- + Strategic innovator in emerging high growth technologies
- + Commenced JDA in 2014 – **Renewed in 2015, 2016, 2017, 2018, 2019 and 2020**
- + Insight into what is important in a data-centric world
- + **Now actively involved with 4DS / imec and remain committed to Storage Class Memory**
- + Siva Sivaram, President of Technology and Strategy at Western Digital , commented **“We are committed to ReRAM, it is scalable with greater density, lower cost and latency and longer endurance”\***





# WORLD # 1 AND 4DS PARTNER.

imec, is the **world's #1** independent semiconductor development institute

- + Collaborates with the who's who of electronic products and systems
- + Collaborates with makers of high-volume high-density memories
- + Has a world leading track record in the transfer of semiconductor processes
- + Uses the same tools as industry for high-volume production of high-density memories
- + Has a proven megabit memory platform to fast track development of megabit chip
- + Used this platform to explore a wide range of emerging memories







# COLLABORATION OBJECTIVES.

- + imec and 4DS **completed Additional Wafers Lot manufacturing after discussions and input from Western Digital**
- + Complete discussions with imec and HGST in July 2020 regarding next steps to incorporate new technical developments established from first megabit platform and additional wafers iterations
- + Develop a **fully transferable** fabrication compatible process
- + **Mimic industry standard** high volume production
- + Utilizing imec's proven megabit memory platform **reduces time and cost**
- + End goal is to fabricate a megabit **4DS Interface Switching chip with a fully functioning Storage Class Memory**



# BOARD AND MANAGEMENT.

**Global expertise** founding and building high-tech companies.



**JIM  
DORRIAN**

Non-Executive Chairman

- Served as CEO of several Silicon Valley companies
- Extensive M&A experience
- Partner at VC firm Crosspoint Venture Partners



**Dr GUIDO  
ARNOUT**

CEO & Managing Director

- 30+ years in commercialising electronics technology
- Successes include, Power-Escape, CoWare, CrossCheck Technology and Silvar-Liso



**HOWARD  
DIGBY**

Non-Executive Director

- Former senior roles at IBM, Adobe, Gartner and the Economist Group
- Director of Vortif Ltd, Cirralto Ltd, Elisight Ltd and Hearmeout Ltd
- Advisor to a number of early stage technology companies



**Dr SESHUBABU  
DESU**

Chief Technology Officer

- Expert in thin films, semiconductor processing and non-volatile memories
- Professor, Dean and Head of Electrical Engineering at various universities



**DAVID  
McAULIFFE**

Executive Director

- Experienced company director
- Involved in numerous capital raisings and in-licensing of technologies
- Founder of several companies in Australia, France and the UK, many of which are now ASX listed. The most recent was Invex Therapeutics Ltd



**MICHAEL  
VAN BUSKIRK**

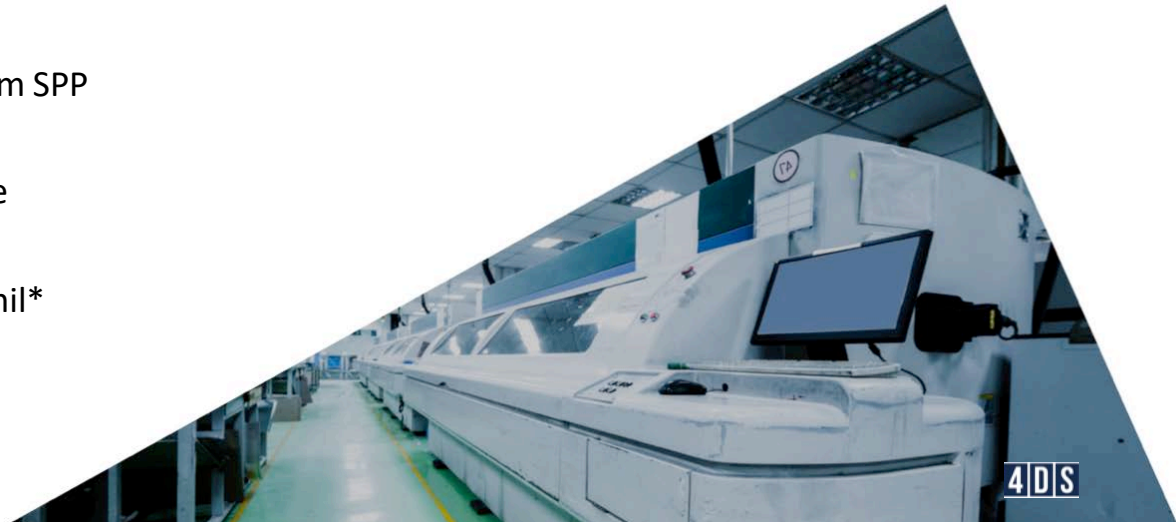
Chief Engineering Officer

- Executive roles with a number of leading memory companies in Silicon Valley
- These include, Adesto Technologies Corporation, Innovative Silicon Inc and Spansion Inc.

# PLACEMENT AND SHARE PURCHASE PLAN (SPP).

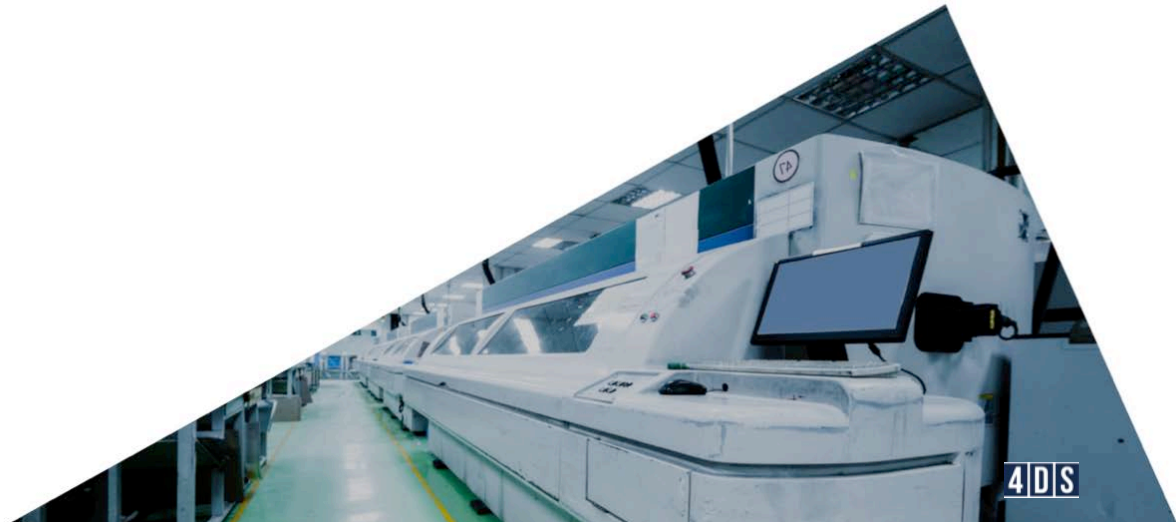
- + Completed a A\$ 4.5 million placement at A\$0.045 per share to USA and Australian institutions and high net worth investors
- + Placement was extremely well supported
- + Undertaking a SPP for A\$ 2.5 million at the same price as the placement for up to A\$15,000
- + The Company may take oversubscriptions or place any shortfall from SPP
- + SPP Booklet will be sent to eligible shareholders as soon as possible
- + Upon successful completion the cash position will be circ A\$ 9.25 mil\*

\* Assumes SPP fully subscribed and less placement fees



# USE OF PROCEEDS

- + Fast track the manufacture of a megabit chip with imec and Western Digital / HGST
- + File additional patents and maintain existing 23 granted patents
- + General working capital



# CAPITAL STRUCTURE.

ASX Code	4DS
Market Cap (Fully Diluted)	A\$ 64 Million*
Ordinary Shares on Issue	1,296 Million*
Unlisted Options	129 Million
Cash	~A\$9.25 Million – July 2020**
Board and Management	6.1%***

\*As at 29 June 2020 placement price and assumes successful SPP

\*\*Assumes successful SPP and after placement expenses

\*\*\* Assumes successful SPP



# VALUE PROPOSITION.

- + 4DS is developing a **breakthrough Interface Switching ReRAM Storage Class Memory** solution
- + Recently produced **pivotal data** applicable for Storage Class Memory and best to date
- + Seven year strategic partnership with HGST, **leader in digital storage**
- + **Imec** - strategic collaboration to develop megabit chip with the **world # 1 developer in nano electronics**
- + **Strong patent portfolio with 23 granted patents** wholly owned and developed in-house
- + **World-class team** of memory specialists, material scientists and test engineers
- + Board experienced in founding, building and **exiting high tech companies**
- + **Sufficient cash to meet current objectives**

**4DS is addressing the massive memory demands of tomorrow**

# TIMETABLE\*

+ Record Date for SPP	Friday, 26 June 2020
+ Booklet Despatch and Opening of SPP	Friday, 3 July 2020
+ Settlement of Placement	Friday, 3 July 2020
+ Allotment of Placement Shares	Monday, 6 July 2020
+ Trading of Placement Shares on ASX	Monday 6 July 2020
+ Closing date of SPP	Friday, 24 July 2020
+ Issue Date of SPP Shares	Wednesday, 30 July 2020

\*Indicative and the Company reserves the right to close the SPP early



ABN 43 145 590 110

ASX Code: 4DS  
[www.4dsmemory.com](http://www.4dsmemory.com)

# THANK YOU

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