

ASX RELEASE

28 August 2018

Replacement USA Marketing Presentation – August 2018

4DS Memory Limited (ASX:4DS) (**4DS**) (the **Company**), advises that it has removed slide 12 from the presentation that was released to ASX yesterday, 28 August 2018 (**Slide 12**).

Slide 12 intended to show that 4DS is targeting a share of the Storage Class Memory market, which is a market that is expected to be of a similar size to the existing System Memory or Silicon Storage markets.

Slide 12 has been removed to avoid any possible interpretation that 4DS itself is expecting to generate yearly revenues equal to the entire current size of the System Memory or Silicon Storage markets.

ENDS

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About 4DS

4DS Memory Limited (ASX: 4DS), with facilities located in Silicon Valley, is a semiconductor development company of non-volatile memory technology, pioneering Interface Switching ReRAM (Non-Filamentary ReRAM), for next generation gigabyte Storage Class Memory. Established in 2007, 4DS owns a patented IP portfolio, comprising 20 granted US patents and 3 patents pending, which has been developed in-house to create high density Storage Class Memory. 4DS has a joint development agreement with Western Digital subsidiary HGST, a global storage leader, which accelerates the evolution of 4DS' technology. 4DS also collaborates with imec, the world's #1 independent semiconductor development institute.

For more information, please visit www.4dsmemory.com.

Disclaimer

This release contains certain forward looking statements that are based on the Company's management's beliefs, assumptions and expectations and on information currently available to management. Such forward looking statements involve known and unknown risks, uncertainties, and other factors which may cause the actual results or performance of 4DS to be materially different from the results or performance expressed or implied by such forward looking statements. Such forward looking statements are based on numerous assumptions regarding the Company's present and future business strategies and the political and economic environment in which 4DS will operate in the future, which are subject to change without notice. Past performance is not necessarily a guide to future performance and no representation or warranty is made as to the likelihood of achievement or reasonableness of any forward looking statements or other forecast. To the full extent permitted by law, 4DS and its directors, officers, employees, advisers, agents and intermediaries disclaim any obligation or undertaking to release any updates or revisions to information to reflect any change in any of the information contained in this release (including, but not limited to, any assumptions or expectations set out in the release).

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A DISRUPTIVE TECHNOLOGY FOR STORAGE CLASS MEMORY

August 2018 - USA Marketing Roadshow

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MEMORY / STORAGE OPPORTUNITY SPACE

- + Super low power or super fast
- + Limited or massive amounts of data
- + Retrieve data locally or from the cloud
- + Retain results locally or stream into the cloud
- + Must not fail in high temperature environment or when moving (automotive)
- + Price-sensitive applications (consumer devices)



3 DISTINCT MEMORY / STORAGE CLASSES

Requirements	Internet-of-things	Embedded on SOC	High density / High volume
Cost	Low chip cost	Lower than SRAM	Low bit cost
Bit capacity	Low	Higher than SRAM	High and higher
Power	Low chip power	Lower than SRAM	
Speed	Low	Fast	Best = DRAM
Retention	Medium	High	Best = NAND Flash

4DS FOCUSED ON HIGH DENSITY / HIGH VOLUME

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CURRENT HIGH DENSITY / HIGH VOLUME LEADERS

Use	Leader	Yearly volume (in gigabytes)	2017 revenue* (by chip makers)	\$ per gigabyte
System Memory	DRAM	11.5 billion	US\$ 72.1 billion	US\$ 6.27
Silicon Storage	NAND Flash	175.7 billion	US\$ 53.7 billion	US\$ 0.30

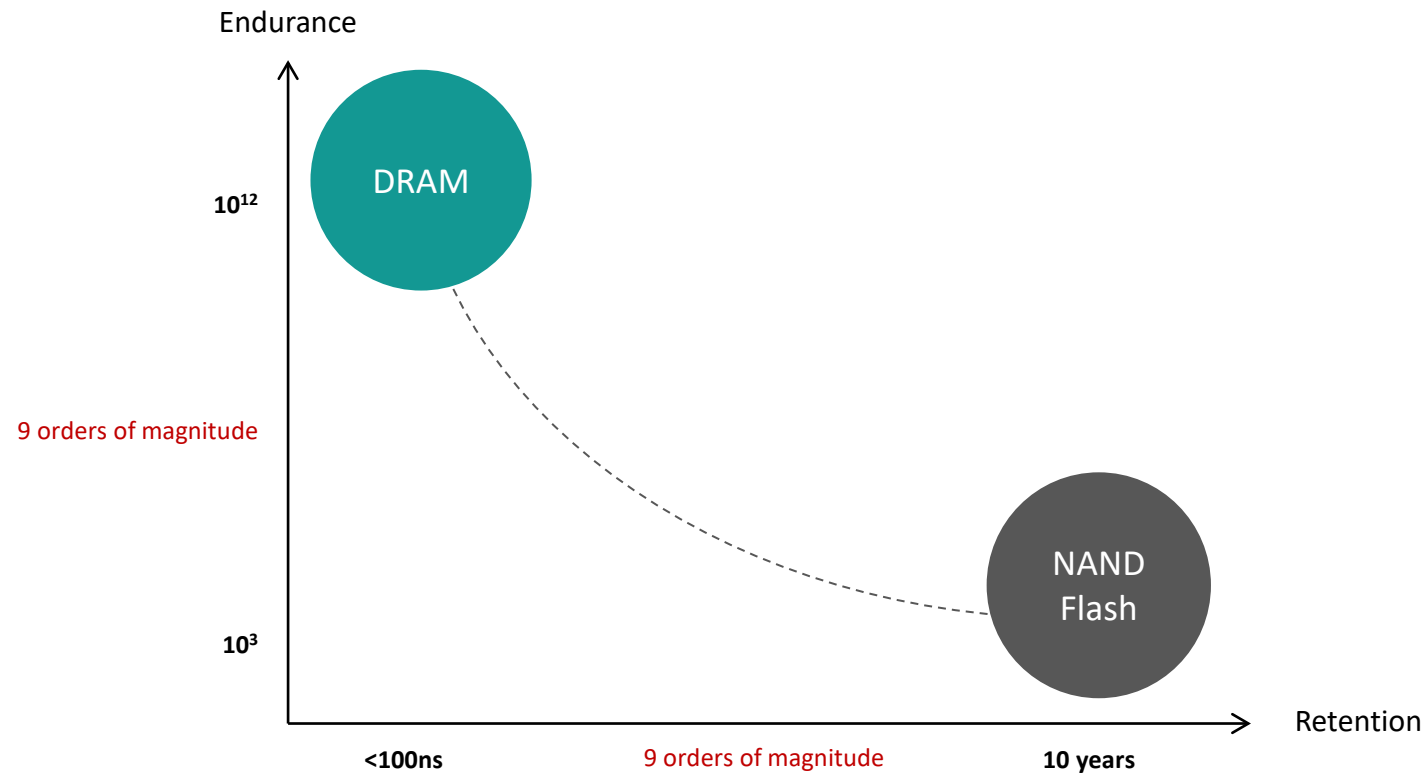
HIGH DENSITY / HIGH VOLUME MEMORY / STORAGE

	DRAM System Memory	NAND Flash Silicon Storage
Cost	Highest 100 times more than HDD	High 10 times more than HDD
Cycling Endurance	Highest 10^{12} times higher than SSD	Lowest 10^3
Data Retention	Lowest 0.1 sec	Medium 10^9 times longer than DRAM
Random Access Read Speed	Fastest	Slow 20 to 200 times slower than DRAM
Bit Capacity	Lowest (2D only)	High (3D stacking)
Power Consumption	Highest	Lowest

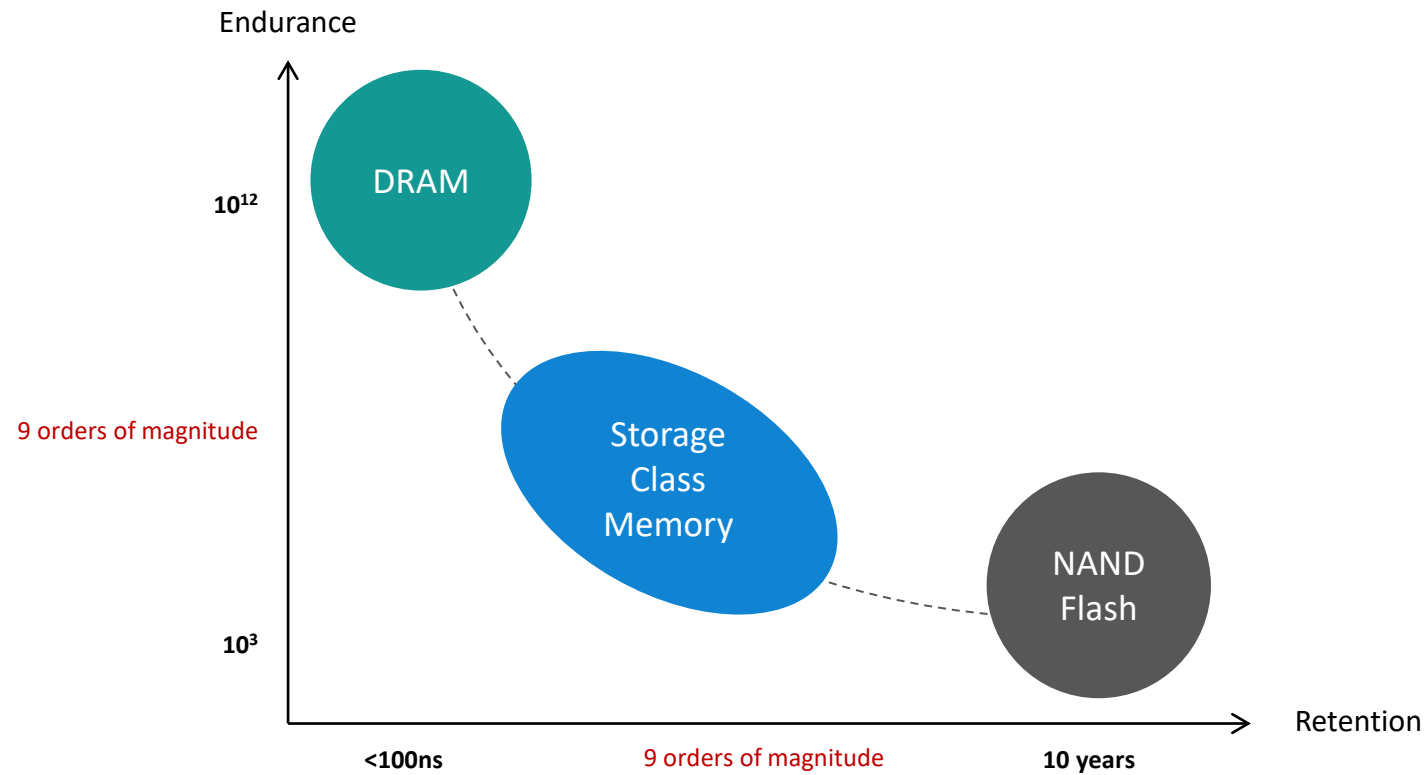
“UNIVERSAL MEMORY” MAY NEVER EXIST

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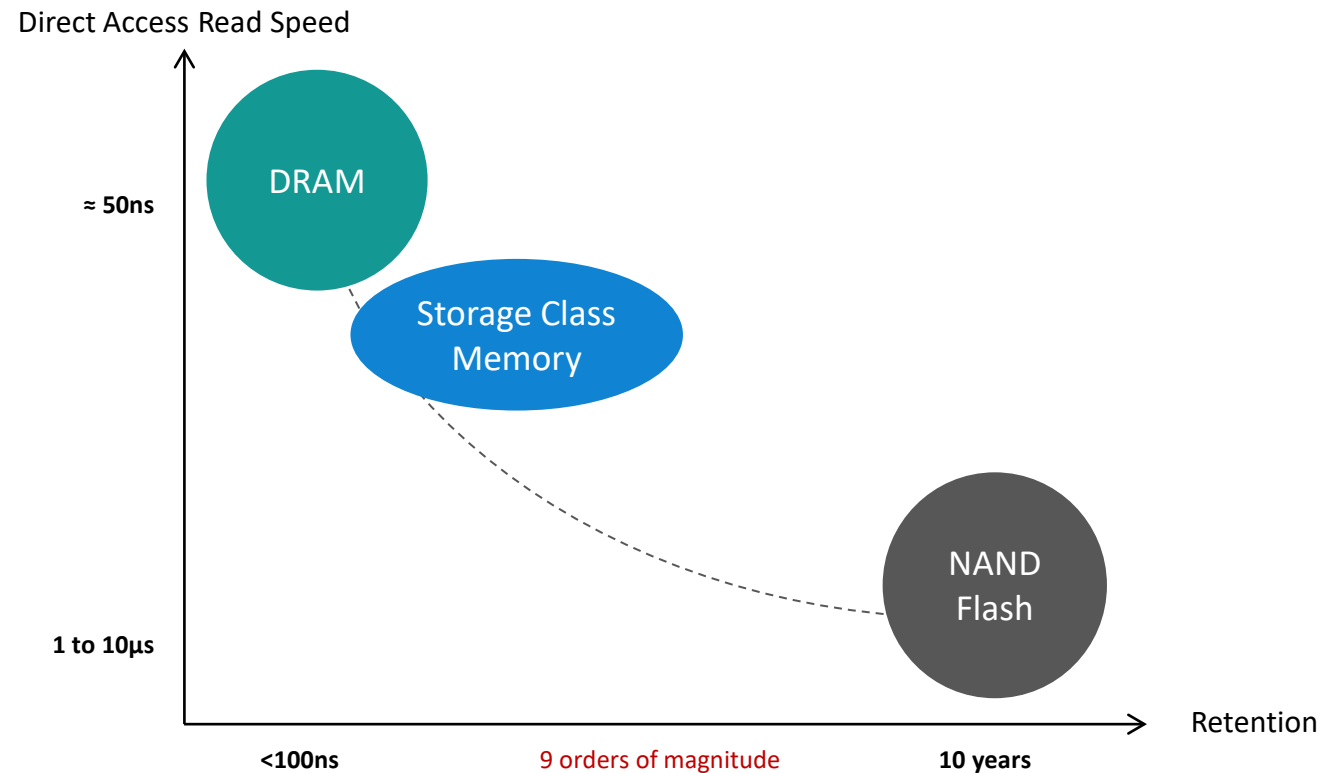
VAST SPACE BETWEEN DRAM MEMORY & NAND FLASH STORAGE



STORAGE CLASS MEMORY (SCM)



4DS AIMING FOR SPACE CLOSE TO DRAM – BIGGEST OPPORTUNITY



STORAGE CLASS MEMORY REQUIREMENTS

Requirements

- Based on **well understood physics** (like DRAM and NAND Flash)
- Scalable technology over **many generations** (like DRAM and NAND Flash)
- **Tunable** technology in the vast space between DRAM and NAND Flash
- Capable of **speed** as close as possible to DRAM
- Capable of **cost/retention** as close as possible to NAND Flash
- Current priority is **DRAM-like read speed** over NAND Flash-like retention
- General consensus is that Storage Class Memory must be **area-based** ReRAM (non filamentary)



STORAGE CLASS MEMORY REQUIREMENTS



4DS

Requirements



- Based on **well understood physics** (like DRAM and NAND Flash)



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- Capable of **speed** as close as possible to DRAM



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HIGH DENSITY / HIGH VOLUME SWEET SPOTS

Memories	Systems Memory	Silicon Storage	Storage Class Memory (close to DRAM read speed)
DRAM	✓		
NAND Flash		✓	
MRAM			
Filamentary ReRAM			
Phase Change ReRAM		✓	
Interface Switching ReRAM			4DS

STORAGE CLASS MEMORY: A DISRUPTIVE TECHNOLOGY

- + Opportunity to offer:
 - + Faster systems
 - + Consuming less power
 - + Capable of processing more data
 - + In a more cost-effective way
- + Critical for the fastest growing segments: Cloud and Mobile



ABOUT 4DS

- + Founded in 2008
- + Publicly traded on Australian Stock Exchange (ASX Code : 4DS)
 - + 964 million shares on issue / 122 million unlisted options / Market Cap fully diluted at A\$0.11.5 = US\$90 mil*
- + All technology developed in-house
 - + All R&D in Silicon Valley
 - + 20 US patents granted + several pending
- + JDA with HGST (subsidiary of Western Digital – US\$ 20 billion Market Cap) since July 2014
 - + Gives us insight into what is really important in a data-centric world

* As of 23rd August 2018



COLLABORATION AGREEMENT

- + Jointly develop a transferrable production ready process
 - + For state-of-the-art high volume / high density production tools
- + Apply this process on imec's proven megabit memory platform
 - + To fabricate a megabit 4DS Interface Switching chip
 - + On same wafer size used for high volume production (300mm)





WHY IMEC?

- + #1 independent semiconductor research & development institute
 - + Collaborates with the who's who of electronic products & systems
 - + Collaborates with the who's who of high volume / high density memories
 - + Has excellent track record in transfer of semiconductor process from "lab" to "fab"
 - + Uses same tools as industry for high volume production of high density memories
 - + Uses same wafer size (300mm = 12") as industry uses for volume production
- + Long track record in research & development of emerging memories
 - + Has a proven megabit memory platform
 - + Has used this platform to explore a wide range of emerging memories



4DS INTERFACE SWITCHING RERAM



CURRENT STATUS

- + Scales to geometries needed for high-density and 3D: 40nm
- + Endurance yield > 97%
- + Read speed comparable to DRAM: *an area-based ReRAM first*
- + No need for speed-crippling error correction: *a ReRAM first*
- + Endurance between DRAM and NAND Flash
- + Retention between DRAM and NAND Flash
- + imec wafers from production equipment due late September 2018

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

Last transaction was the sale of Bill Me Later – a company Jim founded and sold to PayPal for US\$1 billion



**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



**Dr GUIDO
ARNOUT**

CEO & Managing Director

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



**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



**HOWARD
DIGBY**

Non-Executive Director

- Former senior roles at IBM, Adobe, Gartner and the Economist Group
- Non-Executive Director Elsight Ltd and Chairman of Omni Market Ltd
- Advisor to a number of early stage technology companies



**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.



THANK YOU



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