4D-S Transformational Memory Technology

Fitzroy Resources Limited

Presentation to Accompany Takeover Announcement

4DS Memory for any application

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Company Overview After Acquisition & Settlement

Corporate Overview

ASX Code (proposed)	4DS
Share Price	$0.025
Market Cap	$16m
Shares on Issue	659.2m*
Performance Shares	67.6m
Cash (post acquisition)	$3.25m*

*assumes oversubscriptions of $500,000

Technology — 4D-S MOHJO™

- Next Generation Resistive Ram “ReRAM” (or RRAM). Non-volatile memory designed to supersede FLASH for mobile memory storage and cloud solid state device storage
- Established in 2007
- Based in Silicon Valley
- US$10m invested to date
- 19 US and International patents
- Advanced stage of technology development
- Joint Development Agreement with HGST, who helps organizations harness the power of data through a broad portfolio of proven, smarter storage solutions

Company Board

Jim Dorrian
BA
Chairman

Has served as both CEO and Board Member of several Silicon Valley companies with in depth experience in M&A and IPOs. Former partner at Crosspoint Venture Partners

Dr Guido Arnout
PhD
CEO and Managing Director

30 years successfully building early stage electronics technology companies including Power-Escape, CoWare, CrossCheck Technology and Silvar-Lisco

Howard Digby
BE (Hons)
Non-Executive Director

Former senior roles at IBM, Adobe, Gartner and the Economist Group. In Asia. Director of Sun Biomedical (ASX.SBN) and Estrella Resources (ASX:ESR)

David McAuliffe
LLB (Hons), BPharm
Non-Executive Director

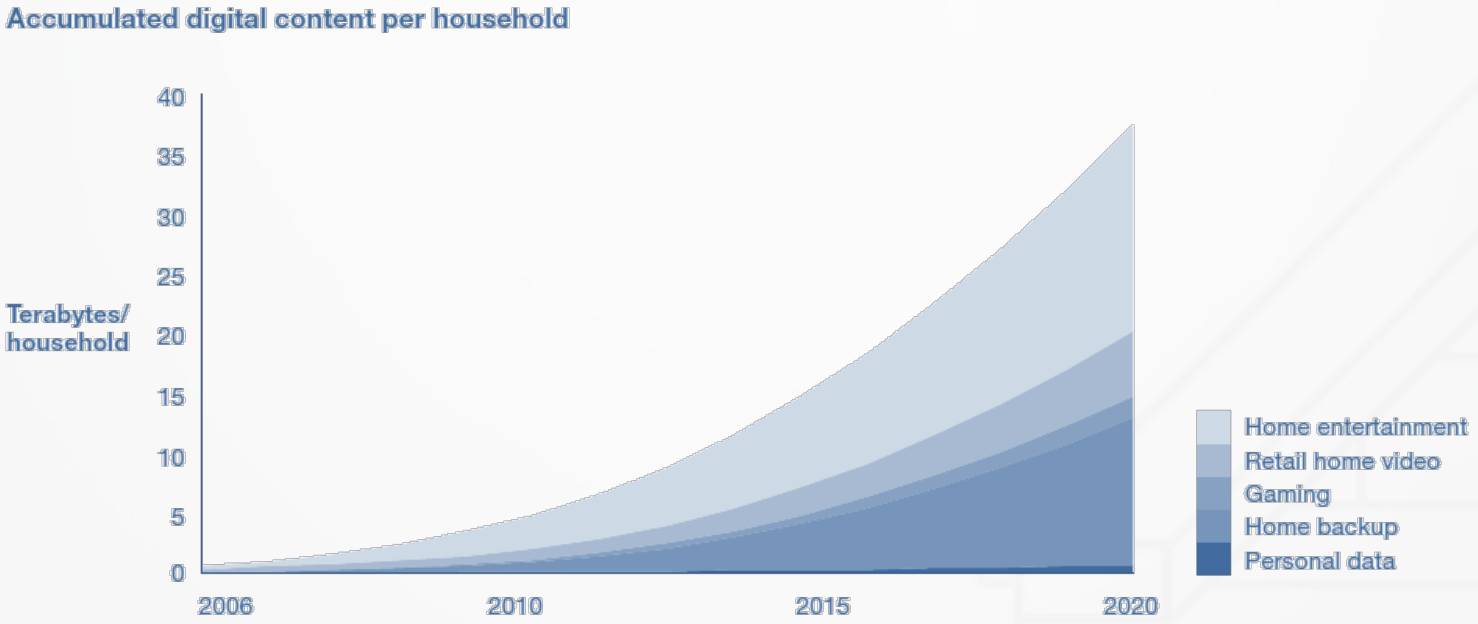
Experienced company director, has been involved in numerous capital raisings and in-licensing of technologies and founder of several companies in Australia, France and the UK, many of which are now publicly listed

Technology Overview

- Next generation non volatile memory. Disruptive technology for cloud storage and mobile devices
- Current mainstream technologies (mainly NAND “Flash” memory) have diminishing ability to scale further and meet future storage needs
- Potential to provide superior performance at fraction of power costs and heat
  - Electricity and cooling is the major operating cost of data centers
  - Power use and storage capacity is the major limiting factor of device thinness, heat output and battery life

Data Storage Today and in the Future

- 90% of data stored today was created in the last 2 years
  - Amazon Web Services, the world's largest cloud provider, adds more server capacity every day than Amazon.com used to run its entire operations 10 years ago
- People, businesses use more and more data



Source: Booz & Company

The Memory Storage Problem

- Memory storage use growing exponentially
  - Cloud Storage banks made up of Solid State Drives (SSD)
  - Wearable technology
  - Mobile Devices
  - The internet of things – memory in normal devices

- Current technology – Flash memory cells can't get much smaller and continue to hold more and more data while still remaining fast and reliable

- **The solution?**
  - Next generation memory that can store exponentially more data, is smaller, cooler, faster, uses less power and is more reliable

Different Memory for Different Uses

Volatile memory

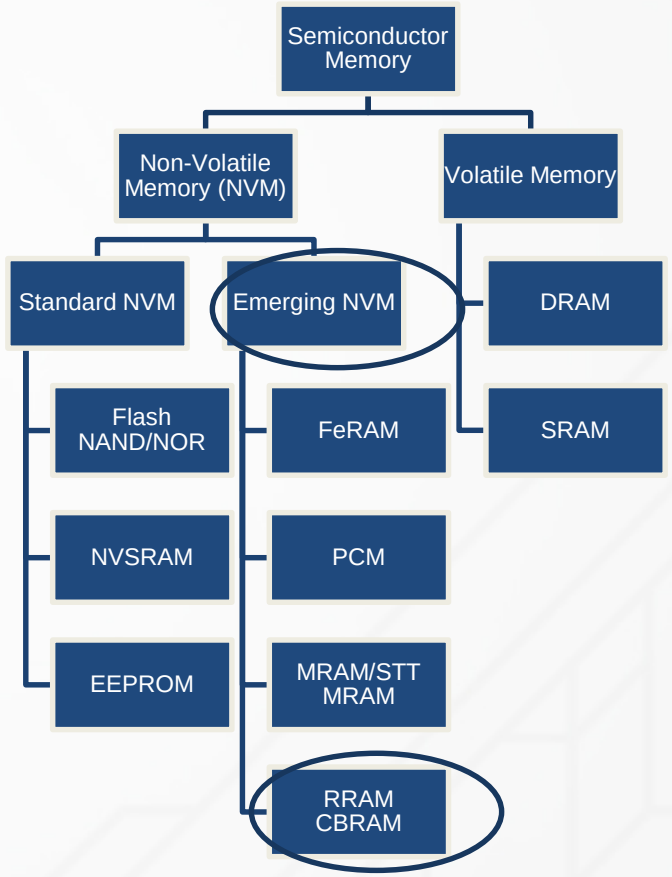
- Requires power to store information
- DRAM and SRAM
- Such as Operative Memory, Cache

Non Volatile memory

- Stores information when the power is off
- Flash (NAND/NOR), EEPROM, NVSRAM
- Today's mobile device memory: Phones, Tablets and Laptops
- Future storage: Cloud and Enterprise (SSDs) and Wearables

Emerging Non Volatile memory

- FeRAM, PCM, MRAM, CBRAM, ReRAM



Flash Memory Will Soon Hit a Wall. What Next?

- Of all the emerging memory storage technologies in development
  - ReRAM-based disruptive technologies have been cited and chosen by major semiconductor corporations and industry analysts as the best potential replacement for NAND Flash

4D-S is developing a transformative and disruptive ReRAM technology to replace Flash and address the massive memory storage demands of the future

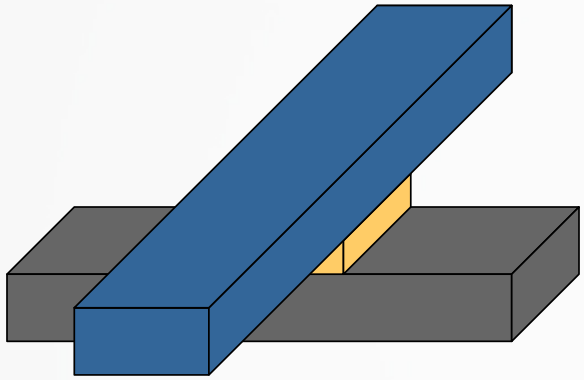
What is ReRAM?

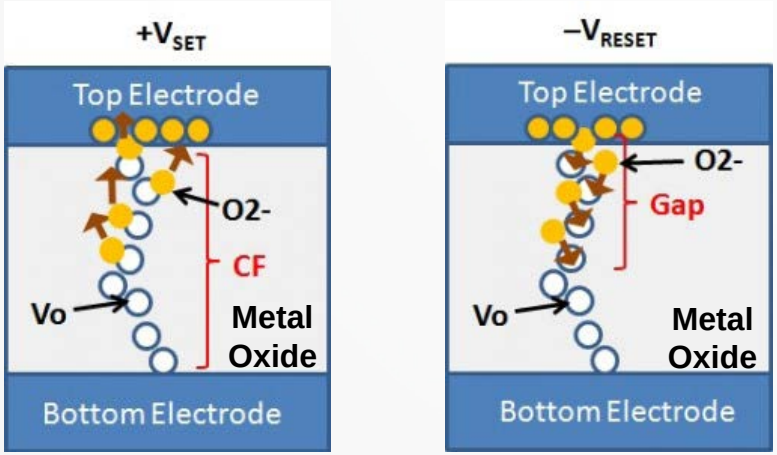
- Today's NVM (e.g. Flash) – a "charge-based" technology
  - Moves and stores electrons
  - Data stored as charge
  - State of the art 2D NAND flash cells move and store as few as 8 electrons at a time
  - Laws of physics will provide a hard stop

- ReRAM: new transformational "material-based" memory technology
  - Changes resistance of switching material
  - Data stored as resistance
  - Potential for terabytes of storage in a single chip
  - Supports future mobile and cloud-based devices

How Does ReRAM Work?

An ReRAM cell consists switching material sandwiched between two electrodes

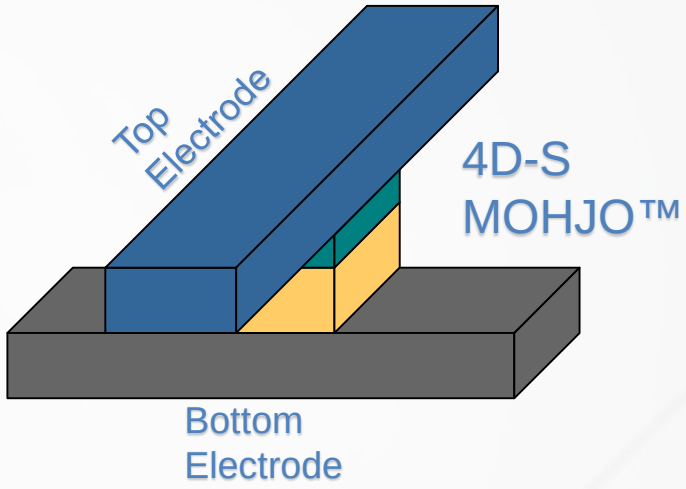




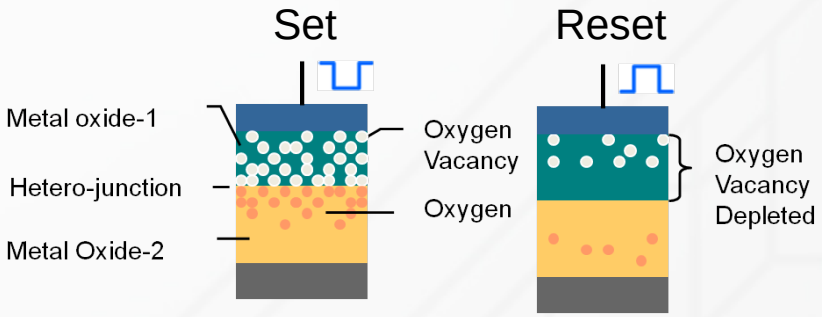
- A voltage pulse reversibly changes resistance
  (typically reversing voltage polarity)
- Resistance change establishes “On” and “Off”
- Switching materials range from simple (binary) metal oxides to multiple element composites
- Most ReRAMs create/eliminating conductive “filaments”
  - Either oxygen vacancy creation or metal injection into switching material
  - Filamentary conduction independent of cell size - potential future scaling issue
  - Poor “on” state retention if incomplete filament created

Why is 4D-S ReRAM Better? No Filament…

- **4D-S MOHJO™**
  - Metal Oxide Hetero Junction – patented cell structure and operation
  - Oxygen exchange across hetero-junction
  - A voltage pulse reversibly changes resistance
  - Reversing voltage polarity switches resistance
  - Non-filamentary switching mechanism



- **4D-S patented ReRAM**
  - Inherently scales well beyond mainstream memories
  - Ideal candidate to replace Flash as dominant future non volatile memory

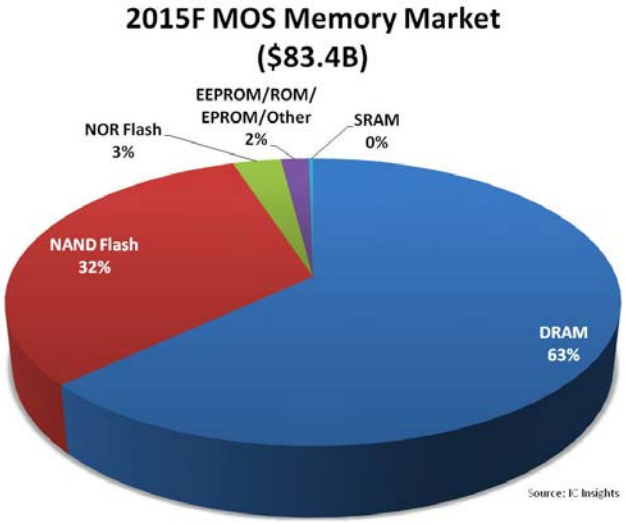


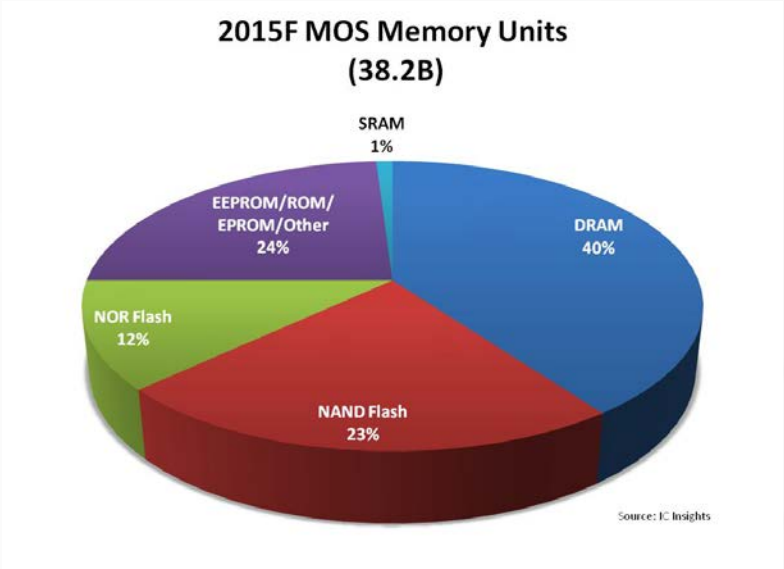
4D-S ReRAM technology is "non filamentary" – no filamentary scaling and retention issues

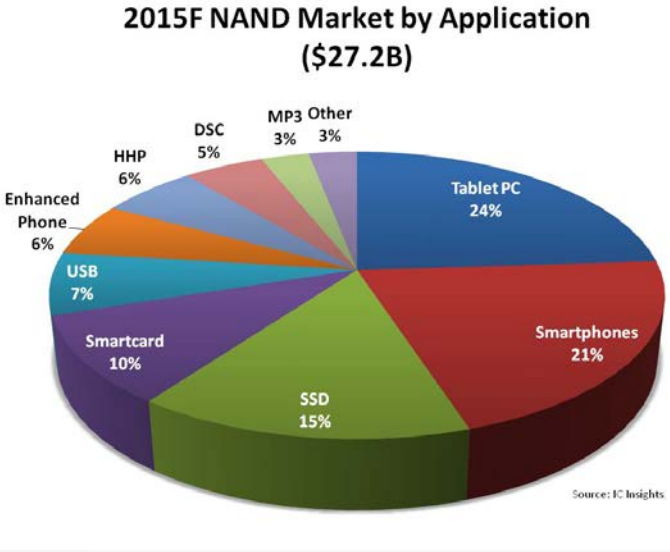
4D-S
Transformational & Disruptive

- Potential to **store** exponentially **more** data than current NVM
  - More scalable than current memory technology's cells
  - Readily configurable for future 3D implementation
- Has demonstrated **higher performance** than existing NVM
  - More than 1000x faster read and write
  - Higher endurance
  - Better data retention
  - Lower energy
- **Easy to manufacture**
  - Fewer steps than conventional memories (e.g. Flash)
  - Shows robust functionality, consistency and scalability
- **Non filament – based**
  - Easier to control and to scale
  - A breakthrough in tackling a major hurdle facing ReRAM

Current Worldwide Memory Market





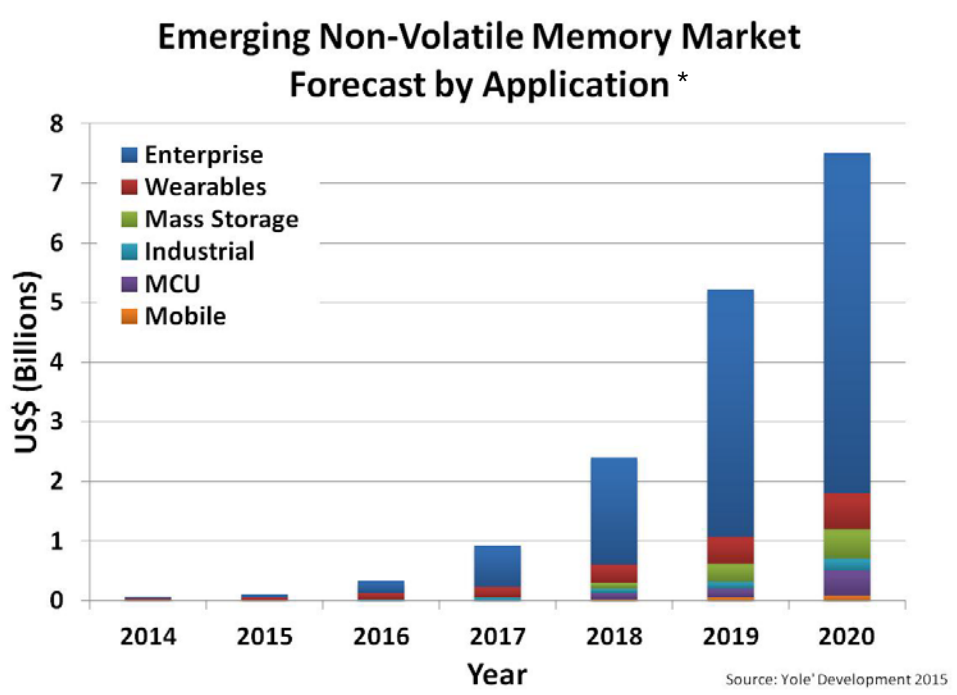


- 2015 semiconductor memory market forecast to be greater than US$80 billion with 15% CAGR
  (Source: SIA, Gartner, IC Insights)
- Current high-density lower-power semiconductor memory market drivers
  - Mobile: smart-phones, tablets and laptops
  - SSD

2020 Worldwide Memory Market

By 2020, high-density lower-power semiconductor memory market drivers

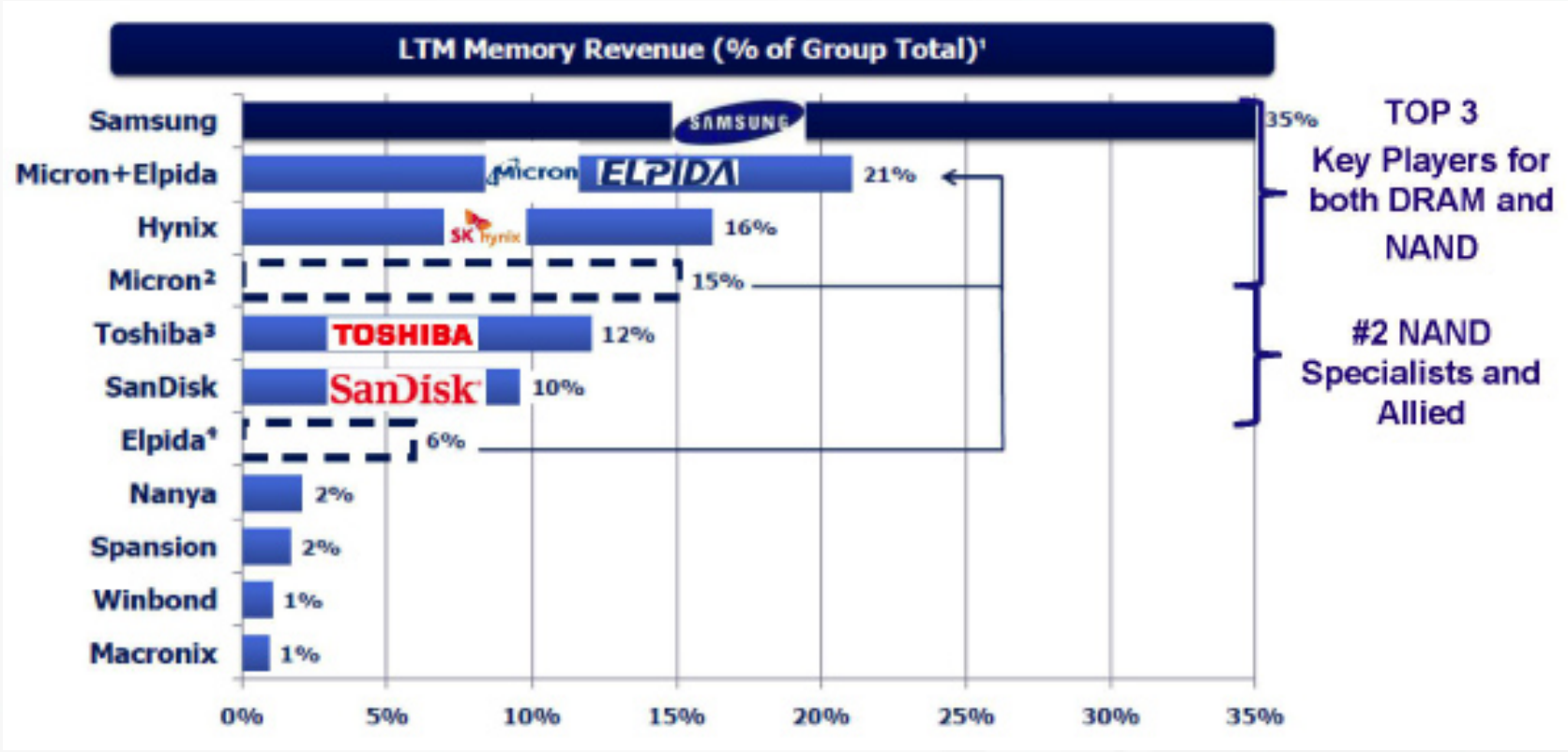
- Enterprise storage, by far the largest
- Wearables, second largest
- Strong demand for low energy memory



* According to independent analyst research including surveys of user trends, memory usage and industry participants

Potential Partners — Memory Market Players

Five big companies control the memory business and will have a leading role in the development and adoption of emerging NVM. These companies are well poised to take advantage of what 4D-S is developing



([1]Market share by revenue)

Source: Yole Development 2013

4D-S Business Model and Strategy

- Breakthrough inventions happen most often in high-tech startups
- Becoming a new high-volume high-density memory maker is virtually impossible
  - Need US$100m to design high-density ReRAM memory to be noticed
  - Requires US$10b to operate high-volume production fab
- Battleground therefore shifted from volume manufacturing to intellectual property (IP)
  - IP ownership by (or IP licensing to) established high-volume high-density memory makers
  - IP ownership by memory users to tailor to their mission critical needs
- Success is being at the center of the new battleground
  - Strength of IP best established by focusing on a specific market segment
  - What drives silicon storage today (mobile)
  - What is emerging as the biggest opportunity for silicon storage – the cloud
- Focused on addressing mission critical needs of the fastest growing market: the cloud
  - Hence, joint development agreement with leading storage company

IP Battleground

- Recent transactions
  - Apple acquired Israeli SSD company Anobit for $390m in 2011
  - Western Digital acquired storage startup Virident for $685m in 2013
  - Seagate acquired Flash company LSI for $540m in 2014
  - Western Digital acquired SSD company sTec for $340m in 2013

- To attract a deal, NVM hopefuls must demonstrate their technology is:
  - Scalable to super high-density
  - Manufacturable with high yield
  - Tunable to the mission critical needs of the key market segments

4D-S Advanced State of Development

- 2007 - 2013: cell proof-of-concept in affordable geometries (16 patents) i.e. basic memory cell technology works well
  - Patented filament-less ReRAM memory cell based on oxygen vacancies
  - Patented low-temperature deposition of essential memory material
- 2014 - current: JDA with leading storage company to demonstrate technology is:
  - Scalable to super high-density
  - Manufacturable with high yield
  - Tunable to the mission critical needs of the “cloud”
  - Goal is to move the technology to a point where only “time and money” needed to productize
- Exit strategy is to be front and center in the IP battleground
- Capital raised will be used to undertake the final steps needed to achieve a high ROI exit

Investment Summary

- Massive and fast growing market. 4D-S is targeting the right segments at the right time: mobile & cloud
- Transformational and disruptive memory platform
- ReRAM technology stands out among other next generation players
- Joint Development Agreement with HGST, who helps organisations harness the power of data through a broad portfolio of proven, smarter storage solutions
- Success is licensing IP to memory makers or acquisition by memory maker or user

4DS Memory for any application

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