Weebit Nano demonstrates commercially viable data retention results at 40nm

Over 10 years' data retention across 40nm scaled devices

18 October 2018 – Weebit Nano (ASX: WBT), the Israel-based semiconductor company seeking to develop and commercialise the next generation of memory technology, is pleased to report the successful data retention results on its scaled down 40nm array. The results achieved indicate that Weebit Nano's technology is capable of maintaining stored information for over 10 years, which is above the requirement to be commercially viable.

The company previously reported similar data retention results on its 300nm cell size and now, as part of the baseline parameter improvement project it is conducting with Leti, reliability tests have confirmed data retention is not impacted by scaling down the memory size.

Data retention is considered one of the most crucial reliability parameters in the non-volatile memory market. Retention errors are the most dominant failure mechanism, responsible for more than 99 per cent of the NAND (or flash memory) failures after one year in the field[1]. It is also known that data retention poses significant reliability challenges in other emerging memory technologies.

Coby Hanoch, CEO of Weebit Nano, said: "Weebit is conducting extensive and robust testing with our partner, Leti, as we continue to develop and improve the baseline parameters of our SiOx technology. Data retention is an important validation and demonstrates one of the key strengths of our technology. These results are essential to our productisation plans, as many markets require 10 years of retention as a 'must-have' feature.

"We are currently in the process optimisation phase whereby we are making improvements to additional parameters such as endurance, yield and manufacturability. This is an important step a we ready our technology for the productisation stage. Our improvement testing is also providing us with significant know-how, which we will use in the next phase of scaling down to 28nm."

The data retention test was conducted in CEA/Leti testing facilities by Weebit Nano engineers under various testing conditions, including elevated temperatures for various periods of time to accelerate and age of the devices in order to replicate 10 years' operation in the field. Data analysis and life-time prediction calculations using industry standard metrics have shown that Weebit's ReRAM SiOx arrays did not present any significant degradation with information being detected with no corruption after 10 years' field operation.

In addition, Weebit's 40nm devices endured an elevated temperature of 260°C for a period of time that well exceeds the requirements of soldering semiconductor components onto a printed circuit board (PCB).

[1] Cai, Yu; Error Patterns in MLC NAND Flash Memory; EDAA 2012

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Weebit Nano is on track to complete its process optimisation phase by the end of the first quarter of the 2019 calendar year.

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About Weebit Nano Limited

Weebit Nano is a leader in the development of next generation computer memory technology, and plans to become the new industry standard in this space. Its goal is to address the growing need for a significantly higher performance and lower power computer memory technology. Weebit Nano's ReRAM technology is based on fab-friendly Silicon Oxide, allowing the company to rapidly execute, without the need for special equipment or preparations. The company secured several patents to ensure optimal commercial and legal protection for its ground-breaking technology.

Weebit Nano's technology enables a quantum leap, allowing semiconductor memory elements to be significantly cheaper, faster, more reliable and more energy efficient than the existing Flash technology. Weebit Nano has signed an R&D agreement with Leti, an R&D institute that specialises in nanotechnologies, to further develop SiOx ReRAM technology.

For more information please visit: http://www.weebit-nano.com/

Glossary of key terms

ReRAM - Resistive random-access memory (ReRAM) is a type of non-volatile (NV) random-access memory that works by changing the resistance across a dielectric solid-state material rather than directly storing charge.

Volatile memory – Volatile memory is computer memory that only maintains its data while the device is powered. When power is interrupted the stored data is lost.

Non-volatile memory – Non-volatile memory (NVM) retains its data even when the power supply is disconnected, and thus is used for storage of data.

Flash / 3D NAND – Flash memory is a type of NVM. It is often found in USB flash drives, MP3 players, digital cameras and solid-state drives.

SiOx- Silicon Oxide (SiOx) is the most commonly used material for producing semiconductor devices.

Fab – A factory where semiconductor devices are fabricated

Embedded memory – a memory which is integrated together with other elements such as processor in a chip.

Single chip memory – a chip which contains only memory

Nanometer – one billionth (10^{-9}) of a meter. It is widely used as a scale for building tiny, complex, and atomic scale computing and electronic components - specifically in nanotechnology.

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