



## Shanghai Huali Microelectronics Corporation (HLMC) Announces Collaboration with Adesto and CNE

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**June 4, 2018** – [Shanghai Huali Microelectronics Corporation \(HLMC\)](#), one of the most advanced pure play wafer foundries in China, announces it is collaborating with [Adesto Technologies](#) (NASDAQ: IOTS), a leading provider of application-specific, ultra-low-power non-volatile memory (NVM) products, and [Crocus Nano Electronics \(CNE\)](#), an advanced foundry dedicated to semiconductor back end of line (BEOL) manufacturing, to develop new RFID and microcontroller (MCU) products based on Adesto's Resistive RAM (RRAM) memory technology trademarked as Conductive Bridging RAM (CBRAM®).

Adesto's proprietary and production-proven CBRAM technology provides the lowest power NVM solution for ultra-low power Internet of Things (IoT) and other MCU applications, enabling significantly lower energy consumption than today's flash memory technologies. It also delivers enhanced performance compared to standard non-volatile memories.

The combination of Adesto's CBRAM technology, HLMC's 55nm ULP (ultra-low power) front-end process, and CNE's 300mm back-end processing technology will enable cost-effective manufacturing of embedded and standalone RRAM memory devices.

At 55nm – the sweet spot for low-power, economical silicon platforms for IoT edge nodes – customers can leverage the advantages of CBRAM while optimizing for energy and speed, and exploiting the ability to execute-in-place. This aligns well with requirements for battery operated IoT and wearable devices, some of which are designed to operate for years without a battery change. Additionally, Adesto's RRAM technology in 55nm offers customers a highly cost-effective solution for embedded designs because it requires a significantly lower number of masks versus alternatives.

"HLMC is devoted to providing customers with advanced process technologies and comprehensive foundry services, and we look forward to working with Adesto and CNE to make this differentiated technology more widely available in a growing number of applications," said Jack Qi Shu, EVP, HLMC. "We anticipate ramping quickly to production in 55nm and are also exploring a potential roadmap for even more advanced nodes."

"Our CBRAM technology is the ideal embedded nonvolatile memory technology for ultra-low power IoT devices, and we're delighted that companies will now be able to embed it in a wide range of products that will benefit from its high density," said Venkatesh ("P.G.") Gopinath, Vice President CBRAM Technology Research and Development, Adesto. "Together with HLMC and CNE, we are enabling development of new families of products that capitalize on expanded market opportunities for this powerful technology."

"CNE's primary focus is on innovative NVM technologies including MRAM and RRAM, and we are ready to work with our customers to achieve market success with products based on Adesto's proven CBRAM technology," said Vladimir Krupnik, Vice President Business Development, CNE. "We are already seeing a great deal of customer interest in this technology for RFID and MCU applications and believe there are many other areas where the technology can provide advantages."

Adesto was the first company to bring a resistive RAM based product to market with its Mavriq Serial EEPROM family, followed by the Moneta family for ultra-low energy and energy harvesting applications. Both Mavriq and Moneta are based on Adesto's CBRAM technology.