ZeroAMP: ultra-low power computing for everywhere, from the Artic wastes to AGA ovens.

ZeroAMP announce a Horizon 2020 funded project to develop ultra-low power computing and memory, using nanomechanical switches that survive extreme environments.

Transistors are the ubiquitous building blocks of digital integrated circuits found in every modern electronic device, from cell phones to computers to industrial electronics. To push beyond the limits of transistors, Microchip Technology (MICROCHIP), a leading provider of smart, connected and secure embedded control solutions, and X-FAB MEMS Foundry GmbH (X-FAB), a leading semiconductor foundry, are working on developing the first large-scale integrated nanoelectromechanical relay-based computers for harsh environments.

Critical expertise is also provided to this international project by the UK's University of Bristol (UNIVBRIS), KTH Royal Institute of Technology (KTH, Sweden), Gesellschaft für Angewandte Mikro- und Optoelektronik mbH (AMO) based in Germany, the Swiss Centre for Electronics and Microtechnology SA (CSEM) and SCIPROM Sàrl (Switzerland).

This work is driven by emerging applications utilising ultra-low power sources that transistor-based electronics cannot efficiently use, and the capability to operate at low power in harsh environmental conditions where transistors cannot perform. Autonomous nodes in the IoT require extremely energy-efficient processors with zero standby power, while all-electric vehicles and more-electric aircraft need electronics controllers that work at very high temperatures. At the other end of the spectrum, readout circuitry for superconducting quantum circuits need to operate close to cryogenic temperatures.

The ZeroAMP project has the goal of developing nanoelectromechanical relay-based field-programmable gate arrays (FPGA) with integrated non-volatile memory that can work at temperatures up to 275 °C, with zero current leakage and standby power. The technology solution will incorporate novel materials, switch designs and circuit techniques along with advanced 3D stacking for large-scale integration of the nanomechanical switching elements, building on the ground-breaking past work of the consortium partners in the area of nanoelectromechanical relay-based computing.

The ZeroAMP project is targeting electronic solutions that unlock the full power of the IoT, aid cryogenic Quantum computing, wirelessly log temperatures deep in industrial processes and advance technologies such as Electric Vehicles that reduce dependency on fossil fuels.

- More info on ZeroAMP: visit the ZeroAMP website at https://www.zeroamp.eu

- Targets for the press release: Electronic Design for Aerospace, Space, Defence, Oil and Gas, cryogenic Quantum computing, Industry, Automotive and IoT (particularly Industrial IoT - IIoT)

- Key word and phrases for Search engines: NVM, non-volatile memory, ultra-low power, FPGA, IoT, IIoT, quantum computing, harsh environments, high temperature, high temperature electronics, MEMS, energy scavenging, the edge, EV, electric vehicles, Automotive, Aerospace, Space, Defence, Oil and Gas

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