ARM De-risks Design Cycle for IoT Chips

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ARM has unveiled a new hardware subsystem to enable the fast and efficient development of highly customized chips for smart connected devices. The ARM IoT subsystem for ARM Cortex-M processors is optimized for use with ARM's most efficient processor and radio technologies, physical IP and ARM mbed OS.

This individually licensable subsystem IP block, together with Cortex-M processor and ARM Cordio radio IP, forms the basis for an IoT endpoint chip design, allowing partners to integrate sensors and other peripherals to create complete SoCs. Using ARM Artisan physical IP, the design is optimized for TSMC's 55nm Ultra-Low Power (55ULP) process technology with embedded flash memory, and will enable chips with reduced size, cost and power consumption, operating at sub one-volt.

"With industry expectations of hundreds of billions of new smart connected sensors by 2030, we see a growing demand for highly customized chips," said James McNiven, general manager, systems and software, ARM. "Creating a highly tailored SoC is complex. The ARM IoT subsystem for Cortex-M enables companies to simplify the process and improve time to market. It enables our partners to focus finite design resources on the system functionality that differentiates them in their market."

The ARM subsystem will support IoT market growth by reducing development risk and enabling companies to quickly create products that address opportunities in the smart homes and smart cities markets. Companies expected to license the subsystem include analog sensor

makers and companies looking to add IoT connectivity to existing IP.

"A SoC is complex combination of logic, memory, and interconnect technologies, but equally as important is the glue that ties all these system components together," said Jim McGregor, founder, TIRIAS Research. "By offering the IoT Subsystem, ARM is enabling both new and established semiconductor vendors to design and deliver solutions in a very timely and cost effective manner, which is critical in the rapidly innovating IoT segment. With the most complete offering of hardware and software solutions for IoT applications, it's no surprise that more IoT devices run on ARM than any other architecture."

The ARM IoT subsystem for Cortex-M processors features a range of peripherals and interfaces; including links to TSMC's embedded flash memory. It is specifically designed for use with Cortex-M processors and optimized for mbed OS and Cordio Bluetooth Smart radio. It is possible to integrate other radios and wireless networking standards such as Wi-Fi and 802.15.4.

This subsystem has been developed in close collaboration with TSMC, one of the world's leading semiconductor foundries, for production on its 55ULP process technology. The combination of Artisan physical IP and TSMC's 55ULP process means the subsystem can run at sub-one volt operation, extending battery life and making it easier to run a device using energy harvesting.

"We have worked alongside ARM to ensure its IoT subsystem for Cortex-M cores is optimized for TSMC's 55ULP process," said Suk Lee, senior director, design infrastructure marketing Division, TSMC. "This process is very well-suited for smart IoT devices as it provides a fine balance of cost and energy-efficiency."

TSMC launched the foundry segment's first and most comprehensive

ULP technology platform in September 2014 to serve a range of applications supporting demand for IoT and wearable devices.

The ARM IoT subsystem for Cortex-M processors builds on the company's suite of IoT enablement technologies and embedded ecosystem and is available for immediate licensing. To date, over eleven billion ARM Cortex-M processor based chips have been shipped, while the mbed developer community has now grown to over 100,000 users.

Provided by ARM