

Synopsys and Chipus

Chipus Achieves First-Pass Silicon Success for UHF RFID Design with Synopsys DesignWare AEON MTP NVM IP



Our end customer's aggressive schedule left no room for error. Synopsys DesignWare IP enabled us to achieve first-pass silicon success for our UHF RFID design, just as we had expected with Synopsys' reputation as a provider of high-quality IP."



Murilo Pessatti
CEO, Chipus Microelectronics

Business

Chipus Microelectronics is an analog IP design house with a focus on data converters, analog front-end, and power management solutions for fabless semiconductor companies and chip integrators. They specialize in designs requiring low power consumption with high performance.

Challenges

- ▶ Deliver rapid turnaround of UHF RFID design for end customer's aggressive schedule
- ▶ Meet customer's extremely low power consumption requirements
- ▶ Integrate high-quality non-volatile memory (NVM) IP that would enable first-pass silicon success

DesignWare IP Solution

- ▶ DesignWare® AEON® Multi-Time Programmable (MTP) NVM IP

Benefits

- ▶ Achieved first-pass silicon success, accelerating time-to-market by an estimated seven months
- ▶ Met power consumption goals and reduced integration risk with silicon-proven DesignWare IP
- ▶ Saved up to 15% on development costs with DesignWare IP available on their target 180-nm process node
- ▶ Saved up to seven months on their development schedule

Overview

Chipus' UHF RFID design is an ultra-low power analog/RF front-end core, ideal for use in passive UHF RFID integrated circuits. The design meets RFID requirements for capturing energy from RF communication alone, without a battery or power supply. Chipus' UHF RFID design features a complete analog/RF front-end, including a rectifier, demodulator, backscattering modulator, power management unit, and short-term memory that generates persistence flags. This design can be used in a variety of RF integrated circuit (IC) applications that require extremely low power consumption, including item- and pallet-level logistical tracking, livestock, apparel, pharmaceuticals, and emerging near field communications (NFC) applications.

RFID designs are used in time-, cost-, and power-sensitive applications, making it critical that Chipus meet these market demands. To support this goal, Chipus required a low-power, silicon-proven solution that they could count on for first-silicon success. In addition, they were looking for fabrication efficiencies that could reduce development costs. Synopsys' DesignWare NVM IP supported these requirements with low-power, silicon-proven AEON MTP IP delivered on Chipus' chosen fabrication process.



After completing thorough research on available NVM IP, we found that only Synopsys DesignWare IP met our design's ultra-low power requirements."

Murilo Pessatti
CEO, Chipus Microelectronics

Silicon-Proven DesignWare NVM IP

Chipus knew that to deliver on their end customer's aggressive schedule, selecting high-quality, silicon-proven IP from a reputable vendor was critical. After thorough research on the IP available, they found that Synopsys' DesignWare AEON MTP NVM IP was the only option that met their quality requirements and offered the low power consumption necessary for the UHF RFID design. In addition, the IP was fully characterized and thoroughly documented, ensuring that the IP would work the first time. Chipus' confidence in Synopsys allowed them to accelerate straight from design to production without an intervening prototyping stage, saving up to seven months on their schedule.

Process Node Availability

RFID designs are often used in low-cost end products, and Chipus knew that keeping development costs low was key to the UHF RFID design's success. To keep their costs down, Chipus wanted to use IP that was available on their design's target 180-nm process node, and only Synopsys

DesignWare IP offered an MTP solution in standard CMOS without the need for additional masks or processing steps. By choosing Synopsys over other IP providers, Chipus saved up to 15% on development costs because they did not require any additional masks.

Responsive, Detailed Support

Including physical integration and all testing, Chipus integrated the DesignWare IP into their design in only three weeks. The accuracy and completeness of Synopsys' product documentation and silicon characterization information eased Chipus' integration of the DesignWare IP into their UHF RFID design. When questions arose, Synopsys' expert technical support was ready to provide timely and knowledgeable help and detailed design reviews.

"The quality of the DesignWare NVM IP, documentation, and technical support exceeded our already high expectations," said Murilo Pessatti, CEO of Chipus Microelectronics. "We are currently using DesignWare IP for new projects and will continue to consider DesignWare IP for future projects."

"We were impressed that Synopsys offered NVM IP on our required CMOS process, which saved us development costs by avoiding the additional mask sets that other vendors' IP might necessitate."

Murilo Pessatti
CEO, Chipus Microelectronics



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