SYNOPSYS®
Predictable Success

Synopsys and Altair

Altair Meets Power and Performance SoC Goals for LTE and WiMAX applications with DesignWare Data Converter IP

"Synopsys is the only IP provider that offered a silicon-proven data converter solution that met our low-power and high-performance SoC design requirements for LTE and WiMAX applications."

Eli Zyss
Vice President of VLSI, Altair Semiconductor

Business

Altair Semiconductor is the world's leading developer of ultra-low power, small footprint and high performance 4G chipsets for LTE that offers device manufacturers a power-optimized, robust and cost-effective solution.

Challenges

- Obtain a baseband analog front-end (AFE) IP solution that meets low-power consumption, and high-performance SoC design requirements
- Acquire proven data converter IP developed for broadband wireless communication applications
- Reduce the risk of integrating a high performance analog IP in a complex SoC

DesignWare IP Solution

- Complete LTE AFE IP, including analog-to-digital converters (ADC) digital-to-analog converters (DAC), and PLL in two leading edge technology nodes

Benefits

- Acquired a robust AFE IP solution for low-power LTE and WiMAX baseband application
- Easily integrated a very efficient AFE IP in a complex SoC, while meeting the power and performance requirements
- Received excellent technical support from a knowledgeable and responsive engineering team

Overview

Altair's comprehensive 4G wireless chipset portfolio includes baseband processors, multi-band RF transceivers for both FDD and TDD bands, and a range of reference hardware and product level-protocol stack software. The baseband processor is the 'brain' behind the communication link, and implements the Physical (PHY) and the Media Access Control (MAC) layers of the modem. Smart and efficient implementation of the baseband processor is the key to achieving good modem performance and low power consumption.

Altair's 4G baseband processors are based on a single processor/hardware architecture and software programmable to implement respective 4G standards such as LTE, WiMAX or XGP. The architecture is based on Altair's patented O²P Software Defined Radio (SDR) processor, which combines a high degree of programmability, ultra-high performance and ultra-low power consumption. All 4G chipsets are designed and manufactured in advanced, low power CMOS processes and excel in very high silicon utilization, resulting in extremely small die sizes and low cost.

With more than a decade of delivering proven data converter IP solutions, Synopsys gave us confidence that the DesignWare IP would be of very high quality and function as expected."

Eli Zyss
Vice President of VLSI, Altair Semiconductor

Leading DesignWare IP Solution

Altair needed to integrate a broadband wireless communications AFE to interface with the analog RF block on their complex SoC. To meet the requirements of their 4G chipset, Altair needed an AFE IP solution that offered a combination of high-performance and low-power dissipation within a small form factor.

Synopsys' DesignWare® AFE IP includes several low power data converters that met the performance and power requirements of Altair's chipset. The DesignWare AFE IP includes additional blocks such as a low-speed ADC for general purpose measurements and to control the RF chain. It also offers a programmable PLL to generate the low jitter sampling clock for all the converters.

The DesignWare AFE IP solution incorporated several advanced functionalities that enable the system to take full advantage of the characteristics of the wireless communication protocols.

This strong feature set resulted in a very robust and efficient AFE IP solution that was easily integrated into Altair's LTE and WiMAX chipsets.

High-Quality IP and Excellent Support

The high-quality DesignWare AFE IP solution allowed Altair to complete the design and verification of the entire chip within their project schedule. "We had confidence that the DesignWare AFE IP would function as expected and enable us to deliver a reliable product to our end-customer on time." said Eli Zyss, Vice President of VLSI at Altair "Synopsys silicon-proven DesignWare IP enabled us to lower the risk of integrating a high performance analog front-end into our complex SoC design and focus our engineering talent on our core competencies."

Furthermore, Synopsys' comprehensive product documentation and knowledgeable technical support team enabled Altair to easily integrate the DesignWare AFE IP into their SoC. Synopsys was there to support Altair, when they needed it, throughout the entire design process, which was instrumental in helping meet the requirements of their end solution.

Synopsys provided Altair with the DesignWare AFE IP solution in two leading edge technology node product generations, both of which were successfully deployed to the market. Synopsys DesignWare IP will continue to play an important role in Altair's next generation product developments.

"In the few times we needed support, Synopsys' technical team was very knowledgeable and responsive. Their willingness to go the extra mile helped ensure the success of our SoC.

Eli Zyss
Vice President of VLSI, Altair Semiconductor

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