Altera and TSMC Collaborate to Bring Advanced Packaging Technology to Arria 10 FPGAs and SoCs

Innovative Copper Bump Package Technology Improves Quality, Reliability and Performance in Altera’s 20nm Device Family

San Jose, Calif. And Hsinchu, Taiwan, R.O.C., April 21, 2014 – Altera Corporation (NASDAQ: ALTR) and TSMC (TWSE: 2330, NYSE: TSM) today announced the two companies have worked together to bring TSMC’s patented, fine-pitch copper bump-based packaging technology to Altera’s 20nm Arria® 10 FPGAs and SoCs. Altera is the first company to adopt this technology in commercial production to deliver improved quality, reliability and performance to Altera’s 20nm device family.

“TSMC has provided a very advanced and robust integrated package solution for our Arria 10 devices, the highest-density monolithic 20nm FPGA die in the industry,” said Bill Mazotti, vice president of worldwide operations and engineering at Altera. “Leveraging this technology is a great complement to Arria 10 FPGAs and SoCs and helps us address the packaging challenges at the 20nm node.”

TSMC’s leading-edge flip chip BGA package technology provides Arria 10 devices with better quality and reliability than standard copper bumping solutions through the use of fine-pitch copper bumps. The technology is able to accommodate very high bump counts as required by high-performance FPGA products. It also provides excellent bump joint fatigue life, improved performance in electro-migration current and low stress on the ELK (Extra Low-K) layers, all highly critical features for products employing advanced silicon technologies.

“TSMC’s copper bump-based package technology provides excellent value for small bump pitch
(<150µm) advanced silicon products featuring ELK,” said David Keller, senior vice president, business management, TSMC North America. “We are pleased that Altera is adopting this highly integrated packaging technology.”

Altera is shipping Arria 10 FPGAs based on TSMC 20SoC process technology and featuring this innovative packaging technology. Arria 10 FPGAs and SoCs provide the FPGA industry’s highest density in a single monolithic die and up to 40 percent lower power than the previous 28nm Arria family. For additional information visit www.altera.com or contact a local sales representative.

TSMC’s copper bump-based package technology is scalable and ideal for products that feature large die size and small bump pitch. It includes a DFM/DFR implementation from TSMC that adjusts package design and structure for wider assembly process windows and higher reliability. The technology has demonstrated better than 99.8% production-level assembly yields.

About Altera

Altera® programmable solutions enable designers of electronic systems to rapidly and cost effectively innovate, differentiate and win in their markets. Altera offers FPGAs, SoCs, CPLDs, ASICs and complementary technologies, such as power management, to provide high-value solutions to customers worldwide. www.Altera.com

About TSMC

TSMC is the world’s largest dedicated semiconductor foundry, providing the industry’s leading process technology and the foundry segment’s largest portfolio of process-proven libraries, IPs, design tools and reference flows. The Company’s owned capacity in 2014 is expected to be about
8.0 million (12-inch equivalent) wafers, including capacity from three advanced 12-inch GIGAFAB™ facilities, four eight-inch fabs, one six-inch fab, as well as TSMC’s wholly owned subsidiaries, WaferTech and TSMC China. TSMC is the first foundry to provide both 28nm and 20nm production capabilities. Its corporate headquarters are in Hsinchu, Taiwan. For more information about TSMC please visit http://www.tsmc.com.

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