Growing Importance of System Integration

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Electromobility, Internet of Things, and energy efficiency will lead to innovative products where compact microelectronic system integration is required. Miniaturization and integration of more functionality with higher performance and reliability will be the challenges for the future. The trend to "More than Moore" causes increasing diversification where companies develop more dedicated technologies for their products. In this presentation we will demonstrate system integration capabilities and the technologies required for the future.

Wirebond technology will remain the main interconnect technology for the future. Flip chip technology will cover high pin count devices. The new eWLB technology will be an important enabler for future high density and high frequency applications. Through silicon via technologies are on the horizon. Chip-Package interaction is getting more sensitive due to the introduction of ultra low k dielectrica. System integration applying system-on-chip or system-in-package causes higher densities e.g. for I/Os or current. The different challenges require a wide range of solutions. We show dedicated examples for power devices, dedicated system-in-package examples for mobile applications, and technology trends we expect for future system integration.

For the technology developments especially testing and yield of system-in-package will play a basic role. System integration in addition needs i) coherent chip-package-system co-design for optimum product development, ii) software to include added value, and iii) appropriate system partitioning concepts.

Infineon is focusing on products addressing the areas of energy efficiency, communications and security. Increasing system integration is driving technology development and the decision to design System on chip System-on-Chip or System-in-Package will be crucial. Basic research and collaborations are required to solve the multiple challenges. Infineon partly has its own R&D and partly works together in public funded German or EU consortia to prepare for future system integration needs.