

Keynote #2

Efficient integrated devices are growing on Engineered Substrates

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Abstract— AI and 5G are transformative megatrends. AI harnesses machine learning for smart decision-making and automation. 5G, a new wireless standard, offers ultra-fast speeds and low latency. Together, they revolutionize industries, enabling advanced applications like autonomous vehicles, remote surgery, and immersive experiences, shaping the future of technology. RFSOI (Radio Frequency Silicon on Insulator) engineered substrate has now totally demonstrated that PPAC optimization can start with substrate and leveraging materials properties. RFSOI enhances radio frequency performance by reducing signal loss and interference. Its insulated layer isolates components, improving energy efficiency and allowing faster data transfer in wireless devices like smartphones and IoT applications. RFSOI is now powering 100% of Smartphones FEM for 4G and its performance is now extended to support 5G spectrum. FD-SOI (Fully Depleted Silicon on Insulator) engineered substrate is a semiconductor material crucial for efficient integrated circuits. It offers better power performance and energy efficiency by utilizing a thin layer of silicon (channel of transistor) on top of an insulating layer. This enables advanced mobile processors and IoT devices, conserving energy and extending battery life. FDSOI now demonstrates not only being perfect platform for edge AI applications but also becoming the standard for 5G transceivers. Photonic-SOI (Silicon on Insulator) engineered substrate combines thicker silicon layer and oxide layer for photonic components for AI applications. It enables faster data transmission using light instead of electricity, enhancing processing speed and energy efficiency. This technology finds use in AI systems for rapid information exchange, improving performance in neural networks and data-intensive tasks. New materials such as III-V compounds and piezoelectric materials are now integrated on the best underlying substrate to further push the limits and performance for processing speed, lowering power consumption and enable new functionalities, for example in filter applications. Engineered substrates are now mature and large volume substrates offering advanced performance to serve megatrends.

Biography



Dr. Christophe Maleville has been appointed Chief Technology Officer of Soitec's Innovation. He joined Soitec in 1993 and was a driving force behind the company's joint research activities with CEA-Leti. For several years, he led new SOI process development, oversaw SOI technology transfer from R&D to production and managed customer certifications. He also served as Vice President, SOI Products Platform at Soitec, working closely with key customers worldwide. Maleville has authored or co-authored more than 30 papers and also holds some 30 patents. He has a PhD in Microelectronics from Grenoble Institute of Technology and obtained an Executive MBA from INSEAD.