Advances in Transceivers for Microwave Links

Speaker:
Dr. Franz Dielacher

Abstract:
Low-cost (silicon- based) mass market exploitation of large amounts of bandwidth at 60 GHz and above can be foreseen over the next decade for areas like wireless-connectivity, sensor networks, car-radar, identification and e-safety.
The small wavelength which characterizes mm-waves makes it possible to use a fusion of electromagnetic and antenna techniques along with the practically unlimited number of reliable transistors in a silicon IC. This allows the creation of a concurrent transmission of various independent data streams in different spatial directions, leading to integrated solutions to create scalable tuneable multi-band and multi-beam techniques like phased arrays for a variety of applications.
In its introduction, the presentation will give a summary of the challenges and requirements in the context of technology selection and system partitioning. Low cost high performance technologies like CMOS and SiGe-bipolar and low loss, low cost organic packaging materials will be considered.
For the circuit design itself new efficient millimetre-wave radios and transceiver concepts will be explored and design issues will be discribed. In this context integrated solutions like MMIC plus integrated antenna are important.
Finally some examples for highly integrated MMIC solutions for applications like indoor (connectivity), high data-rate outdoor (E-band) communications and for car guidance and safety systems will be given.

This talk will explore the current status of Microwave components in SiGe-bipolar and RF-CMOS technologies for Microwave transceivers at 60GHz and above. In addition to the electrical components performance, major criteria to be addressed are high reliability, long lifetime and high yield fabrication. Advanced packaging technologies including MEMS, embedded passive components, 3D integration and package co-design will be addressed too.

Franz Dielacher is with Infineon Technologies Austria AG, Siemensstrasse 2, A-9500 Villach, Austria. E-mail: franz.dielacher@infineon.com, Tel: +43 5 1777 6376