

Wireless 100 Gbps and Beyond: Technologies and System Concepts

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Millimeter wave (mmw) frequencies will provide the large bandwidth required for ultra-high-speed wireless communications with 100 Gbps and beyond. The enormous technological progress accomplished over the last decades facilitates the utilization of mmw frequencies for mass products like automotive radars, industrial/medical sensors and high-speed data communication links. The main enablers are the semiconductor technologies with constantly improving cut-off frequencies reaching several hundred GHz. The dominant limiting factor though for the mass production of low-cost mmw systems above 100 GHz is that, suitable packaging technologies are not yet finally available. The major issue for the packaging is to find a proper way to get all signals in and out of the package, since at mmw frequencies interconnects are very difficult to realize and very lossy. One way out of the dilemma is to integrate the complete transceiver together with the antenna into one single package. Compactness is the key to low losses in mmw interconnects. This also means, that the antenna must be integrated into the package. The second major limiting factor for mmw wireless communication is the link budget, which decreases with frequency squared. To compensate the effect high gain antennas and power combining is required. In this talk, a short overview on technologies and system concepts for ultra-high-speed wireless communication is given. The focus will be on packaging and antenna integration concepts for mmw transceivers followed by some examples.