

Closing the THz Gap? - The Way of SiGe towards higher Frequencies

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Abstract

The "THz gap" has long represented a boundary for silicon-based electronics, but modern Silicon-Germanium (SiGe) technologies are rapidly pushing the limits of high-frequency operation. This talk explores the potential of advanced SiGe platforms to bridge this gap by achieving Terahertz operation frequencies and extremely wide bandwidths, directly enabling next-generation, high-resolution radar. Beyond raw frequency scaling, the presentation addresses how advanced functionality is realized through the integration of multiple channels and novel features like clutter-free harmonic radar localization. To illustrate this path, the potential at the circuit level will be motivated and key highlighted circuits will be discussed. Finally, crucial system design aspects will be considered, culminating in system-level results that demonstrate radar applications achieving unprecedented resolution and range measurement precision.