Design Service

IHP offers full-custom circuit design service for mm-wave and sub-THz sensor circuits and systems. According to your individual needs, we design RF sensing circuits or use available design IPs to fulfill your technical requirements. All designs are manufactured at IHP.

Technical Requirements

Feasibility Study

Individual IC Design

Fabrication

- Modular and scalable multi-band (60-500 GHz) transceiver designs in IHP's 0.13 µm SiGe BiCMOS technologies
- Highly-integrated radar transceivers with integer-N/fractional-N PLLs
- Multi-channel transceivers for phased-array and MIMO radar applications
- Highly miniaturized radar sensors with on-chip antennas
- High-performance on-chip antenna arrays

We design your circuits based on available IPs in IHP's technologies!

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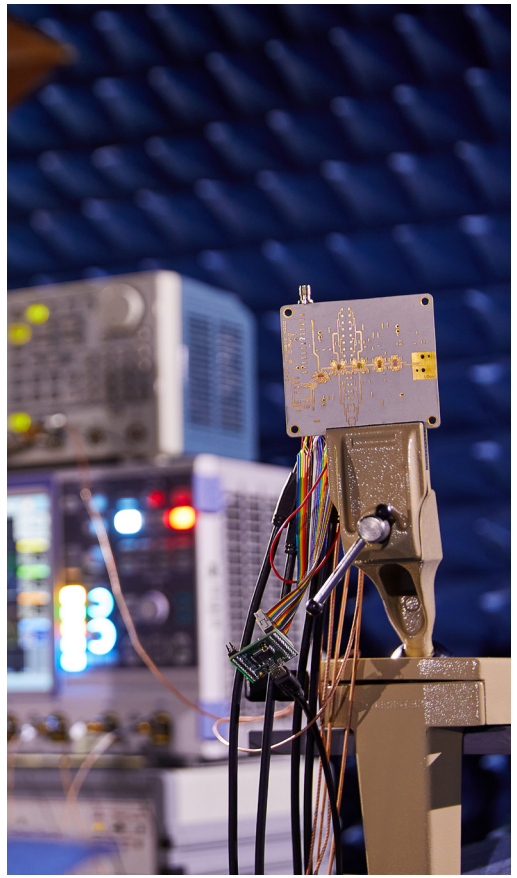
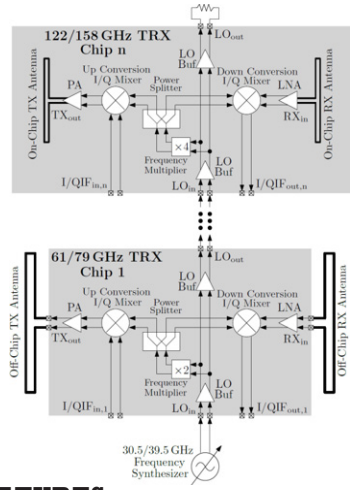
08/2025

Radar Sensors

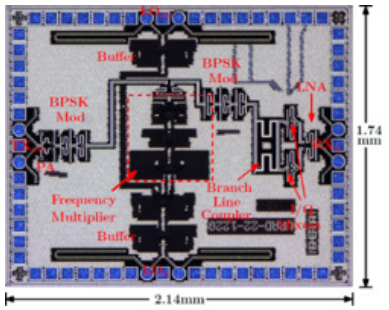


Scalable Multi-Band Transceivers

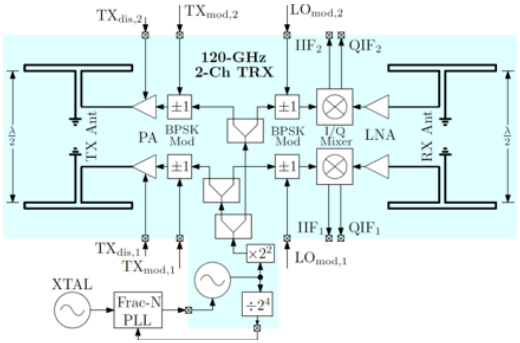


FEATURES

- Multi-purpose multi-band fully-differential transceivers for MIMO radar applications
- 61/79 GHz transceivers for high-dynamic range applications and 122/158 GHz transceivers for high-resolution applications
- Frequency multipliers scale 30.5/39.5 GHz LO signal to 61/79 GHz as well as 122/158 GHz
- Transceivers equipped with BPSK or vector modulators, PA, LNA, I/Q mixers
- Transceivers can be cascaded to build a daisy chain with flexible number of MIMO channels

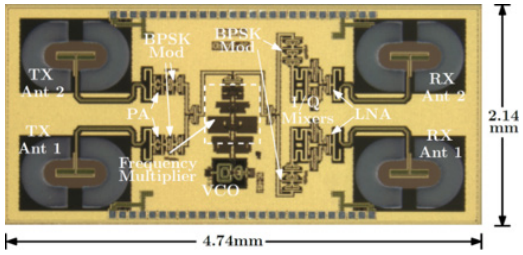


Fully-Integrated Multi-Channel Radar Transceiver With On-Chip Antennas

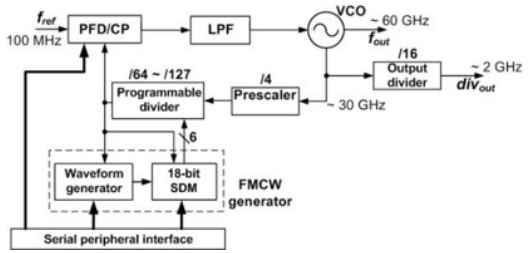


FEATURES

- MIMO radar transceiver for measurements of distance and relative angle of objects
- Efficient on-chip folded dipole antennas using localized backside etching technique
- Integrated LO signal generation unit consisting of VCO, prescaler and frequency multiplier
- Integrated BPSK modulators in TX and RX
- Integrated power amplifiers and I/Q receivers



Fractional-N PLL-based Frequency Synthesizer with Ramp Generation



FEATURES

- Multi-rate chirp generator for FMCW radar
- SPI interface for programming chirp generator
- Sigma-delta modulator with 18-bit resolution
- Push-push VCO
- Prescaler and programmable divider
- Phase-frequency detector and current steering charge-pump