



## DESIGN SERVICE

IHP offers full-custom circuit design service for high-speed fiber optics systems. According to your individual needs, we design electro-optical 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 transceiver design in IHP's 0.13  $\mu\text{m}$  SiGe BiCMOS technology
- Highly-integrated radar transceivers with mixed-signal fractional-N PLL
- Multi-channel transceivers for phased-array and MIMO radar applications
- Highly miniaturized radar sensor with on-chip antennas
- High-performance on-chip antenna arrays

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



IHP – Leibniz- Institute for  
High Performance Microelectronics

Im Technologiepark 25  
15236 Frankfurt (Oder)

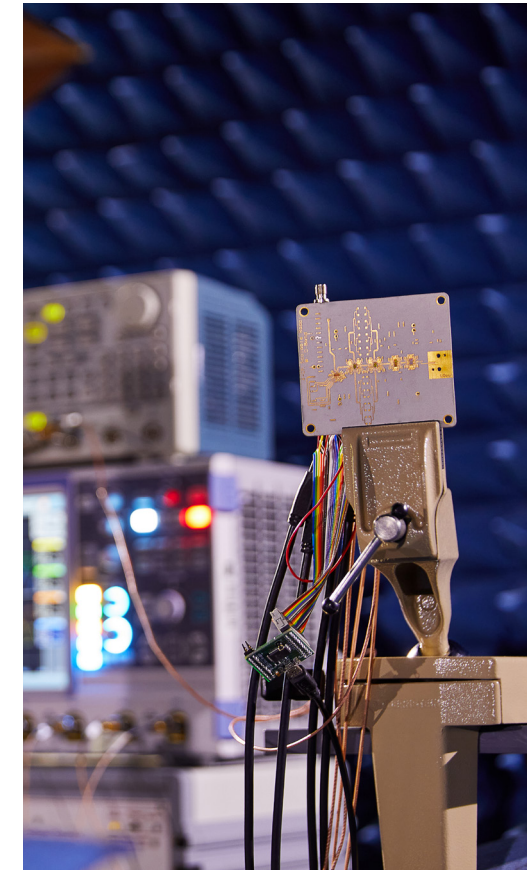
[www.ihp-microelectronics.com](http://www.ihp-microelectronics.com),  
[ihp@ihp-microelectronics.com](mailto:ihp@ihp-microelectronics.com)

Contact:  
Dr. René Scholz  
[scholz@ihp-microelectronics.com](mailto:scholz@ihp-microelectronics.com)

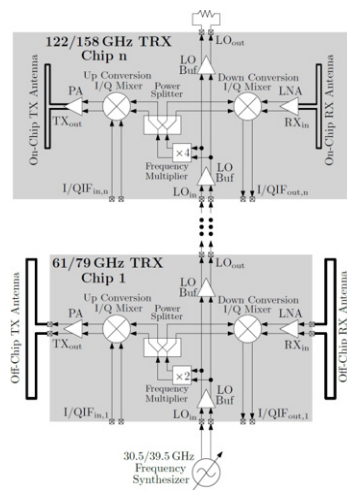


03/2023

## Radar Sensors

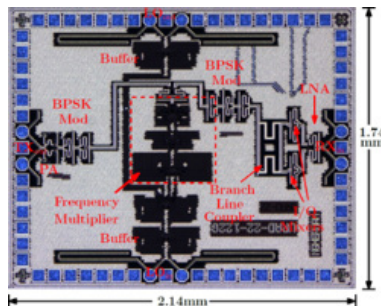


## Scalable Multi-Band Transceivers

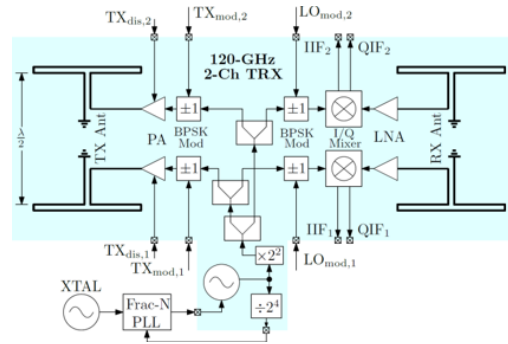


### FEATURES

- 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

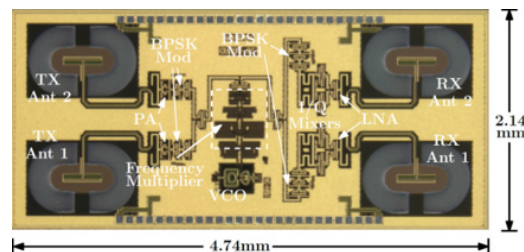


## Fully-Integrated Multi-Channel Radar Transceiver With On-Chip Antennas

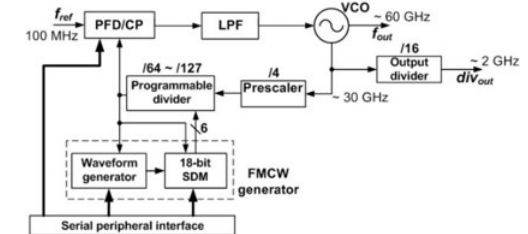


### FEATURES

- 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



## Mixed-Signal Fractional-NPLL - 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

