

B2: MMIC Design and Characterization for Electronic THz Frontends

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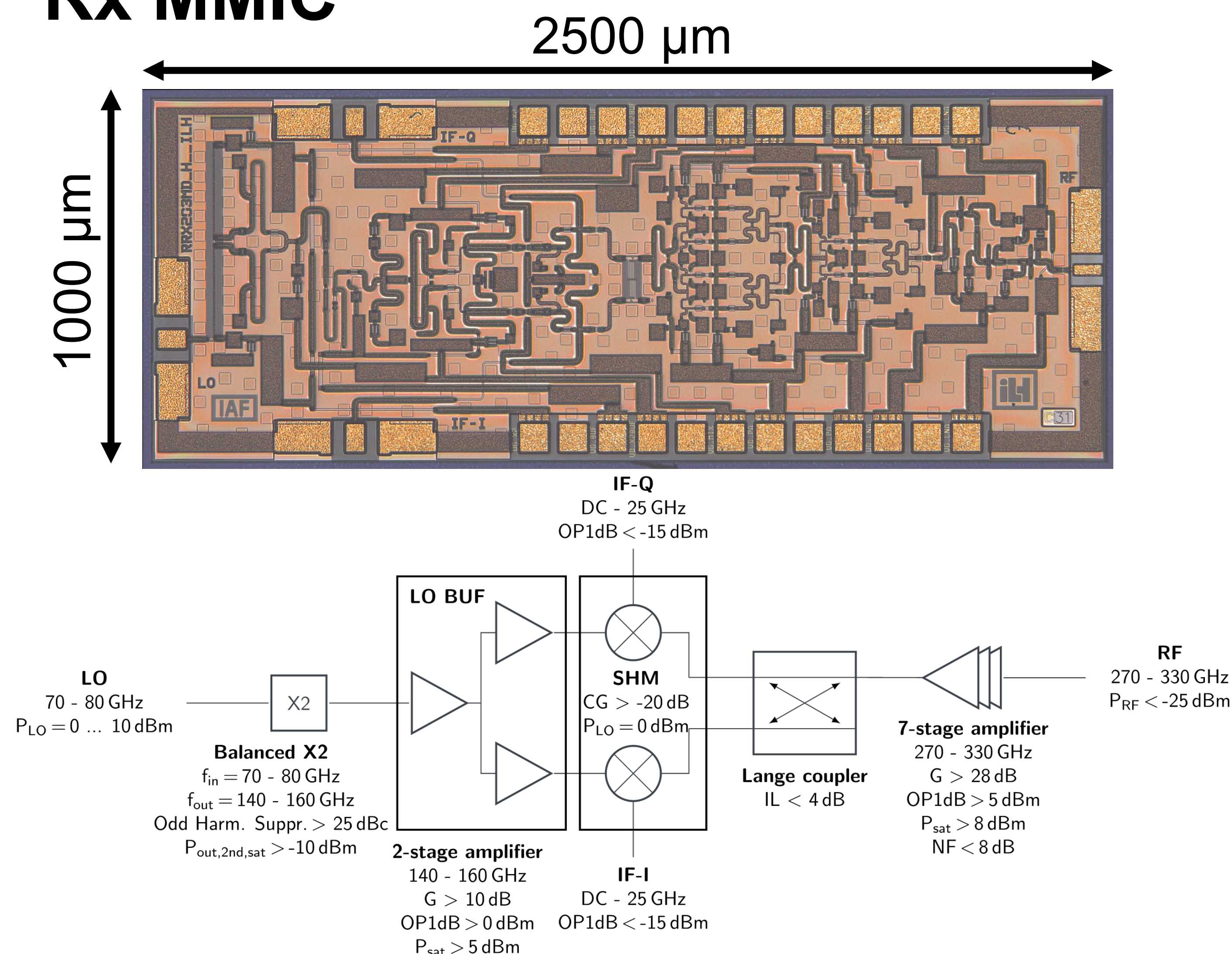
Intro: Traceable THz Transceivers Impairments

- Specific transceiver chipset has been developed
- Adaption of the design and simulation workflow accounting for changes in the BEOL
- Fully integrated Tx / Rx MMICs
- Top-down design approach

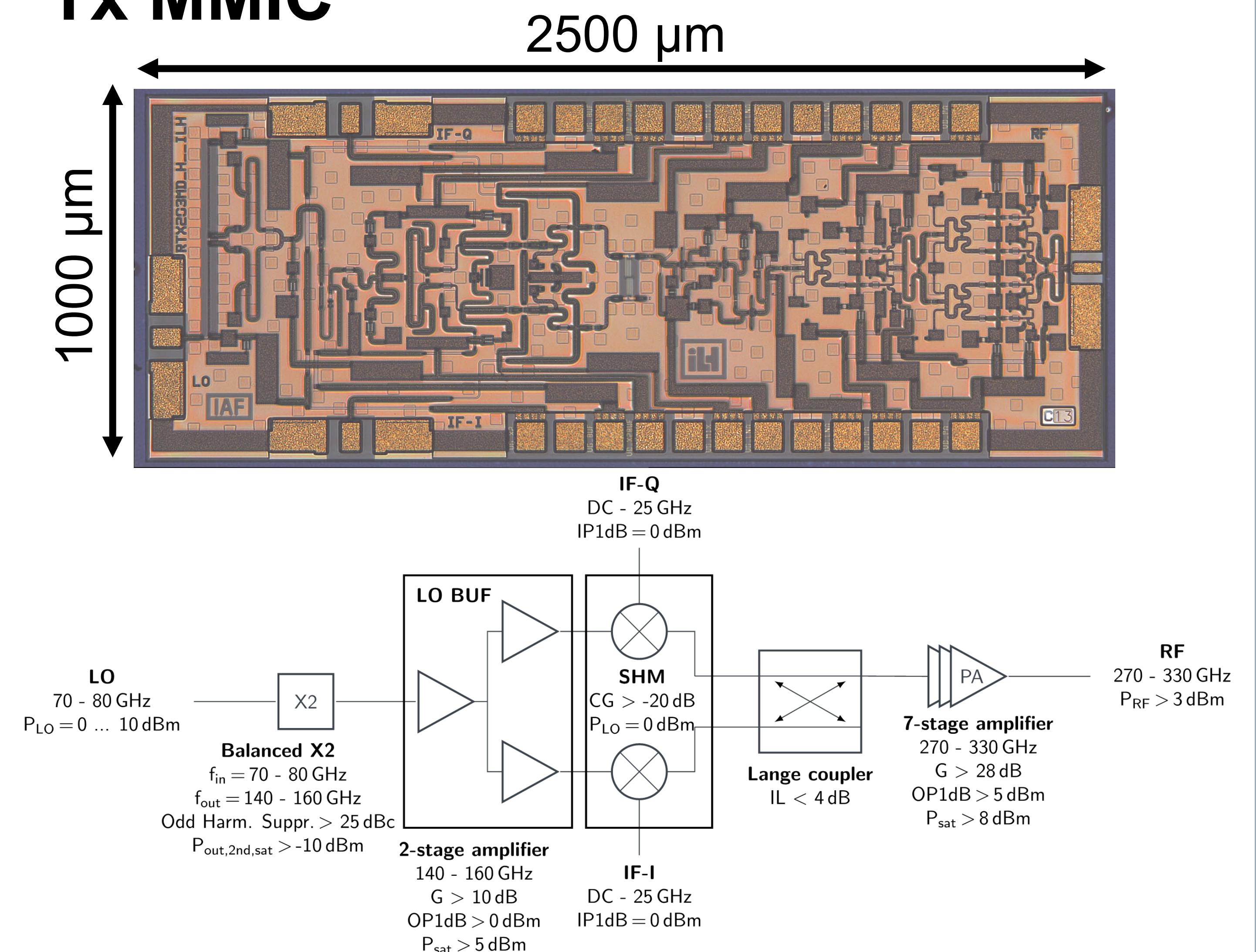
Circuit Design

- Homodyne concept
- LO generation on-chip: balanced frequency multiplier by 2 with class B gain cell + active power divider as LO buffer
- Mixer core: resistive subharmonic IQ
- Advanced 35nm InGaAs mHEMT Technology provide by **Fraunhofer IAF**

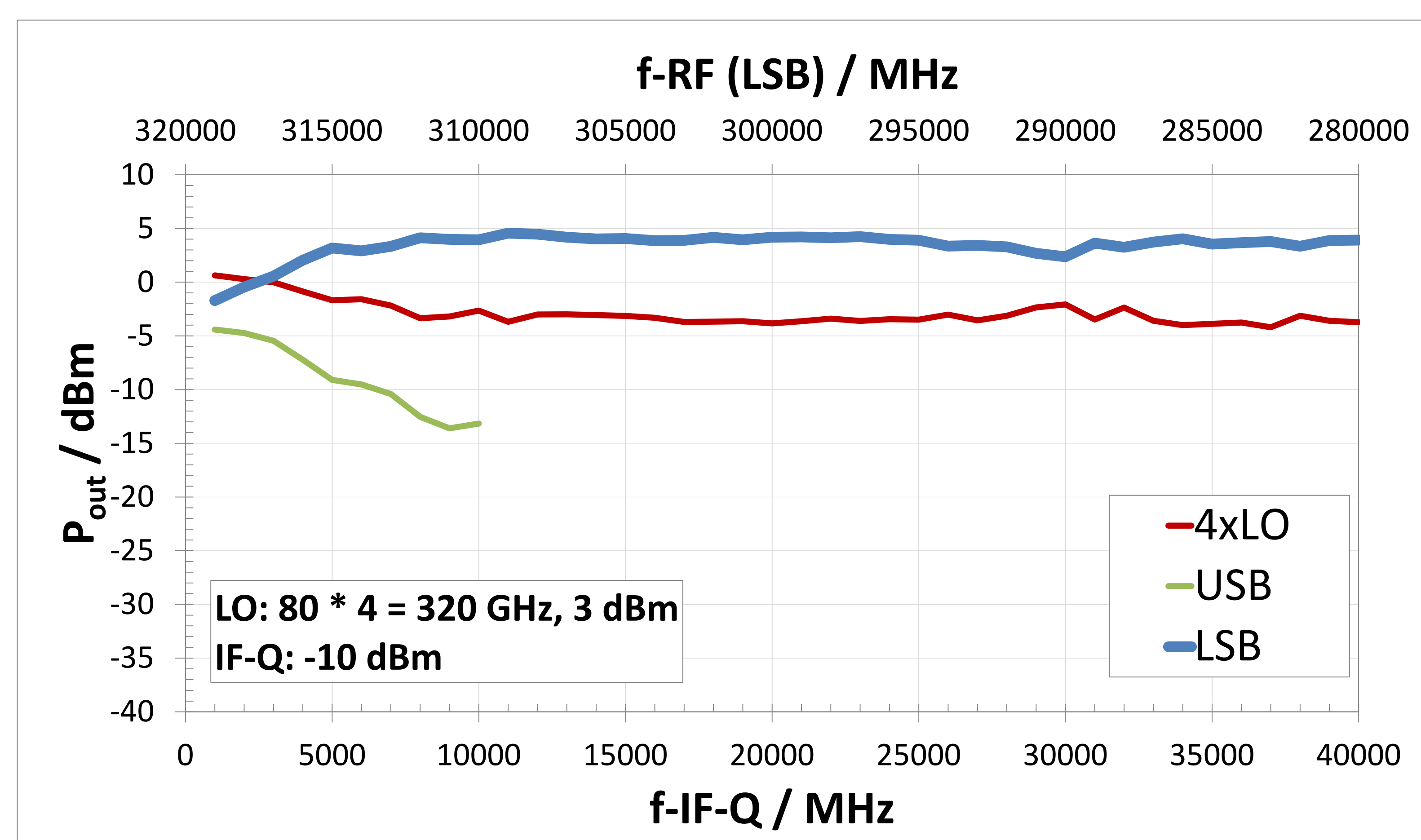
Rx MMIC



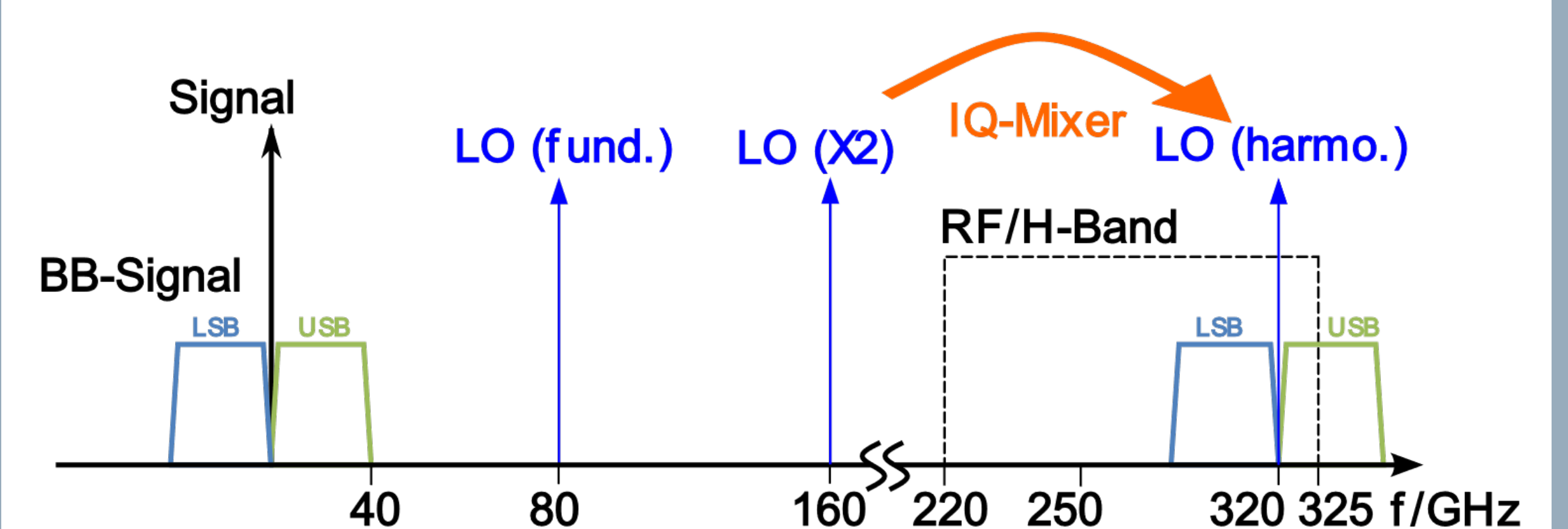
Tx MMIC



First On-Wafer Results



Frequency Plan



- LO tuning range: 70 ... 80 GHz
- $\rightarrow$ LO@RF 280 ... 320 GHz
- $P_{sat} = \sim 8 \text{ dBm}$
- IF-BW = 40 GHz