

Aleksandar N. Vuković

DESIGN ENGINEER · ANALOG RF/MMWAVE IC

Belgrade, Republic of Serbia

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Education

School of Electrical Engineering, University of Belgrade

M.Sc. IN COMPUTER SCIENCE AND ENGINEERING

- Master's thesis: All-digital RF Transceiver Based on Parallel and Approximative DSM

Belgrade, Serbia

Oct 2018 - Sep 2021

School of Electrical Engineering, University of Belgrade

B.Sc. IN COMPUTER SCIENCE AND ENGINEERING

- Bachelor's thesis: 1 GHz Low Noise Phase-Frequency Detector and Charge Pump

Belgrade, Serbia

Oct 2014 - Sep 2018

Skills

Programming languages/scripting	C/C++, Python, TeX, *nix shell
NI AWR Design Environment	Microwave Office
Cadence Custom IC	Virtuoso Platform, schematic entry, custom layout, physical verification, extraction
Cadence Spectre X	Simulator, RF Option, APS
Cadence EM simulator	EMX Planar 3D Solver
Mentor Graphics	Calibre IC Verification: nmDRC, nmLVS, xRC
Keysight PathWave Design	Momentum
Operating systems	GNU/Linux, Microsoft Windows
Languages	Serbian, English

Projects

Colpitts class B Voltage Controlled Oscillator (6-8 GHz)

IHP SiGE 130 NM BiCMOS TECHNOLOGY

- Cascode class B, resistive biasing for low noise
- Robust amplitude control for VCO output
- Simulating residual phase noise for PLL as closed loop using verilogA VCO model

PLL

Oct 2023 - Nov 2024

Flash Analog Digital Converter

TSMC 40 NM LP CMOS TECHNOLOGY

- Redesign of 250 MS/s ADC to have higher supply voltage
- Verification of ADC and comparator redesign, Monte Carlo ENOB
- LDO transient simulations, under current load

Ethernet IEEE 802.3

Jun 2023 - Sep 2023

LC Class C Voltage Controlled Oscillator (6.3 - 13.7 GHz)

TSMC 40 NM CMOS TECHNOLOGY

- Improving phase noise and frequency pushing. Consists of two cores to cover the LO range
- Gate voltage control feedback ensuring oscillation start up and class C operation

LO block VCO

Sep 2022 - Dec 2022

Ku-band 4 Output Active Power Divider (APD)

TSMC 55 NM TECHNOLOGY

- Design of both one-stage and two-stage APDs and comparison on schematic level
- Simulated as part of transmitter chain's LO distribution for isolation between outputs
- KuKa-band One Input Two Output Balun for LO Mixer Ku and Ka inputs
- Parts of passive layout structures simulated using both EMX and ADS simulators

Ku and Ka band TX - LO distribution

May 2021 - Apr 2022

All-digital RF Transceiver Based on Parallel and Approximative DSM

PYTHON SCRIPTS

- Behaviour and application of parallel and approximative DSMs is tested using python language
- Parallel and approximative DSMs can generate RF signals on significantly higher frequencies comparing to the conventional DSM, with minimal signal degradation
- All-digital transceivers, delta-sigma modulation (DSM)

All-Digital Delta-Sigma Modulators

Jun 2021 - Oct 2021

Active-RC Filter and its Operational Amplifier

TSMC 55 NM TECHNOLOGY

Ku and Ka band TX - Low Pass Filter

Dec 2020 - May 2021

- Design of High Unity Gain-Bandwidth Operational Amplifier on schematic level
- Simulating different operational amplifiers in active-RC filter topologies like Rauch and Ackerberg-Mossberg with bandwidth of 250 MHz
- Comparison of different topologies in noise performance and limitations of the finality of uGBW

8 GHz Low Noise Phase Frequency Detector based on Gilbert cell

IHP SiGe 130 NM BiCMOS TECHNOLOGY

Phase Detector

Aug 2020 - Sep 2020

- Simulation of different Gilbert cell based Phase Detectors and different frequency locking techniques on schematic level

57 - 64 GHz Voltage Controlled Oscillator

IBM (GF) SiGe 130 NM BiCMOS TECHNOLOGY

Radar

Dec 2019 - Mar 2020

- Schematic ported from IHP SiGe 130 nm technology and layout redesigned
- Parts of design (matching networks) EM simulated using ADS Momentum

57 - 64 GHz Active Power Divider

IBM (GF) SiGe 130 NM BiCMOS TECHNOLOGY

Radar

Apr 2019 - Nov 2019

- Schematic ported from IHP SiGe 130 nm technology and layout redesigned
- Parts of design (matching networks) EM simulated using ADS Momentum

28 GHz Active Phase Shifter - Vector Modulator

IHP SiGe 130 NM BiCMOS TECHNOLOGY

School project

Jan 2019 - Jun 2019

- Band around 28 GHz (from 26.5 GHz to 29.5 GHz) and controlled by 8-bit ADC simulated on schematic level in Cadence Virtuoso
- Parts of design (all-pass filter, matching networks) EM simulated using ADS Momentum

1 GHz Low Noise Phase-Frequency Detector and Charge Pump

IHP 130 NM BiCMOS TECHNOLOGY

PLL block

May 2018 - Nov 2018

- Schematic and layout design in Cadence Virtuoso
- Post-Layout verification using ADE L and ADE XL on a QRC extracted model

Phase-Frequency detector, CP and Divider as blocks of MDLL

TSMC CMOS I THINK

Multiplying Delay Locked Loop

Oct 2018 - Dec 2018

- Schematic and layout redesign of PFD, CP, divider with surrounding circuits

High Gain Operational Transconductance Amplifier

IHP 130 NM BiCMOS TECHNOLOGY

OTA

Mar 2018 - May 2018

- Schematic and layout design in Cadence Virtuoso
- Post-Layout verification using ADE L and ADE XL on a QRC extracted model

Small Signal GSM 1800 MHz Amplifier

MICROSTRIP TECHNOLOGY

Wi-Fi Band Amplifier

Dec 2017 - Jan 2018

- Schematic design using Microwave office
- Layout design using Altium Designer
- Verification via measurement

Custom IC layout for the Configurable IIR Filter

TSMC 180 NM TECHNOLOGY

Digital Circuitry

Mar 2017 - May 2017

- Schematic and layout design in Cadence Virtuoso
- Post-Layout verification using ADE L and ADE XL on a QRC extracted model

Work Experience

Novelic

JUNIOR DESIGN ENGINEER

Belgrade, Serbia

February 2018 - 2021

- First year internship, schematic design, verification, custom layout and post-layout verification
- Internal projects, feasibility studies, commercial projects, analog IC design at first, RF/mmwave design later

Nirsén

DESIGN ENGINEER

Belgrade, Serbia

2021 - PRESENT

- Mostly commercial projects both analog IC and RF/mmwave design as presented in experience section