

Module: RF Amplifier and RF Buffer (used as a wireless RX Input driver)

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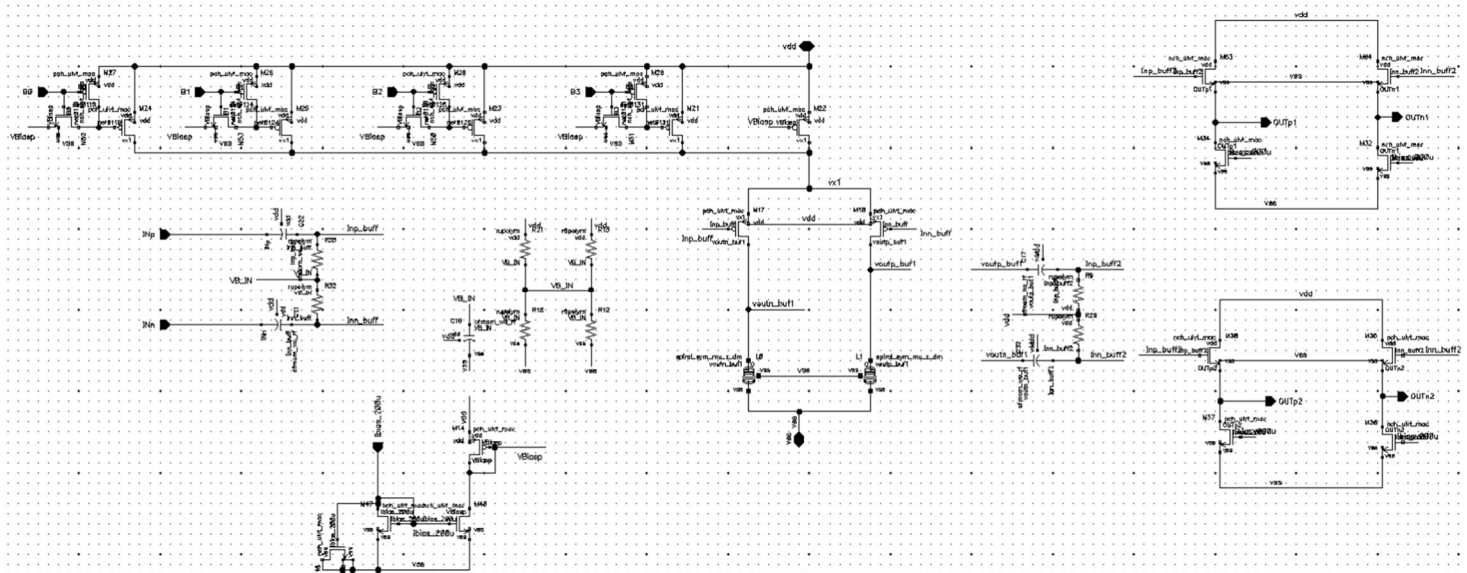
Module Description: A Common Source RF Amplifier with an Inductive Load and followed by a source follower RF buffer.

Top Cell Name: INPUT_BUFFER_parameterized

Technology: TSMC 28nm CMOS

PINS:	
vdd	Supply Voltage
Vss	ground
INp	Input voltage node
Inn	Output voltage node
B0	Current setting bit 0
B1	Current setting bit 1
B2	Current setting bit 2
B3	Current setting bit 3
Ibias_200u	Bias current
OUTP1	Positive output of the first branch
OUTN1	Negative output of the first branch
OUTP2	Positive output of the second branch
OUTN2	Negative output of the second branch

Schematic figures:



Testbenches: RFAMP.scs

Parameters:

Parameters	Symbols
pMOS transistors number of fingers of the Amplifier	W _{pmos_in}
Inner Radius of the Inductors	L_Radius
nMOS transistors number of fingers of the buffer	W _{nmos_follower}

Metrics:

Metrics	Symbols
Gain (dB)	Gain
Center Frequency (Hz)	center_freq
Power consumption (mW)	Power(mW)

Neural Network Model:

The H5 file: RFAMP_model.h5

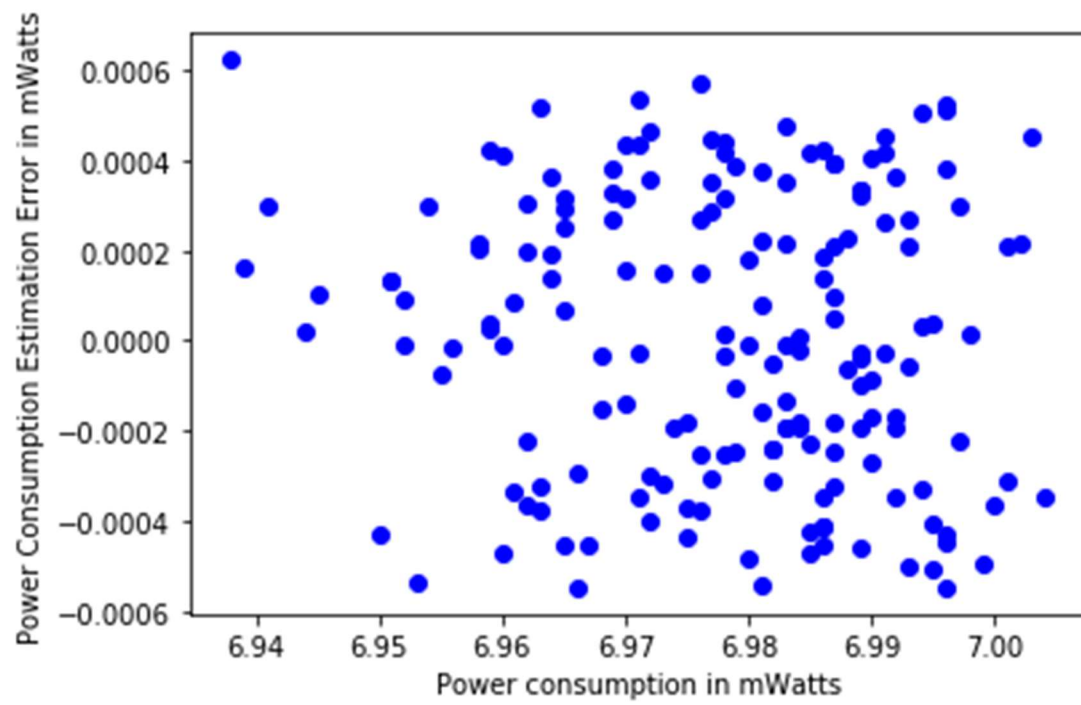
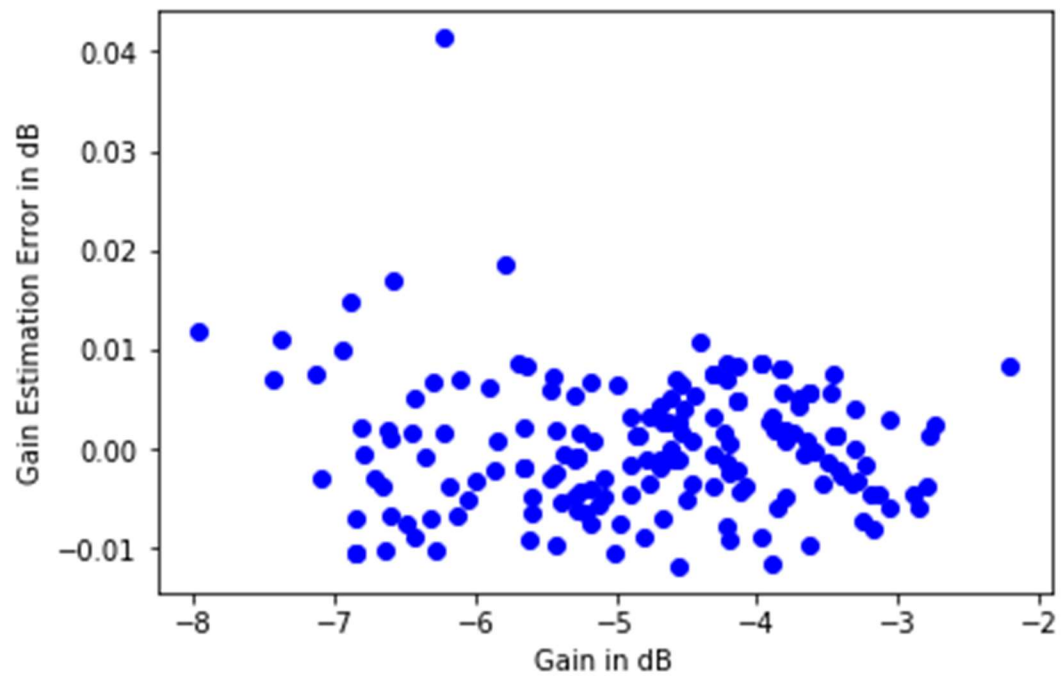
The Json File: RFAMP.json

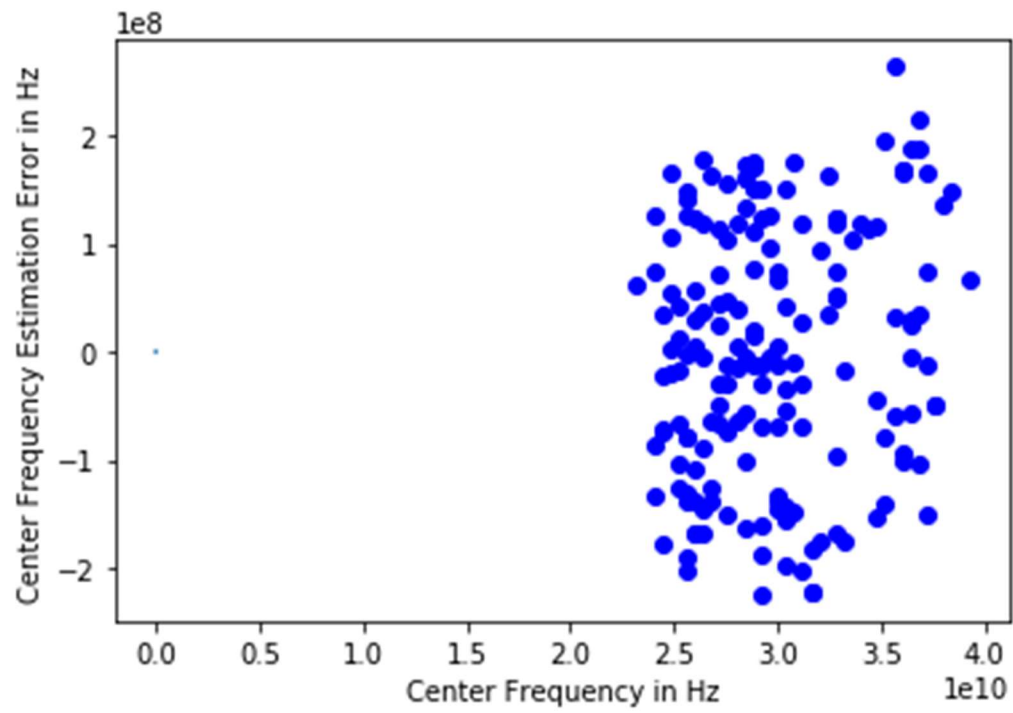
The Input Normalization File: scX_RFAMP.pkl, scY_RFAMP.pkl

The input characterization range of the Model:

Design parameters	
W _{pmos_in}	[25, 35]
L_Radius	[10μm, 20μm]
W _{nmos_follower}	[10, 20]

The error range of the Model:





- The loss value: 4.7613×10^{-4}
- The Final Run accuracy: 98.97%