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1.3.3 Percentage of students undertaking project work/field work/internship (Data for the latest completed academic year)

Dept: M.E -VLSI **Academic Year: 2019-2020**

Sl.No	Description	Page No
1	Project Work Details	1- 4

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25GHz-32.5GHz WIDEBAND TUNABLE BANDPASS LNA FOR mmWAVE 5G IC's AT TSMC 65nm

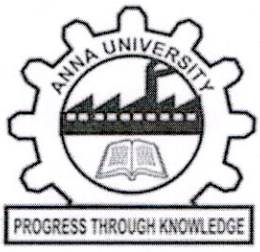
PHASE 2 REPORT

Submitted by

ROJINI PREETHA .M

in partial fulfillment for the award of degree of

MASTER OF ENGINEERING IN
VLSI DESIGN ENGINEERING



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BONAFIDE CERTIFICATE

Certified that this Report titled "**FR1 5G BAND SUB-6GHZ LNA USING INDUCTIVE PEAKING LOAD TECHNIQUE AT TSMC 65NM PROCESS**" is the bonafide work of **ROJINI PREETHA M(812418419002)** who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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INTERNAL EXAMINER 21/11/19

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ABSTRACT

In this thesis reports a wideband low noise amplifier (LNA) for 5G millimeter wave communication cells. The proposed LNA topology construct as of differential ended single stage Common source degenerated with cross-coupled band pass tunable cascade architecture. With the help of cross-coupled band-pass tunable cascade technique proposed LNA has delivered the wideband coverage from 25GHz to 32.5GHz band of amplification dc gain up S21 is 14.3db with input return loss of 10.3db at resonance frequency band. Noise Figure of 3.5db, stability(kf) is 1.7 >1; B1f(0.86) <1; VSWR is 1.8 @25Ghz and Power Consumption of 51uW. Here for unbalanced differential ended input stage has been taken care with balun circuitry which convert unbalanced signal to balanced signal. Sometimes, they also perform the resistance transformation part of the circuit. Thus the Proposed LNA design is a not compromise among power, noise, linearity, gain, stability, input and output matching, and dynamic range among over exisiting mmwave Wideband LNA.

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CHAPTER 6

CONCLUSION

The Proposed Design of mmwave LNA for 5G based Transceiver will deliver wideband of coverage application applicable in near future automation industry (i.e Automotive Radar) . The proposed LNA topology construct as of differential ended single stage Common source degenerated with cross-coupled band pass tunable cascade architecture. With the help of cross-coupled band-pass tunable cascade technique proposed LNA has delivered the wideband coverage from 25GHz to 32.5GHz band of amplification dc gain of 14.3 db, input return loss of 10.3db, noise figure of 3.5db at 32GHz, minimum VSWR of 1.8 at 25GHz , unconditionally provide stability factor of Bf is 0.86<1 at 25 GHz resonant frequency and kf of 1.7 >1 at 25GHz resonant and total power consumption of 51uw. Here for unbalanced differential ended input stage has been taken care with balun circuitry which convert unbalanced signal to balanced signal. Sometimes, they also perform the resistance transformation part of the circuit. Thus the Proposed LNA design is a not compromise among power, noise, linearity, gain, stability, input and output matching, and dynamic range among over existing mmwavewidebandLNA.