Hardware Implementation of RB Processing for 5G NR Transmitter

A Project Report

submitted by

SANGMESHWAR MANGRULE

in partial fulfilment of the requirements

for the award of the degree of

MASTER OF TECHNOLOGY



DEPARTMENT OF ELECTRICAL ENGINEERING INDIAN INSTITUTE OF TECHNOLOGY MADRAS. MAY 2019

THESIS CERTIFICATE

This is to certify that the thesis titled Hardware Implementation of RB Processing for

5G NR Transmitter, submitted by **Sangmeshwar Mangrule**, to the Indian Institute of

Technology, Madras, for the award of the degree of Master of Technology, is a bona

fide record of the research work done by him under our supervision. The contents of

this thesis, in full or in parts, have not been submitted to any other Institute or University

for the award of any degree or diploma.

Dr. Nitin Chandrachoodan

Project Guide Associate Professor Dept. of Electrical Engineering IIT-Madras, 600 036 Dr. Radha Krishna Ganti

Project Guide Associate Professor Dept. of Electrical Engineering IIT-Madras, 600 036

Place: Chennai

Date: 5th May 2019

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude towards several people who enabled me to reach this far with their timely guidance, support and motivation.

First and foremost, I offer my earnest gratitude to my guide, **Dr. Nitin Chandrac-hoodan** whose knowledge and dedication has inspired me to work efficiently on the project and we thank him for motivating me, allowing me freedom and flexibility while working on the project.

I would like to thank my co-guide **Dr. Radha Krishna Ganti** who has guided me throughout the project.

REFERENCES

- [1] 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; NR; Physical channels and modulation (Release 15) (3GPP TS 38.211 V15.1.0 (2018-03)).
- [2] Xilinx, Vivado Design Suite User Guide High-Level Synthesis (UG902). Xilinx (v2018.1) User Guide, 2018.
- [3] Xilinx, Vivado Design Suite User Guide Implementation (UG904). Xilinx (v2018.1) User Guide, 2018.
- [4] LogiCORE IP Fast Fourier Transform Product Guide (PG109).