ABSTRACT

Long Term Evolution (LTE) is a technology that has been released by

3GPP with the ability to achieve data transmission speeds of 100 Mbit / s for

downlink and 50 Mbit / s for uplink. LTE technology is designed to provide better

spectrum efficiency, increased radio capacity, latency and low operating costs for

operators as well as mobile wireless broadband services of high quality to users.

LTE is intended as a comprehensive network solutions and secure communication

with data rates much higher. For the needs of data rate and high throughput on

LTE, the most suitable coding technique is turbo coding. The advantages of Turbo

Code is the minimum power usage at each modulation that allows the

transmission of signals with very low power levels.

Based on the above explanation, it is in this final project to design a

prototype Turbo Code decoder circuit that used in LTE technology using software

Xilinx ISE Design Suite 14.5 with the coding language VHSIC Hardware

Description Language (VHDL) and then be implemented on a Field

Programmable Gate Array (FPGA) board ATLYS Spartan-6 XC6SLX45

CSG324C.

From the results indicated that the design of a prototype implementation of

Turbo Decoder can be done on board ATLYS Spartan-6 XC6SLX45 CSG324C.

The results indicate the implementation of resource usage by 23% on the FPGA

board. This results in a system prototype with a minimum period of 19.662 ns and

frequency of work under the working frequency of the Spartan-6 FPGA, namely

50.963 MHz.

Key Words: LTE, 3GPP, Turbo Code, FPGA

PERANCANGAN DAN IMPLEMENTASI TURBO DECODER PADA TEKNOLOGI LONG TERM EVOLUTION (LTE) BERBASIS FIELD PROGRAMMABLE GATE ARRAY (FPGA)