ABSTRACT

In digital communication system, coding technique is used to get the power efficiency and modulation technique is used to get the bandwidth efficiency. However, the usage of coding technique is causing the redudant bit so it need larger bandwidth. The usage of modulation technique such as M-ary Phase Shift Keying (MPSK) can increase the bandwidth efficiency but reduce the power efficiency.

In consequence, the method which can solve the bandwidth efficiency and power efficiency is needed. Modulation technique which combines coding technique

and modulation technique is 4-QAM and 16-QAM. In this final project, system is combined with the diversity technique on receiver for the purpose of increasing the performance of wireless communication system. From the simulation results can be found that 4-QAM system which is combined with MRC diversity technique on receiver gives diversitas gain in 17 up to 27 dB over AWGN and 4-QAM system which is combined with SC diversity technique on receiver gives diversitas gain in 13 up to 22 dB over AWGN channel. While 16-QAM system which is combined with MRC diversity technique on receiver gives diversitas gain in 16,25 up 26 over AWGN and 16-QAM system which is combined with SC diversity technique on receiver gives diversitas gain in 15 up to 22 dB over AWGN channel.

4-QAM system which is combined MRC diversity technique over multipath fading channel with V=3 km/h up to V= 120 km/h gives diversitas gain in 17.5 up to 29 dB. Beside that system 16-QAM gives diversitas gain in 14,5 up to 25 dB. System 4-QAM which is combined SC diversity technique over multipath fading channel with V=3 km/h up to V= 120 km/h gives diversitas gain in 13.5 up to 23 dB. Beside that system 16-QAM gives diversitas gain in 13 up to 22.5 dB.

Also from the simulation result can be found that 4-QAM and 16-QAM system using MRC diversity can tolerance the phase error with variance about 0 up to 15°.