ABSTRACT

OFDM (Orthogonal Frequency Division Multiplexing) is a multicarrier modulation technology that support for high data rate by using an efficient bandwidth occupation. OFDM has been widely adopted in many standards of wireless communication both in America or Europe, such as *European Telecommunication Standard Institute* (ETSI) for DVB, *Institute of Electrical and Electronics Engineers* (IEEE) for WiFi dan WiMax, and also *Third Generation Partnership Project* (3GPP) for LTE.

The main disadvantages that occur in OFDM system is sensitivity to Intercarrier Interference (ICI). It is happen when subcarrier suffer an interference from other causing by frequency offset between transmitter and receiver. The significant frequency offset will destroy orthogonality of each subcarrier that leads to interference between them.

An efficient ICI self cancellation introduced to mitigate the effect of ICI by deploying a redundancy of two subcarrier for each PSK or QAM symbol. Both of this subcarrier will be subtracted each other in receiver so the interference that suffer by both of them can be cancelled each other (self cancellation). But the main disadvantages of this method is reducing in capacity because of subcarrier redundancy.

From the result of the simulation shows that OFDM with ICI self cancellation's performance is better than conventional OFDM. For Eb/No equal to 14 dB, OFDM with ICI self cancellation able to achieve bit error rate (BER) 10^{-6}, whereas conventional OFDM can only achieve BER approximately 10^{-3}. It means that for the same Eb/No ICI self cancellation able to correct 999 bits from 10^{-6} bits that generated in conventional OFDM. Beside that ICI self cancellation is also give an reliable performance in any user's velocity and in any mapper.

Key words : OFDM, ICI, ICI *self cancellation*, BER.